The projected patent number and issue date are specified above.

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 224 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Jong Ho Kim, Seoul, KOREA, REPUBLIC OF;
Kwang Young Kim, Seoul, KOREA, REPUBLIC OF;
Chang Il Kim, Seoul, KOREA, REPUBLIC OF;
Byung Seok Hwang, Gyegonggi-do, KOREA, REPUBLIC OF;
Min Seok Kim, Seoul, KOREA, REPUBLIC OF;

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail or Fax

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
(571) 273-2855

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22429 7590 08/10/2012
LOWE HAUPERTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

APPLICATION NO. 12/678,050
FILING DATE 03/12/2010
FIRST NAMED INVENTOR Jong Ho Kim
ATTORNEY DOCKET NO. 4900-0037
CONFIRMATION NO. 4956

TITLE OF INVENTION: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

APPLN. TYPE nonprovisional
SMALL ENTITY NO
ISSUE FEE DUE $1770
PUBLICATION FEE DUE $300
PREV. PAID ISSUE FEE $0
TOTAL FEE(S) DUE $2070
DATE DUE 11/13/2012

EXAMINER YERNENI, MRUNALINI
ART UNIT 2617
CLASS-SUBCLASS 455-411000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
   - Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
   - "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47, Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list:
   - (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
   - (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

   Lowe Hauptman Ham & Berner, LLP

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
   PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

   (A) NAME OF ASSIGNEE
   SK PLANET CO., LTD
   (B) RESIDENCE: (CITY and STATE OR COUNTRY)
   Seoul , Republic of Korea

   Please check the appropriate assignee category or categories (will not be printed on the patent):  [ ] Individual  [X] Corporation or other private group entity  [ ] Government

4a. The following fee(s) are submitted:
   [X] Issue Fee
   [X] Publication Fee (No small entity discount permitted)
   [ ] Advance Order - # of Copies

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5. Change in Entity Status (from status indicated above)
   [ ] a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
   [ ] b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Yoon S. Ham/ Date 2012-10-12
Typed or printed name Yoon S. Ham
Registration No. 45307

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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PTOL-85 (Rev. 02/11) Approved for use through 08/31/2013.  OMB 0651-0033  U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
# Electronic Patent Application Fee Transmittal

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**Title of Invention:**
SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

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## U.S. National Stage under 35 USC 371 Filing Fees

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### Payment information:

- **Submitted with Payment**: yes
- **Payment Type**: Credit Card
- **Payment was successfully received in RAM**: $2070
- **RAM confirmation Number**: 4598
- **Deposit Account**: 071337
- **Authorized User**: HAM, YOON S

*The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)*
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Warnings:

Information:

Total Files Size (in bytes): 729868

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.
Notice of Allowability

<table>
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<th>Application No.</th>
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<td>12/678,050</td>
<td>KIM ET AL.</td>
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Examiner

NALINI YERNENI

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to AF 07/17/2012.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____:
   - the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1, 2, 5 and 6.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All   b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☒ Certified copies of the priority documents have been received in Application No. _____.
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE MAILING DATE of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER’S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as “replacement sheets”) must be submitted.
   (a) ☐ including changes required by the Notice of Draftperson’s Patent Drawing Review (PTO-948) attached
       1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner’s Amendment/Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner’s comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 05/17/2012, 12/22/2011
4. ☐ Examiner’s Comment Regarding Requirement for Deposit of Biological Material

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 07/30/2012
7. ☒ Examiner’s Amendment/Comment
8. ☒ Examiner’s Statement of Reasons for Allowance
9. ☐ Other _____

NALINI YERNENI
Examiner, Art Unit 2617

/Dwayne Bost/
Supervisory Patent Examiner, Art Unit 2617

U.S. Patent and Trademark Office
PTOL-37 (Rev. 03-11) Notice of Allowability Part of Paper No./Mail Date 20120726
NOTICE OF ALLOWANCE AND FEE(S) DUE

23420  7590  08/10/2012
LOWE HAUPTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

EXAMINER
YIRNENI, MRUNALINI

ART UNIT  PAPER NUMBER
2617

DATE MAILED: 08/10/2012

APPLICATION NO.  FILING DATE  FIRST NAMED INVENTOR  ATTORNEY DOCKET NO.  CONFIRMATION NO.
12/678,050  03/12/2010  Jong Ho Kim  4900-0037  4956

TITLE OF INVENTION: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

APPLN. TYPE  SMALL ENTITY  ISSUE FEE DUE  PUBLICATION FEE DUE  PREV. PAID ISSUE FEE  TOTAL FEE(S) DUE  DATE DUE
nonprovisional  NO  $1740  $300  $0  $2040  11/13/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:
A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:
A. Pay TOTAL FEE(S) DUE shown above, or
B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee’s responsibility to ensure timely payment of maintenance fees when due.
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Complete and send this form, together with applicable fee(s), to: Mail
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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
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(571) 273-2885

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

23420 7590 08/02/2012
LOWE HAUPTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

INFORMATION: Certificate of mailing or transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (371) 273-2885, on the date indicated below.

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(Date)

(Deposit's name)

(Signatures)

APPLICATION NO. FILING DATE FIRST NAMED INVENTOR ATTORNEY DOCKET NO. CONFIRMATION NO.
12/678,050 03/12/2010 Jong Ho Kim 4900-0037 4956

TITLE OF INVENTION: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

APPLN. TYPE SMALL ENTITY ISSUE FEE DUE PUBLICATION FEE DUE PREV. PAID ISSUE FEE TOTAL FEE(S) DUE DATE DUE
nonprovisional NO $1740 $300 $0 $2040 11/13/2012

EXAMINER ART UNIT CLASS-SUBCLASS
YERENENI, MRUNALINI 2617 455-411000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

Change of correspondence address (or Change of Correspondence Address form PATS/122) attached.

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

3. Change in Entity Status

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _________ (enclose a copy of this form).

4. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies

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5. The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _________ (enclose a copy of this form).
Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 224 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 224 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.
### Examiner-Initiated Interview Summary

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<td>NALINI YERNENI</td>
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<tr>
<td>Art Unit</td>
<td>2617</td>
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</table>

All participants (applicant, applicant’s representative, PTO personnel):

1. NALINI YERNENI.
2. Kien Le.

Date of Interview: **30 July 2012**

Type: [x] Telephonic  [ ] Video Conference  [ ] Personal [copy given to: ]

| Applicant | [ ] applicant  [ ] applicant’s representative |

Exhibit shown or demonstration conducted: [ ] Yes  [ ] No.

If Yes, brief description: ________.

Issues Discussed: [ ] 101  [ ] 112  [ ] 102  [x] 103  [ ] Others

(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: **1, 6 and 7**.

Identification of prior art discussed: **Guahk, Okkonen, Apsang**.

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

*Examiner advised the Attorney to bring up the dependent claims 3 and 4 with additional details from Par. 29-31 of the Specification to overcome the cited prior art for claim 1; since none of the references teach about checking for duplicate subscriber lines and preventing such usage. Similar changes to independent claim 6 as claim 1. Attorney consulted with the Applicant and obtained approval for the Examiner Amendment to include the subject matter. Further, the examiner explained the breadth of claim 7. It was agreed to cancel the claim.*

---

**Applicant recoradation instructions**: It is not necessary for applicant to provide a separate record of the substance of interview.

**Examiner recoradation instructions**: Examiners must summarize the substance of any interview of record. A complete and proper recoradation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recoradation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

[ ] Attachment

NALINI YERNENI

Examiner, Art Unit 2617
DETAILED ACTION

EXAMINER’S AMENDMENT

1. An examiner’s amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

   Authorization for this examiner’s amendment was given in a telephone interview with Kien Le on 07/31/2012.

2. The application has been amended as follows:

   The following changes have been made to the claims that are allowed:

   (Claims 3-4 and 7-9 are cancelled, Claims 1, 5 and 6 are amended).

   1. (Currently Amended) A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

      a mobile communication information management server for receiving unique information of the second terminal and USIM-based subscriber information corresponding to
stored in the first USIM card from the second terminal through a registration message, and for determining and notifying that there has been a device replacement when the unique information of the second terminal and the subscriber information do not coincide are different from each other;

a broadcast information management server for making a request of for modification of broadcast information related to the subscriber information upon receipt of the unique information of the second terminal and the subscriber information from the mobile communication information management server; and

a Conditional Access System (CAS) for transmitting, in response to the request for modification of broadcast information by the broadcast information management server,

to the second terminal, an Entitlement Management Message (EMM) with device change information that includes broadcast information to update information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server and

to the first terminal, an EMM that includes information necessary to delete or terminate subscriber information on the first broadcasting chip in response to a different USIM card mounted in the first terminal.

2. (Original) The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.
3. Cancelled.


5. (Currently Amended) The system as claimed in claim 1, wherein the CAS comprises:
   a database for storing and managing the broadcast information on each subscriber;
   a communication unit for communicating with the broadcast information management
   server and transmitting the device change information to the second terminal;
   a data analysis unit for analyzing both the unique information of the second terminal and
   the subscriber information provided by the broadcast information management server;
   a control unit for extracting the subscriber information and the unique information of the
   second terminal based on an analysis result of the data analysis unit, extracting broadcast
   information on of the first broadcasting chip corresponding to the subscriber information from
   the database, and then providing a message generation command based on the extracted
   broadcast information and the extracted unique information of the second terminal; and
   a message generation unit for generating the device change information in response to the
   message generation command from the control unit, and then providing the generated device
   change information to the communication unit for transmission to the second terminal.

6. (Currently Amended) A method of maintaining broadcast information regardless of
   device replacement when a first USIM card mounted in a first terminal having a first
broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal through a registration message, by a mobile communication information management server;

when the terminal information of the second terminal is different from terminal information corresponding to the subscriber information, determining that there has been a device replacement, and then providing the terminal information of the second terminal and the subscriber information to a broadcast information management server, by the mobile communication information management server;

transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request;

generating, by the CAS, an Entitlement Management Message (EMM) information based on the extracted broadcast information on the first broadcasting chip, and providing, by the CAS, the generated EMM information to the second terminal corresponding to the terminal information of the second terminal; and

updating, by the second terminal, the broadcast information included in the EMM information to of the second broadcasting chip according to the EMM; and
transmitting, by the CAS to the first terminal, an EMM that includes information necessary to delete or terminate subscriber information on the first broadcasting chip, in response to a different USIM card mounted in the first terminal.

7. Cancelled.

8. Cancelled.


3. The following is an examiner’s statement of reasons for allowance:


a. Guahk teaches a method of altering subscriber information on a terminal in a DVB environment using OOB channel as soon as the subscriber information is altered.

b. Okkonen teaches detecting SIM card changes in terminals and downloading required services to the terminals based on the SIM card currently inserted so that the subscriber experiences the same services available on the SIM card despite terminal changes.
c. Apsangi teaches a method to deactivate a provisioned device and add/delete/modify a CAS client image on a provisioned device in a Video on Demand/IPTV environment.

d. Lee discusses the offering of services based upon the movement of the subscriber identity module card among terminals.

e. Choi teaches a system which maintains IPPV usage history and service cancellation information, the CAS determines the total usage limit and sends ECM and EMM to the terminal so as to block illegal usage of the terminal by a user whose service has been temporarily revoked.

f. Yang teaches a method to authorize use of Smart Card in a DBS Receiver using a PIN to prevent fraudulent use.

g. Balestri provides a Universal Smart Card to receive streams from different Service Providers without needing to change Smart Cards.

The Prior Art references identified above alone or in combination do not disclose, teach or suggest directly or indirectly, the following limitations in combination with the other limitations of the claims as follows:

As recited by independent claims 1 and 6, the following actions done by the Conditional Access System:

- a Conditional Access System (CAS) for transmitting, in response to the request for modification of broadcast information by the broadcast information management server,
to the second terminal, an Entitlement Management Message (EMM)

with device change information that includes broadcast information to update information on
the second broadcasting chip of the second terminal to information on the first broadcasting chip
of the first terminal corresponding to the subscriber information, and

to the first terminal, an EMM that includes information necessary to
delete or terminate subscriber information on the first broadcasting chip in response to a
different USIM card mounted in the first terminal.

This method, according to the inventor, would prevent the duplicate use of a subscriber
line in two terminals at the same time; thus preventing fraudulent use of the subscriber lines.

Conclusion

Any comments considered necessary by applicant must be submitted no later than the
payment of the issue fee and, to avoid processing delays, should preferably accompany the issue
fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for
Allowance.”

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to NALINI YERNENI whose telephone number is (571)270-1647.
The examiner can normally be reached on Mon-Fri 9AM to 3PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s
supervisor, Dwayne Bost can be reached on (571)272-7023. The fax phone number for the
organization where this application or proceeding is assigned is 571-273-8300.
Information regarding the status of an application may be obtained from the Patent
Application Information Retrieval (PAIR) system. Status information for published applications
may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
applications is available through Private PAIR only. For more information about the PAIR
system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR
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like assistance from a USPTO Customer Service Representative or access to the automated
information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NALINI YERNENI/  /Dwayne Bost/
Examiner, Art Unit 2617 Supervisory Patent Examiner,
Art Unit 2617
**Notice of References Cited**

**U.S. PATENT DOCUMENTS**

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)

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(Not for submission under 37 CFR 1.99)

- **Application Number**: 12678050
- **Filing Date**: 2010-03-12
- **First Named Inventor**: Jong Ho KIM et al.
- **Art Unit**: [Blank]
- **Examiner Name**: [Blank]
- **Attorney Docket Number**: 4900-0037

#### U.S. PATENTS

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#### NON-PATENT LITERATURE DOCUMENTS

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.M./
**APPLICATION NUMBER**  
12678050

**FILING DATE**  
2010-03-12

**FIRST NAMED INVENTOR**  
Jong Ho KIM et al.

**ART UNIT**

**EXAMINER NAME**

**ATTORNEY DOCKET NUMBER**  
4900-0037

| 2 | Yang et al.; "The conditional access flow using subscriber smart card with Koreasat DBS receiver"; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pgs. 330-336. |  |

If you wish to add additional non-patent literature document citation information please click the Add button.

**EXAMINER SIGNATURE**

Examiner Signature: /Mrunalini Yerneni/  
Date Considered: 08/07/2012

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 See Kind Codes of USPTO Patent Documents at [www.USPTO.gov](http://www.USPTO.gov) or MPEP 901.04.  
2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3).  
3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.  
4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.  
5 Applicant is to place a check mark here if English language translation is attached.
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### NON-PATENT LITERATURE DOCUMENTS

Examiner Initial* | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |
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T₅: ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.M./
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<td>Yang et al.; &quot;The conditional access flow using subscriber smart card with Koreasat DBS receiver&quot;; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pgs. 330-336.</td>
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**EXAMINER SIGNATURE**

Examiner Signature: /Mrunalini Yermen/  
Date Considered: 05/10/2012

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2. Enter office that issued the document, by the two-letter code (WIPO Standard ST.3).  
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### Issue Classification

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NALINI YERNENI
Examiner, Art Unit 2617

07/31/2012

Total Claims Allowed: 4

O.G. Print Claim(s) 1
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### Information Disclosure Statement by Applicant

**Application Number:** 12678050  
**Filing Date:** 2010-03-12  
**First Named Inventor:** Jong Ho KIM et al.  
**Art Unit:**  
**Examiner Name:**  
**Attorney Docket Number:** 4900-0037

#### U.S. Patents

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#### Non-Patent Literature Documents

Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.

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All references considered except where lined through. /Y.M./
INFORMATION DISCLOSURE
STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number 12678050
Filing Date 2010-03-12
First Named Inventor Jong Ho KIM et al.
Art Unit
Examiner Name
Attorney Docket Number 4900-0037

2 Yang et al.; "The conditional access flow using subscriber smart card with Koreasat DBS receiver"; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pgs. 330-336.

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE
Examiner Signature /Mrunallini Yermen/ Date Considered 12/11/2011

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1 See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. 2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). 3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 5 Applicant is to place a check mark here if English language translation is attached.
## EAST Search History

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
Jong Ho KIM et al.
U.S. Patent Application No. 12/678,050
Filed: March 12, 2010

Confirmation No.: 4956
Group Art Unit: 2617
Examiner: YERNENI, MRUNALINI

For: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

AMENDMENT UNDER RULE 116

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The following amendments and remarks are submitted in response to the final Official Action mailed May 17, 2012.
The invention relates to a system and method for varying the terminal information of the client according to the terminal movement of the subscriber identity module card and managing.

To achieve the above object, the invention comprises the interface server for renewing the mobile phone information saved in the terminal information database: terminal information database which it manages it stores the mobile phone information of the customer relationship management system: subscriber managed it stores the caller identifier of the mobile radio communications network including the terminal certification system performing the authentication about IMEI storing IMEI of the mobile communications terminal, and is requested if the IMEI state check message is delivered through the mobile radio communications network, and IMSI, and the service administration number and service species and the push proxy gateway which confirms the URI information of the mobile communications terminal by using the push technique.

According to the invention, the subscriber identity module card is moved and subscriber uses the other mobile communications terminal. And yet, in case of the terminal number of the changed mobile communications terminal, and the terminal information grasp facilitating and offering service including the moving picture, the drawing, the music etc., the service optimized in the function of the mobile communications terminal can be offered.

Representative Drawing(s)

Fig. 2

Keyword(s)
The terminal information operation, smart card, WCDMA, USIM.

Description

Brief Explanation of the Drawing(s)

Figure 1 is a drawing showing the WCDMA terminal in which the subscriber identity module card is built in.

Figure 2 is a block diagram which briefly shows the terminal information changing system of client according to the subscriber identity module card movement according to the working example of the present invention.

Figure 3 is flowchart for illustrating the terminal method for updating information of the client according to the subscriber identity module card movement according to the working example of the present invention.

The description of the denotation about the main part of the drawing.

110: mobile communications terminal 120: subscriber identity module card.
210: wireless base station 212: base station transceiver subsystem.
214: base station controller 220: switch.
230: terminal certification system 240: customer relationship management system.
250: customer information distributed system 260: push proxy gateway.
270: interface server 280: terminal information database.
290: terminal informative section.

Details of the Invention

Purpose of the Invention

The Technical Field to which the Invention belongs and the Prior Art in that Field.

The invention relates to system and the method for varying the terminal information of the client according to the terminal movement of the subscriber identity module card and managing. More specifically, in the WCDMA net, in case of the subscriber identity module card including the information of client being moved to the other mobile communications terminal and receiving service, the terminal information fact of change is traced automatically and it is about renewal, and system and the method for managing.

Provided is the various wireless communications service which uses the wireless network according to computer, the electronics, and the communications technology remarkable, develop. The most basic wireless communications service the wireless voice calling service which wirelessly offers the voice communications to mobile communications terminal users. The feature that it can not troubled by the time and place and it
offer service has. Moreover, the wireless internet service offering the internet service to the user of the mobile communications terminal through the wireless network is actively offered.

Therefore, while anytime freely moving from where by using the wireless calling service, the subscribers of the mobile communications service can talk over the telephone with opponent. In addition, the various information, required for the life for example, the news, weather, sports, bond, exchange rate or the traffic information etc. can be provided through data service through the wireless internet to the various shape including character, the voice or the image etc.

But the terminal information of subscriber has to be known accurately at the mobile communications systems in order to be properly provided this kind of wireless data service. That is, in order to offer the bell sound setting service, it has to confirm whether the mobile communications terminal is the several note. And it has to confirm for the background or the moving image providing whether the terminal in which the mobile communications terminal supports the color of the several bit. Moreover, the service providing which the availability, multimedia moving picture availability, the audio on demand (MOD : Music On Demand) service availability, the MP3 availability etc of the multimedia message service (MMS : Multimedia Messaging Service) is confirmed, suitable for that possibilities.

In the conventional IS-95A / B, the CDMA 1X, and 1X EV-DO net, the customer information and terminal information the same concept, the terminal information of client could be therefore changed through processor the device change. However, in the WCDMA net, according to USIM (Universal Subscriber Identity Module) chip including the personal information be inserted into the mobile communications terminal and use, the customer information and terminal information can separate.

Figure 1 is a drawing showing the WCDMA terminal in which the subscriber identity module card is built in.

The card capable of the storage of the information and data which the subscriber identity module card (120) is used as a kind of the smart card in the WCDMA terminal, and the calculating processing. The smart card says the card which has within the microprocessor (MPU : Micro-Processor Unit), memory, the card operating system (COS : Card Operation System), security algorithm, the EEPROM (Electronically Erasable Programmable Read Only Memory) while filling as the UICC (Universal Integrated Circuit Card) and gets ready the function of the mass storage and itself calculating processing of the COB (Chip On Board) form. There can be the SIM card inserted into the GSM terminal, and the UIM (User Identity Module) inserted into the CDMA terminal and the subscriber identity module card inserted into the WCDMA terminal as the smart card used in the mobile radio communications network.

In the subscriber identity module card (120), the various information including the ID, location information, encryption key, data service parameter value, the telephone number (IMSI : International Mobile Subscriber Identity), function and environmental variable value of the subscriber identity module card, the service network information, table of service, subscriber serial number, PIN, conversation time and billing information etc. is saved.

Therefore, the subscriber identity module card (120) is divided from the mobile communications terminal (110) of user and it inserts on the other mobile communications terminal. In that way the service using the new mobile communications terminal possible. At this time, in order to offer the most suitable service to the mobile communications terminal of subscriber, whether the terminal information in which the corresponding subscriber newly equips the subscriber identity module card is something or not the mobile carrier always has to confirm. And the up-to-dateness terminal information of subscriber is confirmed therefore continually. The technology which rapidly renews the terminal information is required of the mobile communications terminal movement.

- The Technical Challenges of the Invention
There can be renewal, and the purpose in providing the system managing and method the terminal information fact of change is traced automatically service is received it moves as the other mobile communications terminal the subscriber identity module card which the invention includes the information of client in the WCDMA net in order to solve the above-described problem.

### Structure & Operation of the Invention

To achieve the above object, the invention relates to the system in which the terminal information of the client according to the terminal movement of the smart card is traced in the mobile radio communications network and which renews and managing. And it characterizes to include the customer relationship management system (COIS : Custmoter Oriented Information System), the terminal information database, the interface server for renewing the mobile phone information saved in the terminal information database, and the push proxy gateway (PPG : Push Porxy Gateway) including the customer relationship management system (COIS : Custmoter Oriented Information System), the terminal information database, the interface server for renewing the mobile phone information saved in the terminal information database, and the push proxy gateway (PPG : Push Porxy Gateway). The customer relationship management system (COIS : Custmoter Oriented Information System) stores the caller identifier of the mobile radio communications network, and managed. The terminal information database stores the mobile phone information of subscriber and managed. The push proxy gateway (PPG : Push Porxy Gateway) confirms the URI information of the mobile communications terminal by using the push technique.

Moreover, the dissimilar invention of the invention comprises step of being transmitted IMSI from the mobile communications terminal the method it renews following for managing, and in which (a) smart card is inserted. And IMEI value: step performing the access authentication about IMEI through the stored terminal state list in (b) terminal certification system: step of receiving a message the URI information from the mobile communications terminal through (c) push proxy gateway: and (d) IMSI value in the mobile radio communications network the terminal information of the client according to the terminal movement of the smart card, and the step of renewing the terminal information of the terminal information database it matches the URI information and caller identifier.

Hereinafter, the preferred embodiment of the present invention is explained particularly with reference to attached drawings. Firstly, the reference numeral is annexed to the elements of each drawing. Although it is even if marked about the same elements on the other drawing, the symbol similar as long as it possible is had, it has to take a caution. Moreover, in describing the present invention, in case of being determined because of cloudying, in the detailed explanation, the concrete description to the notice organization related to or function omits the gist of the present invention.

Figure 2 is a block diagram which briefly shows the terminal information changing system of client according to the ubscriber identity module card movement according to the working example of the present invention.

The terminal information changing system according to the present invention comprises the mobile communications terminal (110), the wireless base station (210), the switch (220), the terminal certification system (230), the customer relationship management system (240), the customer information distributed system (250), the push proxy gateway (260), the interface server (270), the terminal information database (280) and terminal informative section (290).

The mobile communications terminal (110) to the terminal used in the WCDMA net the terminal including the ubscriber identity module card (120) in inside.

The wireless base station (it hereinafter calls the RAN : Radio Access Network because of 'RAN') (210) comprises the base station transceiver subsystem (it hereinafter calls the RTS : Radio Transceiver Subsystem at 'RTS') (212) and the base station controller (it hereinafter calls the RNC : Radio Network Controller at 'RNC') (214) which accepts the air interface specification of 3GPP standard in order to support WCDMA. The RAN (120) transfers the call request from the mobile communications terminal (110) and data transmission signal to
the mobile switching center (220). And the function of transferring the call request through the mobile switching center (220) and data signal, and data request signal to the mobile communications terminal (110) is proceed.

The RTS (212) is composed of the voice the wireless connection and function with the mobile communications terminal (110) followed into 3 generation partnership project (3rd Generation Partnership Project) air interface specification is proceed, the function, of transmitting and receive image and data traffic to the WCDMA mode generally, the inside subsystem of the RTS (212) is the base transceiver station interface subsystem (BIS : Base-station Interconnection Subsystem) the information with the mobile communications terminal (110) is and receive transmitted through the transmission-reception antenna, and the baseband serve system (BBS : Base Band Subsystem) and radio frequency subsystem, moreover, the RTS (212) is used in 3GPP air interface specification as name called 'Node B'.

The RNC (124) takes charge of the resource management, the protocol matching of the mobile communications terminal (110), the protocol matching of the base station, the soft handoff processing, and the function like the protocol matching, the GPRS (General Packet Radio Service) connection, fault management, the system loading etc of the core network. Here, GPRS supports data transfer rate of 384 Kbps. The multimedia mail is offered. And the communications system of the asynchronous system maximizing the efficiency of the transfer circuit to data transmission of packet-by-packet.

The switch (it hereinafter calls the MSC : Mobile Switching Center at 'MSC') (220) is proceed the basis and additional service processing, incoming and outbound call processing of subscriber, the position registration procedure and handoff procedure management, the interworking function with the other networks etc. Moreover, in the MSC (220), the ATM (Asynchronous Transfer Mode) switch (non illustration) can be included. The ATM switch increases the efficiency of the use of electrical circuit and transfer rate to the packet transmission of the cell unit.

The MSC (220) is composed of the controller, and the channel area and peripheral. And the charge data collection function has. After the caller ID is stored temporarily in the visitor location register (VLR : Visitor Location Register) (non illustration) if in this MSC (220), the call request or data request is delivered, the caller identifier which is temporarily stored is informed to the terminal certification system (230).

If in the terminal certification system (it hereinafter calls the EIR : Equipment Identity Register because of 'EIR') (230), the state check message toward IMEI of the mobile communications terminal (110) is delivered to the system which stores the IMEI (International Mobile station Equipment Identity) of the mobile communications terminal (110) and managed from the MSC (220) through the MAP (Mobile Application Part), the result is back sent in the MSC (220) after questioning the information about the corresponding IMEI in the customer relationship management system (240).

It classifies the state of the mobile communications terminal into the white list, the black list, and the gray list and the EIR (230) manages. Here, in the white list is network, the list of normal IMEI in which use is permitted is said. And the black list says the list of abnormal IMEI in which use is disapproved like the interception terminal on network. Moreover, the gray list says the list of IMEI which temporaries, reserves the determination to the malfunction or availability.

Moreover, in case USIM (120) card is moved and subscriber uses in the other mobile communications terminal (110), it transfers IMEI of the new mobile communications terminal (110) to the interface server (270) and the EIR (230) according to the present invention renews the terminal information.

The customer relationship management system (it hereinafter calls the COIS : Customer Oriented Information System at 'COIS') (240) stores the IMSI (International Mobile Station Identity) of subscriber, and the information about the service administration number and service species equivalent particle.

Here, IMSI the number including the country code (MCC : Mobile Country Code), and the area code (MNC : Mobile Network Code) and terminal ID number (MIN : Mobile Identification Number). That is, IMSI is certainly
necessary in order to use the communications service of outside. And it is enough through MIN in case of using the communications service of the national.

The service administration number the identification value which is assign to each subscriber in order to manage subscriber. The IMSI value of the mobile communications terminal (110) or the IMEI value and the other customer management number. That is, the identification value distinguish the subscription present condition and accounting status type etc. in the mobile carrier even if subscriber varies the mobile communications terminal (110) or the telephone number is varied is necessary. This is the service administration number.

The customer information distributed system (It hereinafter calls the CDS : Customer Data Distribution System at 'CDS') (250) is transmitted the caller identifier from the COIS (240). The system in which this is transferred to the interface server (270) and controlling so that the caller identifier be changed.

The push proxy gateway (it hereinafter calls the PPG : Push Proxy Gateway at 'PPG') (260) play a role of being transmitted and transferring to the interface server (270) the URI information from the mobile communications terminal (110) it is connected to the interface server (270).

The interface server (IFS : Interface Server) (270) the server renewing the terminal information saved in the terminal information database (280). The subscription of the IMSI value, and termination and change information are transmitted from the EIR (230). And the caller identifier is transmitted from the CDS (250). The server in which the URI information of the mobile communications terminal (110) is transmitted from the PPG (260) and renewing the terminal information of the terminal information database (280).

It stores the terminal information of subscriber and the terminal information database (280) is composed of the user information storage part the database managed, and the terminal information storage unit and contents providing managing company non-equivalence. The user information storage part comprises the service administration number of subscriber, MIN of the terminal, which user uses IMSI, the URI information etc. The terminal information storage unit comprises terminal property (the chord volume, and the number of color, the MMS whether or not, the MOD whether or not, the MP3 whether or not, the multimedia moving picture whether or not etc Supporting) information, the hardware configuration information, the loaded application information, the network connection characteristic information, the browser information etc.

Here, the content of the user information storage part is transmitted from the interface server (270). And the content of the terminal information storage unit is transmitted from the terminal informative section (290).

Moreover, the terminal information database (280) immediately renewal the terminal information changed according to the subscriber identity module card (120) movement of user update.

As the part which the terminal informative section (290) offers the characteristic information of the mobile communications terminal (110), it is composed of the terminal supplier (UAP : User Agent Provider) or the contents provider (CP : Contents Provider) etc.

Figure 3 is flowchart for illustrating the terminal method for updating information of the client according to the subscriber identity module card movement according to the working example of the present invention.

User inserts the subscriber identity module card (120) into the other mobile communications terminal (110). If the power is sanctioned (S310) by pressing the power button, the IMSI value and IMEI value of the mobile communications terminal (110) are delivered after the mobile radio communications network to the EIR (230) (S320).

It decides whether the mobile communications terminal (110) confirming the saved terminal state list and requests connection is the valid terminal detect, and the interception terminal and or not the EIR (230) is proceed the access authentication (S330). Here, the IMSI value is transferred to the interface server (270)
in case of the terminal of white list having IMEI in which it refuses the connection request from the mobile communications terminal (110) in case of the terminal, and the mobile communications terminal (110) is normal of the black list having IMEI in which the mobile communications terminal (110) is abnormal. At this time, it is transmitted the caller identifier from the CDS (250) and the interface server (270) matches with the IMSI value (S340).

The interface server (270) transmitted the IMSI value requests the URI information acquisition of the mobile communications terminal (110) through the PPG (260). The PPG (260) transmits the URI information request signal with the mobile communications terminal by using the push technique (S350).

According to the mobile communications terminal (110) is the URI information request from the PPG (260), its own URI information is transferred through the PPG (260) to the interface server (270) (S360). It matches the value of the caller identifier which it at Step S340 gets and IMSI and URI information and the interface server (270) transmitted the URI information of the mobile communications terminal (110) transfers to the terminal information database (290) (S370). By renewing the URI information of the user information storage part using the corresponding IMSI the terminal information database (290) renews the changed terminal information of the field information (S380).

As to the description described in the above, the terminal information operation according to the present invention and management system explained based on the method for using the subscriber identity module card at the WCDMA net. But the invention using the terminal certification system at the Stationary net of rectangular shape, the interface server, the terminal information database and customer relationship management system etc. of the GSM network using the SIM card, and the CDMA network using the UIM card can be embodied.

The description described in the above noes more than to illustratively explain the technical spirit of the present invention. If it grows in the technical field in which the invention belongs, the various correction and deformation will possible in the range that it does not escape from the property of being essential of the present invention. Therefore, it is not limiting the technical spirit of the present invention but the working example started in the invention is to explain. The range of the technical spirit of the present invention is not limited with this working example. The scope of protection of the present invention has to be interpreted with the following claims. And with being included in the scope of right of the present invention all technical spirits having within that and the equivalent range should be interpreted.

Effects of the Invention
As illustrated in the above, according to the invention, the subscriber identity module card is moved and subscriber uses the other mobile communications terminal in the transferable WCDMA net of the subscriber identity module card including the customer information. And yet, in case of the terminal number of the changed mobile communications terminal, and the terminal information grasp facilitating and offering service including the moving picture, the drawing, the music etc., the service optimized in the function of the mobile communications terminal can be offered.

Moreover, user uses the other mobile communications terminal. Even in that case, the mobile communications service can be provided without the need to separately inform the mobile communications terminal fact of change to the mobile communications service provider.

Scope of Claims
Claim 1:
The terminal information operation / management system comprising: the terminal certification system performing the authentication about IMEI which the system in which the terminal information of the client according to the terminal movement of the smart card is traced in the mobile radio communications network and renewing and managing; it stores the IMEI (International Mobile station Equipment Identity) of the mobile
communications terminal; and is requested if the IMEI state check message is delivered through the mobile radio communications network; the customer relationship management system (COS: Customer Oriented Information System) which it stores the caller identifier of the mobile radio communications network including the IMSI (International Mobile Station Identity), and the service administration number and service species; and it manages: the terminal information database which stores the mobile phone information of subscriber and managed: the interface server for renewing the mobile phone information saved in the terminal information database and the push proxy gateway (PPG: Push Proxy Gateway) which confirms the URI information of the mobile communications terminal by using the push technique.

Claim 2:
The terminal information operation / management system which is transmitted the caller identifier from the customer relationship management system and the terminal information operation / management system additionally includes the customer information distributed system (CDS: Customer Data Distribution System) which transfers to the interface server as to the first claim.

Claim 3:
The terminal information operation / management system which the terminal information operation / management system includes the terminal informative section offering the characteristic information of the mobile communications terminal as to the first claim to addition.

Claim 4:
The terminal information operation / management system, wherein the terminal informative section as to claim 3 it is composed of the terminal supplier (UAP: User Agent Provider) or the contents provider (CP: Contents Provider) offering the mobile communications terminal.

Claim 5:
The mobile radio communications network as to the first claim.

The terminal information operation / management system wherein the WCDMA net, the CDMA network, or the GSM network.

Claim 6:
The terminal information operation / management system, wherein the smart card the mobile radio communications network is the WCDMA net as to claim 5 the user identity module card; the smart card the UIM card if the mobile radio communications network is the CDMA network; and the smart card the SIM card if the movement *** GSM network.
Claim 7:
The terminal information operation / management system, wherein the terminal certification system as to the first claim it classifies into the white list having the IMEI value which is normal the state of the mobile communications terminal, and the black list having the abnormal IMEI value in which use is disapproved like the interception terminal and gray list having the IMEI value which temporarily, reserves the determination to the malfunction or availability and it manages.

Claim 8:
The terminal information operation / management system, wherein the interface server as to the first claim the IMSI value is transmitted from the terminal certification system in order to renew the terminal information; the caller identifier is transmitted from the customer relationship management system; and the URI information of the mobile communications terminal is transmitted from the push proxy gateway.

Claim 9:
The terminal information operation / management system which is characterized in that the terminal information database as to the first claim includes the user information storage part, and the terminal information storage unit and contents providing managing company part.

Claim 10:
The terminal information operation / management system, wherein the user information storage part as to claim 9 one or greater is stored among the service administration number of subscriber, MIN of the mobile communications terminal of subscriber, IMSI, and the URI information.

Claim 11:
The terminal information operation / management system, wherein the terminal information storage unit as to claim 9 one or greater is stored among the terminal characteristic information, the hardware configuration information, the loaded application information, and the network connection characteristic information and browser information.

Claim 12:
The terminal information operation / management system which is characterized in that the terminal characteristic information as to claim 11 includes the chord volume of the mobile communications terminal, and the number of color, the MMS whether or not, the MOD whether or not, the MP3 whether or not, the multimedia moving picture working possibly or not Supporting.

Claim 13:
The terminal information operation / management system which is characterized in that the smart card as to the first claim includes the ID, the location information, the encryption key, data service parameter value, IMSI, function and environmental variable value of the smart card, and one or greater among the service network information, the table of service, the subscriber serial number, PIN, the conversation time and billing information.

Claim 14:
The terminal information operation / management system, wherein the smart card as to the first claim the card including including the microprocessor, the memory, the card operating system, the security algorithm, EEPROM of the COB (Chip On Board) form.

Claim 15:
The terminal information operation / management method according to the terminal movement of the smart card comprising: step of being transmitted IMSI from the mobile communications terminal in which the method it renews following for managing; and (a) smart card is inserted. And IMEI value in the mobile radio communications network consisting of the terminal certification system performing the authentication about the mobile communications terminal, the customer relationship management system storing the caller identifier, the terminal information database storing the information of the mobile communications terminal, and the push proxy gateway for confirming the URI information of the mobile communications terminal and the interface server for renewing the mobile phone information the terminal information of the client according to the terminal movement of the smart card; the step performing the access authentication about IMEI through the storaged terminal state list in (b) terminal certification system; the step of receiving a message the URI information from the mobile communications terminal through (c) push proxy gateway and (d) IMSI value, and the step of renewing the terminal information of the terminal information database it matches the URI information and caller identifier.

Claim 16:
The terminal information operation / management method according to the terminal movement of the smart card, wherein above statement step (b) as to claim 15 the storaged terminal state list is confirmed in the terminal certification system and the connection request is refused if IMEI is the abnormal mobile communications terminal of the black list; and the IMSI value of the mobile communications terminal is transferred to the interface server if IMEI is the normal mobile communications terminal of the white list.

Claim 17:
The terminal information operation / management method according to the terminal movement of the smart card, wherein above statement step (c) as to claim 15 in the push proxy gateway, the URI request signal is transmitted with the mobile communications terminal by using the push technique; and the mobile communications terminal transmits the URI information through the push proxy gateway with the interface server.

Claim 18:
A terminal information operation / management method according to the terminal movement of the smart card comprising the steps of: as to claim 15, above statement step (d) is transmitted the IMSI value from the terminal certification system; being transmitted the caller identifier from the customer relationship management system; and being transmitted the URI information of the mobile communications terminal from the push proxy gateway and renewing the terminal information.

Claim 19:
The mobile radio communications network as to claim 15.
The terminal information operation / management method according to the terminal movement of the smart card wherein the WCDMA net, the CDMA network, or the GSM network.

Claim 20:
A terminal information operation / management method according to the terminal movement of the smart card comprising the steps of: as to claim 19, the smart card the subscriber identity module card if the mobile radio communications network is the WCDMA net; the smart card the UIM card if the mobile radio communications network is the CDMA network; and the smart card the SIM card if the movement *** GSM network.
Fig. 3
AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

1. (Currently Amended) A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

   a mobile communication information management server for receiving [[a]] unique information of the second terminal and [[a]] USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying that there has been a device replacement when the unique information of the second terminal and is different from the subscriber information do not coincide with each other:

   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information upon receipt of after the unique information of the second terminal and the subscriber information are provided according to the notification procedure of from the mobile communication information management server; and

   a Conditional Access System (CAS) for transmitting, to the second terminal, device change information that includes broadcast information to update necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

2. (Original) The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.
3. (Original) The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

4. (Currently Amended) The system as claimed in claim 3, wherein the CAS further transmits, to the first terminal, EMM information includes information necessary to cancel the subscription of the first terminal to delete subscriber information on the first broadcasting chip.

5. (Currently Amended) The system as claimed in claim 1, wherein the CAS comprises:

   a database for storing and managing the broadcast information on [[the]] each subscriber according to each of the information on the broadcasting chips;

   a communication unit for communicating with the broadcast information management server and transmitting the device change information to the second terminal;

   a data analysis unit for analyzing both the unique information of the second terminal and the subscriber information provided by the broadcast information management server;

   a control unit for extracting the subscriber information and the unique information of the second terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command based on in regard to a message including the extracted broadcast information and the extracted unique information of the second terminal; and

   a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit for transmission to the second terminal.

6. (Currently Amended) A method [[for]] of maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal
having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal, by a mobile communication information management server;

when the terminal information of the second terminal is different from terminal information corresponding to the subscriber information, determining that there has been a device replacement, and then providing the terminal information of the second terminal and the subscriber information to a broadcast information management server, by the mobile communication information management server;

transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; [[and]]

generating Entitlement Management Message (EMM) information based on the extracted broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information of the second terminal; and

updating the broadcast information included in the EMM information to such that the second terminal modifies the information on the second broadcasting chip to information of the first broadcasting chip.

7. (Currently Amended) A method [[for]] of maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal;
determining that there has been a device replacement, when the terminal information of the second terminal and is different from the subscriber information do not coincide with each other;

extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; [and]

generating Entitlement Management Message (EMM) information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information; and

updating the broadcast information included in the EMM information to the second broadcasting chip.

8. (Currently Amended) The method as claimed in claim 6, further comprising: wherein the

transmitting, to the first terminal, EMM information that includes a cancellation message for cancelling subscription of the first terminal; and

deleting subscriber information on the first broadcasting chip in response to the cancellation message.

9. (Currently Amended) The method as claimed in claim 7, further comprising: wherein the

transmitting, to the first terminal, EMM information that includes a cancellation message for cancelling subscription of the first terminal; and

deleting subscriber information on the first broadcasting chip in response to the cancellation message.
# EAST Search History

## EAST Search History (Interference)

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**Title:** SYSTEM AND METHOD FOR CANCELING IPPV PURCHASING PROGRAM OF VIDEO/AUDIO CHANNEL AND MUSIC CHANNEL OF DMB SYSTEM

**Abstract:** Disclosed is a system and method for canceling an IPPV purchase for a video/audio channel or a music channel in a digital broadcasting system, the IPPV purchase cancellation system including: a callback server; a BIS for receiving an IPPV purchase history and a purchase cancellation history from the callback server, managing a total usage limit and an accumulated usage history, and managing the number of tokens required; a CAS for transmitting an ECM and an EMM to the digital broadcast receiving terminal, wherein the CAS is connected to a PMS, sets an IPPV usage limit of the digital broadcast receiving terminal of a subscriber, manages a total usage limit and purchase, and restricts adult-only programs from being illegally viewed and broadcast programs from being illegally viewed by a user for whom service has been temporarily revoked.


**Agent:** NAM, Sang-Sun: KAL Bldg. 3rd Fl., 41-3, Seosomun-Dong, Jung-Gu, Seoul 100-813 (KR).


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**Publication Language:**
- Korean

**Specimen Diagram:**

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**References:**
- [Continued on next page]
Description

SYSTEM AND METHOD FOR CANCELING IPPV PURCHASING PROGRAM OF VIDEO/AUDIO CHANNEL AND MUSIC CHANNEL OF DMB SYSTEM

Technical Field

The present invention relates to a system and method for canceling an impulse pay-per-view (IPPP) purchase of a program of a video/audio channel or a music channel in a digital multimedia broadcasting (DMB) system, and more particularly to a system and method for canceling an IPPV purchase of a program of a video/audio channel or a music channel in a DMB system, which provides a purchase cancellation function for canceling the purchase of contents which have been purchased in an IPPV manner of paying a fee for every program viewed through a digital broadcast receiving terminal.

Background Art

FIG. 1 is a view illustrating the entire configuration of a general satellite digital multimedia broadcasting (DMB) system.

Satellite DMB provides a service of enabling the user to receive multimedia information, including text data/audio/video and electronic program guide (EPG) information, through not only a fixed receiver, but also through a personal mobile terminal or vehicle-mounted terminal by means of a broadcasting satellite or communication satellite.

The satellite DMB service, which is a convergence service of broadcasting and communication, enables broadcast contents provided from a program provider (PP) to be broadcasted through a satellite DMB broadcasting center and a satellite. Also, the satellite DMB service enables a digital broadcast receiving terminal to receive broadcast program signals, including a video and audio signal for text broadcasting, data for data broadcasting, entitlement control message (ECM) information, entitlement management message (EMM) information, and EPG information (which contains program specific information (PSI) and service information (SI)), and to provide broadcast video and audio signals to a viewer. In addition, the satellite DMB service provides traffic information, news, weather information, shopping information, movies, music broadcasts, sports broadcasts, and living information.

According to such a conventional satellite DMB service, a digital broadcast receiving terminal receives a digital broadcast signal, and demodulates the received digital broadcast signal in cooperation with a conditional access system (CAS) so as to produce a high-quality broadcast video and/or audio signal and broadcast data, thereby allocating various broadcast contents to be utilized. However, the conventional DMB
system has a problem in that the system does not provide a purchase cancellation function for canceling the purchase of contents which have been purchased in the IPPV or PPV manner provided in video/audio channels or music channels.

**Disclosure of Invention**

**Technical Problem**

[6] Therefore, the present invention has been made in view of the above-mentioned problems, and an object of the present invention is to provide a system and method for canceling an IPPV purchase of a program of a video/audio channel or a music channel in a DMB system, which provides a purchase cancellation function for canceling the purchase of contents which have been purchased in an impulse pay-per-view (IPPV) manner of paying a fee for every program viewed through a digital broadcast receiving terminal.

**Technical Solution**

[7] In order to achieve the above-mentioned object, there is provided an impulse pay-per-view (IPPV) purchase cancellation system for a video/audio channel or a music channel in a digital broadcasting system, the IPPV purchase cancellation system including: a callback server for receiving a purchase history and a purchase cancellation history from a digital broadcast receiving terminal; a business information system (BIS) for receiving an IPPV purchase history and a purchase cancellation history from the callback server, providing an account settlement function, managing IPPV request entitlement and a usage limit, granting IPPV request entitlement to adult subscribers, establishing IPPV request entitlement of teenager subscribers and an adult-only content viewing limit function (i.e. a block-out function) for teenager subscribers, setting a limit on a monthly usable amount of money, managing a total usage limit and an accumulated usage history according to each SIM/SMD card of the digital broadcast receiving terminal, and managing the number of tokens required according to IPPV program price information; a conditional access system (CAS) for transmitting an entitlement control message (ECM) and an entitlement management message (EMM) to the digital broadcast receiving terminal; and a program specific information/service information (PSI/SI) system connected to a program management system (PMS), the PSI/SI system transmitting broadcast PSI/SI (e.g. EPG information) to the digital broadcast receiving terminal, wherein the CAS is connected to the PMS, sets an IPPV usage limit of the digital broadcast receiving terminal of a subscriber, manages a total usage limit (i.e. debit limit) and purchase, and restricts adult-only programs from being illegally viewed and broadcast programs from being illegally viewed by a user for whom service has been temporarily revoked.

[8] According to another aspect of the present invention, there is provided a method for
canceling an impulse pay-per-view (IPPV) purchase of a video/audio channel or a
music channel in a digital broadcasting system, the method including the steps of: (a)
when a digital broadcast receiving terminal joins as a subscriber or makes an additional
request, receiving an IPPV and an adult-only content viewing limit (i.e. block-out) for
teenagers, receiving broadcast video and audio signals, an entitlement management
message (EMM), an entitlement control message (ECM), EPG information (i.e. PSI/SI
information) from a DMB broadcasting service system, checking channels programs
through an EPG main, receiving a channel number, and checking if a channel of the
received channel number can be viewed; (b) shifting to a PPV channel, determining if
there is an IPPV product, checking a viewing right, determining if the PPV channel
corresponds to a usage-restricted channel, or if there is an adult-only content viewing
restriction (i.e. block-out) for teenagers, checking an adult-only genre, inputting a PIN/
password, and allowing a broadcast to be viewed; (c) when it is impossible to view the
broadcast, outputting an announcement about subscription, or outputting an an-
nouncement about a usage-restricted channel/program in a case related to an adult-only
content viewing limit (i.e. block-out) for teenagers; (d) outputting an announcement
about termination when a purchasable time has been exceeded because an IPPV
program can be purchased only during the purchasable time; (e) only when a cor-
responding subscriber is a subscriber who can normally purchase and view an IPPV
program, viewing preview contents during a broadcast program preview time, and
viewing the IPPV program through the digital broadcast receiving terminal via a
purchase step during a buy time; (f) after the IPPV program has been purchased,
allowing the digital broadcast receiving terminal to cancel the purchase of the IPPV
program via an IPPV program purchase cancellation step before a purchase-cancelable
time (cancel-time; Ctime) expires, wherein the digital broadcast receiving terminal
includes an application for a purchase cancellation function, and when a purchase can-
cellation is performed and completed according to a predetermined process, a purchase
cancellation history is stored in a SIM/SMD card, and the stored purchase cancellation
history is transmitted to a callback server; (g) updating and storing information about
an IPPV purchase history in the SIM/SDM card within a range not exceeding a usage
limit, deleting tokens as many as the number of used tokens, storing an IPPV purchase
history and a purchase cancellation history in a memory of the terminal, and
performing a termination after viewing; and (h) transmitting a purchase history and a
purchase cancellation history of IPPV programs to the callback server in a pre-
determined scheme at a predetermined time, which are established according to a de-
termination of a service provider.

**Advantageous Effects**
The system and method for enabling a digital broadcast receiving terminal to cancel an IPPV purchase of a video/audio channel or a music channel according to the present invention provides a purchase cancellation function of canceling a purchase of contents purchased in the IPPV or PPV scheme, which requests a fee to be paid for every program viewed through the digital broadcast receiving terminal. In addition, a purchase history and a purchase cancellation history may be stored in a SIM card of a DMB terminal and may be managed, or the histories may be managed by a callback server.

**Brief Description of the Drawings**

The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

**FIG. 1** is a view illustrating the configuration of a general satellite digital multimedia broadcasting (DMB) system;

**FIG. 2** is a view illustrating the configuration of an impulse pay-per-view (IPPV) purchase request information return network;

**FIG. 3** is a block diagram illustrating the configuration of an IPPV callback system;

**FIG. 4** is a view illustrating the configuration of an IPPV program;

**FIG. 5** is a flow diagram illustrating a CAS callback processing produce;

**FIG. 6** is a flowchart illustrating a purchasing method of an IPPV terminal;

**FIG. 7** is a flowchart illustrating a purchase canceling method of an IPPV terminal;

**FIG. 8** is a view illustrating a flow of an IPPV service; and

**FIGs. 9 to 12** are views illustrating screens for an IPPV service.

**Best Mode for Carrying Out the Invention**

Hereinafter, preferred embodiments of the present invention will be described with reference to the accompanying drawings.

**FIG. 2** is a view illustrating the configuration of an impulse pay-per-view (IPPV) purchase history and purchase cancellation history return network.

An IPPV purchase request information return network cooperates with a wireless data communication network, which includes a terminal, a base station (BS), a base station controller (BSC), a mobile switching center (MSC), a Packet Data Service Node (PDSN), and an AAA authentication server, and also cooperates with a TU media network (i.e. satellite DMB network) for receiving a satellite multimedia broadcast. In the following description, TU represents a satellite DMB service.

**FIG. 3** is a block diagram illustrating the configuration of an IPPV callback system.

The IPPV callback system includes a digital broadcast receiving terminal 100, a callback server 200, a business information system (BIS) 300, and a conditional access...
The digital broadcast receiving terminal 100 includes a satellite DMB application program 110 for receiving a satellite DMB broadcast signal and electronic program guide (EPG) information, a conditional access (CA) module 120 for keeping adult-only programs from being illegally viewed and broadcast programs from being illegally viewed by either a non-subscriber or a user for whom service has been temporarily revoked, and a SIM/SMD card (hereinafter, referred to as a subscriber identity module (SIM) card 130, as shown in FIG. 3). The SIM card 130 has the IPPV function, stores information about IPPV viewing rights, and can store a purchase history and a purchase cancellation history of an IPPV event. Also, there is no restriction in a purchase history and a purchase cancellation history of an IPPV event, which are stored in the SIM card 130. In addition, since overwriting is automatically performed when the capacity of the memory in SIM card 130 is completely filled, a case where the amount of IPPV purchase history/purchase cancellation history exceeds the capacity of the memory does not occur.

The callback server 200 receives IPPV purchase history/purchase cancellation history from the digital broadcast receiving terminal 100, stores the received IPPV purchase history/purchase cancellation history in a database, and transmits the IPPV purchase history/purchase cancellation history to the BIS 300.

The BIS 300 manages IPPV request entitlement and a usage limit (i.e. debit limit), grants IPPV request entitlement to adult subscribers, establishes IPPV request entitlement and a block-out function (which is a function of limiting teenagers from viewing adult-only contents) for teenagers, sets a monthly debit limit (e.g. within 10,000 won per month), manages a total debit limit and an accumulated usage history according to each SIM card, allocates IPPV program goods, defines the number of tokens (i.e. event cost) required according to price information, and performs a settlement function according to an IPPV Personal Identification Number (IPPV PIN) code reset and IPPV request information received from the callback server 200.

The CAS 400 receives a conditional access (CA) schedule from a program management system (PMS), and transmits an entitlement control message (ECM) and an entitlement management message (EMM) to the digital broadcast receiving terminal 100.

At the same time, a PSI/SI system connected with the program management system (PMS) transmits program specific information/service information (PSI/SI), i.e. EPG information, to the digital broadcast receiving terminal 100.

The CAS 400 is connected with the program management system (PMS), sets an IPPV debit limit of each subscriber terminal, manages debit limits and customer purses, and keeps adult-only programs from being illegally viewed and broadcast
programs from being illegally viewed by either a non-subscriber or a user for whom service has been temporarily revoked.

[31] The CAS 400 manages one or more PINs (that is, identification numbers for the use of service, e.g. TU PINs) stored in smart cards, and can change or initialize a PIN code stored in a memory or a SIM card 130 of the digital broadcast receiving terminal 100 by means of the EMM of the CAS 400. The PINs managed by the CAS 400 are used in an identification process upon an IPPV purchase and a purchase cancellation.

[32] According to a CAS processing flow for access to an IPPV channel, an IPP service subscription checking function, a block-out checking function, a pre-purchase checking function, and a preview time/purchasable time checking function are performed.

[33] The callback server 200 receives an IPPV purchase history from the digital broadcast receiving terminal 100 according to the IPPV-related functions of the CAS, and stores the IPPV purchase history information. The cases of performing a callback for an IPPV purchase history include: a case where there is an IPPV purchase history (i.e. a request history) when a TU mode is switched off (for example, when a TU service end button, i.e. a general communication end button, has been pressed, when an end button has been pressed for a long time so as to switch off a terminal, when a call is received and connected during viewing, when an MMS is received and connected during viewing, and when the terminal accesses a wireless Internet during viewing); a case where there is an IPPV event purchase history when the user attempts to purchase an IPPV event; and a case where a requested purchase has been rejected, wherein, upon a failure in a callback, it becomes impossible to purchase an IPPV purchase event in the future. Such a IPPV purchase and purchase history callback policy is determined by each service provider, and may be operated in such a manner as to perform a callback once every predetermined number of times of purchase.

[34] It should be noted that a callback for IPPV request information can be performed in all types of networks, including 2G, 2.5G, 3G, and 4G networks.

[35] Contents recorded at every IPPV request include a service ID, an event ID, a buy time (date and time), a total debit limit, and a customer purse.

[36] The service ID corresponds to information (i.e. the number of a channel used for purchase) about the channel through which a purchase-requested IPPV event has been broadcasted.

[37] The event ID is a unique ID (i.e. a PSI/SI event ID) for each purchased program, and corresponds to the code (e.g. 0-65535) of a purchase-requested event.

[38] The buy time represent a time when an IPPV event is purchased.

[39] The total debit limit represents the number (e.g. a value within a range from 0 to 65535) of tokens for the total debit limit stored in the SIM card 130 of the digital
broadcast receiving terminal 100.

[40] The customer purse represents the accumulated number of usable tokens stored in the SIM card 130 of the digital broadcast receiving terminal 100.

[41] FIG. 5 is a flow diagram illustrating a CAS IPPV-related callback processing produce.

[42] A CAS manages one or more PIN codes (e.g. TU PINs) recorded in smart cards, and can initialize and change a PIN code stored in a SIM/SMD card by transmitting an EMM.

[43] The CAS supports three PIN codes, that is, a parental code, an IPPV code, and a general code. All the three codes are stored in a smart card. The CAS supports a function of comparing PIN codes stored in the smart card.

[44] In order to compare PIN codes stored in the smart card, an EPG program uses an EPG_MSG_PIN_CODE_CHECK message.

[45] As shown in FIG. 5, the comparison is performed based on a query and control scheme of communicating between the terminal s EPG program and a CAS task.

[46] When it is a callback time point appointed by a DMB broadcasting service company (when it is a DMB broadcast viewing end time point or purchase time point in a case of TU media), an EPG must carry an EPG_MSG_IPPV_CALLBACK message (including an opcode of MSG_REQUEST) in order to check if callback data exists in the CAS (except for vehicle-only terminals). The CAS transmits callback data with an opcode of MSG_RESPONSE in response to the EPG_MSG_IPPV_CALLBACK message.

[47] When receiving callback data, an EPG must carry the respective callback structure information callback_st, including a service ID, an event ID, a buy time, a total debit limit, and a customer purse, to the callback server, wherein a result of the transmission must be replied to the CA module only when the callback structure information has been completely transmitted. The reply is performed by using an EPG_MSG_Callback message, wherein a value of MSG_Response is used as an opcode. When the transmission has failed, no reply is sent to the CA module.

[48] When an event of an IPPV channel corresponds to an IPPV preview section, the CAS transmits an EPG_MSG_IPPV_PREVIEW message to the EPG. The EPG_MSG_IPPV_PREVIEW message includes service_id (the number of a channel to which the event belongs), event_id (the ID of the event to be purchased), preview_time (a time when the preview will be terminated), token_type (a type of tokens required for purchasing the event), and token_amount (the number of tokens required for purchasing the event).

[49] When the user is to purchase an event of an IPPV channel or is to use a prepayment right for time, the EPG reports a purchase history to the CAS through an
EPG_MSG_IPPV_PURCHASE message. The EPG_MSG_IPPV_PURCHASE message includes: type (a value of determining whether the message corresponds to a prepayment right, an IPPV purchase, or a purchase cancellation, wherein the type has a PAY_BUY value upon purchasing a prepayment right for time, has an IPPV_BUY value upon purchasing an IPPV event, and has an IPPV_CANCEL value upon canceling an IPPV purchase), token_type (a type of tokens required for purchasing an event), service_id (the number of a channel to which the event belongs), event_id (the ID of the event to be purchased), token_amount (the number of tokens required for purchasing the event), PIN (information about the PIN of the user), Ctime (a time until which a corresponding purchase can be canceled), and result (a value resulting from processing of a requested purchase).

A purchase request message transmitted from the EPG to the CA module extracts the value from an EPG_MSG_IPPV_PURCHASE_REPLY message, outputs the extracted value as a purchase-cancelable time on the screen. In a case of an event whose purchase cannot be canceled, the value is expressed as zero.

When an EPG calls a CAS_Getstatus function in order to request purchase of a prepayment right or IPPV event, an opcode is set to MSG_REQUEST and a structure value is set to pppv_purchase_st. In contrast, when CAS relays a result of a requested purchase by means of a Notification function, an opcode is set to MSG_RESPONSE, pvParams has the structure value of pppv_purchase_st, as well, and the result is set to a value resulting from processing of a requested purchase. The pvParams has the structure value of pppv_purchase_st, as well, and the result is set to a value resulting from processing of a requested purchase.

When the result has been set to ERR_PAYTV_BUY_ACCESS (CAS msg #E405 in FIG. 11), it represents that a purchase has been successfully performed. Even with respect to a purchase cancellation request IPPV_CANCEL, when the cancellation has been successfully performed, an ERR_PAYBUY_SUCCESS code is returned.

When the result has been set to ERR_PIN_VERIFICATION_FAILED (CAS MSG #E402 in FIG. 10), it represents that a purchase has failed because a PIN value input for a purchase is different from the PIN value of a smart card.

When the result has been set to ERR_PPV_CALLBACK_LIMIT (CAS msg #E358 in FIG. 9), it represents that there is data which has not been called back. Therefore, in this case, after a callback process is performed, a purchase procedure must be again performed.

When the result has been set to ERR_NO_MORE_BUY_PPV (CAS Error msg #E308 in FIG. 10), it represents that it is impossible to purchase another IPPV event because a debit limit has been exceeded.

When the result has been set to ERR_EXPIRED_BUY_REFUND_TIME(CAS
MSG #E404 in FIG. 10), it represents that a time available for a purchase or purchase cancellation has been exceeded.

[57] The EPG can identify a purchase history of the user through the current screen by means of an EPG_MSG_SS_PPV message. A structure of pvParam responded by the CAS includes a result (which represents whether following data is effective, wherein following data is effective only when the result has a value of zero) and count (which corresponds to following purchase_log_st).

[58] Through the screen of a terminal, service_id (the number of a channel to which a purchase event belongs), Event_ID (a DVB Event ID of a purchased event), buy_time (a time when tokens or event information is purchased/consumed/canceled), amount (a token unit used for a purchase or consumption), and type (an identifier for distinguishing between purchase, consumption, and cancellation, for example, 0x0D: IPPV purchase, and 0x0E: IPPV purchase cancellation) are provided.

[59] FIG. 4 is a view illustrating the configuration of an IPPV program. In FIG. 4, an A section indicates a time (hereinafter, referred to as a purchasable time) when purchases can be made, a B section indicates a preview time, and a C section indicates an IPPV program broadcasting time.

[60] There is no limit to playing time per program, and an account is settled by periodically collecting account information according to a settlement schedule.

[61] A subscriber to use an IPPV service must have an IPPV viewing right, which has been stored in the SIM card 130 of the digital broadcast receiving terminal 100, wherein the IPPV viewing right is granted to adult and teenager subscribers according to ratings established upon service subscription. A block-out function of the CAS is applied to teenager subscribers in order to restrict the teenagers from requesting and viewing adult-only contents. The teenager subscribers are restricted from viewing programs rated for those 19 years old or older, among IPPV channel programs. In addition the teenager subscribers have a limit in viewing based on a monthly debit limit. The adult subscribers may be restricted to viewing only programs rated for those 19 years old or older. A request history of to each subscriber is transferred to the callback server 200.

[62] A request and a viewing right control are performed by using the IPPV function of the CAS. In order to restrict teenagers from viewing programs rated for those 19 years old or older, the block-out function of the CAS is used.

[63] Fees for IPPV use may be different, which the CAS controls by using tokens. When the value of each token is set as 500 won, and a fee for use of a program is 5,000 won, 10 tokens are required. A monthly debit limit is controlled by using a total debit limit (DL) stored in a SIM card, and a customer purse (CP). The total debit limit and the customer purse are measured in units of tokens.
The total debit limit is set to the max (65535) upon personalizing a SIM card, before the SIM card is put on the market. 

An IPPV program can be purchased during a purchasable time when purchases can be made, without regard to a preview time. 

FIG. 6 is a flowchart illustrating a purchasing method of an IPPV terminal, and FIG. 7 is a flowchart illustrating a purchase canceling method of an IPPV terminal. 

First, referring to FIG. 6, when the user of the digital broadcast receiving terminal 100 joins as a subscriber or makes an additional request, IPPV and a block-out product are granted to the user. 

An EPG main receives a broadcast video/audio signal, an entitlement management message (EMM), an entitlement control message (ECM: CW, IPPV Product), EPG information (i.e. PSI/SI information) from the DMB broadcasting service (HE) system, identifies the programs of a premium channel, receives a channel number, and checks if there is an error code. 

When there is an error code, a subscription announcement is output based on the error code, or an announcement about use-restricted channels or programs is provided in the case where the error code corresponds to a Block-out. 

During a time when purchases can be made, it is possible to purchase an IPPV program. When the purchasable time has terminated, a termination announcement is provided. 

In the cases where the error code corresponds to either an error code of notifying that it is within a preview viewing time, or an error code of notifying that it is within the purchasable time, when it is within a broadcast program preview time, a preview is viewed, and when it is within a purchasable time when purchases can be made, a purchase announcement and a purchase request are transmitted through the callback server 200, and it is determined if there was a previous request. 

When a PIN code has been input to an EPG and is confirmed within three attempts after a purchase has been checked, an IPPV purchase history is updated within a range not exceeding a debit limit and the updated information is stored in a SIM card, the CP increases, and a record of an IPPV purchase event is recorded in a terminal s memory. 

* (Callback Error) 

Upon requesting an IPPV event purchase, if a callback has failed in a state where a purchase history exists, the digital broadcast receiving terminal displays a purchase-failure popup window (e.g. Purchase Unavailable, Please Try Again ) on the screen. Thereafter, when a confirmation button is pressed, the digital broadcast receiving terminal resumes TU, and then moves to a previous viewing channel. 

Upon terminating a TU service, if a callback has failed in a state where a purchase history exists, the TU service is terminated, and the purchase history is left without
being deleted.

(IPPV PIN Code Error)

The basic processing of an IPPV PIN code input error is based on the function of the CAS. When an input error of the PIN code occurs four times or more, and thus an input window is locked, it is necessary to call and request customer service to reset the IPPV PIN code (which is announced through a popup window). A subscriber recognizes the reset of the IPPV PIN code as a reset of a TU service password (see IPPV PIN code processing).

When the number of times of input errors exceeds a predetermined number, a CAS block message for an IPPV PIN code input is used.

According to an exemplary embodiment of the present invention, in the case of an Epsilon card, when the number of IPPV event recorded in a SIM card exceeds a predetermined number, e.g., 255, the Epsilon card may be set to apply an automatic reset function to a SIM card 130, or may be set to automatically overwrite exceeded records on previous records.

The SIM card 130 includes a function of the CAS, the customer purse in the digital broadcast receiving terminal 100 increases whenever an IPPV event, defined by an IPPV program use fee and the basic value of a token (i.e., by an event cost), is purchased, and an error occurs when a debit limit is exceeded upon requesting an IPPV program.

Upon terminating a TU service, when there is purchase request information, the digital broadcast receiving terminal 100 requests a callback of the purchase request information to the callback server 200. Upon requesting an IPPV event purchase, when there is previous request information, the digital broadcast receiving terminal 100 requests a callback of the previous request information to the callback server 200, wherein, if the callback has failed, a separate exceptional processing is applied.

Purchase record data and callback security are stored, without encryption, in an area in which data is not deleted, even when data stored in an NVRAM of the digital broadcast receiving terminal 100 is upgraded by software of the terminal. According to an exemplary embodiment of the present invention, a purchase history and/or a purchase cancellation history may be stored in a memory, in a SIM/SMD, or in both according to the policy of each manufacturing company, and may be encrypted.

A graphic user interface (GUI) of the digital broadcast receiving terminal 100 uses a soft-key scheme, includes an IPPV flow, wherein types of service channels include a video channel, an audio channel, a music channel, a PPC channel, and a PPV channel.

Hereinafter, a purchase cancellation procedure will be described. As shown in FIG. 7, when a purchase cancellation is selected from a menu during viewing after an IPPV has been purchased, it is determined if the current time is within a time when the
purchase can be canceled. If the current time is past the time when the purchase can be canceled, the selected purchase cancellation is ignored.

[85] In contrast, if the current time is within the time when the purchase can be canceled, the user is requested to input a password. When the password is input by the user and is confirmed, the CAS restores the CP to the original state, and a purchase cancellation history is stored. Then, a callback message according to the purchase cancellation is transmitted to the terminal, and the user is restricted from using (e.g. viewing) the corresponding program.

[86] Hereinafter, the present invention will be described in detail with reference to the accompanying drawings.

[87] FIG. 8 is a view illustrating a flow of an IPPV service which requests a fee to be paid for each viewed program. FIG. 8 illustrates a scenario until a callback is performed after a digital broadcast receiving terminal has completed a purchase, upon a first access to an IPPV channel. In the scenario, only colored steps are processed through a user interface (UI), and numerals attached to the colored steps are identical to screen numbers in following drawings. Checking if a corresponding PPV channel is an adult-only channel, a use restriction based on program ratings, etc., are performed before the first step, i.e. at the precise moment when the user accesses the PPV channel.

[88] It is determined if there is IPPV product information on a smart card. When there is no IPPV product information on the smart card, the user joins in IPPV service, so that IPPV product information is transmitted to the smart card.

[89] When there is IPPV product information on the smart card, it is determined if a corresponding program has been blocked-out. When the program has been blocked-out, it is impossible to view and purchase the program (see reference numeral 1-1). When the program has not been blocked-out, an adult verification password is checked through a PPV purchase, and the program is viewed.

[90] It is determined if a PPV event has already been purchased through the IPPV. Then, if the PPV event has not been purchased, it is checked if a preview has expired. When the preview has not expired, the preview is checked (see reference numeral 2), an IPPV purchase history is checked, and a callback must be carried out before the PPV event can be purchased (see reference numeral 3).

[91] When there is no IPPV purchase history, a coverage and a battery are checked, it is determined if a CAS PIN has been locked, it is checked if the user has been authenticated by inputting a PIN, and the user contacts customer service when a debit limit has been exceeded, i.e. when no credit remains, (see reference numerals 4 and 5).

[92] After authentication of the PIN, when the purchase of broadcast data has been completed (see reference numeral 6), a broadcast is viewed, and when the TU has
been terminated, a callback must be carried out by checking if there is an IPPV purchase history before the next IPPV program can be purchased (see reference numeral 7).

[93] In a normal case, an IPPV service is provided via steps indicated by reference numerals 2, 4, 5, 6, and 7.

[94] FIGs. 9 to 12 are views illustrating screens for an IPPV service.

[95] Although a program name and a price are individually input upon input of EPG information in a TU terminal, the program name and the price are unitedly transmitted as the program name upon transmission of EPG data. Therefore, it is unnecessary to configure a separate mini-EPG for a PPV channel in the terminal.

[96] According to an exemplary embodiment of the present invention, an EPG menu may not provide an IPPV-related menu, such as a purchase history inquiry.

[97] Upon joining in a TU, all subscribers are granted IPPV products. However, additional service users who are restricted from using an IPPV service are not granted an IPPV product.

[98] In an IPPV service, a block-out filter is applied and used for channels and programs. When a channel or program has been blocked out, a loading animation is stopped while a popup window is opened.

[99] Referring to FIG. 9, only when an event information table EIT(p) has been received, a lower purchase banner is displayed, and a purchase function is activated. When a cancellation is selected in a state where the purchase banner has been displayed, the purchase banner disappears, and the channel is shifted to a previous viewing channel.

[100] When an L button is pressed in the current screen, a mini-EPG is displayed while the purchase banner disappears. When the mini-EPG has disappeared, the purchase banner is again displayed. hh:mm represents a buy-time duration based on a start time, and is expressed as a sum of the start time and the buy time duration.

[101] On the screens indicated by reference numerals 2 and 2-1, although a purchase button is pressed, if the mobile terminal is in a MIN number initialization state or in a non-registration state, the procedure does not proceed to the next step, and a popup window saying You can apply after registration of the mobile terminal, without an OK button is opened.

[102] When a preview has expired during viewing, the last reproduction image is displayed as a still image. When the mobile terminal shifts to a channel after a preview has expired, a loading screen of the channel is displayed.

[103] When a buy time has been exceeded, it is impossible to make a purchase, and the channel is shifted to a previous viewing channel (see reference numeral 2-2).

[104] When a result of a query about if there is callback data corresponds to CAS
message #E358, it is impossible to make a purchase. When a transmission has failed, an attempt for the transmission is again made up to three times. When a callback has been completed at the third attempt during the attempts for the transmission, TU is resumed at the next step.

[105] Referring to FIG. 10, when there is no IPPV purchase history, a coverage and a battery are checked, it is checked if a CAS PIN has been locked, an authentication is performed by inputting a PIN, and the user contacts customer service when a debit limit has been exceeded, i.e. upon no credit, (see reference numerals 4 and 5).

[106] Referring to FIG. 11, when an authentication has been made before a buy time hh:mm, and a purchase of broadcast data has been completed within a debit limit, it is checked if there is an IPPV purchase history upon termination of the TU, and the IPPV purchase history is transmitted when the IPPV purchase history exists.

[107] As shown in FIG. 12, after a purchase, it is possible to cancel the purchase by clicking a purchase cancellation button and inputting a TU password until a predetermined time hh:mm (which is shown up to the minute unit). After a purchase, if the user is continuously viewing a PPV channel or if the channel shifts to another channel and then to the PPV channel, a purchase cancellation menu is displayed only until a purchase-cancelable time has expired. Even after the purchase-cancelable time has expired, the purchase cancellation menu may be displayed. In this case, when the purchase cancellation menu is selected, a popup window saying It is impossible to cancel the purchase, is opened.

[108] The purchase cancellation menu is implemented in such a manner as to add a purchase cancellation function to a sub-menu when the sub-menu exists in a menu key, or as to display a banner indicated by reference numeral 8 during a purchase-cancelable time when a menu key is used only for display of a mini-EPG. When the purchase cancellation function is displayed as a sub-menu, no separate banner is displayed on the screen.

[109] A period of time for which the purchase cancellation banner or the purchase cancellation menu is displayed and operated is based on a Ctime value returned through a client library upon PPV purchase.

[110] According to an exemplary embodiment of the present invention, the purchase cancellation function may be set to be displayed/operated only when the returned Ctime value exceeds zero, and not to be displayed when the returned Ctime value is zero. Otherwise, the purchase cancellation function may be set to be displayed/operated only when the returned Ctime value is zero. Also, it is possible to display a popup window saying It is impossible to cancel the purchase, when the menu is selected. When a purchase is to be canceled in a state where a PPV purchase history has not been called back, neither PPV purchase history nor a purchase cancellation history is called back.
When a purchase is to be canceled in a state where a PPV purchase history has been called back, a purchase cancellation history is called back.

Information about the purchase-cancelable time is included in an entitlement control message (ECM), and is transmitted from the CAS to the digital broadcast receiving terminal. According to an implementation scheme, the information about the purchase-cancelable time may be included in a PSI/SI table, instead of the ECM, so as to be transmitted according to implementation schemes.

When the purchase cancellation function operates by the CAS, and information about the purchase-cancelable time is included in ECM information of the CAS, the information about the purchase-cancelable time is included in a response message. When the purchase-cancelable time is zero, it represents that it is impossible to cancel a purchase. In this case, the screen of the purchaser's terminal displays The purchase cannot be canceled when the user selects cancellation, or the screen does not display a purchase cancellation menu/function from the very first.

According to the policy of each service provider, it is set that purchase cancellation is possible X times (wherein X is an integer equal to or greater than one).

When the purchase cancellation function operates by separate PSI/SI information, a buy time and a purchase-cancelable time of the terminal are calculated, and the user interface (UI) of the terminal is controlled.

The purchase cancellation history is stored and called back, wherein the purchase cancellation history is stored in a memory of the terminal or an SMD card, similar to the purchase history. Even when the purchase history has already been called back, the purchase cancellation history must necessarily be called back. When a purchase is canceled in a state where the purchase history has not been called back, it is possible to call back both the purchase history and purchase cancellation history, or it is possible to manage only the terminal without calling back the purchase history and the purchase cancellation history.

The method according to the present invention, as described above, can be realized by a program and can be stored in a recording medium (such as a CD ROM, a RAM, a floppy disk, a hard disk, a magneto-optical disk, etc.) in a format that can be read by a computer.

Meanwhile, as described above, the present invention provides a purchase cancellation function so that it is possible to cancel program contents which have been purchased through a service requesting a fee to be paid for every viewed program, and has been explained with the IPPV service as such a service, which is just one embodiment of the present invention. That is, the present invention may be applied even to a pay-per-view (PPV) service, which requests a fee to be paid for every program viewed through a digital broadcast receiving terminal, like the IPPV service.
Therefore, when the present invention is applied to the PPV service, the same effects as those described above will be obtained even in the PPV service.

[118] Although several preferred embodiments of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

**Industrial Applicability**

[119] According to the present invention, there is a provided a purchase cancellation function of canceling a purchase of contents purchased in the IPPV or PPV scheme, which requests a fee to be paid for every program viewed through a digital broadcast receiving terminal. In addition, a purchase history and a purchase cancellation history may be stored in a SIM card of a DMB terminal and may be managed, or the histories may be managed by a callback server.

[120] Accordingly, the present invention has industrial applicability because it has sufficient marketability or business possibility as well as applicability to related services, and is also obviously practicable.

[121]
Claims

[1] An impulse pay-per-view (IPPV) purchase cancellation system for a video/audio channel or a music channel in a digital broadcasting system, the IPPV purchase cancellation system comprising:

- a callback server for receiving a purchase history and a purchase cancellation history from a digital broadcast receiving terminal;
- a business information system (BIS) for receiving an IPPV purchase history and a purchase cancellation history from the callback server, providing an account settlement function, managing IPPV request entitlement and a usage limit, granting IPPV request entitlement to adult subscribers, establishing IPPV request entitlement of teenager subscribers and an adult-only content viewing limit function (i.e. a block-out function) for teenager subscribers, setting a limit on a monthly usable amount of money, managing a total usage limit and an accumulated usage history according to each SIM/SMD card of the digital broadcast receiving terminal, and managing the number of tokens required according to IPPV program price information;
- a conditional access system (CAS) for transmitting an entitlement control message (ECM) and an entitlement management message (EMM) to the digital broadcast receiving terminal; and
- a program specific information/service information (PSI/SI) system connected to a program management system (PMS), the PSI/SI system transmitting broadcast PSI/SI (e.g. EPG information) to the digital broadcast receiving terminal, wherein the CAS is connected to the PMS, sets an IPPV usage limit of the digital broadcast receiving terminal of a subscriber, manages a total usage limit (i.e. debit limit) and purchase, and restricts adult-only programs from being illegally viewed and broadcast programs from being illegally viewed by a user for whom service has been temporarily revoked.

The IPPV purchase cancellation system as claimed in claim 1, wherein the digital broadcast receiving terminal comprises a user interface (UI) for an IPPV purchase and a purchase cancellation.

[3] A method for canceling an impulse pay-per-view (IPPV) purchase of a video/audio channel or a music channel in a digital broadcasting system, the method comprising the steps of:

(a) when a digital broadcast receiving terminal joins as a subscriber or makes an additional request, receiving an IPPV and an adult-only content viewing limit (i.e. block-out) for teenagers, receiving broadcast video and audio signals, an entitlement management message (EMM), an entitlement control message (ECM),
EPG information (i.e., PSI/SI information) from a DMB broadcasting service system, checking channels programs through an EPG main, receiving a channel number, and checking if a channel of the received channel number can be viewed;
(b) shifting to a PPV channel, determining if there is an IPPV product, checking a viewing right, determining if the PPV channel corresponds to a usage-restricted channel, or if there is an adult-only content viewing restriction (i.e., block-out) for teenagers, checking an adult-only genre, inputting a PIN/password, and allowing a broadcast to be viewed;
(c) when it is impossible to view the broadcast, outputting an announcement about subscription, or outputting an announcement about a usage-restricted channel/program in a case related to an adult-only content viewing limit (i.e., block-out) for teenagers;
(d) outputting an announcement about termination when a purchasable time has been exceeded because an IPPV program can be purchased only during the purchasable time;
(e) only when a corresponding subscriber is a subscriber who can normally purchase and view an IPPV program, viewing preview contents during a broadcast program preview time, and viewing the IPPV program through the digital broadcast receiving terminal via a purchase step during a buy time;
(f) after the IPPV program has been purchased, allowing the digital broadcast receiving terminal to cancel the purchase of the IPPV program via an IPPV program purchase cancellation step before a purchase-cancelable time (cancel-time; Ctime) expires, wherein the digital broadcast receiving terminal includes an application for a purchase cancellation function, and when a purchase cancellation is performed and completed according to a predetermined process, a purchase cancellation history is stored in a SIM/SMD card, and the stored purchase cancellation history is transmitted to a callback server;
(g) updating and storing information about an IPPV purchase history in the SIM/SDM card within a range not exceeding a usage limit, deleting tokens as many as the number of used tokens, storing an IPPV purchase history and a purchase cancellation history in a memory of the terminal, and performing a termination after viewing; and
(h) transmitting a purchase history and a purchase cancellation history of IPPV programs to the callback server in a predetermined scheme at a predetermined time, which are established according to a determination of a service provider.

The method as claimed in claim 3, wherein, in step (f), a purchase cancellation button is clicked before the purchase-cancelable time expires, a password is
input, and the purchase is canceled by making reference to a service ID of a
broadcast program purchased in IPPV, an event ID, an order time (date and
time), a buy time, a total usage limit (debit limit), and an accumulated usable
number (i.e. a customer purse).

[5] The method as claimed in claim 4, wherein, in step (f), a purchase cancellation
function displayed as a purchase cancellation banner or menu provides a function
of canceling a purchase in consideration of the purchase-cancelable time "Ctime"
returned through a client library upon an IPPV purchase.

[6] The method as claimed in claim 5, wherein the purchase cancellation function is
displayed and operated only when a "Ctime" value exceeding zero is returned,
and is not displayed when a "Ctime" value of zero is returned.

[7] The method as claimed in claim 4, wherein neither the IPPV purchase history nor
the purchase cancellation history is called back when a purchase is canceled in a
state where the IPPV purchase history has not been called back, and the purchase
cancellation history is called back to the callback server when a purchase is
canceled in a state where the IPPV purchase history has been called back.

[8] The method as claimed in claim 5, wherein the purchase-cancelable time is
included in an entitlement control message (ECM) by a conditional access
system (CAS), and is transmitted to the digital broadcast receiving terminal.

[9] The method as claimed in claim 5, wherein the purchase-cancelable time is
included in a PSI/SI table, instead of ECM information, according to an imple-
mentation scheme, and is transmitted to the digital broadcast receiving terminal.

[10] The method as claimed in claim 7, wherein, when the purchase cancellation
function operates by the CAS, and the purchase-cancelable time is included in
ECM information by the CAS, the purchase-cancelable time is included in a
response message,
in which, when the purchase-cancelable time has a value of zero, which
represents that a corresponding purchase cannot be canceled, "Purchase Cancellation Is Impossible." is displayed on a screen of the digital broadcast
receiving terminal of a purchaser (i.e. user) if the user selects cancellation.

[11] The method as claimed in claim 5, wherein, when the purchase cancellation
function operates by the CAS, and the purchase-cancelable time is included in
ECM information by the CAS, the purchase-cancelable time is included in a
response message, and "Purchase Cancellation Is Impossible." is displayed when
the purchase-cancelable time has been exceeded.

[12] The method as claimed in claim 4, wherein it is established that a purchase can-
cellation is possible at least one time based on a policy of an IPPV purchase and
purchase cancellation service provider.
cancellation history is called back to the callback server, and the purchase cancellation history is stored in the SMD/CIM card or the memory of the terminal, similar to the purchase history.

The method as claimed in claim 4, wherein, when a purchase is canceled in a state where the IPPV purchase history has been called back, the purchase cancellation history is called back to the callback server.

The method as claimed in claim 4, wherein, when a purchase is canceled in a state where the IPPV purchase history has not been called back, both the purchase history and the purchase cancellation history are called back to the callback server, or the purchase cancellation is stored and managed only in the SMD/SIM or the memory of the terminal without calling back the purchase history and the purchase cancellation history.

The method as claimed in claim 3, wherein, in step (f), in order to receive an IPPV account from the digital broadcast receiving terminal, each SIM card cooperates with the callback server according to SIN card numbers, in which a cooperation period of a Near Real Time (basic billing; Hotbill) is used.

A computer-readable recording medium storing instructions to perform a method for canceling an impulse pay-per-view (IPPV) purchase of a video/audio channel or a music channel in a digital broadcasting system, the method comprising the steps of:

(a) when a digital broadcast receiving terminal joins as a subscriber or makes an additional request, receiving an IPPV and an adult-only content viewing limit (i.e. block-out) for teenagers, receiving broadcast video and audio signals, an entitlement management message (EMM), an entitlement control message (ECM), EPG information (i.e. PSI/SI information) from a DMB broadcasting service system, checking channels programs through an EPG main, receiving a channel number, and checking if a channel of the received channel number can be viewed;

(b) shifting to a PPV channel, determining if there is an IPPV product, checking a viewing right, determining if the PPV channel corresponds to a usage-restricted channel, or if there is an adult-only content viewing restriction (i.e. block-out) for teenagers, checking an adult-only genre, inputting a PIN/password, and allowing a broadcast to be viewed;

(c) when it is impossible to view the broadcast, outputting an announcement about subscription, or outputting an announcement about a usage-restricted channel/program in a case related to an adult-only content viewing limit (i.e. block-out) for teenagers;

(d) outputting an announcement about termination when a purchasable time has
been exceeded because an IPPV program can be purchased only during the purchasable time;
(e) only when a corresponding subscriber is a subscriber who can normally purchase and view an IPPV program, viewing preview contents during a broadcast program preview time, and viewing the IPPV program through the digital broadcast receiving terminal via a purchase step during a buy time;
(f) after the IPPV program has been purchased, allowing the digital broadcast receiving terminal to cancel the purchase of the IPPV program via an IPPV program purchase cancellation step before a purchase-cancelable time (cancel-time; Ctime) expires, wherein the digital broadcast receiving terminal includes an application for a purchase cancellation function, and when a purchase cancellation is performed and completed according to a predetermined process, a purchase cancellation history is stored in a SIM/SMD card, and the stored purchase cancellation history is transmitted to a callback server;
(g) updating and storing information about an IPPV purchase history in the SIM/SDM card within a range not exceeding a usage limit, deleting tokens as many as the number of used tokens, storing an IPPV purchase history and a purchase cancellation history in a memory of the terminal, and performing a termination after viewing; and
(h) transmitting a purchase history and a purchase cancellation history of IPPV programs to the callback server in a predetermined scheme at a predetermined time, which are established according to a determination of a service provider.
[Fig. 6]

Grant Block-Out Product, IPPV (When joining & making additional request)

Cancel

OK

Program Table

OK

Cancel Number Input

Premium Channel

Subscription Announcement

Error Code

E25

E23, E24

Announcement about Usage Limit Channel or Program (Block-out)

Within Time (E23)

Preview Time

Preview

End (E24)

After Buy Time

Within

Announcement about Preview and Buy Time Termination (EPG 2-2)

Announcement about Preview Time Termination & Purchase (EPG 2-1)

OK

Preview available, but Purchase unavailable

Cancel

Purchase Request

OK

Purchase Request

Check if Previous Purchase Request Information is present

Presence

absence

Request PIN Code Input (EPG)

Check Purchase

Input PIN Code

DLCPC+5C

SIM Card Event

History>25

Record IPPV Event Purchase in Terminal Memory

No

Delete SIM card information Record & Token

YES (E27)

Error

Check if PIN Code is Right

YES

number of error

Re-input

Cancelling

Only Popup Window disappears (maintain previous screen image)

End

Return to "Purchase Unavailable" upon failure

Callback (three times)

Callback

Terminate Viewing

IPPV EVENT PURCHASE PROCEDURE
[Fig. 7]

PPV Purchase State

View

Select Purchase Cancellation

Impossible

Check Of Purchase Cancellation Time

Purchase Cancellation Impossible

Possible

Input Password

Check Password

X

Restore CP To Original State

Callback Purchase Cancellation History

Store Purchase Cancellation History

Viewing Impossible (State Before PPV Purchase)
• Only when EFP(p) has been received, a lower purchase banner is displayed, and a purchase function is also activated.
• When cancellation is input in a purchase banner display state, the purchase banner does not disappear, and the channel is shifted to the previous viewing channel.
• When an "L" button is pressed in the current screen, a mini-EFP is displayed while the purchase banner disappears. When the mini-EFP has disappeared, the purchase banner is again automatically displayed.
• Minifont, time+buy time+citation
• CAS msg #261
  In the screens of numbers 2 and 2-1 above, although the "purchase" button is pressed, if the mobile terminal is in a MSK number initialization state or in a non-registration state, the procedure does not proceed to the next step, and the following popup window is opened.
  - "You can apply after registration of the mobile terminal." (popup window with no "OK" button)
  - Upon OK/Cancel input, shift to a previous viewing channel.
  - See CAS requirements for detailed specification.
• The length of the purchase banner cannot exceed 22 pixels.

Program Name
Play Time: hh:mm - hh:mm
The preview has expired.
Purchase?

- 91 movie PPV CE.
  Wing's Fighter (3,000 won) 10:00-11:00

- The preview has expired (CAS msg #2504) & buy time not over.
- No: Shift to a previous viewing channel.
- Yes: Shift to a previous viewing channel.
  The last reproduction image is displayed as a still image. When the terminal shifts to a channel after a preview has expired, a loading screen of the channel is displayed.
  Keep the same line charges as those known in the example.
  The first line (program name) in the popup necessarily requires a scrolling function. When it is impossible to provide a scrolling function, the entire program name must be displayed even if the program name is continued to the next line.

Please wait a little while.
It is being checked if the purchase is possible.

- 91 movie PPV CE.
  Wing's Fighter (3,000 won) 10:00-11:00

- The preview has expired (CAS msg #2504) & buy time not over.
- OK/Cancel: Shift to a previous viewing channel.
- The preview has expired – when the terminal continuously displays a channel until a buy time has expired, a lower message is automatically changed.

Purchase is impossible. Please try again.

- Whether or not there is callback data when a result of query in CAS msg #258.
  - When a transmission has failed, the transmission is re-attempted.
  - Even during the re-attempt, U1 is the same as that shown in No. 3.
  - After call back has been completed in No. 3, T2 is resumed in step 4.
**Program name**
Play time: hh:mm - hh:mm
Refund is impossible after purchase.
Would you like to purchase it?
Yes  No

- **No**: Only the popup window disappears.
- **A background reproduction is stopped while the popup window is opened.**
- **Layers other than the popup window disappear (which is applied to all the following steps).**
- **mm (minute): Event duration**

**Input TU password**

- **CAS MSG #E402**: Password authentication failure
- **CAS MSG #E403**: Password authentication success
- **CAS MSG #E404**: Buy time is exceeded due to excess of input time
- **When cancellation is pressed, only the popup window disappears.**

**Excess of PPV usage limit**
Contact Customer Service

- **CAS Error msg #E308**: Remainder = the number of remaining tokens x 500 won
- CAS msg #2409
- The popup window automatically disappears after 3 seconds.

- When the TU is terminated, it is checked if there is an IPPV purchase history, and the IPPV purchase history is transmitted if the IPPV purchase history exists.
- CAS MSG #2409 is displayed when there is data to be called back, and CAS MSG #240 is displayed when there is no data to be called back.
- A transmission interruption function (input of a cancel/end key during transmission) is not provided. That is, after a transmission starts, the transmission cannot be stopped before a battery is disconnected.
- NATE, magicN, ez-web access screens are not displayed, and only data communication is attempted.
It is possible to cancel purchase, the purchase until h:mm cancel time.

- After a purchase, the purchase can be canceled before a predetermined time. Upon a purchase, a purchase-cancelable time is changed.
- h:mm-purchase-cancelable time
- After a purchase, when a 2PV channel is continuously viewed, or when the channel is shifted to another channel and then to the PPV channel, the purchase cancellation banner or menu is displayed only until a purchase-cancelable time, but is not displayed after the purchase-cancelable time.
- A key allocated for "purchase cancellation" must be the same as that allocated for "purchase". When the purchase cancellation function is allocated as a separate menu, an OK key must be allocated (menu-purchase cancellation selection? OK)
- When an "X" button is pressed in the current screen, a mini-F/5 is displayed while the purchase banner disappears. When the mini-OPC is disappeared, the purchase banner is again automatically displayed.

CAS msg #1200 status

(Progran name)
will you cancel the purchase?
Yes
No

 CAS msg #1405
- The popup window automatically disappears, and two items of PPV are displayed according to time.

CAS msg #202
- Only the popup window disappears.
- A background reproduction is stopped while the popup window is opened. Layers other than the popup window disappear (which is applied to all the following steps).

Input TV password ****
OK

 CAS msg #806
- It is the same as a TV password verification process.
 CAS msg #801: Password authentication failure
 CAS msg #806: Password authentication success
 CAS msg #810: Error time is exceeded due to excess of input time
 CAS msg #811: Error time is exceeded due to excess of input time
 CAS msg #812: Error time is exceeded due to excess of input time

The purchase cancellation menu is implemented in such a manner as to add a purchase cancellation function to a sub-menu when the sub-menu exists in a menu key, or as to display a banner indicated by reference numeral 8 during a purchase-cancelable time when a menu key is used only for display of a mini-OPC. When the purchase cancellation function is displayed as a sub-menu, no separate banner is displayed on the screen (shift to "X" without menu of "X").

A period of time for which the purchase cancellation banner or menu is displayed and operated is based on a Ctime value returned through a client library upon a POS purchase.

The purchase cancellation function is displayed/operated only when the returned Ctime value exceeds zero, and not to be displayed when the returned Ctime value is zero.

When a purchase is canceled in a state where a PPV purchase history has not been called back, neither a PPV purchase history nor a purchase cancellation history is called back. When a purchase is canceled in a state where a PPV purchase history has been called back, a purchase cancellation history is called back.

- A purchase cancellation is performed in a sequence of 0-1, 0-2, and 0-3.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

H04N 7/16(2006.01) j1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility Models : IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS(KIPO Internal): "impulse pay-per-view (IPPV)", "DMB"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>A</td>
<td>KR 10-2006-0126211 A (SK TELECOM CO., LTD.) 7 Dec. 2006 See abstract, page 6 lines 5-41; claims 1,8; figure 5.</td>
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<td>A</td>
<td>KR 10-2001-0078828 A (LEE, MAN YOUNG) 22 Aug. 2001 See abstract, page 2 lines 34-58; claims 1-2; figures 1-2.</td>
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<td>A</td>
<td>KR 10-2001-0047389 A (KOREA ELECTRONICS TELECOMM) 15 Jun. 2001 See abstract, page 3 lines 14-44; claim 1; figure 2-4.</td>
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
  "E" earlier application or patent but published on or after the international filing date
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search 23 JUNE 2008 (23.06.2008)

Date of mailing of the international search report 23 JUNE 2008 (23.06.2008)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seosona-ro, Seogu, Daejeon 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer

CHOI, Seong Jin
Telephone No. 82-42-481-8366

Form PCT/ISA/210 (second sheet) (April 2007)
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## Index of Claims

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### CLAIM

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Docket No.: 4900-0037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
Jong Ho KIM et al.
U.S. Patent Application No. 12/678,050
Filed: March 12, 2010

Confirmation No.: 4956
Group Art Unit: 2617
Examiner: YERNENI, MRUNALINI

For: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

AMENDMENT UNDER RULE 116

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The following amendments and remarks are submitted in response to the final Official Action mailed May 17, 2012.
AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

1. (Currently Amended) A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

   a mobile communication information management server for receiving [[a]] unique information of the second terminal and [[a]] USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying that there has been a device replacement when the unique information of the second terminal and is different from the subscriber information do not coincide with each other;

   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information upon receipt of after the unique information of the second terminal and the subscriber information are provided according to the notification procedure of from the mobile communication information management server; and

   a Conditional Access System (CAS) for transmitting, to the second terminal, device change information that includes broadcast information to update necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

2. (Original) The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.
3. (Original) The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

4. (Currently Amended) The system as claimed in claim 3, wherein the CAS further transmits, to the first terminal, EMM information including information necessary to cancel the subscription of the first terminal to delete subscriber information on the first broadcasting chip.

5. (Currently Amended) The system as claimed in claim 1, wherein the CAS comprises:

   a database for storing and managing the broadcast information on [[the]] each subscriber according to each of the information on the broadcasting chips;

   a communication unit for communicating with the broadcast information management server and transmitting the device change information to the second terminal;

   a data analysis unit for analyzing both the unique information of the second terminal and the subscriber information provided by the broadcast information management server;

   a control unit for extracting the subscriber information and the unique information of the second terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command based on in regard to a message including the extracted broadcast information and the extracted unique information of the second terminal; and

   a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit for transmission to the second terminal.

6. (Currently Amended) A method [[for]] of maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal
having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal, by a mobile communication information management server;

when the terminal information of the second terminal is different from terminal information corresponding to the subscriber information, determining that there has been a device replacement, and then providing the terminal information of the second terminal and the subscriber information to a broadcast information management server, by the mobile communication information management server;

transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; and

generating Entitlement Management Message (EMM) information based on the extracted broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information of the second terminal; and

updating the broadcast information included in the EMM information to such that the second terminal modifies the information on the second broadcasting chip to information of the first broadcasting chip.

7. (Currently Amended) A method of maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal;
determining that there has been a device replacement, when the terminal information of the second terminal and is different from the subscriber information do not coincide with each other;

extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; [[and]]

generating Entitlement Management Message (EMM) information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information; and

updating the broadcast information included in the EMM information to the second broadcasting chip.

8. (Currently Amended) The method as claimed in claim 6, further comprising: wherein the

transmitting, to the first terminal, EMM information that includes a cancellation message for cancelling subscription of the first terminal; and

deleting subscriber information on the first broadcasting chip in response to the cancellation message.

9. (Currently Amended) The method as claimed in claim 7, further comprising: wherein the

transmitting, to the first terminal, EMM information that includes a cancellation message for cancelling subscription of the first terminal; and

deleting subscriber information on the first broadcasting chip in response to the cancellation message.
REMARKS

Applicant appreciates the Examiner’s review of the present application, and respectfully requests reconsideration in light of the preceding amendments and the following remarks.

Claims Amendments/Status

Claims 1-9 are pending in the instant application. Several claims have been amended to better define the claimed invention. The amended claims find solid support in the original specification and drawings. Especially, the amended claim is supported by at least paragraph [0045] of the application publication. No new matter has been introduced through the foregoing amendments.

Information Disclosure Statement

The Examiner’s consideration of the IDS is noted with appreciation.

Claim Rejections under 35 U.S.C. §103


(1) Independent Claim 1

Amended independent claim 1 recites:

1. A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:
   a mobile communication information management server for receiving unique information of the second terminal and USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying that there has been a device replacement when the unique information of the second terminal and the subscriber information do not coincide with each other;
   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information upon
receipt of the unique information of the second terminal and the subscriber information from the mobile communication information management server; and

a Conditional Access System (CAS) for transmitting, to the second terminal, device change information that includes broadcast information to update information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

The applied references, singly or in combination, do not teach or suggest the subject matter of claim 1, especially the above highlighted feature, i.e., the second broadcasting chip is updated with broadcast information when there has been a device replacement.

It should be noted that there are two different types of changes involved in the references.

*Guahk* is related to subscriber information changes. The purpose of *Guahk* is to transmit changes (generation, modification, cancellation) in subscriber information to a mobile terminal on time. See *Guahk* at paragraph 52. Subscriber information is stored in a smart card of the mobile terminal. See *Guahk* at paragraphs 9 and 35. Subscriber information changes are updated by an EMM (Entitlement Management Message) generated by a CAS (Conditional Access System). Apparently, it is the smart card that will be updated with the subscriber information changes included in the CAS’s EMM.

*Okkonen* is related to a completely different type of change, i.e., device/SIM changes. The purpose of *Okkonen* is to ensure that the services associated with a SIM card (subscribed by the end-user) continue to be delivered on to the new electronic device (terminal) currently associated with the SIM card. This purpose is achieved by updating the terminal with configuration information, preferences, software updates, device driver changes, firmware updates etc. See *Okkonen* at paragraph 0042. The reference does not teach or suggest where the updates are to be stored in the terminal. The reference is also silent on the meanings of “configuration information” and “preference.” Given the other updates, i.e., software, firmware, a person of ordinary skill in the art would understand that the updates of *Okkonen*, including “configuration information” and “preference,” are related to the operational environment of the terminal, and are unrelated to subscriber information such as that discussed in *Guahk*. 
The Office proposes to modify Guahk to cause updates in the new terminal upon a SIM/device change as taught by Okkonen. Such a combination, if at all proper, would result in, at best and if at all, only updates in the operational environment (i.e., software, firmware, preferences) of the new terminal and need not involve the Guahk CAS’s EMM. The reason is that the Guahk CAS’s EMM is sent when there is a subscriber information change, rather than when there is a device/SIM change. Thus, in the Office’s proposed combination, the Guahk CAS would not send any message to the terminal in response to a device/SIM change, contrary to the claimed subject matter.

Further, even if assuming arguendo that the references were combinable, i.e., assuming arguendo that the Guahk CAS in the Office’s combination would send a message to the terminal in response to a device/SIM change, such message would include information to be updated in the smart card of the terminal, in accordance with the teachings of Guahk. To the contrary, the claimed subject matter recites an update of the broadcast information in the chip of the second terminal.

Accordingly, Applicants respectfully submit that

(i) The references of Guahk and Okkonen are not properly combinable in the manner suggested in the Final Office Action, and

(ii) Assuming arguendo that the references were combinable, the combination would only update the smart card, rather than the chip, contrary to the claimed subject matter.

The deficiencies of Guahk and Okkonen are not deemed curable by the teaching reference(s) of Apsangi, and therefore independent claim 1 is patentable over the applied art of record.

(2) Claims 2-9

Amended independent claims 6 and 7 have the same or similar distinguishable limitations as/to those of claim 1, and these claims are patentable at least for the reasons stated in connection with claim 1.
Claims 2-5, 8, and 9, which are dependent on any one of claims 1, 6, and 7 are also patentable at least for the reasons discussed above with regard to claims 1, 6, and 7.

**Conclusion**

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited. Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

LOWE HAUPTMAN HAM & BERNER, LLP

/Yoon S. Ham/
Yoon S. Ham
Registration No. 45,307

1700 Diagonal Road, Suite 300
Alexandria, Virginia 22314
(703) 684-1111
(703) 518-5499 Facsimile
Date: **July 17, 2012**
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.
# PATENT APPLICATION FEE DETERMINATION RECORD

**APPLICATION AS FILED – PART I**

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If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

* If the difference in column 1 is less than zero, enter "0" in column 2.

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## APPLICATION AS AMENDED – PART II

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*** If the "Highest Number Previously Paid For" in THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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Legal Instrument Examiner: MARQUITA JONES

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.
Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) [ ] Responsive to communication(s) filed on 22 March 2012
2a) [ ] This action is FINAL.
2b) [ ] This action is non-final.
3) [ ] An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
4) [ ] Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) [ ] Claim(s) 1-9 is/are pending in the application.
   5a) Of the above claim(s) _____ is/are withdrawn from consideration.
6) [ ] Claim(s) _____ is/are allowed.
7) [ ] Claim(s) 1-9 is/are rejected.
8) [ ] Claim(s) _____ is/are objected to.
9) [ ] Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10) [ ] The specification is objected to by the Examiner.
11) [ ] The drawing(s) filed on _____ is/are: a) [ ] accepted or b) [ ] objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
12) [ ] The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) [ ] Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) [ ] All  b) [ ] Some * c) [ ] None of:
   1. [ ] Certified copies of the priority documents have been received.
   2. [ ] Certified copies of the priority documents have been received in Application No. _____.
   3. [ ] Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) [ ] Notice of References Cited (PTO-892)
2) [ ] Notice of Draftsman’s Patent Drawing Review (PTO-948)
3) [ ] Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date Paper No(s)/Mail Date 04/16/2010
4) [ ] Interview Summary (PTO-413)
   Paper No(s)/Mail Date
5) [ ] Notice of Informal Patent Application
6) [ ] Other: ____.
DETAILED ACTION

1. This action is responsive to the Amendment filed on 03/22/2012. Claims 1-9 are pending in the application. Claims 1, 6 and 7 are independent claims.

Information Disclosure Statement

2. The prior art Reference missing in the IDS submitted on 04/16/2010 is provided by the Applicant on 03/22/2012. Accordingly, the IDS is being considered by the Examiner.

Response to Amendment

3. Applicants’ amendments to claim 5 overcome the 35 USC § 112 rejection set forth in the previous office action. Accordingly, the 35 USC § 112 rejection on claim 5 has been withdrawn.

Response to Arguments

4. Applicant's arguments filed on 03/22/2012 have been fully considered but they are not persuasive.

a. Applicant argued in Pg. 3 of Remarks that in Claim 1 of the Instant Application, the broadcast information management server makes a request of modification of broadcast information only after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server. Guahk at paragraphs [37] merely discloses or teaches that "BIS transmits' a terminal information and an alteration recoding of a subscriber information to a CAS". Hence, Guahk does not teach this limitation of
claim 1. **In Response:** Examiner conveyed in the previous office action that Guahk teaches the BIS performing modification of broadcast information based on changes in subscriber information, but does not explain how the BIS learns about the change in subscriber information and hence does not teach the broadcast information management server making request for modification based on notification from mobile communication information management server. The combination of Guahk and Okkonen teach this limitation as can be seen in the 35 USC § 103 rejection section below.

b. Applicant argue in Pg.3 of Remarks regarding claim 1 that Okkonen merely teaches that a service coordinator detects a change in a SIM card by comparing "a SIM card information received from an electronic device" to "a previously stored SIM card information," and then communicates SIM card change to a service provider. In contrast, claim 1 recites, in part, the limitation "device replacement is determined depending on whether or not a unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card coincide with each other." **In Response:** The amended limitation of claim 1 is found in multiple sections of Okkonen. See for example ¶41-42: “*when the electronic device 109 reports a change in SIM card 123 and the SIM card 123 change is determined to be a change in electronic device 109, the service coordinator can access the provisioning information for the SIM card 123, including all services subscribed to by the end-user, and enable access to all those services via the changed electronic device 123.... in order to determine a change in electronic device, if any, associated with a change in SIM card, the service provider 119 processes the received report of SIM card change provided by the electronic device and looks into its...*"
database to determine if there is change of electronic device indicated. If it determines that the electronic device 123 has changed, based on make, model, version information received along with the SIM card change report, it takes action to ensure that the services associated with the SIM card (subscribed by the end-user) continue to be delivered on to the new electronic device, currently associated with the SIM card” with the information in the database explained in ¶49: “the database 213 contains information about the end-user’s SIM cards and electronic device information, such as make, model and version numbers. This information can be used to map a SIM card information to information regarding the electronic device”; mapping the SIM card information to that of the electronic device to determine device replacement.

c. Applicant argued in Pg.3-4 of Remarks regarding claim 1 that Okkonen merely discloses that in order to provide an end-user with corresponding services, provisioning information is selectively accessed by the service provider. "a CAS for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information in response to the request for modification of broadcast information by the broadcast information management server." In Response: Okkonen teaches that once a device or terminal change has been identified, to make sure that the services provided by the first terminal according to SIM card information are also available on the second terminal, the service coordinator 119 coordinates the selective transfer of configuration information, preferences, software updates, device driver changes, firmware updates etc. from the
manufacturer's environment, the service provider 127 or from its own database
(Okkonen, ¶42 and OTA provisioning in ¶45). Hence, Okkonen was relied upon to teach
that after determination from the service coordinator that there was a device change, the
service provider network can make necessary downloads (including software updates,
device driver changes, firmware updates etc.) to the second terminal according to the
subscriber information and the services available on the first terminal so that the end-user
is not interrupted due to lack of services on the second terminal that were already
available on the first terminal when the SIM changed). Guahk was relied upon to teach
that a CAS can transmit change information on the second broadcasting chip necessary
Corresponding to the subscriber information in response to the request for modification of
broadcast information by the broadcast information management server (See 103
rejection below and Guahk, ¶4 and ¶37-38). It would have been obvious to a person of
ordinary skill in the art at the time of the invention to combine the teachings of Guahk
and Okkonen and require the CAS to communicate the device change information
necessary in order to change information on the second broadcasting chip of the second
terminal to information on the first broadcasting chip of the first terminal corresponding
to the subscriber information when notified by the BIS in order to provide services
already available to the subscriber on the first terminal when the subscriber SIM is
inserted into the second terminal to ensure all the services available to the subscriber are
provided by the new device without the user being interrupted.

d. Applicant argued in Pg.4 of Remarks regarding claim 1 that Okkonen at
paragraph [0060], lines 7-14 merely discloses that if the service coordinator detects a
SIM card change, it then selectively communicates the SIM card change to the
manufacturer's environment, to the service provider(s) or to other external systems. In
contrast, in claim 1, a mobile communication information management server determines
whether a user device has been changed, and notifies device replacement to a broadcast
information management server; the broadcast information management server makes
and transmits a request of modification of broadcast information to a CAS; and the CAS
transmits device change information to the second terminal ("a mobile communication
information management server -> the broadcast information management server -> CAS
-> the second terminal"). It is believed that the correspondence relation asserted by the
Examiner is improper. **In Response:** Okkonen teaches the service coordinator detects a
SIM card change due to terminal change and communicates it to the service provider
network which in turn makes necessary downloads onto the second terminal. Guahk
teaches identifying change in subscriber information (for example *(namely, information
of an incoming terminal, a smart card and subscriber)*) and notifying the CAS which in
turn makes necessary modifications on the smart cast mounted on the second terminal to
comply with the SIM card change. The combination of Okkonen and Guahk teach the
elements of the claim 1 namely: service coordinator -> Service provider (BIS + CAS) ->
second terminal which would be combining known prior art elements in a known way to
yield predictable results.

**Claim Rejections - 35 USC § 103**
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guahk* in view of Okkonen*.

*References provided in the previous office action.

**Regarding claim 1**, Guahk teaches a system for maintaining broadcast information regardless of modifications in subscriber information through OOB, the system comprising:

- a broadcast information management server (Guahk, ¶37: “*Business Information System (BIS 210)*”) for making a request of modification of broadcast information related to the subscriber information after the unique information of the second terminal and the subscriber information are provided (Guahk, ¶37: “The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated”);

- a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal corresponding to the subscriber information (Guahk, ¶4: “*The CAS performs
the reception restriction function by adjusting the viewing grade through a smart cast mounted in an incoming terminal, and performs the security function preventing from viewing digital multimedia broadcasting through the illegal use of the smart card”; this explains that the CAS adjusts the viewing grade of the broadcast chip of the incoming terminal (for example: the second terminal), corresponding to the subscriber information), in response to the request for modification of broadcast information by the broadcast information management server (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250 through the mobile station server 230, the telecommunication server 240 and a telecommunication network... the EMM (Entitlement Management Message) includes information of a user’s viewing qualification, the viewing grade of the fee channel and the serial number of a smart card”; alteration recording is the change information corresponding to the subscriber information).

Guahk teaches the BIS performing modification of broadcast information based on changes in subscriber information, but does not explain how the BIS learns about the change in subscriber information. Hence, Guahk does not teach a mobile communication information management server for receiving a unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying that there has been a device replacement when the unique information of the second terminal is different from the subscriber information.

Guahk teaches modification of the user’s viewing qualification and viewing grade of fee channel through EMM message but does not specifically teach the change in the information as a
result of device change; thus fails to teach device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information.

Guahk talks about the terminals having a broadcasting chip and also discusses adjusting information on the broadcasting chip so as to prevent viewing digital multimedia broadcasting through the illegal use of the smart card in ¶4 but does not explicitly talk about device replacement.

Identification of device replacement by an operator network, and communicating the changes to service providers and the service providers modifying the services available on the new terminal based on subscriber information using over-the-air provisioning is well known in the art of telecommunications.

Okkonen teaches a mobile communication information management server (Okkonen, ¶60: “service coordinator”) for receiving a unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card from the second terminal (Okkonen, ¶13: “the electronic device of communicates the programmed card changed event and device type information of the electronic device, wherein the event comprises identification information uniquely identifying the any authorized programmed card that is currently employed in the programmed card reader of the electronic device in the current session” and ¶16: “The intelligent agent reads the input data from the programmed card when the programmed card is inserted into the programmed card reader” with ¶19: “intelligent agent capable of assembling or retrieving a device specific information from the electronic device wherein the intelligent agent communicates the device specific information and the input data from the programmed card to
the carrier network along with the programmed card changed event”), and for determining and
notifying that there has been a device replacement when the unique information of the second
terminal is different from the subscriber information (Okkonen, ¶23: “The service coordinator
maintains a saved mapping information that maps a plurality of known programmed card
related information to associated known electronic devices. The service coordinator also detects
a programmed card changed event by comparing the received first programmed card
information to the saved mapping information. It then associates the first programmed card with
the second electronic device specifications and stores an association information as part of the
saved mapping information” and ¶60: “the service coordinator is responsible for and capable of
determining if a SIM card changed in an electronic device. In this embodiment, the agent in the
electronic device selectively reports SIM card information whenever the electronic device is
powered-up or whenever a SIM card related information is manipulated. The service
coordinator stores SIM card information and other related information communicated to it by
the agent. Whenever it receives SIM card information from the agent, it compares it to the stored
information to detect a change in SIM card, if any. If it detects a SIM card change, it then
selectively communicates the SIM card change to the manufacturer's environment, to the service
provider(s) or to other external systems”);

Okkonen also teaches the service provider communicating device change information
necessary in order to change information on the second terminal to information on the first
terminal corresponding to the subscriber information (Okkonen, ¶41-42: “If an end-user has a
plurality of electronic devices 123 and uses the same SIM card 123 in each of them, then a
change of SIM card 123 reported to the service coordinator 119 by the agent 125 of the
electronic device 109 implies that the electronic device 109 has changed. In order to continue to provide the end-user with all the services subscribed to by the end-user, as referenced by the SIM card information, despite the change of electronic devices 109, provisioning information, when available, is selectively accessed by the service provider 119 from the provisioning system 115. Thus, when the electronic device 109 reports a change in SIM card 123 and the SIM card 123 change is determined to be a change in electronic device 109, the service coordinator can access the provisioning information for the SIM card 123, including all services subscribed to by the end-user, and enable access to all those services via the changed electronic device 123 .... in order to determine a change in electronic device, if any, associated with a change in SIM card, the service provider 119 processes the received report of SIM card change provided by the electronic device and looks into its database to determine if there is change of electronic device indicated. If it determines that the electronic device 123 has changed, based on make, model, version information received along with the SIM card change report, it takes action to ensure that the services associated with the SIM card (subscribed by the end-user) continue to be delivered on to the new electronic device, currently associated with the SIM card” with the information in the database explained in ¶49: “the database 213 contains information about the end-user's SIM cards and electronic device information, such as make, model and version numbers. This information can be used to map a SIM card information to information regarding the electronic device”; mapping the SIM card information to that of the electronic device to determine device replacement”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and enable the carrier network to inform the BIS
about change of the SIM from one terminal to the other since the mobile terminal needs to register with the carrier network providing the carrier network with subscriber and terminal identity in order to gain access to the network.

One would be motivated to make such a combination to use the already existing infrastructure of the carrier network to validate the subscriber and terminal identities.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and require the CAS to communicate the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information to provide services already available to the subscriber on the first terminal when the subscriber SIM is inserted into the second terminal to ensure all the services available to the subscriber are provided by the new device without the user being interrupted.

**Regarding claim 2,** Guahk and Okkonen teach the system as claimed in claim 1,

Guahk further teaches wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal (Guahk, Abstract: “The system of the invention transmits a message for the alteration of the subscriber information to terminal through the OOB”).

**Regarding claim 3,** Guahk and Okkonen teach the system as claimed in claim 1,

Guahk further teaches wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of
a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250").

Regarding claim 6, method claim 6 is rejected for the same reason as system claim 1 since the recited elements of claim 1 would perform the claimed steps. Further, Guahk teaches such that the second terminal modifies the information on the second broadcasting chip (Guahk, \(\S\)35: “the incoming terminal 250 stores includes a smart card 255 which stores subscriber information, receives the EMM (Entitlement Management Message) and adjusts and modifies the viewing grade” with \(\S\)4: “The CAS performs the reception restriction function by adjusting the viewing grade through a smart cast mounted in an incoming terminal” hence the second terminal modifying the information on the second broadcasting chip).

Guahk does not teach modification of the information on the second broadcasting chip to information of the first broadcasting chip.

Okkonen teaches the limitation where the second terminal is upgraded to have the same services as the first terminal as explained in claim 1 (Okkonen, \(\S\)41-42).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and change the information on the broadcasting chip on the second terminal according to the one on the first terminal so that the same services are available to the user when using the same SIM on multiple terminals as explained in Okkonen.

Regarding claim 7, Guahk teaches a method for maintaining broadcast information regardless of change of subscriber information, the method comprising the steps of:
extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber (Guahk, ¶37: “The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated”); and

generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250 through the mobile station server 230, the telecommunication server 240 and a telecommunication network... the EMM (Entitlement Management Message) includes information of a user's viewing qualification, the viewing grade of the fee channel and the serial number of a smart card”; alteration recording is the change information corresponding to the subscriber information).

Guahk teaches the BIS performing modification of broadcast information based on changes in subscriber information, but does not explain how the BIS learns about the change in subscriber information. Hence, Guahk does not teach receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the
second terminal; and determining that there has been a device replacement, when the terminal
information is different from the subscriber information;

Guahk talks about the terminals having a broadcasting chip and also discusses adjusting
information on the broadcasting chip so as to prevent viewing digital multimedia broadcasting
through the illegal use of the smart card in ¶4 but does not explicitly talk about device
replacement;

Identification of device replacement by an operator network, and communicating the
changes to service providers and the service providers modifying the services available on the
new terminal based on subscriber information using over-the-air provisioning is well known in
the art of telecommunications. Okkonen teaches receiving terminal information on the second
terminal and subscriber information corresponding to the first USIM card from the second
terminal (Okkonen, ¶13: “the electronic device of communicates the programmed card changed
event and device type information of the electronic device, wherein the event comprises
identification information uniquely identifying the any authorized programmed card that is
currently employed in the programmed card reader of the electronic device in the current
session” and ¶16: “The intelligent agent reads the input data from the programmed card when
the programmed card is inserted into the programmed card reader” with ¶19: “intelligent agent
capable of assembling or retrieving a device specific information from the electronic device
wherein the intelligent agent communicates the device specific information and the input data
from the programmed card to the carrier network along with the programmed card changed
event”);
Okkonen also teaches determining that there has been a device replacement, when the terminal information is different from the subscriber information (Okkonen, ¶41-42: “If an end-user has a plurality of electronic devices 123 and uses the same SIM card 123 in each of them, then a change of SIM card 123 reported to the service coordinator 119 by the agent 125 of the electronic device 109 implies that the electronic device 109 has changed. In order to continue to provide the end-user with all the services subscribed to by the end-user, as referenced by the SIM card information, despite the change of electronic devices 109, provisioning information, when available, is selectively accessed by the service provider 119 from the provisioning system 115. Thus, when the electronic device 109 reports a change in SIM card 123 and the SIM card 123 change is determined to be a change in electronic device 109, the service coordinator can access the provisioning information for the SIM card 123, including all services subscribed to by the end-user, and enable access to all those services via the changed electronic device 123.... in order to determine a change in electronic device, if any, associated with a change in SIM card, the service provider 119 processes the received report of SIM card change provided by the electronic device and looks into its database to determine if there is change of electronic device indicated. If it determines that the electronic device 123 has changed, based on make, model, version information received along with the SIM card change report, it takes action to ensure that the services associated with the SIM card (subscribed by the end-user) continue to be delivered on to the new electronic device, currently associated with the SIM card” with the information in the database explained in ¶49: “the database 213 contains information about the end-user’s SIM cards and electronic device information, such as make, model and version numbers. This information can be used to map a SIM card information to information regarding
the electronic device”; mapping the SIM card information to that of the electronic device to determine device replacement”)

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and enable the carrier network to inform the BIS about change of the SIM from one terminal to the other since the mobile terminal needs to register with the carrier network providing the carrier network with subscriber and terminal identity in order to gain access to the network.

One would be motivated to make such a combination to use the already existing infrastructure of the carrier network to validate the subscriber and terminal identities.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and require the CAS to communicate the change in device to the second terminal in order to enable the second communication device to provide services available to the subscriber when the subscriber SIM is inserted into the device to ensure all the services available to the subscriber are provided by the new device.

7. Claims 4-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guahk in view of Okkonen further in view of Apsangi*.

*References provided in the previous office action.

Regarding claim 4, Guahk and Okkonen teach the system as claimed in claim 3, Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message)
including the serial number of a smart card and the alteration recording thereof” wherein the alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of a terminal via a message.

In a related art of provisioning CPE within a content-based network, Apsangi talks about providing addition, deletion and modification of conditional access to a provisioned device associated with a subscriber. Apsangi discloses wherein the EMM information includes information necessary to cancel the subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187: “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network ("targeted populations") are subsequently given access to content”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.

**Regarding claim 5**, Guahk and Okkonen teach the system as claimed in claim 1,
Guahk teaches the CAS comprising a communication unit for communicating with the broadcast information management server (Guahk, ¶37: “The BIS 110 transmits ... the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220”; therefore a communication module in CAS to communicate with BIS) and transmitting the device change information to the second terminal (Guahk, ¶38: “The CAS 220 ... transmits the same to the incoming terminals 250”; therefore a communication module in CAS to transmit device change information);

Guahk do not go into the detailed architecture of the CAS and hence does not disclose wherein the CAS comprises a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips; a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server; a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.
In a related art of provisioning CPE within a content-based network, Apsangi describes a CA System implemented in a HFC network. Apsangi describes a CAS 500 in Fig.5a comprising a Personalization Server 310, ECM and EMM Generator Functions 502 and 504, a Device Provisioning function 506 and a Service Provisioning function 508. Each of these entities either by themselves or in combination of the other entities in the CA System accomplish the features of the claim not directly taught by Guahk as set forth herein:

a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips (Apsangi, Fig.10; PS 310);

a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server (Apsangi, ¶200: “the AP compares the SM Class Identifier and list of SM Client Identifiers to the list of approved SM Client Identifiers for this SM”);

a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database (Apsangi, Fig.10, steps 1018-1020 with details of the steps in ¶200-¶201), and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal (Apsangi, Fig.5a-5b where AP is connected to the EMMG in the network and the Fig.10 step 1022); and

a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from
the control unit, and then providing the generated device change information to the
communication unit (Apsangi, Fig.10 step 1022 and ¶201: “The AP then generates a DCAS
DownloadInfo message 1022 to the SM” hence sending the device change information to the
communication unit).

Note: The procedure when a terminal is replaced with the same SM is explained in
Apsangi, Fig.13 with ¶210-213. The reason for using narration of Fig.10 is to explain each
message and steps clearly to the applicant since Fig.13 steps assumes the reader has knowledge
of the different messages and the working of the system based on previous figures.

It would have been obvious to one skilled in the art at the time of the invention to modify
the teachings of Guahk and Okkonen according to Apsangi and provide a CA system to
accomplish remote provisioning, de-provisioning and Client change to the system of Guahk in
order to use already existing CA systems to accomplish the tasks of automated changes of
Guahk.

Regarding claim 8, Guahk and Okkonen teach the method as claimed in claim 6,

Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a
subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message)
including the serial number of a smart card and the alteration recording thereof” wherein the
alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of subscription of a terminal via a message.

In a related art of provisioning CPE within a content-based network, Apsangi talks about
providing addition, deletion and modification of conditional access to a provisioned device
associated with a subscriber. Apsangi discloses wherein the EMM information includes a
cancellation message for cancelling subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187; “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network (“targeted populations”) are subsequently given access to content”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.

Regarding claim 9, Guahk and Okkonen teach the method as claimed in claim 7,

Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof” wherein the alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of subscription of a terminal via a message.
In a related art of provisioning CPE within a content-based network, Apsangi talks about providing addition, deletion and modification of conditional access to a provisioned device associated with a subscriber. Apsangi discloses wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187; “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network ("targeted populations") are subsequently given access to content”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.
Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NALINI YERNENI whose telephone number is (571)270-1647. The examiner can normally be reached on Mon-Fri 9AM to 3PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Lester Kincaid can be reached on (571)272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NALINI YERNENI/
Examiner, Art Unit 2617

/LESTER KINCAID/
Supervisory Patent Examiner, Art Unit 2617
## EAST Search History

### EAST Search History (Interference)

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### Search Notes

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**Examiner** NALINI YERNENI  
**Date**  
**Date**  

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#### INTERFERENCE SEARCH

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NALINI YERNENI  
Examiner Art Unit 2617
# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

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## U.S. PATENTS

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.M./
**APPLICATION**

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<td>Yang et al.; &quot;The conditional access flow using subscriber smart card with Koreasat DBS receiver&quot;; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pgs. 330-336.</td>
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If you wish to add additional non-patent literature document citation information please click the Add button

**EXAMINER SIGNATURE**

| Examiner Signature | /Mrunalini Yernen/ | Date Considered | 05/10/2012 |

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.*

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1 See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04.  
2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3).  
3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.  
4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.  
5 Applicant is to place a check mark here if English language translation is attached.
Docket No.: 4900-0037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :

KIM, JONG HO et al. : Confirmation No.: 4956

U.S. Patent Application No. 12/678,050 : Group Art Unit: 2617

Filed: March 12, 2010 : Examiner: YERNENI, MRUNALINI

For: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

RESPONSE TO OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The following amendments and remarks are submitted in response to the Official Action mailed December 22, 2011.
AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

1. (Currently Amended) A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

   a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information receiving a unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying that there has been a device replacement when the unique information of the second terminal is different from the subscriber information;

   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the second terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

   a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.
2. (Original) The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.

3. (Original) The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

4. (Original) The system as claimed in claim 3, wherein the EMM information includes information necessary to cancel the subscription of the first terminal.

5. (Currently Amended) The system as claimed in claim 1, wherein the CAS comprises:

   a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips;

   a communication unit for communicating with the broadcast information management server and transmitting the device change information to the second terminal;

   a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server;

   a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and
then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and

a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.

6. (Currently Amended) A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal, by a mobile communication information management server;

when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been a device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server;

transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and
extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; and

generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information such that the second terminal modifies the information on the second broadcasting chip to information of the first broadcasting chip; and

modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.

7. (Currently Amended) A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal;

determining that there has been a device replacement, when the terminal information is different from the subscriber information;

extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; and

generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information.
8. (Previously Presented) The method as claimed in claim 6, wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal.

9. (Previously Presented) The method as claimed in claim 7, wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal.
REMARKS

Applicant appreciates the Examiner’s review of the present application, and respectfully requests reconsideration in light of the preceding amendments and the following remarks.

Claims Amendments/Status

Claims 1-9 are pending in the instant application. Claims 1, 5, and 6 have been amended to better define the claimed invention. The amended claims find solid support in the original specification and drawings. Especially, the amended claim is supported by at least paragraphs [0041], Fig. 4 and corresponding descriptions thereof, of the published specification. No new matter has been introduced through the foregoing amendments.

Information Disclosure Statement

With respect to an Information Disclosure Statement (IDS) submitted on April 16, 2010, the Examiner admitted in a telephone call that legible copies of the foreign patent and the non-patent literature were submitted. Applicant submits a full text of the Non-Patent Literature (Kyu-tae YANG et al. “The conditional access flow using subscriber smart card with Koreasat DBS receive”; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pages 330-336) along with this OA response, according to the Examiner’s request. Accordingly, consideration of the NPL document is respectfully requested.

Rejection under 35 U.S.C. §112 (2)

Claim 5 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicant has amended claim 5 to include “to the second terminal” according to the option (a) suggested by the Examiner. Accordingly, Applicant respectfully requests withdrawal of the rejection.

Claim Rejections under 35 U.S.C. §103

(1) Independent claim 1

Amended independent claim 1 recites:

1. A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

   a mobile communication information management server for receiving an unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card from the second terminal, and for determining and notifying device replacement when the terminal information and the subscriber information do not coincide with each other:

   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

   a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

In rejecting claim 1, the Examiner asserted that Guakh at paragraph [37] discloses “a broadcast information management server … after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server” (see the Office Action, page 4, lines 1-11). However, Guakh at paragraphs [16], [17], [22], [35]-[37], and [40] merely relates to a system transmitting a CAS message (e.g., EMM) to an incoming terminal through a channel out of band (OOB) when a subscriber information is changed, and receiving a feedback information regarding the success or failure of the CAS message transmission from the incoming terminal. Specially, Guakh at paragraphs [37] merely discloses or teaches that “BIS transmits a terminal information and an alteration recoding of a subscriber information to a CAS” as follows:

[37] The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and
subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated. It is preferable that the information of an incoming terminal is the number of the incoming terminal (for example, MDN).

In contrast, in claim 1, the broadcast information management server makes a request of modification of broadcast information only after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server. Accordingly, it is believed that Guahk fails to disclose or teach the limitation of claim 1.

Meanwhile, the Examiner asserted that Okkonen at paragraph [0060] teaches the limitation “a mobile communication information management server... for determining and notifying device replacement when the terminal information and the subscriber information do not coincide with each other” of claim 1. However, the cited paragraph in Okkonen merely discloses that a service coordinator detects a change in a SIM card by comparing “a SIM card information received from an electronic device” to “a previously stored SIM card information,” and then communicates SIM card change to a service provider. In contrast, claim 1 recites, in part, the limitation “device replacement is determined depending on whether or not a unique information of the second terminal and a USIM-based subscriber information stored in the first USIM card coincide with each other.” Accordingly, it is believed that Okkonen fails to disclose or teach the limitation of claim 1, and therefore it fails to cure the deficiencies of Guahk.

Furthermore, the Examiner asserted that Okkonen at paragraph [0041] teaches “the service provider communicating device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information” (see the Office Action, page 6, lines 6-9). However, the cited paragraph in Okkonen merely discloses that in order to provide an end-user with corresponding services, provisioning information is selectively accessed by the service provider. In contrast, claim 1 recites, in part, the limitation
“a CAS for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information in response to the request for modification of broadcast information by the broadcast information management server.” Accordingly, it is believed that Okkonen fails to disclose or teach the limitation of claim 1, and therefore it fails to cure the deficiencies of Guahk.

The Examiner also seems to assert that “a service coordinator,” and “a service provider” of Okkonen respectively corresponds to “a mobile communication information management server,” and “CAS” in claim 1 (see the Office Action, page 5, lines 5-19; and page 6, lines 6-9). However, Okkonen at paragraph [0060], lines 7-14 merely discloses that if the service coordinator detects a SIM card change, it then selectively communicates the SIM card change to the manufacturer's environment, to the service provider(s) or to other external systems. In contrast, in claim 1, a mobile communication information management server: the broadcast information management server determines whether a user device has been changed, and notifies device replacement to a broadcast information management server: the broadcast information management server makes and transmits a request of modification of broadcast information to a CAS; and the CAS transmits device change information to the second terminal (“a mobile communication information management server ⇒ the broadcast information management server ⇒ CAS ⇒ the second terminal”). It is believed that the correspondence relation asserted by the Examiner is improper. Accordingly, Okkonen fails to disclose or teach the limitation of the claim 1, and therefore it fails to cure the deficiencies of Guahk.

In conclusion, for all of the above reasons, Applicant submits that claim 1 is patentable over Guahk in view of Okkonen. Accordingly, withdrawal of this rejection is respectfully requested.

(2) Claims 2-9

Amended independent claims 6 and 7 have the same or similar distinguishable limitations as/to those of claim 1, and these claims are patentable at least for the reasons stated in connection with claim 1.
Claims 2-5, 8, and 9, which are dependent on any one of claims 1, 6, and 7 are also patentable at least for the reasons discussed above with regard to claims 1, 6, and 7. Especially, with regards to claims 4, 5, 8, and 9, it is believed that Apsangi does not supply the above-noted deficiencies of Guahk and Okkonen.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited. Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

LOWE HAUPTMAN HAM & BERNER, LLP

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Yoon S. Ham
Registration No. 45,307

1700 Diagonal Road, Suite 300
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(703) 684-1111
(703) 518-5499 Facsimile
Date: March 22, 2012
YSH/SSK/jr
THE CONDITIONAL ACCESS FLOW USING SUBSCRIBER SMART CARD
WITH KOREASAT DBS RECEIVER

Kyu-Tae Yang, Dong-Hee Han, Jin-Ho Kim and Jin-Man Cho
Electronics and Telecommunications Research Institute
161 Kajong-Dong, Yusong-Gu, Taejon, 305-350, Korea

Abstract

The Koreasat DBS system adopted MPEG-2 digital compression and multiplexing. It provides conditional access services using the security device such as smart card. The conditional access services permit that only subscribers who pay receiving fee can watch programs. This paper presents the conditional access flow using subscriber smart card with Koreasat DBS receiver.

I. Introduction

The Koreasat DBS system[1] adopted MPEG-2 system[2], MPEG-2 MP@ML video[3], and MPEG-1 layer 2 audio[4]. It has been broadcasting two test programs since July 1, 1996. The Koreasat DBS system has reserved 6 Koreasat transponders for its services. It has been designed to provide 4 TV program service channels and 4 data service channels per each transponder. So it can broadcast 24 TV program services and 24 data services at the same time.

To improve the quality of DBS services and extend commercial DBS business, it is necessary to adopt conditional access services[5]. The conditional access services permit that only subscribers who pay receiving fee can watch programs. Subscribers need Subscriber Smart Card(SSC)[6] for conditional access services.

The Koreasat DBS system is composed with 3 subsystems such as Resources and Subscribers Management System(RSMS)[7], transmitter stations, and Koreasat DBS receivers[8] as depicted at figure 1. The transmitter station encodes TV programs and data to Packet Elementary Stream(PES) based on MPEG-2. The encoded PESs are transformed to MPEG-2 transport stream and are multiplexed before they are broadcasted. The RSMS creates RSMS data and sends it to all the Koreasat DBS receivers which are widely scattered in service area to give valuable information for de-multiplexing MPEG-2 transport stream and supporting conditional access services. The RSMS issues SSCs for conditional access services and manages all subscribers' usage records stored in SSCs which were uploaded from Koreasat DBS receivers. The RSMS communicates with Koreasat DBS receivers to collect usage records stored in SSCs through PSTN/PSDN(Public Switched Telephone Network/Data Network). The Koreasat DBS receiver consists of 45cm antenna, LNB, Set-Top-Box, remote controller, and SSC. It de-multiplexes MPEG-2 transport stream and browses TV program on the TV or data on data terminal due to a subscriber's request by remote controller.

Figure 1. The Configuration of the Koreasat DBS System

This paper focuses on the conditional access mechanism using SSC that is able to provide pay TV services in the Koreasat DBS system. Section II describes Koreasat DBS receiver and section III introduces the conditional access flow using SSC with Koreasat DBS receiver. Section IV gives the conclusion.

II. Koreasat DBS Receiver

The Koreasat DBS receiver gets RSMS data over the satellite link which consists of Service Information(SI) and RSMS messages pertaining to a subscriber's service subscription. The SI includes Program Specific Information (PSI) which enables the Koreasat DBS receiver to demultiplex MPEG-2 transport stream and additional Service Information which aids automatic tuning for a selected carrier. The Koreasat DBS receiver provides program guide and service configuration change like pan/scan, audio toggle, or program scheduling. The Koreasat DBS receiver interfaces with PSTN to upload SSC usage records.
1. Design of Koreasat DBS Receiver Software

The Koreasat DBS receiver software has been designed and implemented to provide user interface for conditional access services, TV program guide, or service configuration change menu based on a real-time multi-tasking Operating System. All the software tasks talk to each other by passing pre-defined mailbox messages. The figure 2 shows Koreasat DBS receiver software structure. Name in circle designates task name and the arrow line designates direction of mailbox message transmission. After cold start, all the input into the Koreasat DBS receiver software are Key-Pad input, Infra-Red input, or SSC in/out. The table 1 describes functions of all the software tasks.

![Diagram of Koreasat DBS Receiver Software](image)

**Figure 2. Software Structure of Koreasat DBS Receiver**

- **Cold Start Procedure**

After power-on, the DMX task sends PSI and additional Service Information transport stream to the TBL task. The TBL task returns PAT, CAT, PMT, NIT, SDT, EIT, and TDT to the DMX task. Then the CHN task requests PAT, CAT, PMT, and NIT from the DMX task. The CHN task extracts and saves all channel information from PAT, CAT, PMT, and NIT. Then the CHN task sends TDT, EMM, and RCM Packet Identification(PID) value to the DMX task. The DMX task extracts RCM using RCM PID and current time from TDT using TDT PID. The CHN task also requests program guide update to the PG task. The PG task requests EITs from the DMX task. The PG task is updating program guide database using EITs from the DMX task for later viewing. Then the CHN task is processing channel change procedure using the UI task mailbox message (the last viewed channel number). The figure 3 shows sequence flow on cold start at the Koreasat DBS receiver.

- **Channel Change Procedure**

The following description is an example on channel change to subscription channel y. Section III describes channel characteristics in detail. When a subscriber requests channel change to subscription channel y by Infra-Red input or Key-Pad input, the IR task sends channel number y to the UI task. The UI task displays requested channel number y via video overlay for a subscriber’s convenience and requests channel y to the CHN task. The CHN task requests that the DMX task disable current channel service. Then the CHN task requests that the DMX task enable subscription channel y service. The DMX task checks whether current program is scrambled. If current program is not scrambled, the DMX task displays current program. Otherwise, the DMX task sends every different ECM on current program to the SC task. The SC task checks that valid SSC is in the Koreasat DBS receiver and SSC Personal Identification Number(PIN) was confirmed. If SSC PIN was not confirmed or SSC is not in the Koreasat DBS receiver, the SC task sends “This program is scrambled.” message to the UI task. Then the UI task notifies “This program is scrambled.” message via video overlay. If SSC PIN was confirmed, the SC task sends received ECM to the SSC. The SSC responds control words with subscription program notification information. Then the SC task sends control words to the DMX task. The DMX task de-scrambles scrambled MPEG-2 transport stream with control words and displays current program. The figure 4 shows sequence flow on channel change to subscription channel y.

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<td>IR</td>
<td>- detect Infra-Red and Key-Pad button event</td>
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<td></td>
<td>- send Infra-Red or Key-Pad button event to UI task</td>
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<tr>
<td>User Interface</td>
<td>UI</td>
<td>- display SSC PIN prompt</td>
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<td></td>
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<td>- display conditional access state</td>
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<td>Channel Control</td>
<td>CHN</td>
<td>- set RF tuner frequency</td>
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<td>- select PID corresponding to a selected channel</td>
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<td>- build PSI and SI tables</td>
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<td>- control channel change</td>
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<td>Smart Card Interface</td>
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<td>- send control words to DMX task</td>
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<td>- send SSC usage records to DB task</td>
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<td>- upload SSC usage records through PSTN</td>
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<td>- manage audio/video sync</td>
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<td></td>
<td>- send RCM to DB task</td>
</tr>
<tr>
<td>Program Guide</td>
<td>PG</td>
<td>- build program guide database</td>
</tr>
<tr>
<td>Table Parsing</td>
<td>TBL</td>
<td>- parse PSI and additional Service information and send them to DMX task</td>
</tr>
<tr>
<td>PC bus control</td>
<td>PC</td>
<td>- control audio decoder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- send closed caption data to NTSC converter</td>
</tr>
</tbody>
</table>
2. RSMS Data

The RSMS data includes all the transmitter stations’ configuration information and program guide information. The RSMS data is divided into 3 classes such as Program Specific Information (PSI), additional Service Information (SI), and RSMS messages.

a. Program Specific Information (PSI)

The PSI specifies valuable information that enables demultiplexing of TV programs based on MPEG-2[2]. The PSI includes Program Association Table (PAT), Conditional Access Table (CAT), and Program Map Table (PMT).

- PAT:
  The PAT provides the correspondence between a program number (the numeric label associated with a program) and the PID value of the MPEG-2 transport stream packets. It provides PID values of PMT, Network Information Table (NIT), Service Description Table (SDT), Time and Date Table (TDT), and Receiver Command Message (RCM). The PID value of PAT is fixed to 0. KoreanSat DBS receiver begins to demultiplex MPEG-2 transport stream with PAT.

- CAT:
  The CAT provides PID value of Entitlement Management Message (EMM). The PID value of CAT is fixed to 1.

- PMT:
  The PMT provides the mapping between program number and program elements (video, audio, and closed caption per TV program, or data per data). It provides PID value of Entitlement Control Message (ECM).

b. Additional Service Information (SI)

The additional SI is used to aid automatic tuning to a selected carrier and to create program guide based on ETSI/DVB[9]. It includes Network Information Table (NIT), Service Description Table (SDT), Event Information Table (EIT), and Time and Date Table (TDT).

- NIT:
  The NIT provides information about the physical organization of all the transmitter stations and the characteristics of the DBS network. It provides PID value of EIT. The NIT can be used to aid automatic tuning to a selected carrier.

- SDT:
  The SDT describes Koreasat DBS service type, for example, digital TV service, digital still video service, etc.

- EIT:
  The EIT provides program guide information in chronological order of events (TV programs).

- TDT:
  The TDT provides UTC-time and date information.

c. RSMS Messages

The RSMS messages are used only to provide conditional access services. It consists of Entitlement Control Message (ECM), Entitlement Management Message (EMM), and Receiver Command Message (RCM) to manipulate conditional access services effectively. The figure 5 shows the RSMS message format.

The ECM contains sequence number, number of control words pair, control words pairs. The figure 6 shows the ECM format.

- sequence number:
  It is used for Koreasat DBS receiver to filter redundant messages.

- number of control words pair:
  It designates number of control words pair blocks that follow. The maximum value is 6.

- control words pair:
  - event boundary flag:
    It is used to divide events (programs). It is toggled between events. The Koreasat DBS receiver uses this flag to detect program change in the same channel.
channel ID:
It means channel number.
- even/odd selection flag:
It is used to select even or odd scrambler control words.
- encrypted even/odd scrambler control words:
SSC decrypted even/odd scrambler control words using its decrypting algorithm. SSC returns even or odd decrypted control words by even/odd selection flag to the Koreasat DBS receiver. Then the Koreasat DBS receiver de-scrambles scrambled MPEG-2 transport stream with control words.
- current system time:
It is used to record viewing history whenever a PPV program is selected.

It designates number of vector blocks that follow. The maximum value is 19.
- key ID:
It identifies the key which encrypted vectors.
- vector:
  - channel ID
  It means channel number.
  - even/odd key information
  It is used for SSC to generate a key for the even/odd encryption period. SSC de-scrambles ECM with the key.
  - expiration time of channel entitlement:
  It provides expiration time of subscribed pay channel entitlement.

**Figure 7. The EMM Format**

The RCM consists of usage upload request message and service message. The usage upload request message and the service message provide Koreasat DBS receivers with different PSTN telephone number and PSDN X.25 number of PSTN/PSDN to collect SSC usage records, respectively. The size of the RCM is 32 bytes. First 16 bytes are PSTN telephone number, next 16 bytes are PSDN X.25 number.

- usage upload request message:
The RSM sends this message periodically by scheduling. When the Koreasat DBS receiver gets this message, it calls the RSM immediately to upload SSC usage records.
- service message:
This message is used to upload SSC usage records when SSC usage records are over 90 percent full.

**III. The Conditional Access Flow**

TV program channel can be classified into 2 classes such as free channel and pay channel. The free channel is not a scrambled channel. The pay channel is a scrambled channel and can be classified into 2 classes such as subscription channel and Pay-Per-View (PPV) channel. The subscription channel requires receiving fee in a specific period unit, ex. month. The PPV channel requires receiving fee in a program unit.
TV program can be classified into 3 classes such as free program, subscription program, and PPV program. The free program is not a scrambled program. Every subscriber can watch this program without his/her SSC. The subscription program and the PPV program are scrambled programs. Subscribers who has an entitlement on subscription or PPV channel can watch every program on that channel with his/her SSC. When a subscriber watches a PPV program, he/she must pay the receiving fee of that PPV program.

The Koreasat DBS system is servicing every channel with channel based and program based. The table 2 shows the accessibility of viewing right in the Koreasat DBS system. To watch a specific pay channel, a subscriber must apply for that pay channel to the RSMS at first. Then the RSMS sends EMM, which contains an entitlement on that pay channel, to SSC. Now a subscriber can watch any programs of that pay channel with his/her SSC.

<table>
<thead>
<tr>
<th>channel</th>
<th>free program</th>
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<th>PPV program</th>
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<tr>
<td>free channel</td>
<td>O</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>subscription channel</td>
<td>O</td>
<td>O</td>
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</tr>
<tr>
<td>PPV channel</td>
<td>O</td>
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</table>

where,
O: permit viewing right,
X: prohibit viewing right

The figure 8 shows flow mechanism on the conditional access services we designed and implemented. When a subscriber changes channel or powers on, the Koreasat DBS receiver tunes channel to be changed or the last viewed channel, that is, current channel. Then the Koreasat DBS receiver checks whether current program is scrambled. If current program is not scrambled, that is, free program, the Koreasat DBS receiver displays current program. Otherwise, that is, if current program is subscription program or PPV program, the Koreasat DBS receiver checks that SSC is in and SSC PIN was confirmed. If SSC is not in or SSC PIN was not confirmed, the Koreasat DBS receiver displays “Current program is scrambled.”. If SSC is in and SSC PIN was confirmed, the Koreasat DBS receiver sends every different ECM on current program to SSC. The response from SSC which has been designed in the Koreasat DBS system is divided into 4 cases.

- case 1: “Current program is a subscription program.”
  Because SSC has an entitlement on this subscription program, the Koreasat DBS receiver displays current program.

- case 2: “Current program is a PPV program.”

The Koreasat DBS receiver checks whether current program is new PPV program by event boundary flag change of ECM. If current program is not a new PPV program and SSC PIN was not confirmed before, the Koreasat DBS receiver displays “Current program is a PPV program. SSC PIN was not confirmed.”. If current program is not a new PPV program and SSC PIN was confirmed before, the Koreasat DBS receiver displays current program.
watch new PPV program due to SSC usage records full. In case SSC usage records are full, a subscriber can watch new PPV program only after SSC usage records are sent to the RSMS successfully.

- case 3: “There is no entitlement on current channel.” Because SSC doesn’t have an entitlement on current channel, the Koreasat DBS receiver displays “There is no entitlement on current channel.”.

- case 4: “SSC usage records are full.” When a subscriber selects a PPV program, this message can be responded. Because SSC doesn’t have any space to store new usage records, the Koreasat DBS receiver displays “SSC usage records are full.” Then the Koreasat DBS receiver also takes SSC usage records and transmits them to the RSMS. If SSC usage records are sent to the RSMS successfully, SSC clears its usage records. Or if it fails, the Koreasat DBS receiver displays “SSC usage records are full. Take SSC to the RSMS.”.

Whenever SSC is inserted at any time, the Koreasat DBS receiver displays SSC PIN prompt. If the subscriber doesn’t confirm SSC PIN, the Koreasat DBS receiver displays “SSC PIN was not confirmed.” After that, the Koreasat DBS receiver does normal procedure.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Time</th>
<th>Free Prog 1</th>
<th>Free Prog 2</th>
<th>Free Prog 3</th>
<th>Free Prog 4</th>
<th>Free Prog 5</th>
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<tr>
<td>Chan. x (Free Chan.)</td>
<td>0 + 30 min.</td>
<td>Free Prog 1</td>
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<td>Free Prog 3</td>
<td>Free Prog 4</td>
<td>Free Prog 5</td>
</tr>
<tr>
<td>Chan. y (Sub. Chan.)</td>
<td>Sub. Prog 1</td>
<td>Free Prog 2</td>
<td>Free Prog 3</td>
<td>Free Prog 4</td>
<td>Sub. Prog 5</td>
<td></td>
</tr>
<tr>
<td>Chan. z (PPV Chan.)</td>
<td>PPV Prog 1</td>
<td>Sub. Prog 2</td>
<td>PPV Prog 3</td>
<td>PPV Prog 4</td>
<td>Sub. Prog 5</td>
<td></td>
</tr>
</tbody>
</table>

where,
- 0 means reference time.
- *(x)* min. means *(x)* minutes later from reference time.

The table shows an example of the broadcast schedule and program characteristics for pay TV services. The table shows the program accessibility results based on the broadcast schedule shown at table 3. As shown at table 4, a subscriber can watch any free programs with or without SSC (program x1 to x5, y2, and y4). Because channel entitlement is not necessary to free program. A subscriber can watch any programs of pay channel with the pay channel entitlement (program y1, z1, and z2). A subscriber can’t watch subscription program and PPV program of pay channel without channel entitlement (program y5, z4, and z5). But even though channel entitlement is expired, a subscriber can watch any programs of its channel the maximum until twice of EMM change period (program y3 and z3). Because SSC creates channel entitlement with even and odd key information of EMM.

### IV. Conclusion

The Koreasat DBS system has developed from Feb. 1994 and adopted MPEG-2 digital compression and multiplexing. It is located in Yong-In, Korea and is broadcasting test programs from July 1, 1996. The Koreasat DBS system adopted conditional access services to improve DBS service quality and extend commercial DBS business. The Koreasat DBS system adopted DVB standard as scrambler and de-scrambler algorithm for conditional access services. This paper has proposed the conditional access flow using subscriber smart card with Koreasat DBS receiver.

The proposed algorithm is based on a program event and is working very well. A subscriber can’t watch any subscription or PPV programs of a pay channel without its channel entitlement. Giving an entitlement on pay channel prevents some subscribers like children from watching a particular channel like adult channel in advance. This conditional access mechanism can be used as a reference of HDTV system or other digital service system. This algorithm can be easily extendible by defining additional messages between the Koreasat DBS receiver and subscriber smart card.

### References


Biographies

Kyu-Tae Yang was born in Taegu on 15 Nov. 1963. He received B.S. and M.S. degrees in electronic engineering from Kyungpook National University, Taegu, Korea, in 1986 and 1991, respectively. He has worked on VSAT System, DBS System, and HDTV System at ETRI as a research staff. His research interests are in DBS, Network Management System, and Java Language.

Dong-Hee Han was born in Taegu on 4 Oct. 1960. He received B.S. and M.S. degrees in electronic engineering from Kyungpook National University, Taegu, Korea, in 1983 and 1985, respectively. Since 1985 he has worked at Communication System Group and Satellite Communication Group of ETRI as a research staff. His research interests are in DSP application, Network Protocol, VSAT, and micro-processor applications.

Jin-Ho Kim was born in Youngcheon on 4 Mar. 1965. He received B.S. degree in electronic engineering from Kyungpook National University, Taegu, Korea, in 1988 and M.S. degree in electrical and electronic engineering from KAIST(Korea Advanced Institute of Science and Technology), Seoul, Korea, in 1990. Since 1990 he has worked at Satellite Communication Group of ETRI as a research staff. His research interests are in image processing, error control coding, digital DBS, HDTV, and game theory.

Jin-Man Cho was born in Taegon on 10 Sep. 1966. He received B.S. and M.S. degrees in computer science from Chungnam National University, Taegon, Korea, in 1989 and 1991, respectively. Since 1991 he has worked at Satellite Communication Group of ETRI as a research staff. His research interests are in image processing, conditional access systems, and smart card.
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Title of Invention: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

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**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.
Office Action Summary

Application No. 12/678,050

Applicant(s) KIM ET AL.

Examiner NALINI YERNENI

Art Unit 2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) X Responsive to communication(s) filed on 12 March 2010.

2a) [ ] This action is FINAL.
   2b) [X] This action is non-final.

3) [ ] An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4) [ ] Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) [X] Claim(s) 1-9 is/are pending in the application.
   5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) [ ] Claim(s) _____ is/are allowed.

7) [X] Claim(s) 1-9 is/are rejected.

8) [ ] Claim(s) _____ is/are objected to.

9) [ ] Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10) [ ] The specification is objected to by the Examiner.

11) [X] The drawing(s) filed on 12 March 2010 is/are: a) [X] accepted or b) [ ] objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12) [ ] The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) [X] Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) [X] All  b) [ ] Some  c) [ ] None of:
   1. [ ] Certified copies of the priority documents have been received.
   2. [ ] Certified copies of the priority documents have been received in Application No. _____.
   3. [X] Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) [X] Notice of References Cited (PTO-892)

2) [ ] Notice of Draftsman’s Patent Drawing Review (PTO-948)

3) [X] Information Disclosure Statement(s) (PTO/SB/08)

   Paper No(s)/Mail Date ______.

4) [ ] Interview Summary (PTO-413)

   Paper No(s)/Mail Date ______.

5) [ ] Notice of Informal Patent Application

6) [ ] Other: ______.
DETAILED ACTION

Priority


Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 04/16/2010 is in compliance with the provisions of 37 CFR 1.97. However, the IDS fails to meet the provisions of 37 CFR 1.98(a). A legible copy of the foreign patent and the NPL is required. Accordingly, the information disclosure statements are not being considered by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites in lines 4-5: “a communication unit for communicating with the broadcast information management server and transmitting the device change information”. It is not clear if

(a) the communication unit is used to communicate with the broadcast information management server and communicating device change information to the terminal OR
(b) the communication unit is used to communicate with the broadcast
information management server and **communicating device change information to the**
broadcast information management server.

If (b), there is no antecedent basis for this limitation since the broadcast information
management server receives notification of device change from a mobile communication
information management server and not the CAS according to claim 1 which is the base claim
for claim 5.

For the purpose of examination, interpretation according to (a) is taken so as to comply
with the limitation in claim 1. Applicant is requested to clarify about this limitation.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
such that the subject matter as a whole would have been obvious at the time the invention was made to a person
having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
manner in which the invention was made.

6. Claims 1-3 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Min-
Suk Guahk et al. (WO 2006/043766 A1; Subscriber Management System and a Method Thereof
in the Digital Multimedia Broadcasting; hereinafter Guahk) in view of Harri Okkonen et al. (US
2004/0166839 A1; Communications Network Capable of Determining SIM Card Changes in
Electronic Devices).

**Regarding claim 1.** Guahk discloses a system for altering subscriber information to a
terminal through OOB, the system comprising:
a broadcast information management server (Guahk, ¶37: “Business Information System (BIS 210)” for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server (Guahk, ¶37: “The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated”); and

a Conditional Access System (CAS) for transmitting, to the second terminal, change information corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250 through the mobile station server 230, the telecommunication server 240 and a telecommunication network... the EMM (Entitlement Management Message) includes information of a user's viewing qualification, the viewing grade of the fee channel and the serial number of a smart card”; alteration recording is the change information corresponding to the subscriber information).
Guahk teaches the BIS performing modification of broadcast information based on changes in subscriber information, but does not explain how the BIS learns about the change in subscriber information. Hence, Guahk does not teach the mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information.

Guahk teaches modification of the user’s viewing qualification and viewing grade of fee channel through EMM message but does not specifically teach the change in the information as a result of device change; thus fails to teach device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information.

Identification of device replacement by an operator network, and communicating the changes to service providers and the service providers modifying the services available on the new terminal based on subscriber information using over-the-air provisioning is well known in the art of telecommunications. Okkonen teaches a mobile communication information management server (Okkonen, ¶60: “service coordinator”) for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information to the external service provider (Okkonen, ¶60: “the service coordinator is responsible for and capable of determining if a SIM card changed in an electronic device. In this embodiment, the agent in the electronic device selectively reports SIM card information whenever the electronic device is powered-up or whenever a SIM card related information is
manipulated. The service coordinator stores SIM card information and other related information communicated to it by the agent. Whenever it receives SIM card information from the agent, it compares it to the stored information to detect a change in SIM card, if any. If it detects a SIM card change, it then selectively communicates the SIM card change to the manufacturer's environment, to the service provider(s) or to other external systems”;

Okkonen also teaches the service provider communicating device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information (Okkonen, ¶41: “If an end-user has a plurality of electronic devices 123 and uses the same SIM card 123 in each of them, then a change of SIM card 123 reported to the service coordinator 119 by the agent 125 of the electronic device 109 implies that the electronic device 109 has changed. In order to continue to provide the end-user with all the services subscribed to by the end-user, as referenced by the SIM card information, despite the change of electronic devices 109, provisioning information, when available, is selectively accessed by the service provider 119 from the provisioning system 115. Thus, when the electronic device 109 reports a change in SIM card 123 and the SIM card 123 change is determined to be a change in electronic device 109, the service coordinator can access the provisioning information for the SIM card 123, including all services subscribed to by the end-user, and enable access to all those services via the changed electronic device 123”)

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and enable the carrier network to inform the BIS about change of the SIM from one terminal to the other since the mobile terminal needs to
register with the carrier network providing the carrier network with subscriber and terminal identity in order to gain access to the network.

One would be motivated to make such a combination to use the already existing infrastructure of the carrier network to validate the subscriber and terminal identities.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and require the CAS to communicate the change in device to the second terminal in order to enable the second communication device to provide services available to the subscriber when the subscriber SIM is inserted into the device to ensure all the services available to the subscriber are provided by the new device.

**Regarding claim 2,** Guahk and Okkonen teach the system as claimed in claim 1,

Guahk further teaches wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal (Guahk, Abstract: “*The system of the invention transmits a message for the alteration of the subscriber information to terminal through the OOB*”).

**Regarding claim 3,** Guahk and Okkonen teach the system as claimed in claim 1,

Guahk further teaches wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information (Guahk, ¶38: “*The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250*”).

**Regarding claim 6,** method claim 6 is rejected for the same reason as system claim 1 since the recited elements of claim 1 would perform the claimed steps.
Regarding claim 7, Guahk teaches a method for maintaining broadcast information regardless of change of subscriber information, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information; extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber Guahk, ¶37: “The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated”; and

generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250 through the mobile station server 230, the telecommunication server 240 and a telecommunication network... the EMM (Entitlement Management Message) includes information of a user’s viewing qualification, the viewing grade of the fee channel and the serial number of a smart card”; alteration recording is the change information corresponding to the subscriber information).

Guahk teaches the BIS performing modification of broadcast information based on changes in subscriber information, but does not explain how the BIS learns about the change in
subscriber information. Guahk teaches modification of the user’s viewing qualification and viewing grade of fee channel through EMM message but does not specifically teach the change in the information as a result of device change;

Identification of device replacement by an operator network, and communicating the changes to service providers and the service providers modifying the services available on the new terminal based on subscriber information using over-the-air provisioning is well known in the art of telecommunications. Okkonen teaches receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal (Okkonen, ¶60: “the service coordinator is responsible for and capable of determining if a SIM card changed in an electronic device. In this embodiment, the agent in the electronic device selectively reports SIM card information whenever the electronic device is powered-up or whenever a SIM card related information is manipulated. The service coordinator stores SIM card information and other related information communicated to it by the agent. Whenever it receives SIM card information from the agent, it compares it to the stored information to detect a change in SIM card, if any. If it detects a SIM card change, it then selectively communicates the SIM card change to the manufacturer's environment, to the service provider(s) or to other external systems”);

Okkonen also teaches the service provider communicating device change information necessary to the second terminal (Okkonen, ¶41: “If an end-user has a plurality of electronic devices 123 and uses the same SIM card 123 in each of them, then a change of SIM card 123 reported to the service coordinator 119 by the agent 125 of the electronic device 109 implies that the electronic device 109 has changed. In order to continue to provide the end-user with all the
services subscribed to by the end-user, as referenced by the SIM card information, despite the change of electronic devices 109, provisioning information, when available, is selectively accessed by the service provider 119 from the provisioning system 115. Thus, when the electronic device 109 reports a change in SIM card 123 and the SIM card 123 change is determined to be a change in electronic device 109, the service coordinator can access the provisioning information for the SIM card 123, including all services subscribed to by the end-user, and enable access to all those services via the changed electronic device 123.”

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and enable the carrier network to inform the BIS about change of the SIM from one terminal to the other since the mobile terminal needs to register with the carrier network providing the carrier network with subscriber and terminal identity in order to gain access to the network.

One would be motivated to make such a combination to use the already existing infrastructure of the carrier network to validate the subscriber and terminal identities.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk according to Okkonen and require the CAS to communicate the change in device to the second terminal in order to enable the second communication device to provide services available to the subscriber when the subscriber SIM is inserted into the device to ensure all the services available to the subscriber are provided by the new device.
7. Claims 4-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guahk in view of Okkonen further in view of Shrikanth Apsangi et al. (US 2008/0177998 A1; Apparatus and Method for Provisioning in a Download-Enabled System; hereinafter Apsangi).

**Regarding claim 4,** Guahk and Okkonen teach the system as claimed in claim 3,

Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof” wherein the alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of a terminal via a message.

In a related art of provisioning CPE within a content-based network, Apsangi talks about providing addition, deletion and modification of conditional access to a provisioned device associated with a subscriber. Apsangi discloses wherein the EMM information includes information necessary to cancel the subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187; “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network ("targeted populations") are subsequently given access to content").
It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.

**Regarding claim 5**, Guahk and Okkonen teach the system as claimed in claim 1,

Guahk teaches the CAS comprising a communication unit for communicating with the broadcast information management server (Guahk, ¶37: “The BIS 110 transmits ... the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220”; therefore a communication module in CAS to communicate with BIS) and transmitting the device change information (Guahk, ¶38: “The CAS 220 ... transmits the same to the incoming terminals 250”; therefore a communication module in CAS to transmit device change information);

Guahk do not go into the detailed architecture of the CAS and hence does not disclose wherein the CAS comprises a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips; a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server; a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and
the extracted unique information of the terminal; and a message generation unit for generating
the device change information necessary in order to change information on the second
broadcasting chip of the second terminal to information on the first broadcasting chip in response
to the message generation command from the control unit, and then providing the generated
device change information to the communication unit.

In a related art of provisioning CPE within a content-based network, Apsangi describes a
CA System implemented in a HFC network. Apsangi describes a CAS 500 in Fig.5a comprising
a Personalization Server 310, ECM and EMM Generator Functions 502 and 504, a Device
Provisioning function 506 and a Service Provisioning function 508. Each of these entities either
by themselves or in combination of the other entities in the CA System accomplish the features
of the claim not directly taught by Guahk as set forth herein:

a database for storing and managing the broadcast information on the subscriber
according to each of the information on the broadcasting chips (Apsangi, Fig.10: PS 310);

a data analysis unit for analyzing both the unique information of the terminal and the
subscriber information provided by the broadcast information management server (Apsangi,
¶200: “the AP compares the SM Class Identifier and list of SM Client Identifiers to the list of
approved SM Client Identifiers for this SM”);

a control unit for extracting the subscriber information and the unique information of the
terminal based on an analysis result of the data analysis unit, extracting broadcast information on
the first broadcasting chip corresponding to the subscriber information from the database
(Apsangi, Fig.10, steps 1018-1020 with details of the steps in¶200-¶201), and then providing a
message generation command in regard to a message including the extracted broadcast
information and the extracted unique information of the terminal (Apsangi, Fig.5a-5b where AP is connected to the EMMG in the network and the Fig.10 step 1022); and

a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit (Apsangi, Fig.10 step 1022 and ¶201: “The AP then generates a DCAS DownloadInfo message 1022 to the SM” hence sending the device change information to the communication unit).

Note: The procedure when a terminal is replaced with the same SM is explained in Apsangi, Fig13 with ¶210-213. The reason for using narration of Fig.10 is to explain each message and steps clearly to the applicant since Fig.13 steps assumes the reader has knowledge of the different messages and the working of the system based on previous figures.

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and provide a CA system to accomplish remote provisioning, de-provisioning and Client change to the system of Guahk in order to use already existing CA systems to accomplish the tasks of automated changes of Guahk.

*Regarding claim 8,* Guahk and Okkonen teach the method as claimed in claim 6, Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message)
including the serial number of a smart card and the alteration recording thereof” wherein the alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of subscription of a terminal via a message.

In a related art of provisioning CPE within a content-based network, Apsangi talks about providing addition, deletion and modification of conditional access to a provisioned device associated with a subscriber. Apsangi discloses wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187; “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network ("targeted populations") are subsequently given access to content”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.

**Regarding claim 9**, Guahk and Okkonen teach the method as claimed in claim 7,
Guahk talks about the CAS sending the EMM necessary to cancel the subscription of a subscriber (Guahk, ¶38: “The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof” wherein the alteration recording can be the stop of subscriber information).

Guahk does not teach cancellation of subscription of a terminal via a message.

In a related art of provisioning CPE within a content-based network, Apsangi talks about providing addition, deletion and modification of conditional access to a provisioned device associated with a subscriber. Apsangi discloses wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal (Apsangi, Fig.11, Deactivate Host Provisioning Flow ¶203-206; “When the AP 208 receives the request from the MPS, it sends a unicast DCASDownload message to the SM within the host device. In the next step 1124, the SM sends a ClientSignOn message to the AP. In the next step 1126, the AP sends a unicast ClientSignOn confirmation message to the SM. When it gets this message, in the next step 1128, the SM deletes the common and personalized images corresponding to the personalized image programmed in the host device. Next, in step 1130, the SM sends a DCAST status message to the AP.”; and ¶187: “the Entitlement Management Messages (EMMs) are used to specify which host/CPE within the network ("targeted populations") are subsequently given access to content”).

It would have been obvious to one skilled in the art at the time of the invention to modify the teachings of Guahk and Okkonen according to Apsangi and send an EMM to deactivate the terminal in the same way as sending an EMM to cancel a subscriber. One would be motivated to
make such a combination to avoid expensive trip from the service provider personnel to secure the device from fraudulent use.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NALINI YERNENI whose telephone number is (571)270-1647. The examiner can normally be reached on Mon-Fri 9AM to 5PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Dwayne Bost can be reached on (571)272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dwayne Bost/
Supervisory Patent Examiner,
Art Unit 2617

/NALINI YERNENI/
Examiner, Art Unit 2617
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Abstract: Disclosed are a subscriber management system and a method thereof using OOB (Out Of Band) channel in the DMB (Digital Multimedia Broadcasting). The system of the invention transmits a message for the alteration of the subscriber information to terminal through the OOB, and receives the result of the transmitting of message, that the result comprises a success of the transmitting/alteration, a failure of the alteration, and an error of the transmitting. Therefore, the system is able to apply the alteration of subscriber information to the terminal as soon as the subscriber information is altered.
Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
Description

SUBSCRIBER MANAGEMENT SYSTEM AND METHOD THEREOF IN THE DIGITAL MULTIMEDIA BROADCASTING

Technical Field

[1] The present invention relates to a subscriber management system and method thereof in the digital multimedia broadcasting, and more particularly, to a subscriber management system and method thereof in the digital multimedia broadcasting which manages a subscriber in the digital multimedia broadcasting.

Background Art

[2] The digital multimedia broadcasting is the broadcasting service which can view and listen various multimedia broadcasting such as video, audio or data by the multimedia channels through a personal portal or an automotive incoming terminal mounting the receiving antenna outdoors or on walking.

[3] The service provides a high quality of tone, various data services, interactivity and good moving reception quality by converting a conventional analog broadcasting signal into a digital signal and enhance conventional broadcasting concept in the manner that a user views, listens and participates the broadcasting. And the service, except for the music broadcasting, can transmit various multimedia broadcasting such as news, traffic information, weather information, geographic position information and moving picture information as the pattern of text and graph through the data broadcasting.

[4] On the other hand, generally, the above-mentioned digital multimedia broadcasting uses a CAS (Conditional Access System) for restricting the reception of subscribers. The CAS performs the reception restriction function by adjusting the viewing grade through a smart cast mounted in an incoming terminal, and performs the security function preventing from viewing digital multimedia broadcasting through the illegal use of the smart card.

[5] But whether the incoming terminal received a message transmitted to the incoming terminal from the CAS or not is not able to be identified and the CAS message is transmitted to the incoming terminal of all subscribers every 30 minutes. Therefore, the incoming terminal had to wait the next CAS message in the case that the CAS message is not received at a time.

[6] Hereinafter, preferable embodiments according to the conventional art will be described with reference to the accompanying drawings.

[7] FIG. 1 illustrates a block diagram of a subscriber management system in the digital multimedia broadcasting in accordance with the conventional art.
As depicted in FIG. 1, the subscriber management system in the digital multimedia broadcasting in accordance with the conventional art comprises a BIS (Business Information System) 110 for managing subscriber information of the digital multimedia broadcasting, a CAS (Conditional access system) 120 for generating a CAS message related to the viewing qualification of a subscriber and the viewing grade of the fee channel at predetermined intervals and transmitting the CAS message to an incoming terminal through a broadcasting network, an incoming terminal 130 for receiving a broadcasting signal and the CAS message transmitted through the broadcasting network, analyzing the CAS message and then displaying only a broadcasting signal corresponding to the viewing grade.

Herein, the incoming terminal 130 includes a smart card 135 for storing the subscriber information, receiving the CAS message and then adjusting and modifying the viewing grade.

A subscriber management system in the digital multimedia broadcasting in accordance with the conventional art will be described.

At first, the BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal to the CAS 120 together with the alteration recording if the alteration such as the generation, the modification and the stop of subscriber information is generated.

The CAS 120 generates a CAS message including the serial number of a smart card and the alteration recording thereof transmits (broadcasts) the same to all incoming terminals 120. Namely, the CAS 120 manages a user's viewing qualification and the viewing grade of the fee channel through the CAS message. At this time, the CAS message includes the message that relates to information (EMM; Entitlement Management Message) of a user's viewing qualification and the viewing grade of the fee channel, and relates to key information (ECM; Entitlement Control Message) which can decrypt the scramble of the fee channel.

Accordingly, the incoming terminal 130 receives the CAS message from a broadcasting network and manages a user's viewing qualification and the viewing grade of the fee channel through the EMM (Entitlement Management Message) in the case that the CAS message is the same to key information of the built-in smart card 135 by analyzing (namely, parsing) the ECM (Entitlement Control Message).

However, as described above, conventional art have the problem that because the CAS message is transmitted to all incoming terminals 120 at every 30 minutes, the varied viewing qualification and viewing grade of the fee channel are not entitled on
time in the case that an incoming terminal in the shadow area doesn’t receive the CAS message.

In addition, there is the problem that because a broadcasting network has the unilateral characteristics, digital multimedia broadcasting operator cannot correctively know whether the CAS message transmitted to an incoming terminal through the broadcasting network is received.

**Disclosure of Invention**

**Technical Problem**

Accordingly, it is an object of the present invention to provide a subscriber management system and method thereof in the digital multimedia broadcasting using a channel out of band.

**Technical Solution**

It is a first aspect of the present invention to provide a subscriber management system in the digital multimedia broadcasting, the system comprising: a broadcasting center for performing the subscriber management by transmitting a broadcasting signal through a channel in band and transmitting a message through a channel out of band and then performing the feedback of the same; and an incoming terminal for analyzing the message and then displaying a broadcasting signal transmitted through the channel in band on the screen in the basis of the viewing qualification and the viewing grade in accordance with the analyzing result.

It is a second aspect of the present invention to provide a subscriber management system and method thereof in the digital multimedia broadcasting, the system comprising: a customer management apparatus for managing subscriber information in the digital multimedia broadcasting; a conditional access system for generating a message related to the viewing qualification and the viewing grade of the digital multimedia broadcasting in accordance with the alteration of the subscriber information; a mobile station server for selecting a telecommunication network to transmit the message; a telecommunication server for converting the message into the data type for transmitting through the telecommunication network and then transmitting the converted message through the selected telecommunication network; and an incoming terminal for analyzing the message and then displaying a broadcasting signal transmitted through the broadcasting network on the screen in the basis of the viewing qualification and the viewing grade in accordance with the analyzing result.

It is a third aspect of the present invention to provide a subscriber management method in the digital multimedia broadcasting, the method comprising the steps of: (a) a broadcasting center for transmitting a message for the alteration of the subscriber in-
formation through a channel out of band; and (b) receiving information corresponding to the success, the failure and the error of the message transmission as the feedback.

[20] It is a fourth aspect of the present invention to provide a subscriber management method in the digital multimedia broadcasting, the method comprising the steps of: (a) transmitting a message corresponding to the alteration of subscriber information to the conditional access system in the case that a customer management apparatus changes subscriber information; (b) the conditional access system of generating a subscriber change message in the basis of the command message and then transmitting the same to mobile station server; (c) the mobile station of analyzing the subscriber change message and then transmitting the subscriber change message to a telecommunication server of a corresponding telecommunication operator; (d) the telecommunication server of processing into a data type which is able to be transmitted through a telecommunication network, and then transmitting the same to an incoming terminal; and (e) the incoming terminal of parsing the subscriber change message, performing an operation corresponding to the alteration of corresponding subscriber information in the case that a smart card number and included at the subscriber change message is the same to a smart card number of the incoming terminal, receiving a broadcasting signal transmitted through a broadcasting network, and then displaying the same on the screen.

[21] **Advantageous Effects**

[22] As described above, the present invention applies the alteration items to the incoming terminal as soon as the alteration of the subscriber information is generated by the digital multimedia broadcasting using a channel out of band (for example, telecommunication network).

[23] The present invention can provide subscriber with a reliable service because whether the alteration message of the subscriber information is correctly transferred to the incoming terminal can be identified as soon as the alteration of the subscriber information is generated by the digital multimedia broadcasting using a channel out of band (for example, telecommunication network).

[24] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims as well as the appended drawings.

**Brief Description of the Drawings**
The accompanying drawings, which are included to aid in understanding the invention and are incorporated into and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principles of the invention. In the drawings:

FIG. 1 illustrates a block diagram of a subscriber management system in the digital multimedia broadcasting in accordance with the conventional art;

FIG. 2 illustrates a block diagram of a subscriber management system in the digital multimedia broadcasting in accordance with an exemplary embodiment of the present invention;

FIG. 3 illustrates a command message in accordance with an exemplary embodiment of the present invention;

FIG. 4 illustrates a SOROOb command message in accordance with an exemplary embodiment of the present invention; and

FIG. 5 illustrates an EMM (Entitlement Management Message) in accordance with an exemplary embodiment of the present invention.

The following Examples are given for the purpose of illustration only and are not intended to limit the scope of this invention.

Best Mode for Carrying Out the Invention

Hereinafter, preferable embodiments according to the present invention will be described with reference to the accompanying drawings. Here, when one element is connected to another element, one element may be not only directly connected to another element but also indirectly connected to another element via another element. Further, irrelevant elements are omitted for clarity. Also, like reference numerals refer to like elements throughout.

The channel out of band has various kinds of forms like a telecommunication network and an IP based packet network, etc. however, the preferable embodiment of the present invention will be explained on the basis of the telecommunication network for the telecommunication service propelled together with the digital multimedia broadcasting.

FIG. 2 illustrates a block diagram of a subscriber management system in the digital multimedia broadcasting in accordance with an exemplary embodiment of the present invention.

As depicted in FIG. 2, the customer management apparatus for managing subscriber information in the digital multimedia broadcasting comprises a BIS (Business Information System) 210 for managing subscriber information in the digital multimedia broadcasting; a CAS (Conditional Access System) 220 for generating an EMM (Entitlement Management Message) in accordance with the alteration of the subscriber
information and for transmitting the EMM (Entitlement Management Message) to a mobile station server; the mobile station server 230 for receiving the EMM (Entitlement Management Message) and transmitting EMM (Entitlement Management Message) to a telecommunication server of a telecommunication operator corresponding to the number of an incoming terminal included at the EMM (Entitlement Management Message); the telecommunication server 240 for transmitting the EMM (Entitlement Management Message) generated from the mobile station server to an incoming terminal through the telecommunication network; and the incoming terminal 250 for receiving the EMM (Entitlement Management Message) transmitted through the telecommunication network, analyzing the EMM (Entitlement Management Message) and then displaying a signal transmitted through a broadcasting network on a screen in accordance with the viewing grade. Herein, the incoming terminal 250 stores a smart card 255 which stores subscriber information, receives the EMM (Entitlement Management Message) and adjusts and modifies the viewing grade.

In addition, the BIS 210, the CAS and the mobile station server 230 is equipped inner side of a broadcasting center (not shown).

The BIS 110 performs the management such as the generation, the modification and the stop of subscriber information (namely, information of an incoming terminal, a smart card and subscriber) in the digital multimedia broadcasting and simultaneously transmits the serial number of a smart card of a corresponding subscriber incoming terminal 250 together with the alteration recording to the CAS 220 if the alteration (namely, event) such as the generation, the modification and the stop of subscriber information is generated. It is preferable that the information of an incoming terminal is the number of the incoming terminal (for example, MDN).

The CAS 220 generates an EMM (Entitlement Management Message) including the serial number of a smart card and the alteration recording thereof and transmits the same to the incoming terminals 250 through the mobile station server 230, the telecommunication server 240 and a telecommunication network. Namely, the CAS 220 manages a user's viewing qualification and the viewing grade of the fee channel through the EMM (Entitlement Management Message). At this time, the EMM (Entitlement Management Message) includes information of a user's viewing qualification, the viewing grade of the fee channel and the serial number of a smart card. Accordingly, only the incoming terminal 250, which is the same to the serial number of a smart card, modifies information of a user's viewing qualification, the viewing grade of the fee channel. At this time, the CAS (Conditional Access System) 220 transmits the EMM (Entitlement Management Message) including information as to whether subscriber is authenticated or may be dependently transmit only message including the alteration recording and information as to whether subscriber is au-
thenticate on behalf of the EMM (Entitlement Management Message).

The mobile station server 230 plays a role on a message analysis server between the
CAS 220 and the telecommunication server 240 of the telecommunication network,
stores information which is able to divisionally manage a session in accordance with
respective telecommunication agency (namely, service provide) at the EMM
(Entitlement Management Message) and then transmits the telecommunication server
240 of the telecommunication network by packaging the EMM (Entitlement
Management Message) as the format that the telecommunication server 240 is able to
receive.

In addition, the mobile station server 230 includes separate management module for
managing the success, the failure and error information of the EMM transmission of
the telecommunication server 240 to the incoming terminal 250. For example, the
management module become a basis of the EMM re-transmission of the CAS 220 of
the mobile station server 230 by receiving success, the failure and error information of
the EMM transmission from the incoming terminal 250 as the feedback through a
Callback URL of an SMS (Short Message Service) transmitted to the incoming
terminal 250 using the management module and transmitting the same to CAS 220.

The telecommunication server 240 is built in accordance with respective service
provider, processes the EMM into the data format (for example, an OTA (Over The
Air), an SMS (Short Message Service) and a data packet) which is able to transmit the
EMM through the telecommunication network and transmits the same to the incoming
terminal 250. The telecommunication server 240 plays a role in being included at the
mobile station server 230 in accordance with the kind of a channel out of band or being
provided as a relay server (not shown).

The incoming terminal 250 is classified as an incoming terminal which simultaneou-
sely performs the function of the terminal for the digital multimedia broadcasting
and a telecommunication service. At this time, the incoming terminal 250 applied to
the exemplary embodiment in accordance with the present invention is limited to the
compatible incoming terminal. And the incoming terminal 250 receives the EMM,
analyzes the same and decides on the viewing qualification and the viewing grade of
the fee channel in the case that the serial number of the smart card included at the
EMM is the same to the number of the built-in smart card and displays on a screen by
receiving a broadcasting signal transmitted through a broadcasting network.

Hereinafter, the operation of a subscriber management system in the digital
multimedia broadcasting in accordance with an exemplary embodiment of the present
invention will be explained.

The BIS 210 shares information related to the possibility of a telecommunication
service with the CAS 220 by transmitting a SOROOB command to the CAS 220
whenever the opening and goods in the digital multimedia broadcasting service are varied (hereinafter, the event generation). For the operation, the BIS 210 discriminates whether correspond incoming terminal is used as a mobile phone through a subscriber information inquiry in case of the event generation. If the correspond incoming terminal is not used as a mobile phone in the discrimination result, because the fact of the event generation has to be transmitted, as depicted in FIG. 3, a command message for an incoming terminal which does not apply the telecommunication service is transmitted to the CAS 220. Herein, the SOROOB message has the structure as depicted in FIG. 4.

Namely, ₋SC#₎ represents the serial number of the smart card 255, ₋Device Type₎ includes information as to whether the incoming terminal is not applied to the telecommunication service, and ₋Message_Destination_Data₎ includes classification information of the telecommunication service operator and the telephone number (for example, MDN) of the incoming terminal 250.

And it is preferable that because the interworking of real time subscriber information between a subscriber management system of the telecommunication service operator in case of the event generation with the BIS 210 is not easy, the SOROOB message is firstly transmitted to the CAS 220 and the event generation message is next transmitted.

The CAS 220 generates the EMM on the basis of the command message transmitted from the BIS 210 and transmits the same to the mobile station server 230. At this time, the EMM transmitted to the mobile station server 230 from the CAS 220 is defined as depicted in FIG. 5. In addition, the EMM has not the TS format but the encrypted binary state, and includes at least one of the EMM as depicted in the numeral reference 510 of FIG. 5.

The mobile station server 230 analyzes the EMM inputted from the CAS 220 and transmits the EMM to the telecommunication server 240 of corresponding telecommunication service operator. And the mobile station server 230 manages whether the EMM is correctly transmitted to the telecommunication server 240. Namely, a retransmission is adjusted against the transmission failure. In addition, the mobile station server 230 monitors the state of the EMM and the transmission recording, and includes the function of the duplexing management and the statistics management.

The telecommunication server 240 processes the EMM into the data type (for example, an OTA (Over The Air), an SMS (Short Message Service) and a data packet) which can be transmitted through a telecommunication network and transmits the same to the incoming terminal 250.

The incoming terminal 250 receives the EMM, analyzes the same and decides on the viewing qualification and the viewing grade of the fee channel in the case that the
serial number of the smart card included at the EMM is the same to the number of the
built-in smart card, and displays on a screen by receiving a broadcasting signal
transmitted through a broadcasting network. And as the incoming terminal 250
transmits a response message of the EMM to the telecommunication server 240
through the telecommunication network, the telecommunication service operator
identifies whether the EMM is correctly transmitted to the incoming terminal 250.

Herein, the smart card 255 includes a broadcasting module (not shown), transmits
the EMM by enabling the state of the broadcasting module to be on the ON in the case
that the state of the broadcasting module is on the OFF, and then again enables the
state of the broadcasting module to be on the OFF.

According to the above-mentioned method, the fact (the generation, the mod-
ification and the stop of subscriber information) as to whether the event generation can
be correctly transmitted to an incoming terminal on time through a telecom-
munication network on behalf of a broadcasting network.

While the invention is susceptible to various modifications and alternative forms,
specific embodiments thereof have been shown by way of example in the drawings and
are herein description in detail. It should be understood, however, that the description
herein of specific embodiments is not intended to limit the invention to the particular
forms disclosed, but on the contrary, the invention is to include all modifications,
equivalents and alternatives falling within the spirit and scope of the invention as
deﬁned by the appended claims.

**Industrial Applicability**

The present invention is able to manage a subscriber in the digital multimedia
broadcasting using a channel out of band.
Claims

[1] Subscriber management system in the digital multimedia broadcasting, the system comprising:
a BIS (Business Information System) for managing subscriber information in the digital multimedia broadcasting;
a conditional access system for generating a message related to the viewing qualification and the viewing grade of the digital multimedia broadcasting in accordance with the alteration of the subscriber information;
a mobile station server for selecting a telecommunication network to transmit the message;
a telecommunication server for converting the message into the data type for transmitting through the telecommunication network and then transmitting the converted message through the selected telecommunication network; and
an incoming terminal for analyzing the message and then displaying a broadcasting signal transmitted through the broadcasting network on the screen in the basis of the viewing qualification and the viewing grade in accordance with the analyzing result.

[2] The system as claimed in claim 1, wherein the BIS (Business Information System) includes a discrimination means for discriminating the kind and the capability of the incoming terminal through the subscriber information.

[3] The system as claimed in claim 1, wherein the BIS (Business Information System), whenever the opening and goods in the digital multimedia broadcasting service are varied, discriminates whether the service is applied to the incoming terminal or not and then transmits respective different commands to the conditional access system.

[4] The system as claimed in claim 3, wherein the commands applied to the digital multimedia broadcasting service include information related to a smart card, the classification of a mobile service provider and the telephone number of the incoming terminal.

[5] The system as claimed in claim 1, wherein the conditional access system includes a message generation means having a command corresponding to at least one of the new affiliation, the termination and the provisional stop of the service, cancellation of the provisional stop and the service variation within the message in the basis of the variation of the subscriber information.

[6] The system as claimed in claim 5, wherein the message generation means further includes the telephone number of the incoming terminal within the message.

[7] The system as claimed in claim 1, wherein the mobile station server comprises:
a selection means for selecting a mobile communication network operator in the basis of the subscriber information included within the message; and a management means for receiving information corresponding to the success, the failure and the error of the message transmission as the feedback and then transmitting the same to the conditional access system.

[8] The system as claimed in claim 1, wherein the incoming terminal includes a smart card for analyzing subscriber information included at the message and receiving a broadcasting signal only when the broadcasting signal is the same to the subscriber information.

[9] The system as claimed in claim 8, wherein the smart card transmits a subscriber change message by enabling the reception state of digital multimedia broadcasting to be on the ON in the case that the broadcasting reception state is on the OFF, and then again enabling the broadcasting reception state to be on the OFF.

[10] The system as claimed in any one of claims 1 through 9, wherein the data type is any one of an OTA (Over The Air), an SMS (Short Message Service) and a data packet.

[11] Subscriber management system in the digital multimedia broadcasting, the system comprising: a broadcasting center for performing the subscriber management by transmitting a broadcasting signal through a channel in band and transmitting a message through a channel out of band and then performing the feedback of the same; and an incoming terminal for analyzing the message and then displaying a broadcasting signal transmitted through the channel in band on the screen in the basis of the viewing qualification and the viewing grade in accordance with the analyzing result.

[12] The system as claimed in claim 11, wherein the mobile station server comprises: a conditional access system for generating a message related to the viewing qualification and the viewing grade of the digital multimedia broadcasting in accordance with the alteration of the subscriber information; and a mobile station server for selecting a channel out of band to transmit the message, processing into a data type which is able to be transmitted through the channel out of band, and then transmitting the same.

[13] The system as claimed in claims 11 or 12, wherein the channel out of band is a telecommunication network.

[14] The system as claimed in claims 11 or 12, wherein the conditional access system includes a message generation means having a command corresponding to at least one of the new affiliation, the termination and the provisional stop of the
service, cancellation of the provisional stop and the service variation within the message in the basis of the variation of the subscriber information.

[15] The system as claimed in claims 11 or 12, wherein the mobile station server comprises:
a selection means for selecting a mobile communication network operator in the basis of the subscriber information included within the message; and
a management means for receiving information corresponding to the success, the failure and the error of the message transmission as the feedback and then transmitting the same to the conditional access system.

[16] The system as claimed in claims 11 or 12, wherein the incoming terminal includes a smart card for analyzing subscriber information included at the message and receiving a broadcasting signal only when the broadcasting signal is the same to the subscriber information.

[17] The system as claimed in claim 16, wherein the smart card transmits a subscriber change message by enabling the reception state of digital multimedia broadcasting to be on the ON in the case that the broadcasting reception state is on the OFF, and then again enabling the broadcasting reception state to be on the OFF.

[18] Subscriber management method in the digital multimedia broadcasting, the method comprising the steps of:
(a) a broadcasting center for transmitting a message for the alteration of the subscriber information through a channel out of band; and
(b) receiving information corresponding to the success, the failure and the error of the message transmission as the feedback.

[19] The method as claimed in claim 18, wherein the channel out of band is a telecommunication network.

[20] The method as claimed in claims 18 or 19, wherein the alteration of the subscriber information is any one of the new affiliation, the termination and the provisional stop of the service, cancellation of the provisional stop and the service variation.

[21] Subscriber management method in the digital multimedia broadcasting, the method comprising the steps of:
(a) transmitting a message corresponding to the alteration of subscriber information to the conditional access system in the case that a BIS (Business Information System) changes subscriber information;
(b) the conditional access system of generating a subscriber change message in the basis of the command message and then transmitting the same to mobile station server;
(c) the mobile station of analyzing the subscriber change message and then transmitting the subscriber change message to a telecommunication server of a corresponding telecommunication operator;
(d) the telecommunication server of processing into a data type which is able to be transmitted through a telecommunication network, and then transmitting the same to an incoming terminal; and
(e) the incoming terminal of parsing the subscriber change message, performing an operation corresponding to the alteration of corresponding subscriber information in the case that a smart card number and included at the subscriber change message is the same to a smart card number of the incoming terminal, receiving a broadcasting signal transmitted through a broadcasting network, and then displaying the same on the screen.

[22] The method as claimed in claim 21, wherein the step (a) comprises the steps of:
(a1) discriminating whether the kind of a corresponding subscriber incoming terminal can use a telecommunication service together with a digital multimedia broadcasting service in the case that a BIS (Business Information System) changes subscriber information; and
(a2) transmitting a command message corresponding to the alteration of subscriber information and the discriminating result to the conditional access system.

[23] The method as claimed in claims 21 or 22, wherein the command message includes the possibility of applying the incoming terminal to a telecommunication service, a telephone number of the incoming terminal and a serial number of a smart card.

[24] The method as claimed in claims 21 or 22, wherein the subscriber change message of the step (b) is transmitted as an encrypted binary state.

[25] The method as claimed in claims 21 or 22, wherein the subscriber change message of the step (d) includes information distinguishing a telecommunication service from a digital multimedia broadcasting service.

[26] The method as claimed in claims 21 or 22, wherein the step (d) comprises the step of transmitting a response message corresponding to the reception state of a corresponding message to the telecommunication server, by the incoming terminal receiving the subscriber change message.

[27] The method as claimed in claims 21 or 22, wherein the step (e) further comprises the step of transmitting the subscriber change message by enabling a DMB (Digital Multimedia Broadcasting) module to be on the ON state in the case that the DMB module is on the OFF state, and then again enabling the DMB module to be on the OFF state.
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Message type 1 byte uimsbf
Message length 2 bytes uimsbf
Continuity serial number 1 byte uimsbf
Smartcard serial number 10 bytes bslbf
Message_Deslination_Data 50 bytes bslbf

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for(i=0; i<emm_count; i++)
{
    emm_type 1 byte uimsbf
    emm_length 1 byte uimsbf
    Emm_data  emm_length uimsbf
}
This International search report has been prepared by the International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[ ] It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report
   a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   [ ] With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. Certain claims were found unsearchable (See Box No. II)

3. Unity of invention is lacking (See Box No. III)

4. With regard to the title,
   [x] the text is approved as submitted by the applicant.
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the abstract,
   [x] the text is approved as submitted by the applicant.
   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,
   a. the figure of the drawings to be published with the abstract is Figure No. 2
      [x] as suggested by the applicant.
      [ ] because the applicant failed to suggest a figure.
      [ ] because this figure better characterizes the invention.
   b. [ ] none of the figure is to be published with the abstract.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

H04B 7/216(2006.01)ii
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04B 7/216, E04N 7/00, H04H 7/20, H04H 1/00, G06F 17/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>KR 2006-0004170 A (LG TELECOM CO., LTD.) 12 January 2006 See the whole documents</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search
27 FEBRUARY 2006 (27.02.2006)

Date of mailing of the international search report
27 FEBRUARY 2006 (27.02.2006)

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea

Authorized officer
NAM, Oek Woo

Faxesimile No. 82-42-472-7140

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(Not for submission under 37 CFR 1.99)

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<td>Jong Ho KIM et al.</td>
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### U.S. PATENTS

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### U.S. PATENT APPLICATION PUBLICATIONS

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### NON-PATENT LITERATURE DOCUMENTS

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If you wish to add additional non-patent literature document citation information please click the Add button.

**EXAMINER SIGNATURE**

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<th>Examiner Signature</th>
<th>Mrunalini Yermen</th>
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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### Search Notes

**Application/Control No.**
12676050

**Applicant(s)/Patent Under Reexamination**
KIM ET AL.

**Examiner**
NALINI YERNENI

**Art Unit**
2617

#### SEARCHED

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/NALINI YERNENI/
Examiner Art Unit 2617
Title: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Publication No: US-2010-0227590-A1
Publication Date: 09/09/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

03/12/2010
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS

03/12/2010
DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE. The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363). Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

• Copy of the International Application filed on 03/12/2010
• Copy of the International Search Report filed on 03/12/2010
• Preliminary Amendments filed on 03/12/2010
• Information Disclosure Statements filed on 04/16/2010
• Oath or Declaration filed on 03/12/2010
• Request for Immediate Examination filed on 03/12/2010
• U.S. Basic National Fees filed on 03/12/2010
• Priority Documents filed on 03/12/2010

Date Mailed: 06/02/2010
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INDIA L EVANS

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CONFIRMATION NO. 4956

FILING RECEIPT

22429
LOWE HAUPTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

Date Mailed: 06/02/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections.

Applicant(s)

Jong Ho Kim, Seoul, KOREA, REPUBLIC OF;
Kwang Young Kim, Seoul, KOREA, REPUBLIC OF;
Chang Il Kim, Seoul, KOREA, REPUBLIC OF;
Byung Seok Hwang, Gyeonggi-do, KOREA, REPUBLIC OF;
Min Seok Kim, Seoul, KOREA, REPUBLIC OF;

Assignment For Published Patent Application
SK TELECOM CO., LTD., Seoul, KR

Power of Attorney: The patent practitioners associated with Customer Number 22429

Domestic Priority data as claimed by applicant
This application is a 371 of PCT/KR08/00249 01/15/2008

Foreign Applications

If Required, Foreign Filing License Granted: 05/31/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 12/678,050

Projected Publication Date: 09/09/2010

Non-Publication Request: No

Early Publication Request: No
SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

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(Not for submission under 37 CFR 1.99)

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<td>Yang et al.; &quot;The conditional access flow using subscriber smart card with Koreasat DBS receiver&quot;; IEEE Transactions on Consumer Electronics; August 1997; Vol. 43; Issue 3; pgs. 330-336.</td>
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**EXAMINER SIGNATURE**

| Examiner Signature | Date Considered |

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2 Enter office that issued the document, by the two-letter code (WIPO Standard ST.3).  
3 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.  
4 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.  
5 Applicant is to place a check mark here if English language translation is attached.
CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature /Yoos. Ham/ Date (YYYY-MM-DD) 2010-04-16
Name/Print Yoon S. Ham Registration Number 45,307

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.
Title: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Abstract: Disclosed is a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment where broadcast information can be automatically modified in response to device replacement. The method includes: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.
Description

SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Technical Field

[1] The present invention relates to a system and a method for maintaining broadcasting chip information even when a mobile terminal device having the broadcasting chip information is replaced by a new mobile terminal, and more particularly to a system and a method for maintaining broadcasting chip information in a Universal Subscriber Identity Module (USIM) unlock environment, in which, when a mobile terminal device is replaced by a new mobile terminal, information that a new USIM has been mounted in the new mobile terminal is reported to a broadcast information management server of a broadcasting company, so that broadcasting chip information of the new mobile terminal can be easily replaced by broadcasting chip information of the existing mobile terminal.

Background Art

[2] A USIM refers to a single module, which includes a Subscriber Identity Module (SIM) card loaded with subscriber information and a Universal Integrated Circuit Card (UICC) are combined with each other, and has various functions, such as user authentication, global roaming, electronic commerce, etc. While a SIM stores personal information in order to provide various services, such as authentication, the charging of price, and security function, to subscribers of a mobile communication service, the USIM has both a subscriber authentication function one-step evolved from the subscriber authentication function of the SIM and the functions of a Universal IC Card (UICC), such as a transportation card, a credit card, etc.

[3] Meanwhile, a USIM unlock environment signifies an environment where a USIM having information on a mobile communication subscriber can be moved between and used for multiple terminals. In the USIM unlock environment, by carrying the USIM, it is possible to use a voice mobile phone service, including international roaming, and an electronic commerce service, regardless of the types of terminals and communication providers.

[4] Meanwhile, in association with Digital Multimedia Broadcasting (DMB), active research has recently been conducted in order to integrate a broadcast receiving function into a mobile communication terminal, so that an infrastructure has been recently constructed, in which it is possible to view a DMB broadcast upon receiving the DMB broadcast with the configuration of a terrestrial DMB receiving unit or a
satellite DMB receiving unit in a mobile communication terminal.

[5] In the case of viewing a DMB broadcast by using a mobile communication terminal, not only the viewer information but also information on the terminal, i.e., terminal information provided from a USIM card or a SIM card, is necessary. That is, since not only personal information on a viewer but also terminal information is required in order to view a DMB broadcast, each of recently produced terminals is equipped with a USIM card or a SIM card.

[6] Also, a broadcast receiving chip is mounted within the terminal. The broadcast receiving chip may have various forms, such as a Subscriber Identity Module (SIM), a Surface Mounted Device (SMD), a Multiple Chip Package (MCP), and the like. The broadcasting chip as described above is usually a HardWare (H/W) module loaded with broadcast subscriber information, which has a stable structure. Differently from the USIM, the broadcasting chip is usually fixedly embedded in a terminal, and restricts broadcast reception by exchanging a broadcast recipient’s personal information with a broadcasting system, e.g., a broadcast conditional access system.

[7] In a broadcasting system, satellite DMB from among various DMB services restricts broadcast reception such that only paying subscribers can receive a relevant broadcast, like other types of satellite broadcasting services. Such a system as described above in which only subscribers can selectively receive broadcasts is called a Conditional Access System (CAS) and is applied to the satellite DMB.

[8] Representative examples of receivers, to which the CAS is applied, include a set-top box for receiving pay channels of satellite broadcasting or cable broadcasting. Generally, a broadcast to which the CAS is applied, is sent in a state where images, sounds, and the like of the broadcast have been scrambled according to a prescribed algorithm or processed according to other schemes so that it is impossible to view the broadcast by itself. Then, the scrambled broadcast information can be restored to its original state by analyzing the relevant algorithm through the set-top box, thereby enabling normal viewing of the broadcast. Therefore, only subscribers are allowed to view the relevant broadcast. Hence, in the case of satellite DMB where subscriber-based broadcasting is considered, even a mobile communication terminal equipped with a DMB receiving unit for receiving a DMB broadcast requires a means for supporting the CAS.

[9] The aforementioned CAS corresponds to such a system that a user’s receiver determines if it is possible to receive a particular broadcast program. The CAS is intended to allow only those who pay a legitimate receiving fee to view programs, and viewing of digital broadcasting can become charged through the CAS. On this account, it can be said that the CAS is an element essential to commercialize digital broadcasting. The CAS having a conditional access function (or the reception re-
striction function) is configured to include scrambling technology of mixing voice data, image data, and the like for the protection from an unauthenticated reception, encryption technology of delivering data by using a control word key so as to view a broadcast only with a specific receiver, and the user service support function of providing users with various forms of services based on the scrambling technology and the encryption technology. A conventional CAS employs a fixed-type disc descrambler device in which a decoding algorithm and secret keys are stored, but recently, it is generalized to deliver, by a smart card loaded with unique personal information of a subscriber, a secret key to a user in consideration of the charging of price, convenience property, security, and others.

[10] As illustrated in FIG. 1, the CAS as described above includes: an Entitlement Control Message (ECM) generator for generating an ECM upon receiving program information, package information, etc., from a TCS (i.e., a broadcast schedule generator); an Entitlement Management Message (EMM) generator for generating an EMM upon receiving subscriber information and purchase information from an SCIS (i.e., a subscriber management system); and a security/authentication server for carrying out encryption with the application of a reliable security algorithm so as to safely deliver a control word.

[11] Also, the CAS is assigned a digital signature which authenticates a message, such as an ECM, an EMM, etc., as a legal message sent from a broadcasting center and can then confirm the transformation of a relevant message, and includes receiver CA SoftWare (S/W) equipped within a receiver, which takes charge of authentication and filtering in regard to a message, such as an ECM, an EMM and the like, and carries out a mutual authentication between a smart card and a receiver. In addition, the above smart card corresponds to a card having a built-in chip equipped with its own processor and memory, which is provided to a subscriber so as to view satellite broadcasting, and both physical and electrical characteristics and a transfer protocol of the smart card comply with a definition of ISO 7816-1, 2, and 3.

[12] Therefore, the CAS receives an input ECM from a receiver, and then makes a comparison between conditional access properties (i.e., viewing right, reception area restriction, reception age restriction, etc.) of the ECM and the contents of the smart card, thereby determining if a broadcast can be received. If it is determined that a broadcast can be received, the CAS generates a control word corresponding to a key capable of descrambling a scrambled broadcasting signal to provide the generated control word to the receiver, and performs a command delivered by the EMM, thereby modifying or producing information (i.e., subscriber information, purchase information, etc.) within the smart card.

[13] Along with the SCIS, the CAS configured as described above corresponds to a
core system of a broadcasting system required for a pay digital satellite broadcasting service, enables each subscriber to be provided with desired services in an accurate and convenient manner, prevents illegal viewing for the sake of broadcasters, and provides various marketing data, such as each subscriber's viewing propensity and others, thereby providing a system which enables a viewer-oriented broadcasting service on the basis of the various marketing data.

[14] However, the CAS as described above is used as a system for restricting broadcast reception. Therefore, in the case of DMB-receiving mobile terminals that have recently been widely used, replacement of a terminal device may restrict reception of broadcast programs, which causes inconvenience in the use of the mobile terminal. That is, since it is usual that a broadcasting chip is fixed to a terminal differently from a USIM, a broadcasting chip of the new terminal cannot be replaced by a broadcasting chip of an existing terminal even when the existing terminal is replaced by the new terminal and a USIM of the existing terminal is mounted in the new terminal. Then, the CAS cannot recognize correlation between recipient information and the new terminal, and cannot provide proper control to the pay digital satellite broadcasting service.

**Disclosure of Invention**

**Technical Problem**

[15] Accordingly, the present invention has been made to solve the above-stated problems occurring in the prior art, and it is an object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which information on movement of a USIM to a new terminal is reported to an information management server of a broadcasting company, and the user's broadcast-related information is moved from an existing terminal to the new terminal having the moved USIM on the basis of broadcasting chip information of the new terminal and broadcasting chip information of the existing terminal, so that Conditional Access (CA) information can be automatically changed in accordance with user's actual circumstances.

[16] It is another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which an information management server of a broadcasting company changes the type of an existing terminal and transmits a CA message according to the change through a broadcasting network or a mobile communication network, so that it is possible to easily construct a system by means of a service employing the existing broadcasting infrastructure.

[17] It is still another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a
USIM unlock environment, in which, when a USIM user replaces an existing terminal by a new terminal and terminates a broadcasting chip of the existing terminal, and a USIM card of another subscriber of the broadcasting service is mounted in the existing terminal, the two users' relevant broadcast-related information is maintained according to an existing scheme, so as to increase the convenience of each user.

**Technical Solution**

[18] In accordance with a first aspect of the present invention for achieving the above objects, there is provided a system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system including: a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information; a broadcast information management server for making a request of modification regarding broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

[19] In accordance with a second aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a
request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information on the first broadcasting chip.

[20] In accordance with a third aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal; extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; and generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information.

Advantageous Effects

[21] In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

Brief Description of the Drawings

[22] The above and other exemplary features, aspects, and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[23] FIG. 1 is a view illustrating the configuration of a conventional Conditional Access System (CAS);

[24] FIG. 2 is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention;

[25] FIG. 3 is a block diagram illustrating important functions of a Conditional Access System (CAS) according to the present invention; and
FIG. 4 is a flowchart showing essential operations of the present invention.

Best Mode for Carrying Out the Invention

[27] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

[28] In embodiments of the present invention, a terminal_A is defined as an original terminal used by a user, and a terminal_B is defined as a new terminal by which the user replaces the original terminal. The terminal_A includes a broadcasting chip_A, and has a detachable USIM_A card. Also, the terminal_B includes a broadcasting chip_B, and has a detachable USIM_B card. Based on the structure as described above, two embodiments will be presented below for a case where a user replaces a terminal_A by a terminal_B.

According to the first embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is maintained while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

[30] According to the second embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is deleted or removed while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

[31] The first embodiment is based on a presumption that another USIM card is not mounted in the terminal_A. On the same principle, the first embodiment is based on a state in which the USIM_B card used by the terminal_B has been removed, i.e. in a state where the USIM_B card is not mounted in any other terminal. Hence, according to the first embodiment, if a separate USIM card is mounted in the terminal_A while subscriber lines in regard to the broadcasting chip_A and the broadcasting chip_B are being used in a duplicate manner, an existing subscriber line in regard to the broadcasting chip_A is canceled, or subscriber information on the broadcasting chip_A is deleted.

[32] FIG. 2 is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock en-
vironment according to the present invention. FIG. 2 is based on a system for maintaining broadcast information in a case where a USIM_A card mounted in an existing terminal_A having a broadcasting chip_A is separated from the existing terminal_A and is then mounted in a terminal_B having a broadcasting chip_B.

As illustrated in FIG. 2, the system for maintaining broadcasting chip information includes: a mobile communication information management server 201 for managing subscriber information based on unique information of each terminal and USIM information on the relevant terminal, and for performing a notification procedure corresponding to device replacement by supposing that the device replacement occurs if unique information of a terminal and subscriber information are different from each other; a broadcast information management server 203 for making a request necessary to modify broadcast information on a relevant subscriber after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server 201; and a Conditional Access System (CAS) 205 for controlling the transfer, to a terminal_B, of an Entitlement Management Message (EMM) necessary to modify broadcasting chip information from information on a broadcasting chip_A of an existing terminal_A corresponding to the subscriber information to information on a broadcasting chip_B of the terminal_B, by which a user replaces the user's existing terminal_A, in response to the request necessary to modify broadcast information (or the broadcast information modification request) of the broadcast information management server 203.

The CAS 205 employs either broadcasting network including a satellite network and a terrestrial network, or a Out-Of-Band(OOB) network so as to modify information on the broadcasting chip_B of the terminal_B. Also, a subscription message (i.e. an EMM) provided by the CAS 205 is required to modify broadcasting chip information with which a receiving terminal is loaded, and since a broadcast receiving terminal has already been loaded with an algorithm for modifying information, a detailed description of the algorithm for modifying information will be omitted.

Meanwhile, the CAS 205 can maintain a subscriber line of the existing terminal_A according to the first embodiment as described above, and can simultaneously provide a cancelation message (i.e. an EMM) necessary to cancel the subscription of the existing terminal_A besides the subscription message (i.e. the EMM) according to the second embodiment as described above.

FIG. 3 is a block diagram illustrating important functions of the CAS according to the present invention.

As illustrated in FIG. 3, the CAS includes: a database 301 for storing and managing broadcast information on each subscriber corresponding to a broadcasting chip; a com-
munication unit 305 for performing communication with the broadcast information management server 203 on the basis of a set protocol and for transferring a message (i.e. an EMM) through a broadcasting network or a mobile communication network; a data analysis unit 307 for performing analysis on data provided by the broadcast information management server 203; a control unit 309 for extracting the subscriber information and the terminal information on a relevant subscriber on the basis of the analysis results of the data analysis unit 307, for receiving input broadcasting chip_A information on the relevant subscriber from the database on the basis of the subscriber information, and then providing a message generation command in regard to a message including the broadcasting chip_A information and the terminal information; and a message generation unit 311 for providing the communication unit 305 with a subscription message (i.e. an EMM) necessary to modify the broadcasting chip_B information of the terminal_B corresponding to the terminal information to the broadcasting chip_A information in response to the message generation command from the control unit 309.

[38] Herein, the control unit 309 can additionally generate a message cancelation command necessary to delete the broadcasting chip_A information of the existing terminal_A, or necessary to cancel a subscription line regarding the broadcasting chip_A of the existing terminal_A, and in response to the additionally generated message cancelation command, the message generation unit 311 provides a cancelation message (i.e. an EMM) necessary to delete or terminate the broadcasting chip_A information of the existing terminal_A.

[39] Hereinafter, a detailed description of an operation of the present invention will be made based on the accompanying drawings as follows.

[40] FIG. 4 is a flowchart showing essential operations of the present invention. As illustrated in FIG. 4, in step S401, a user removes a USIM_A card of an existing terminal_A having a built-in broadcasting chip_A from the existing terminal_A, and mounts the removed USIM_A card in a terminal_B having a built-in broadcasting chip_B, by which the user replaces the existing terminal_A. Accordingly, the terminal_B has the built-in broadcasting chip_B, and is equipped with the USIM_A card. In step S403, after a prescribed time unit passes, or after the terminal_B is equipped with the USIM_A card, when a power source is initially applied to the terminal_B, the terminal_B transfers, to the mobile communication information management server 201, subscriber information stored in the USIM_A card, including unique information of the relevant terminal (e.g., identity number information thereof) according to a communication protocol.

[41] The mobile communication information management server 201 detects a registration status regarding currently received unique information of the relevant terminal
and subscriber information, and if the unique information of the relevant terminal and the subscriber information do not coincide with each other, the mobile communication information management server 201 senses the occurrence of device replacement. Accordingly, the mobile communication information management server 201 proceeds to step S405, where the mobile communication information management server 201 notifies the broadcast information management server 203 of the fact that device replacement regarding a subscriber occurs. At this time, the mobile communication information management server 201 transfers terminal information of the terminal_B and subscriber information corresponding to the USIM_A card to the broadcast information management server 203.

[42] In step S407, the broadcast information management server 203 requests the CAS 205 to modify broadcast information in response to device replacement. Also, the broadcast information management server 203 provides the CAS 205 with the terminal information of the terminal_B and the subscriber information. Based on a preset protocol, the communication unit 305 receives communication data provided by the broadcast information management server 203. In step S409, the control unit 309 provides the data analysis unit 307 with the communication data received by the communication unit 305, and the data analysis unit 307 extracts terminal information and subscriber information from the currently received communication data.

[43] Thereafter, the control unit 309 extracts broadcast information on each subscriber corresponding to a relevant subscriber from the database 301 on the basis of the extracted subscriber information. Herein, the extracted broadcast information corresponds to broadcast information, with which the broadcasting chip_A of the existing terminal_A is loaded, and the control unit 309 provides the message generation unit 311 with a command necessary to direct the generation of a subscription message (i.e. an EMM) including the relevant broadcast information.

[44] In step S411, the message generation unit 311 generates a subscription message (i.e. an EMM) on the basis of the broadcast information and terminal information of the terminal_B in response to the direction command from the control unit 309, and in step S413, provides the subscription message (i.e. the EMM) to the communication unit 305. The communication unit 305 transfers the subscription message (i.e. the EMM) to the terminal_B through a broadcasting network or an Out-Of-Band (OOB) network 207.

[45] After the terminal_B receives the subscription message (i.e. the EMM) transferred from the CAS 205, in step S415, the terminal_B updates the broadcast information included in the subscription message (i.e. the EMM) to the broadcasting chip_B equipped within the terminal_B. Hence, the user can be provided with a broadcasting service through the terminal loaded with the USIM_A card, by which the user has replaced the
Meanwhile, in step S413, the CAS 205 can delete the broadcasting chip_A information of the existing terminal_A, or can additionally send a cancelation message (i.e. an EMM) necessary to cancel a subscription line of the broadcasting chip_A. The deletion of the broadcasting chip_A information or the additional transmission of the cancelation message can be selectively applied depending on a service environment according to the present invention. Consequently, the existing terminal_A receives the cancelation message (i.e. an EMM) in step S415, and then cancels a line in relation to the broadcasting chip_A information.

The merits and effects of exemplary embodiments, as disclosed in the present invention, and as so configured to operate above, will be described below.

In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

**Industrial Applicability**

Consequently, even when an existing terminal is replaced by a new terminal, existing broadcast information is maintained through a mutual linkage between a mobile communication network and a broadcasting network system, thereby producing quality improvement in a communication service, which in turn increases value for industrial use.

While the invention has been shown and described with reference to exemplary embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention. Therefore, the spirit and scope of the present invention must be defined not by described embodiments thereof but by the appended claims and equivalents of the appended claims.
Claims

[1] A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information;

a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

[2] The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.

[3] The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

[4] The system as claimed in claim 3, wherein the EMM information includes information necessary to cancel the subscription of the first terminal.

[5] The system as claimed in claim 1, wherein the CAS comprises:

a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips;

a communication unit for communicating with the broadcast information management server and transmitting the device change information;

a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server;
a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and
a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.

[6] A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:
transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server;
when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server;
transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request;
generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and
modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.

[7] A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:
receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal; extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; and generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information.

[8] The method as claimed in claim 6 or 7, wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal.
**Fig. 4**

- **S401**: Move card
- **S403**: Provide terminal information/subscriber information
- **S405**: Give notice of device replacement
- **S407**: Request broadcast information modification
- **S409**: Provide terminal/subscriber information
- **S411**: Extract broadcast information on relevant subscriber
- **S413**: Generate subscription message (EMM) based on broadcast information
- **S415**: Transfer cancellation message to existing terminal A
- **S415**: Modify broadcasting chip B information
- **S415**: Delete information and cancel line regarding broadcasting chip A

**Diagram:**
- **Broadcasting chip B**
  - Changed Terminal B
  - USIM A
- **Broadcasting chip A**
  - Existing Terminal A
  - USIM A
- **Mobile communication information management server**
- **Broadcast information management server**
- **CAS (reception restriction system)**
A. CLASSIFICATION OF SUBJECT MATTER

H04Q 7/20(2006.01)11

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 H04Q, H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal) & IEEE(http://ieeexplore.ieee.org/)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>A</td>
<td>EP 1 775 948 A2 (SAMSUNG ELECTRONICS CO., LTD.) 18 April 2007 See Paragraph [0048]-[0066] &amp; Fig. 4</td>
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<td>A</td>
<td>KYU-TAE YANG et al. 'The conditional access flow using subscriber smart card with Korensat DBS receiver' In: IEEE Transactions on Consumer Electronics, August 1997, Vol. 43, No. 3, pages 330-336, ISSN 0098-3063 See the whole document</td>
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☐ Further documents are listed in the continuation of Box C.  ☒ See patent family annex.

Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
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"&" document member of the same patent family

Date of the actual completion of the international search
20 JUNE 2008 (20.06.2008)

Date of mailing of the international search report
20 JUNE 2008 (20.06.2008)

Name and mailing address of the ISA/KR
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Authorized officer
YFO, Won Hyeon
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INTERNATIONAL SEARCH REPORT

INTERNATIONAL APPLICATION NO.
PCT/KR2008/000249

A. CLASSIFICATION OF SUBJECT MATTER

H04Q 7/20(2006.01) I

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 8 H04Q, H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
eKIPASS (KIPO internal) & IEEE (http://ieeexplore.ieee.org)

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Date of the actual completion of the international search
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Date of mailing of the international search report
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Name and mailing address of the ISA/KR
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Digital broadcasting conditional access system and method

Provided is a digital broadcasting conditional access system and method, including a digital broadcasting transmitter and a digital broadcasting receiver. The transmitter scrambles a broadcasting signal using a control key, generates broadcasting viewing restriction information and broadcasting viewing entitlement information, and transmits the scrambled broadcasting signal after incorporating the broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal. The receiver extracts the broadcasting viewing restriction information and the broadcasting viewing entitlement information included in the scrambled broadcasting signal to generate the control key, descrambles the broadcasting signal using the control key, and reproduces the descrambled broadcasting signal. Thus, the system and method can be provided for a digital broadcasting receiver including a smart card. Moreover, the digital broadcasting receiver can easily access to digital broadcasting using a Short Message Service (SMS) message and a smart card.
Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention generally relates to a digital broadcasting system, and in particular, to a digital broadcasting conditional access system and method.

2. Description of the Related Art

[0002] A Conditional Access System (CAS) indicates a system for authorizing access to pay broadcasting services. A broadcasting station providing pay broadcasting services scrambles a broadcasting signal before transmission, and a receiver descrambles the received broadcasting signal, thereby allowing only an authorized subscriber to enjoy the pay broadcasting services provided.

[0003] When a broadcasting station provides free broadcasting, the CAS cannot be used. However, when such a broadcasting station requires billing for a particular reason (e.g., broadcasting subscription in shadow areas or subscription for contents requiring billing), an appropriate CAS should be implemented.

[0004] A mobile communication terminal equipped with a smart card has recently been developed and user data and other data are stored in a flash memory of the smart card. One of the representative uses of the smart card is to provide a roaming service of the mobile communication terminal with a mobile communication terminal user identity module embedded in the smart card. Examples of a mobile communication terminal user identity module include a Subscriber Identity Module (SIM) card of a Universal Mobile Telecommunication System (UMTS), a Universal Subscriber Identity Module (USIM) of a Global System for Mobile Communications (GSM) system, and a User Identity Module (UIM) card and a Removal User Identity Module (RUIM) of a Code Division Multiple Access (CDMA) system. The smart card having the mobile communication terminal user identity module embedded therein is basically used to share data with the mobile communication terminal.

[0005] However, as a mobile communication terminal equipped with such a smart card becomes capable of receiving digital broadcasting and the demand for such an equipped mobile communication terminal increases, a digital broadcasting CAS for the mobile communication terminal is required.

SUMMARY OF THE INVENTION

[0006] It is, therefore, an object of the present invention to provide a digital broadcasting conditional access system and method for a digital broadcasting receiver equipped with a smart card.

[0007] It is another object of the present invention to provide a digital broadcasting conditional access system and method using a Short Messaging Service (SMS) and a smart card.

[0008] According to the present invention, there is provided a digital broadcasting conditional access system including a digital broadcasting transmitter and a digital broadcasting receiver. The digital broadcasting transmitter scrambles a broadcasting signal using a control key, generates broadcasting viewing restriction information and broadcasting viewing entitlement information, and transmits the scrambled broadcasting signal after incorporating the generated broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal. The digital broadcasting receiver extracts the broadcasting viewing restriction information and the broadcasting viewing entitlement information included in the scrambled broadcasting signal to generate the control key, descrambles the broadcasting signal using the control key, and reproduces the descrambled broadcasting signal.

[0009] According to the present invention, there is provided a digital broadcasting transmitter including a control key generator, a scrambler, a broadcasting viewing restriction information generator, a broadcasting viewing entitlement information generator and a multiplexer. The control key generator generates and outputs a control key, the scrambler scrambles a broadcasting signal using the control key. The broadcasting viewing restriction information generator generates broadcasting viewing restriction information including the control key and broadcasting channel-based reception entitlement information. The broadcasting viewing entitlement information generator generates broadcasting viewing entitlement information including a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information. The multiplexer incorporates the generated broadcasting viewing restriction information and broadcasting viewing entitlement information into the broadcasting signal scrambled by the scrambler.

[0010] According to the present invention, there is provided a broadcasting signal transmission method of a digital broadcasting transmitter. The broadcasting signal transmission method includes scrambling a broadcasting signal using a control key for scrambling the broadcasting signal, generating broadcasting viewing restriction information and broadcasting viewing entitlement information for the broadcasting signal, and transmitting the generated broadcasting viewing restriction information and broadcasting viewing entitlement information after incorporating the broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal.

[0011] According to the present invention, there is provided a digital broadcasting receiver including a digital broadcasting receiving unit, a filter, a control key generator and a descrambler. The digital broadcasting receiving unit receives a scrambled broadcasting signal. The filter extracts broadcasting viewing restriction information.
and broadcasting viewing entitlement information from the received broadcasting signal. The control key generator generates a control key using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information. The descrambler descrambles the scrambled broadcasting signal using the generated control key.

[0012] Preferably, the digital broadcasting receiver further includes a Radio-Frequency (RF) transceiver for transmitting a digital broadcasting subscription request to a separate server upon request from a user and receiving a first key for decrypting the broadcasting viewing entitlement information from the server responding to the digital broadcasting subscription request.

[0013] According to the present invention, there is provided a digital broadcasting conditional access method of a digital broadcasting receiver. The digital broadcasting conditional access method includes extracting broadcasting viewing restriction information and broadcasting viewing entitlement information included in a received broadcasting signal scrambled in a digital broadcasting reception mode, generating a control key for descrambling the scrambled broadcasting signal using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information, and descrambling the scrambled broadcasting signal using the generated control key.

[0014] Preferably, the digital broadcasting conditional access method further includes transmitting a digital broadcasting subscription request to a separate server upon request from a user and receiving a first key for decrypting the broadcasting viewing entitlement information from the server responding to the digital broadcasting subscription request and storing the first key.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The above and other objects, features, and advantages of preferred embodiments of the present invention will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates a digital broadcasting conditional access system according to the present invention;

FIG. 2 is a block diagram of a digital broadcasting transmitter according to the present invention;

FIG. 3 is a flowchart illustrating an operation of a digital broadcasting transmitter according to the present invention;

FIG. 4 is a block diagram of a digital broadcasting receiver according to a first embodiment of the present invention;

FIG. 5 is a block diagram of a digital broadcasting receiver according to a second embodiment of the present invention;

FIG. 6 is a flowchart illustrating an operation of a digital broadcasting receiver according to the present invention; and

FIG. 7 is a flowchart illustrating the generation of a control key in the operation of FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The matters defined in the description such as a detailed construction and elements are provided to assist in a comprehensive understanding of preferred embodiments of the invention. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the embodiments described herein can be made without departing from the scope and spirit of the invention. Also, descriptions of well-known functions and constructions are omitted for the sake of clarity and conciseness.

[0017] FIG. 1 illustrates a digital broadcasting conditional access system according to the present invention.

[0018] Referring to FIG. 1, the digital broadcasting conditional access system includes a digital broadcasting transmitter 100a or 100b (e.g., a broadcasting station) for configuring multimedia data as digital broadcasting data to provide a digital broadcasting service and a digital broadcasting receiver 200 for receiving the digital broadcasting data to output the multimedia data.

[0019] A repeater 40a or 40b transmits a digital broadcasting signal transmitted from the digital broadcasting transmitter 100a or 100b to the digital broadcasting receiver 200.

[0020] In particular, the digital broadcasting transmitter 100a or 100b scrambles a broadcasting signal using a control key and generates broadcasting viewing restriction information and broadcasting viewing entitlement information for the broadcasting signal. The digital broadcasting transmitter 100a or 100b incorporates the generated broadcasting restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal and transmits the scrambled broadcasting signal to the digital broadcasting receiver 200.

[0021] The digital broadcasting receiver 200 extracts the broadcasting viewing restriction information and broadcasting viewing entitlement information included in the scrambled broadcasting signal to generate the control key and descrambles the scrambled broadcasting signal using the generated control key, thereby reproducing the broadcasting signal. The control key indicates a Control Word (CW) for scrambling or descrambling the broadcasting signal.

[0022] In the present invention, the broadcasting viewing restriction information indicates an Entitlement Con-
control Message (ECM) including broadcasting channel-based reception entitlement information and the control key. The broadcasting channel-based reception entitlement information indicates reception entitlement for programs broadcast in each broadcasting channel and may be, for example, reception entitlement for a broadcasting program broadcast in a specific pay channel.

[0023] The broadcasting viewing entitlement information indicates an Entitlement Management Message (EMM) including a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information. The subscriber-based broadcasting viewing entitlement information indicates viewing entitlement for digital broadcasting.

[0024] The digital broadcasting transmitter 100a or 100b may generate the broadcasting viewing entitlement information by incorporating a first key for decrypting the broadcasting viewing entitlement information into the broadcasting viewing entitlement information at predetermined intervals. The first key is used to update a first key of the digital broadcasting receiver 200, because the first key of the digital broadcasting receiver 200 is used for each period (e.g., on a daily, weekly or monthly basis).

[0025] The digital broadcasting receiver 200 includes a database storing the broadcasting channel-based reception entitlement information, the subscriber-based broadcasting viewing entitlement information, the first key and the second key.

[0026] The digital broadcasting conditional access system may further include a subscriber management server for managing digital broadcasting subscriber information and may be implemented with, for example, an Over-The-Air (OTA) activation server.

[0027] The subscriber management server transmits the first key for decrypting the broadcasting viewing entitlement information to digital broadcasting receivers requesting subscription for digital broadcasting. At this time, the subscriber management server transmits the first key after incorporating the first key into a data region of an OTA message. The structure of the OTA message is well known and therefore, a description thereof will not be given.

[0028] The digital broadcasting receiver 200 may transmit a digital broadcasting subscription request to the subscriber management server using an SMS message or the wireless Internet and stores the first key received from the subscriber management server in a SIM card. In case the SIM card is not included, the digital broadcasting receiver 200 may store the first key in a memory.

[0029] Upon reception of the scrambled broadcasting signal, the digital broadcasting receiver 200 extracts the second key and the subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing entitlement information using the first key stored in the SIM card and extracts the control key and the broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information using the extracted second key. When the first key is included in the broadcasting viewing entitlement information, the digital broadcasting receiver 200 updates the stored first key with the first key included in the broadcasting viewing entitlement information.

[0030] FIG. 2 is a block diagram of the digital broadcasting transmitter 100 according to the present invention.

[0031] Referring to FIG. 2, the digital broadcasting transmitter 100 includes a video/audio encoder 110, a scrambler 120, a CW generator 130, an EMM generator, an EMM generator 150, a database 160, a multiplexer 170, a modulator 180, and a transmitting unit 190. Although not shown in FIG. 2, the digital broadcasting transmitter 100 is assumed to include a controller for controlling overall operations of the digital broadcasting receiver 200.

[0032] The video/audio encoder 110 encodes an input broadcasting signal including video and audio signals.

[0033] The scrambler 120 scrambles the encoded broadcasting signal using a control key and outputs the scrambled broadcasting signal to the multiplexer 170.

[0034] The CW generator 130 generates a control key for scrambling or descrambling the encoded broadcasting signal, i.e., a CW, and outputs the generated control key to the scrambler 120 and the EMM generator 140. The CW generator 130 may generate the control key using information about subscribers requesting subscription for digital broadcasting.

[0035] The EMM generator 140 generates broadcasting viewing restriction information (i.e., an EMM) including the control key output from the CW generator 130 and broadcasting channel-based reception entitlement information stored in the database 160 and outputs the generated broadcasting viewing restriction information to the multiplexer 170.

[0036] The EMM generator 150 reads a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information from the database 160 to generate broadcasting viewing entitlement information (i.e., an EMM) including the second key and the subscriber-based broadcasting viewing entitlement information and outputs the generated broadcasting viewing entitlement information to the multiplexer 170. The EMM generator 150 may read a first key for decrypting the broadcasting viewing entitlement information from the database 160 and incorporate the read first key into the broadcasting viewing entitlement information at predetermined intervals.

[0037] The database 160 stores the broadcasting channel-based reception entitlement information, the subscriber-based broadcasting viewing entitlement information, the first key for decrypting the broadcasting viewing entitlement information and the second key for decrypting the broadcasting viewing restriction information.
[0038] The multiplexer 170 outputs the broadcasting signal scrambled by the scrambler 120 to the modulator 180 after incorporating the generated broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal, and the broadcasting signal modulated by the modulator 180 is transmitted through the transmitting unit 190.

[0039] FIG. 3 is a flowchart illustrating an operation of the digital broadcasting transmitter 100 according to the present invention.

[0040] Referring to FIGs. 1 through 3, the digital broadcasting transmitter 100 generates a control key for scrambling an encoded broadcasting signal in step S110.

[0041] The digital broadcasting transmitter 100 scrambles the encoded broadcasting signal using the generated control key in step S120.

[0042] The digital broadcasting transmitter 100 generates broadcasting viewing restriction information and broadcasting viewing entitlement information for the broadcasting signal in step S130. At this time, the digital broadcasting receiver 200 may generate the broadcasting viewing entitlement information after incorporating a new first key into the broadcasting viewing entitlement information at predetermined intervals to update a first key of the digital broadcasting receiver 200.

[0043] The digital broadcasting transmitter 100 multiplexes the generated broadcasting viewing restriction information and broadcasting viewing entitlement information with the scrambled broadcasting signal in step S140. Hence, the broadcasting viewing restriction information and the broadcasting viewing entitlement information are included in the broadcasting signal.

[0044] When terrestrial digital broadcasting is employed, a digital broadcasting frame includes a Main Service Channel (MSC) including broadcasting data and a Fast Information Channel (FIC) indicating information of the MSC and the MSC includes multiple sub-channels (e.g., 0 - 63 sub-channels) including video, audio and data channels.

[0045] Thus, the digital broadcasting transmitter 100 may incorporate the broadcasting viewing restriction information and the broadcasting viewing entitlement information into the FIC or into one of the 64 sub-channels (e.g., a 64th sub-channel) when multiplexing the broadcasting viewing restriction information and the broadcasting viewing entitlement information with the scrambled broadcasting signal.

[0046] The digital broadcasting transmitter 100 transmits the multiplexed broadcasting signal in step S150.

[0047] FIG. 4 is a block diagram of the digital broadcasting receiver 200 according to a first embodiment of the present invention.

[0048] The digital broadcasting receiver 200 includes a digital broadcasting receiving unit 205, a demodulator 210, a demultiplexer 215, a decoder 220, a display unit 225, a speaker 230, a controller 240, a Radio-Frequency (RF) transceiver 245, a memory 250, a descrambler 255, a key input unit 260 and a SIM card unit 265.

[0049] The digital broadcasting receiving unit 205 receives a scrambled broadcasting signal and outputs the scrambled broadcasting signal to the demodulator 210 under the control of the controller 240.

[0050] The demodulator 210 demodulates the scrambled broadcasting signal received by the digital broadcasting receiving unit 205 into a digital broadcasting transport stream and outputs the digital broadcasting transport stream to the demultiplexer 215. The demultiplexer 215 may be included in the controller 240.

[0051] The demultiplexer 215 demultiplexes the broadcasting signal demodulated into the digital broadcasting transport stream to divide the digital broadcasting transport stream into an audio data stream and a video data stream. The audio data stream and the video data stream are decoded into an analog audio signal and an analog video signal by the decoder 220 and then output through an output unit, which indicates the display unit 225 and the speaker 230.

[0052] The demultiplexer 215 extracts broadcasting viewing entitlement information and broadcasting viewing restriction information from the broadcasting signal and outputs the extracted information to the controller 240. At this time, as described with reference to FIG. 1, the demultiplexer 215 searches sub-channels of the broadcasting signal to extract broadcasting viewing entitlement information and broadcasting viewing restriction information if they are included in a predetermined sub-channel.

[0053] The amount of broadcasting viewing entitlement information and broadcasting viewing restriction information included in the broadcasting signal varies with the number of digital broadcasting subscribers. Thus, it is obvious that broadcasting viewing entitlement information and broadcasting viewing restriction information included in the broadcasting signal varies with subscribers.

[0054] The controller 240 (e.g., an MSM) controls overall operations of the digital broadcasting receiver 200. If a user requests subscription for digital broadcasting, the controller 240 controls the RF transceiver 245 to transmit the digital broadcasting subscription request to a separate server (e.g., the subscriber management server) and to receive a first key for decrypting the broadcasting viewing entitlement information from the requested server. The digital broadcasting subscription request may use an SMS message or the wireless Internet. The received first key is stored in the SIM card 265 or may be stored in the memory 250.

[0055] The controller 240 includes a filter 242 and a control key generator 244.

[0056] The filter 242 extracts only broadcasting viewing restriction information and broadcasting viewing entitlement information corresponding to subscriber information of the digital broadcasting receiver 200 and transmits the same to the control key generator 244. In other words, the filter 242 extracts broadcasting viewing restriction information and broadcasting viewing entitle-
ment information according to the subscriber information of the digital broadcasting receiver 200.

0057] The broadcasting viewing restriction information and broadcasting viewing entitlement information according to the subscriber information of the digital broadcasting receiver 200 are received at predetermined intervals. In other words, the broadcasting viewing restriction information is received at intervals of a first time (e.g., two minutes) as being included in the broadcasting signal and the broadcasting viewing entitlement information is received at intervals of a second time (e.g., two minutes and ten seconds) longer than the first time as being included in the broadcasting signal. Thus, it is preferable that the filter 242 simultaneously transmits the broadcasting viewing restriction information received at intervals of the first time and the broadcasting viewing entitlement information received at intervals of the second time to the control key generator 244. The control key generator 244 decrypts the power consumption of the digital broadcasting receiver 200. To this end, the filter 244 may include a separate buffer that may be included in the controller 240.

0058] The control key generator 244 generates a control key using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information. In other words, the control key generator 244 decrypts the broadcasting viewing entitlement information using the first key stored in the SIM card 265 or the memory 250 and extracts a second key and subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing entitlement information. The control key generator 244 decrypts the broadcasting viewing restriction information using the extracted second key and extracts the control key and broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information.

0059] The control key generator 244 compares the extracted subscriber-based broadcasting viewing entitlement information with broadcasting channel-based reception entitlement information. If the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other (i.e., if a corresponding subscriber is an authorized subscriber), the control key generator 244 transmits the control key to the descrambler 255 under the control of the controller 240.

0060] When the first key is included in the broadcasting viewing entitlement information, the control key generator 244 transmits the first key to the SIM card 265 or the memory 250 under the control of the controller 240 to update a previously stored first key. Updating the first key indicates renewing digital broadcasting subscription for security.

0061] Accordingly, even when the digital broadcasting subscription period of a user of the digital broadcasting receiver 200 is one month, a first key received from the subscriber management server at the time of digital broadcasting subscription is not used for one month, but is updated at predetermined intervals (e.g., weekly) through received broadcasting viewing entitlement information included in a broadcasting signal, thereby improving security.

0062] It is preferable that a first key initially stored in the SIM card 265 be used, e.g., for a week, and then updated on a weekly basis through received broadcasting viewing entitlement information included in a broadcasting signal.

0063] The memory 250 stores various information required for control of the digital broadcasting receiver 200. The memory 250 may store the first key received from a server responding to a user's request for digital broadcasting subscription under the control of the controller 240.

0064] The descrambler 255 descrambles the scrambled broadcasting signal using the control key generated by the control key generator 244. The descrambled broadcasting signal is decoded by the decoder 220 and is output to an output unit.

0065] The key input unit 260 may include character keys, number keys and function keys and outputs a key input signal corresponding to a key input by the user to the controller 240. Thus, the user may request digital broadcasting subscription or cancellation thereof through the key input unit 260.

0066] The SIM card 265 stores the first key received through the RF transceiver 245 (i.e., a key for decrypting the broadcasting viewing entitlement information) through a SIM interface unit (not shown) providing an interface with the digital broadcasting receiver 200. The SIM card 265 is removable from the digital broadcasting receiver 200.

0067] The SIM card 265 may include the filter 242 and the control key generator 244 as illustrated in FIG. 5, which is a block diagram of the digital broadcasting receiver 200 according to a second embodiment of the present invention.

0068] The SIM card 265 may vary with the communication system it is used with. For example, the SIM card 265 may be USIM card for a UMTS or a UIM card or a RUIM card for a CDMA system.

0069] When the SIM card 265 is a pre-paid SIM card including a first key that is available only for a predetermined period, the digital broadcasting receiver 200 may allow a user to use only limited contents (e.g., contents of limited genres or categories) using the pre-paid SIM card.

0070] Although the controller 240 or the SIM card 265 includes the filter 242 and the control key generator 244 in the foregoing embodiments of the present invention, the filter 242 and the control key generator 244 may be included in the demultiplexer 215. Moreover, the descrambler 255 may also be included, together with the filter 242 and the control key generator 244.

0071] In addition, the present invention is applicable when the demultiplexer 214 is included in the controller 240.
FIG. 6 is a flowchart illustrating an operation of the digital broadcasting receiver 200 according to the present invention.

The digital broadcasting receiver 200 determines whether a user requests digital broadcasting subscription in step S210. The user’s request involves requesting a first key allowing the digital broadcasting receiver 200 to receive digital broadcasting. The digital broadcasting receiver 200 can decrypt digital viewing entitlement information included in a broadcasting signal broadcast by the digital broadcasting transmitter 100 using the first key.

The digital broadcasting receiver 200 transmits the user’s digital broadcasting subscription request to a separate server (e.g., a subscriber management server) in step S220. At this time, the digital broadcasting receiver 200 transmits subscriber information to the server using an SMS message or the wireless Internet. The subscriber information may include user information and information about the SIM card 265 included in the digital broadcasting receiver 200.

If the server transmits the first key after authorization of the digital broadcasting subscription request, the digital broadcasting receiver 200 receives and stores the first key in step S230.

The digital broadcasting receiver 200 determines whether the user requests digital broadcasting reception in step S240. The user may request digital broadcasting reception by inputting a hot key preset for digital broadcasting reception or using a menu. The hot key may be one of the keys included in the digital broadcasting receiver 200 or may be separately provided.

If the user requests digital broadcasting reception, the digital broadcasting receiver 200 switches an operation mode into a digital broadcasting reception mode and receives a scrambled broadcasting signal in step S250.

The digital broadcasting receiver 200 extracts broadcasting viewing restriction information and broadcasting viewing entitlement information included in the received broadcasting signal in step S260. At this time, the digital broadcasting receiver 200 extracts only broadcasting viewing restriction information and broadcasting viewing entitlement information corresponding to subscriber information (i.e., subscriber information of the digital broadcasting receiver 200).

The digital broadcasting receiver 200 generates a control key using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information in step S270. Generation of the control key in steps S270 will be described in more detail with reference to FIG. 7.

The digital broadcasting receiver 200 descrambles the scrambled broadcasting signal using the generated control key in step S280, and outputs the descrambled broadcasting signal in step S290.

FIG. 7 is a flowchart illustrating generation of the control key in the operation S270 of FIG. 6.

Referring to FIGs. 6 and 7, after extracting broadcasting viewing restriction information and broadcasting viewing entitlement information included in the received broadcasting signal in step S260 of FIG. 6, the digital broadcasting receiver 200 extracts a second key and subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing entitlement information using a previously stored first key in step S310. The first key is used to decrypt the broadcasting viewing entitlement information and the second key is used to decrypt the broadcasting viewing restriction information.

The digital broadcasting receiver 200 determines whether the first key is included in the broadcasting viewing entitlement information when decrypting the broadcasting viewing entitlement information to extract the second key and the subscriber-based broadcasting viewing entitlement information in step S320.

If the first key is included in the broadcasting viewing entitlement information, the digital broadcasting receiver 200 updates the previously stored first key in step S330.

If the first key is not included in the broadcasting viewing restriction information, the digital broadcasting receiver 200 extracts the control key and broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information using the extracted second key in step S340.

The digital broadcasting receiver 200 compares the extracted subscriber-based broadcasting viewing entitlement information with broadcasting channel-based reception entitlement information in step S350 to determine whether they coincide with each other in step S360.

If the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other (i.e., if a corresponding subscriber is an authorized subscriber), the digital broadcasting receiver 200 generates the control key in step S370 and returns to the process.

As described above, a digital broadcasting conditional access system and method can be provided for a digital broadcasting receiver including a smart card.

Moreover, according to the present invention, a digital broadcasting receiver can easily make a conditional access to digital broadcasting using an SMS message and a smart card.

While the present invention has been shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

Claims

1. A digital broadcasting conditional access system
comprising:

a digital broadcasting transmitter for scrambling a broadcasting signal using a control key, generating broadcasting viewing restriction information and broadcasting viewing entitlement information, and transmitting the scrambled broadcasting signal after incorporating the generated broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal; and

a digital broadcasting receiver for extracting the broadcasting viewing restriction information and the broadcasting viewing entitlement information included in the scrambled broadcasting signal to generate the control key, descrambling the broadcasting signal using the control key, and reproducing the descrambled broadcasting signal.

2. The digital broadcasting conditional access system of claim 1, wherein the broadcasting viewing restriction information is an Entitlement Control Message (ECM) including broadcasting channel-based reception entitlement information and the control key.

3. The digital broadcasting conditional access system of claim 1, wherein the broadcasting viewing entitlement information is an Entitlement Management Message (EMM) including a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information.

4. The digital broadcasting conditional access system of claim 1, wherein the digital broadcasting transmitter incorporates a first key for decrypting the broadcasting viewing entitlement information into the broadcasting viewing entitlement information at predetermined intervals when generating the broadcasting viewing entitlement information.

5. The digital broadcasting conditional access system of claim 1, wherein the digital broadcasting transmitter includes a database for storing the broadcasting channel-based reception entitlement information, the subscriber-based broadcasting viewing entitlement information, a second key and a first key.

6. The digital broadcasting conditional access system of claim 1, further comprising a subscriber management server for managing digital broadcasting subscriber information.

7. The digital broadcasting conditional access system of claim 6, wherein the digital broadcasting receiver receives a first key for decrypting the broadcasting viewing entitlement information by transmitting a digital broadcasting subscription request to the subscriber management server.

8. The digital broadcasting conditional access system of claim 7, wherein the digital broadcasting receiver transmits the digital broadcasting subscription request to the subscriber management server using one of a Short Message Service (SMS) message and the wireless Internet.

9. The digital broadcasting conditional access system of claim 7, wherein the digital broadcasting receiver stores the first key in a Subscriber Identify Module (SIM) card or a memory.

10. The digital broadcasting conditional access system of claim 1, wherein the digital broadcasting receiver extracts the second key and the subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing entitlement information using the first key and extracts the control key and the broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information using the extracted second key.

11. The digital broadcasting conditional access system of claim 10, wherein the digital broadcasting receiver updates a previously stored first key with the first key if the first key is included in the broadcasting viewing entitlement information.

12. The digital broadcasting conditional access system of claim 10, wherein the digital broadcasting receiver compares the extracted subscriber-based broadcasting viewing entitlement information with broadcasting channel-based reception entitlement information and descrambles the scrambled broadcasting signal using the generated control key if the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other.

13. A digital broadcasting transmitter comprising:

   a control key generator for generating and outputting a control key;
   a scrambler for scrambling a broadcasting signal using the control key;
   a broadcasting viewing restriction information generator for generating broadcasting viewing restriction information including the control key and broadcasting channel-based reception entitlement information;
   a broadcasting viewing entitlement information
generator for generating broadcasting viewing entitlement information including a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information; and a multiplexer for multiplexing the generated broadcasting viewing restriction information and broadcasting viewing entitlement information with the broadcasting signal scrambled by the scrambler.

14. The digital broadcasting transmitter of claim 13, further comprising a transmitting unit for transmitting the broadcasting signal output from the multiplexer.

15. The digital broadcasting transmitter of claim 13, wherein the broadcasting viewing entitlement information is an Entitlement Management Message (EMM).

16. The digital broadcasting transmitter of claim 13, wherein the broadcasting viewing restriction information is an Entitlement Control Message (ECM).

17. The digital broadcasting transmitter of claim 13, wherein the broadcasting viewing entitlement information generator generates the broadcasting viewing entitlement information after incorporating a first key for decrypting the broadcasting viewing entitlement information into the broadcasting viewing entitlement information at predetermined intervals.

18. The digital broadcasting transmitter of claim 13, further comprising a database for storing the broadcasting channel-based reception entitlement information, the subscriber-based broadcasting viewing entitlement information, a first key for decrypting the broadcasting viewing entitlement information, and the second key for decrypting the broadcasting viewing restriction information.

19. A broadcasting signal transmission method of a digital broadcasting transmitter, the broadcasting signal transmission method comprising the steps of:

scrambling a broadcasting signal using a control key for scrambling the broadcasting signal;
generating broadcasting viewing restriction information and broadcasting viewing entitlement information for the broadcasting signal; and transmitting the scrambled broadcasting signal after incorporating the broadcasting viewing restriction information and broadcasting viewing entitlement information into the scrambled broadcasting signal.

20. The broadcasting signal transmission method of claim 19, wherein the broadcasting viewing restriction information is an Entitlement Control Message (ECM) including broadcasting channel-based reception entitlement information and the control key.

21. The broadcasting signal transmission method of claim 19, wherein the broadcasting viewing entitlement information is an Entitlement Management Message (EMM) including a second key for decrypting the broadcasting viewing restriction information and subscriber-based broadcasting viewing entitlement information.

22. The broadcasting signal transmission method of claim 21, further comprising storing the broadcasting channel-based reception entitlement information, the subscriber-based broadcasting viewing entitlement information, a first key for decrypting the broadcasting viewing entitlement information, and the second key for decrypting the broadcasting viewing restriction information.

23. The broadcasting signal transmission method of claim 22, further comprising generating the control key.

24. The broadcasting signal transmission method of claim 23, wherein the step of generating the control key comprises generating the broadcasting viewing entitlement information after incorporating the first key decrypting the broadcasting viewing entitlement information into the broadcasting viewing entitlement information at predetermined intervals.

25. A digital broadcasting receiver comprising:

- a digital broadcasting receiving unit for receiving a scrambled broadcasting signal;
- a filter for extracting broadcasting viewing restriction information and broadcasting viewing entitlement information from the received broadcasting signal;
- a control key generator for generating a control key using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information; and
- a descrambler for descrambling the scrambled broadcasting signal using the generated control key.

26. The digital broadcasting receiver of claim 25, wherein the broadcasting viewing restriction information is an Entitlement Control Message (ECM) including broadcasting channel-based reception entitlement information and the control key.

27. The digital broadcasting receiver of claim 25, wherein the broadcasting viewing entitlement information is an Entitlement Management Message (EMM) in-
including a second key for decrypting the broadcasting viewing restriction information and subscriber-based viewing entitlement information.

28. The digital broadcasting receiver of claim 25, further comprising a Radio-Frequency (RF) transceiver for transmitting a digital broadcasting subscription request to a separate server upon request from a user and receiving a first key for decrypting the broadcasting viewing entitlement information from the server responding to the digital broadcasting subscription request.

29. The digital broadcasting receiver of claim 28, wherein the RF transceiver transmits the digital broadcasting subscription request to the server using one of a Short Message Service (SMS) message and the wireless Internet.

30. The digital broadcasting receiver of claim 28, further comprising a Subscriber Identify Module (SIM) card for storing the first key.

31. The digital broadcasting receiver of claim 30, wherein the SIM card includes the filter and the control key generator.

32. The digital broadcasting receiver of claim 27, wherein the control key generator extracts the second key and the subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing entitlement information using the first key and extracts the control key and the broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information using the extracted second key.

33. The digital broadcasting receiver of claim 32, wherein the control key generator compares the extracted subscriber-based broadcasting viewing entitlement information with broadcasting channel-based reception entitlement information and transmits the control key to the descrambler if the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other.

34. The digital broadcasting receiver of claim 30, wherein the control key generator transmits the first key to the SIM card if the first key is included in the broadcasting viewing entitlement information.

35. A digital broadcasting conditional access method of a digital broadcasting receiver, the digital broadcasting conditional access method comprising the steps of:

- extracting broadcasting viewing restriction information and broadcasting viewing entitlement information included in a received broadcasting signal scrambled in a digital broadcasting reception mode;
- generating a control key for descrambling the scrambled broadcasting signal using the extracted broadcasting viewing restriction information and broadcasting viewing entitlement information; and
- descrambling the scrambled broadcasting signal using the generated control key.

36. The digital broadcasting conditional access method of claim 35, further comprising:

- transmitting a digital broadcasting subscription request to a separate server upon a request from a user; and
- receiving a first key for decrypting the broadcasting viewing entitlement information from the server responding to the digital broadcasting subscription request and storing the first key.

37. The digital broadcasting conditional access method of claim 35, wherein the broadcasting viewing restriction information is an Entitlement Control Message (ECM) including broadcasting channel-based reception entitlement information and the control key.

38. The digital broadcasting conditional access method of claim 35, wherein the broadcasting viewing entitlement information is an Entitlement Management Message (EMM) including a second key for decrypting the broadcasting viewing restriction information and subscriber-based viewing entitlement information.

39. The digital broadcasting conditional access method of claim 36, wherein transmitting the digital broadcasting subscription request comprises transmitting the digital broadcasting subscription request to the server using a Short Message Service (SMS) message or the wireless Internet.

40. The digital broadcasting conditional access method of claim 36, wherein storing the first key comprises storing the first key in a Subscriber Identify Module (SIM) card or a memory.

41. The digital broadcasting conditional access method of claim 36, wherein generating the control key comprises:

- extracting the second key and the subscriber-based broadcasting viewing entitlement information included in the broadcasting viewing en-
titilement information using the first key; extracting the control key and the broadcasting channel-based reception entitlement information included in the broadcasting viewing restriction information using the extracted second key; determining whether the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other; and generating the control key if the extracted subscriber-based broadcasting viewing entitlement information and broadcasting channel-based reception entitlement information coincide with each other.

42. The digital broadcasting conditional access method of claim 41, further comprising updating a previously stored first key if the first key is included in the broadcasting viewing entitlement information.
FIG. 2
START

S110

GENERATE CONTROL KEY

S120

SCRAMBLE BROADCASTING SIGNAL USING CONTROL KEY

S130

GENERATE BROADCASTING VIEWING RESTRICTION INFORMATION AND BROADCASTING VIEWING ENTITLEMENT INFORMATION

S140

MULTIPLEX BROADCASTING VIEWING RESTRICTION INFORMATION AND BROADCASTING VIEWING ENTITLEMENT INFORMATION WITH SCRAMBLED BROADCASTING SIGNAL

S150

TRANSMIT MULTIPLEXED BROADCASTING SIGNAL

END

FIG. 3
START

DIGITAL BROADCASTING SUBSCRIPTION REQUESTED?

YES

TRANSMIT DIGITAL BROADCASTING SUBSCRIPTION REQUEST TO SERVER

RECEIVE FIRST KEY FROM SERVER AND STORE FIRST KEY

NO

DIGITAL BROADCASTING RECEPTION REQUESTED?

YES

RECEIVE SCRAMBLED BROADCASTING SIGNAL

EXTRACT BROADCASTING VIEWING RESTRICTION INFORMATION AND BROADCASTING VIEWING ENTITLEMENT INFORMATION

NO

GENERATE CONTROL KEY USING BROADCASTING VIEWING RESTRICTION INFORMATION AND BROADCASTING VIEWING ENTITLEMENT INFORMATION

DESCRAMBLE BROADCASTING SIGNAL USING GENERATED CONTROL KEY

OUTPUT DESCRAMBLED BROADCASTING SIGNAL

END

FIG.6
CONTROL KEY GENERATION - S270

EXTRACT SECOND KEY AND SUBSCRIBER-BASED BROADCASTING VIEWING ENTITLEMENT INFORMATION USING FIRST KEY - S310

FIRST KEY INCLUDED? - S320

YES

UPDATE PREVIOUSLY STORED FIRST KEY - S330

NO

EXTRACT CONTROL KEY AND BROADCASTING CHANNEL-BASED RECEPTION ENTITLEMENT INFORMATION USING SECOND KEY - S340

COMPARE SUBSCRIBER-BASED BROADCASTING VIEWING ENTITLEMENT INFORMATION WITH BROADCASTING CHANNEL-BASED RECEPTION ENTITLEMENT INFORMATION - S350

COINCIDE? - S360

NO

YES

GENERATE CONTROL KEY - S370

RETURN

FIG. 7
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**Title of Invention:** SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

| **First Named Inventor/Applicant Name:** | JONG HO KIM |
| **Customer Number:** | 22429 |
| **Filer:** | Yoon Ham/james rhee |
| **Filer Authorized By:** | Yoon Ham |
| **Attorney Docket Number:** | 4900-0037 |
| **Receipt Date:** | 16-APR-2010 |
| **Filing Date:** | |
| **Time Stamp:** | 15:55:32 |
| **Application Type:** | U.S. National Stage under 35 USC 371 |

## Payment information:
- Submitted with Payment: no

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**Total Files Size (in bytes):** 2152218

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.
**TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371**

<table>
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<th>INTERNATIONAL APPLICATION NO.</th>
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**TITLE OF INVENTION**
SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

**APPLICANT(S) FOR DO/EO/US**
KIM, JONG HO; KIM, KWANG YOUNG; KIM, CHANG IL; HWANG, BYUNG SEOK; KIM, MIN SEOK

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) as indicated below.
4. ☒ The US has been elected (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☒ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☒ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendment has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Items 11 to 20 below concern document(s) or information included:**

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98; PTO-1449 Form and Foreign References
14. ☒ An Application Data Sheet under CFR 1.76
15. ☐ A substitute specification.
16. ☒ A power of attorney and/or change of address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821–1.825
18. ☒ A copy of the published international application w/ISR
20. ☐ Other items or information:
The following fees are submitted:

21. Basic national fee (37 CFR 1.492(a)) .................................................. $330.00

22. Examination fee (37 CFR 1.492(c))

If the written opinion prepared by USI/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) .............................. $0
All other situations .................................................................................. $220.00

23. Search fee (37 CFR 1.492(b))

If the written opinion of the ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) .............................. $0
Search fee (37 CFR 1.445(a)(2)(i)) has been paid on the international application to the USPTO as an International Search Authority ................................................................. $100.00
International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB ....................................................... $430.00
All other situations .................................................................................. $540.00

TOTAL OF 21, 22 and 23 = $980.00

□ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) or computer program listing filed in an electronic medium) (37 CFR 1.492(j)).
The fee is $270.00 for each additional 50 sheets of paper or fraction thereof.

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TOTAL OF ABOVE CALCULATIONS = $980.00

□ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½

SUBTOTAL = $980.00

Processing fee of $130.00 for furnishing the English translation later than the 30 months from the earliest claimed priority date (37 CFR 1.492(h)).

TOTAL NATIONAL FEE = $980.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property

TOTAL FEES ENCLODED = $980.00

Amount to be refunded:

Amount to be charged:

a. □ A check in the amount of $______90.00 to cover the above fees is enclosed.

b. □ Please charge my Deposit Account No. 07-1327 in the amount of $______ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. □ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1327. A duplicate copy of this sheet is enclosed.

d. □ Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.466 has not been met, a petition to revise (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status. Kindly use the attorneys' address associated with the following Customer Number for future correspondence.

SEND ALL CORRESPONDENCE TO:

LOWE HAUPTMAN HAM & BERNER, LLP
1700 Diagonal Road, Suite 300
Alexandria, VA 22314
(703) 535-7340

Customer No. 22429
PATENT TRADEMARK OFFICE

/Yoon S. Ham/

SIGNATURE

Yoon S. HAM
NAME

45,307
REGISTRATION NUMBER
Application Data Sheet 37 CFR 1.76

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<th>SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF</th>
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The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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**Application Data Sheet 37 CFR 1.76**

**Title of Invention:** SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

### Citizenship under 37 CFR 1.41(b) i

**KR**

### Mailing Address of Applicant:

| Address 1 | 602, 155-7bunji, Sindang 5dong, Jung-gu |
| Address 2 | |
| City | Seoul |
| State/Province | |
| Postal Code | 100-819 |
| Country | KR |

### Applicant Authority

- **Inventor**
- **Legal Representative under 35 U.S.C. 117**
- **Party of Interest under 35 U.S.C. 118**

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### Residence Information (Select One)

- **US Residency**
- **Non US Residency**
- **Active US Military Service**

| City | Gunpo-si, Gyeonggi-do |
| Country Of Residence | KR |

### Mailing Address of Applicant:

| Address 1 | 201-903, ChungmuJugong Apt., Geumjeong-dong |
| Address 2 | |
| City | Gunpo-si, Gyeonggi-do |
| State/Province | |
| Postal Code | 435-050 |
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### Residence Information (Select One)

- **US Residency**
- **Non US Residency**
- **Active US Military Service**

| City | Seoul |
| Country Of Residence | KR |

### Correspondence Information:

- Enter either Customer Number or complete the Correspondence Information section below.
- For further information see 37 CFR 1.33(a).

- **An Address is being provided for the correspondence Information of this application.**

| Customer Number | 22429 |
**Application Data Sheet 37 CFR 1.76**

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**Publication Information:**

- □ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
- □ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not been and will not be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing.

**Representative Information:**

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

**Domestic Priority Information:**

This section allows for the applicant to claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c). Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a) (4), and need not otherwise be made part of the specification.

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**Foreign Priority Information:**

Additional Domestic Priority Data may be generated within this form by selecting the Add button.
**Application Data Sheet 37 CFR 1.76**

| Title of Invention | SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF |

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

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Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

**Assignee Information:**

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

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**Assignee 1**

If the Assignee is an Organization check here.  ☒

**Organization Name:** SK Telecom Co., Ltd.

**Mailing Address Information:**

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Additional Assignee Data may be generated within this form by selecting the **Add** button.

**Signature:**

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

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This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
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Title: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Abstract: Disclosed is a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment where broadcast information can be automatically modified in response to device replacement. The method includes: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information, and modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.
Description

SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Technical Field

[1] The present invention relates to a system and a method for maintaining broadcasting chip information even when a mobile terminal device having the broadcasting chip information is replaced by a new mobile terminal, and more particularly to a system and a method for maintaining broadcasting chip information in a Universal Subscriber Identity Module (USIM) unlock environment, in which, when a mobile terminal device is replaced by a new mobile terminal, information that a new USIM has been mounted in the new mobile terminal is reported to a broadcast information management server of a broadcasting company, so that broadcasting chip information of the new mobile terminal can be easily replaced by broadcasting chip information of the existing mobile terminal.

Background Art

[2] A USIM refers to a single module, which includes a Subscriber Identity Module (SIM) card loaded with subscriber information and a Universal Integrated Circuit Card (UICC) are combined with each other, and has various functions, such as user authentication, global roaming, electronic commerce, etc. While a SIM stores personal information in order to provide various services, such as authentication, the charging of price, and security function, to subscribers of a mobile communication service, the USIM has both a subscriber authentication function one-step evolved from the subscriber authentication function of the SIM and the functions of a Universal IC Card (UICC), such as a transportation card, a credit card, etc.

[3] Meanwhile, a USIM unlock environment signifies an environment where a USIM having information on a mobile communication subscriber can be moved between and used for multiple terminals. In the USIM unlock environment, by carrying the USIM, it is possible to use a voice mobile phone service, including international roaming, and an electronic commerce service, regardless of the types of terminals and communication providers.

[4] Meanwhile, in association with Digital Multimedia Broadcasting (DMB), active research has recently been conducted in order to integrate a broadcast receiving function into a mobile communication terminal, so that an infrastructure has been recently constructed, in which it is possible to view a DMB broadcast upon receiving the DMB broadcast with the configuration of a terrestrial DMB receiving unit or a
satellite DMB receiving unit in a mobile communication terminal.

[5] In the case of viewing a DMB broadcast by using a mobile communication terminal, not only the viewer information but also information on the terminal, i.e. terminal information provided from a USIM card or a SIM card, is necessary. That is, since not only personal information on a viewer but also terminal information is required in order to view a DMB broadcast, each of recently produced terminals is equipped with a USIM card or a SIM card.

[6] Also, a broadcast receiving chip is mounted within the terminal. The broadcast receiving chip may have various forms, such as a Subscriber Identity Module (SIM), a Surface Mounted Device (SMD), a Multiple Chip Package (MCP), and the like. The broadcasting chip as described above is usually a HardWare (H/W) module loaded with broadcast subscriber information, which has a stable structure. Differently from the USIM, the broadcasting chip is usually fixedly embedded in a terminal, and restricts broadcast reception by exchanging a broadcast recipient’s personal information with a broadcasting system, e.g., a broadcast conditional access system.

[7] In a broadcasting system, satellite DMB from among various DMB services restricts broadcast reception such that only paying subscribers can receive a relevant broadcast, like other types of satellite broadcasting services. Such a system as described above in which only subscribers can selectively receive broadcasts is called a Conditional Access System (CAS) and is applied to the satellite DMB.

[8] Representative examples of receivers, to which the CAS is applied, include a set-top box for receiving pay channels of satellite broadcasting or cable broadcasting. Generally, a broadcast to which the CAS is applied, is sent in a state where images, sounds, and the like of the broadcast have been scrambled according to a prescribed algorithm or processed according to other schemes so that it is impossible to view the broadcast by itself. Then, the scrambled broadcast information can be restored to its original state by analyzing the relevant algorithm through the set-top box, thereby enabling normal viewing of the broadcast. Therefore, only subscribers are allowed to view the relevant broadcast. Hence, in the case of satellite DMB where subscriber-based broadcasting is considered, even a mobile communication terminal equipped with a DMB receiving unit for receiving a DMB broadcast requires a means for supporting the CAS.

[9] The abovementioned CAS corresponds to such a system that a user’s receiver determines if it is possible to receive a particular broadcast program. The CAS is intended to allow only those who pay a legitimate receiving fee to view programs, and viewing of digital broadcasting can become charged through the CAS. On this account, it can be said that the CAS is an element essential to commercialize digital broadcasting. The CAS having a conditional access function (or the reception re-
striction function) is configured to include scrambling technology of mixing voice
data, image data, and the like for the protection from an unauthenticated reception,
encryption technology of delivering data by using a control word key so as to view a
broadcast only with a specific receiver, and the user service support function of
providing users with various forms of services based on the scrambling technology and
the encryption technology. A conventional CAS employs a fixed-type disc descrambler
device in which a decoding algorithm and secret keys are stored, but recently, it is
generalized to deliver, by a smart card loaded with unique personal information of a
subscriber, a secret key to a user in consideration of the charging of price, convenience
property, security, and others.

As illustrated in FIG. 1, the CAS as described above includes: an Entitlement
Control Message (ECM) generator for generating an ECM upon receiving program informa-
tion, package information, etc., from a TCS (i.e., a broadcast schedule generator); an Entitlement Management Message (EMM) generator for generating an
EMM upon receiving subscriber information and purchase information from an SCIS
(i.e., a subscriber management system); and a security/authentication server for
carrying out encryption with the application of a reliable security algorithm so as to
safely deliver a control word.

Also, the CAS is assigned a digital signature which authenticates a message, such as
an ECM, an EMM, etc., as a legal message sent from a broadcasting center and can then confirm the transformation of a relevant message, and includes receiver CA
SoftWare (S/W) equipped within a receiver, which takes charge of authentication and
filtering in regard to a message, such as an ECM, an EMM and the like, and carries out
a mutual authentication between a smart card and a receiver. In addition, the above
smart card corresponds to a card having a built-in chip equipped with its own processor
and memory, which is provided to a subscriber so as to view satellite broadcasting, and
both physical and electrical characteristics and a transfer protocol of the smart card
comply with a definition of ISO 7816-1, 2, and 3.

Therefore, the CAS receives an input ECM from a receiver, and then makes a
comparison between conditional access properties (i.e., a viewing right, reception area
restriction, reception age restriction, etc.) of the ECM and the contents of the smart
card, thereby determining if a broadcast can be received. If it is determined that a
broadcast can be received, the CAS generates a control word corresponding to a key
capable of descrambling a scrambled broadcasting signal to provide the generated
control word to the receiver, and performs a command delivered by the EMM, thereby
modifying or producing information (i.e., subscriber information, purchase informa-
tion, etc.) within the smart card.

Along with the SCIS, the CAS so configured as described above corresponds to a
core system of a broadcasting system required for a pay digital satellite broadcasting service, enables each subscriber to be provided with desired services in an accurate and convenient manner, prevents illegal viewing for the sake of broadcasters, and provides various marketing data, such as each subscriber's viewing propensity and others, thereby providing a system which enables a viewer-oriented broadcasting service on the basis of the various marketing data.

However, the CAS as described above is used as a system for restricting broadcast reception. Therefore, in the case of DMB-receiving mobile terminals that have recently been widely used, replacement of a terminal device may restrict reception of broadcast programs, which causes inconvenience in the use of the mobile terminal. That is, since it is usual that a broadcasting chip is fixed to a terminal differently from a USIM, a broadcasting chip of the new terminal cannot be replaced by a broadcasting chip of an existing terminal even when the existing terminal is replaced by the new terminal and a USIM of the existing terminal is mounted in the new terminal. Then, the CAS cannot recognize correlation between recipient information and the new terminal, and cannot provide proper control to the pay digital satellite broadcasting service.

**Disclosure of Invention**

**Technical Problem**

Accordingly, the present invention has been made to solve the above-stated problems occurring in the prior art, and it is an object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which information on movement of a USIM to a new terminal is reported to an information management server of a broadcasting company, and the user's broadcast-related information is moved from an existing terminal to the new terminal having the moved USIM on the basis of broadcasting chip information of the new terminal and broadcasting chip information of the existing terminal, so that Conditional Access (CA) information can be automatically changed in accordance with user's actual circumstances.

It is another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which an information management server of a broadcasting company changes the type of an existing terminal and transmits a CA message according to the change through a broadcasting network or a mobile communication network, so that it is possible to easily construct a system by means of a service employing the existing broadcasting infrastructure.

It is still another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a
USIM unlock environment, in which, when a USIM user replaces an existing terminal by a new terminal and terminates a broadcasting chip of the existing terminal, and a USIM card of another subscriber of the broadcasting service is mounted in the existing terminal, the two users’ relevant broadcast-related information is maintained according to an existing scheme, so as to increase the convenience of each user.

**Technical Solution**

In accordance with a first aspect of the present invention for achieving the above objects, there is provided a system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system including: a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information; a broadcast information management server for making a request of modification regarding broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

In accordance with a second aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a
request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information on the first broadcasting chip.

[20] In accordance with a third aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal; extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; and generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information.

**Advantageous Effects**

[21] In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

**Brief Description of the Drawings**

[22] The above and other exemplary features, aspects, and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[23] FIG. 1 is a view illustrating the configuration of a conventional Conditional Access System (CAS);

[24] FIG. 2 is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention;

[25] FIG. 3 is a block diagram illustrating important functions of a Conditional Access System (CAS) according to the present invention; and
FIG. 4 is a flowchart showing essential operations of the present invention.

Best Mode for Carrying Out the Invention

Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

In embodiments of the present invention, a terminal_A is defined as an original terminal used by a user, and a terminal_B is defined as a new terminal by which the user replaces the original terminal. The terminal_A includes a broadcasting chip_A, and has a detachable USIM_A card. Also, the terminal_B includes a broadcasting chip_B, and has a detachable USIM_B card. Based on the structure as described above, two embodiments will be presented below for a case where a user replaces a terminal_A by a terminal_B.

According to the first embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is maintained while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

According to the second embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is deleted or removed while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

The first embodiment is based on a presumption that another USIM card is not mounted in the terminal_A. On the same principle, the first embodiment is based on a state in which the USIM_B card used by the terminal_B has been removed, i.e. in a state where the USIM_B card is not mounted in any other terminal. Hence, according to the first embodiment, if a separate USIM card is mounted in the terminal_A while subscriber lines in regard to the broadcasting chip_A and the broadcasting chip_B are being used in a duplicate manner, an existing subscriber line in regard to the broadcasting chip_A is canceled, or subscriber information on the broadcasting chip_A is deleted.

FIG. 2 is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock en-
environment according to the present invention. FIG. 2 is based on a system for maintaining broadcast information in a case where a USIM_A card mounted in an existing terminal_A having a broadcasting chip_A is separated from the existing terminal_A and is then mounted in a terminal_B having a broadcasting chip_B.

As illustrated in FIG. 2, the system for maintaining broadcasting chip information includes: a mobile communication information management server 201 for managing subscriber information based on unique information of each terminal and USIM information on the relevant terminal, and for performing a notification procedure corresponding to device replacement by supposing that the device replacement occurs if unique information of a terminal and subscriber information are different from each other; a broadcast information management server 203 for making a request necessary to modify broadcast information on a relevant subscriber after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server 201; and a Conditional Access System (CAS) 205 for controlling the transfer, to a terminal_B, of an Entitlement Management Message (EMM) necessary to modify broadcasting chip information from information on a broadcasting chip_A of an existing terminal_A corresponding to the subscriber information to information on a broadcasting chip_B of the terminal_B, by which a user replaces the user's existing terminal_A, in response to the request necessary to modify broadcast information (or the broadcast information modification request) of the broadcast information management server 203.

The CAS 205 employs either broadcasting network including a satellite network and a terrestrial network, or a Out-Of-Band(OOB) network so as to modify information on the broadcasting chip_B of the terminal_B. Also, a subscription message (i.e. an EMM) provided by the CAS 205 is required to modify broadcasting chip information with which a receiving terminal is loaded, and since a broadcast receiving terminal has already been loaded with an algorithm for modifying information, a detailed description of the algorithm for modifying information will be omitted.

Meanwhile, the CAS 205 can maintain a subscriber line of the existing terminal_A according to the first embodiment as described above, and can simultaneously provide a cancelation message (i.e. an EMM) necessary to cancel the subscription of the existing terminal_A besides the subscription message (i.e. the EMM) according to the second embodiment as described above.

FIG. 3 is a block diagram illustrating important functions of the CAS according to the present invention.

As illustrated in FIG. 3, the CAS includes: a database 301 for storing and managing broadcast information on each subscriber corresponding to a broadcasting chip; a com-
munication unit 305 for performing communication with the broadcast information management server 203 on the basis of a set protocol and for transferring a message (i.e. an EMM) through a broadcasting network or a mobile communication network; a data analysis unit 307 for performing analysis on data provided by the broadcast information management server 203; a control unit 309 for extracting the subscriber information and the terminal information on a relevant subscriber on the basis of the analysis results of the data analysis unit 307, for receiving input broadcasting chip_A information on the relevant subscriber from the database on the basis of the subscriber information, and then providing a message generation command in regard to a message including the broadcasting chip_A information and the terminal information; and a message generation unit 311 for providing the communication unit 305 with a subscription message (i.e. an EMM) necessary to modify the broadcasting chip_B information of the terminal_B corresponding to the terminal information to the broadcasting chip_A information in response to the message generation command from the control unit 309.

[38] Herein, the control unit 309 can additionally generate a message cancelation command necessary to delete the broadcasting chip_A information of the existing terminal_A, or necessary to cancel a subscription line regarding the broadcasting chip_A of the existing terminal_A, and in response to the additionally generated message cancelation command, the message generation unit 311 provides a cancelation message (i.e. an EMM) necessary to delete or terminate the broadcasting chip_A information of the existing terminal_A.

[39] Hereinafter, a detailed description of an operation of the present invention will be made based on the accompanying drawings as follows.

[40] FIG. 4 is a flowchart showing essential operations of the present invention. As illustrated in FIG. 4, in step S401, a user removes a USIM_A card of an existing terminal_A having a built-in broadcasting chip_A from the existing terminal_A, and mounts the removed USIM_A card in a terminal_B having a built-in broadcasting chip_B, by which the user replaces the existing terminal_A. Accordingly, the terminal_B has the built-in broadcasting chip_B, and is equipped with the USIM_A card. In step S403, after a prescribed time unit passes, or after the terminal_B is equipped with the USIM_A card, when a power source is initially applied to the terminal_B, the terminal_B transfers, to the mobile communication information management server 201, subscriber information stored in the USIM_A card, including unique information of the relevant terminal (e.g., identity number information thereof) according to a communication protocol.

[41] The mobile communication information management server 201 detects a registration status regarding currently received unique information of the relevant terminal
and subscriber information, and if the unique information of the relevant terminal and the subscriber information do not coincide with each other, the mobile communication information management server 201 senses the occurrence of device replacement. Accordingly, the mobile communication information management server 201 proceeds to step S405, where the mobile communication information management server 201 notifies the broadcast information management server 203 of the fact that device replacement regarding a subscriber occurs. At this time, the mobile communication information management server 201 transfers terminal information of the terminal_B and subscriber information corresponding to the USIM_A card to the broadcast information management server 203.

In step S407, the broadcast information management server 203 requests the CAS 205 to modify broadcast information in response to device replacement. Also, the broadcast information management server 203 provides the CAS 205 with the terminal information of the terminal_B and the subscriber information. Based on a preset protocol, the communication unit 305 receives communication data provided by the broadcast information management server 203. In step S409, the control unit 309 provides the data analysis unit 307 with the communication data received by the communication unit 305, and the data analysis unit 307 extracts terminal information and subscriber information from the currently received communication data.

Thereafter, the control unit 309 extracts broadcast information on each subscriber corresponding to a relevant subscriber from the database 301 on the basis of the extracted subscriber information. Herein, the extracted broadcast information corresponds to broadcast information, with which the broadcasting chip_A of the existing terminal_A is loaded, and the control unit 309 provides the message generation unit 311 with a command necessary to direct the generation of a subscription message (i.e. an EMM) including the relevant broadcast information.

In step S411, the message generation unit 311 generates a subscription message (i.e. an EMM) on the basis of the broadcast information and terminal information of the terminal_B in response to the direction command from the control unit 309, and in step S413, provides the subscription message (i.e. the EMM) to the communication unit 305. The communication unit 305 transfers the subscription message (i.e. the EMM) to the terminal_B through a broadcasting network or an Out-Of-Band (OOB) network 207.

After the terminal_B receives the subscription message (i.e. the EMM) transferred from the CAS 205, in step S415, the terminal_B updates the broadcast information included in the subscription message (i.e. the EMM) to the broadcasting chip_B equipped within the terminal_B. Hence, the user can be provided with a broadcasting service through the terminal loaded with the USIM_A card, by which the user has replaced the
existing terminal.

[46] Meanwhile, in step S413, the CAS 205 can delete the broadcasting chip_A information of the existing terminal_A, or can additionally send a cancelation message (i.e. an EMM) necessary to cancel a subscription line of the broadcasting chip_A. The deletion of the broadcasting chip_A information or the additional transmission of the cancelation message can be selectively applied depending on a service environment according to the present invention. Consequently, the existing terminal_A receives the cancelation message (i.e. an EMM) in step S415, and then cancels a line in relation to the broadcasting chip_A information.

[47] The merits and effects of exemplary embodiments, as disclosed in the present invention, and as so configured to operate above, will be described below.

[48] In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

**Industrial Applicability**

[49] Consequently, even when an existing terminal is replaced by a new terminal, existing broadcast information is maintained through a mutual linkage between a mobile communication network and a broadcasting network system, thereby producing quality improvement in a communication service, which in turn increases value for industrial use.

[50] While the invention has been shown and described with reference to exemplary embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention. Therefore, the spirit and scope of the present invention must be defined not by described embodiments thereof but by the appended claims and equivalents of the appended claims.
Claims

[1] A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information;

a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

[2] The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.

[3] The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

[4] The system as claimed in claim 3, wherein the EMM information includes information necessary to cancel the subscription of the first terminal.

[5] The system as claimed in claim 1, wherein the CAS comprises:

a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips;

a communication unit for communicating with the broadcast information management server and transmitting the device change information;

a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server;
a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and
a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.

[6]
A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:
transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server;
when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server;
transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request;
generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and
modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.

[7]
A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:
receiving terminal information on the second terminal and subscriber information
corresponding to the first USIM card from the second terminal;
extracting broadcast information corresponding to the subscriber information
from previously stored broadcast information on each subscriber; and
generating EMM information based on the broadcast information, and
transmitting the EMM information to the second terminal corresponding to the
terminal information.

[8] The method as claimed in claim 6 or 7, wherein the EMM information includes a
cancellation message for cancelling subscription of the first terminal.
DECLARATION AND POWER OF ATTORNEY

As a below-named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name; I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention (Design, if applicable) entitled:

SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

the specification of which (check one):
☐ is attached hereto.
☒ was filed on 15 January 2008 as International Application (PCT) No. PCT/KR2008/000249, and was amended on (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose information that is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56. I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which the priority is claimed.

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I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating The United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information that is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: I (We) hereby appoint as my (our) attorneys all practitioners associated with customer number 22429, with full powers of substitution and revocation, to prosecute this application and transmit all business in the Patent and Trademark Office.

Send correspondence to: LOWE HAUPTMAN HAM & BERNER, LLP
CUSTOMER NO. 22429
1700 Diagonal Road, Suite 300
Alexandria, Virginia 22314

TELEPHONE CALLS TO:
Yoon S. Ham
(703) 535-7340

I hereby authorize the U.S. attorneys and agents named herein to accept and follow instructions from Nam & Nam World Patent & Law Firm to any actions to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. attorneys will be so notified by the undersigned.

☑ See following page(s) for additional joint inventors.

Full name of sole or first inventor: KIM, JONG HO

Inventor's signature: KIM, JONG HO   Date: January 22, 2010

Residence: Seoul, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: 113-1405, 1712bunji, Gwanakdreamtown, Bongcheon-dong, Gwanak-gu, Seoul 151-050, Republic of Korea
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Docket No.: 4900-0037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : 
KIM, JONG HO et al. : Confirmation No.: Not Yet Assigned 
Filed: March 11, 2010 : Examiner: Not Yet Assigned

For: SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

PRELIMINARY AMENDMENT

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Prior to prosecution on the merits, please amend the above-identified application as follows:

- Amendments to the Specification;
- Amendments to the Claims; and
- Remarks and arguments.
Amendments to the Specification:

Please insert the following heading and paragraph after the title of the application on page 1 of the specification:

--Cross Reference to Related Application

This application claims the priority of Korean Patent Application No. 10-2007-0096622, filed on September 21, 2007 in the KIPO (Korean Intellectual Property Office), the disclosure of which are incorporated herein in their entirety by reference. Further, this application is the National Phase application of International Application No. PCT/KR2008/000249, filed January 15, 2008, which designates the United States and was published in English. Each of these applications is hereby incorporated by reference in their entirety into the present application.--
Amendments to the Claims:

The following claims will replace all prior versions of the claims in this application (in the unlikely event that no claims follow herein, the previously pending claims will remain):

Listing of the Claims

1. (Original) A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

   a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information;

   a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

   a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal
corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

2. (Original) The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.

3. (Original) The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

4. (Original) The system as claimed in claim 3, wherein the EMM information includes information necessary to cancel the subscription of the first terminal.

5. (Original) The system as claimed in claim 1, wherein the CAS comprises:
   a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips;
   a communication unit for communicating with the broadcast information management server and transmitting the device change information;
   a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server;
a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and

a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.

6. (Original) A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:

transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server;

when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server;
transmitting a request for modification of broadcasting chip information from the mobile
communication information management server to a Conditional Access System (CAS), and
extracting, by the CAS, broadcast information on the first broadcasting chip based on the
subscriber information in response to the request;

generating EMM information based on the broadcast information on the first
broadcasting chip, and providing the generated EMM information to the second terminal
_corresponding to the terminal information; and

modifying the information on the second broadcasting chip of the second terminal to
information of the first broadcasting chip.

7. (Original) A method for maintaining broadcast information regardless of device
replacement when a first USIM card mounted in a first terminal having a first broadcasting chip
is separated from the first terminal and is then mounted in a second terminal having a second
broadcasting chip in a USIM unlock environment, the method comprising the steps of:

receiving terminal information on the second terminal and subscriber information
_corresponding to the first USIM card from the second terminal;

extracting broadcast information corresponding to the subscriber information from
previously stored broadcast information on each subscriber; and

generating EMM information based on the broadcast information, and transmitting the
EMM information to the second terminal corresponding to the terminal information.
8. (Currently Amended) The method as claimed in claim 6 or 7, wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal.

9. (New) The method as claimed in claim 7, wherein the EMM information includes a cancellation message for cancelling subscription of the first terminal.
REMARKS

The present amendment adds reference to the priority application to the specification and removes the multiple dependencies prior to examination. No new matter has been added.

It is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

LOWE HAUITMAN HAM & BERNER, LLP.

By: /Yoon S. Ham/
Yoon S. Ham
Registration No. 45,307

1700 Diagonal Road
Alexandria, VA  22314
Direct Phone (703) 535-7340
Facsimile (703) 518-5499

Date: March 12, 2010
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

H04Q 7/20(2006.01)j

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 8 H04Q, H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS(KIPO internal) & IEEE(http://ieeexplore.ieee.org/)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>US 7 043 920 B2 (MICHEL MAILLARD et al.) 9 May 2006 See abstract</td>
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<td>EP 1 775 948 A2 (SAMSUNG ELECTRONICS CO., LTD.) 18 April 2007 See Paragraph [0048]-[0066] &amp; Fig. 4</td>
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<td>KYU-TAE YANG et al. 'The conditional access flow using subscriber smart card with Koresat DVB receiver' In: IEEE Transactions on Consumer Electronics, August 1997, Vol. 43, No. 3, pages 330-336, ISSN 0099-3063 See the whole document</td>
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☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

"#" Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
20 JUNE 2008 (20.06.2008)

Date of mailing of the international search report
20 JUNE 2008 (20.06.2008)

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seoona-ro, Seogu, Daejeon 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
YEOL Won Heon
Telephone No. 82-42-481-5696

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**Electronic Patent Application Fee Transmittal**

**Application Number:**

**Filing Date:**

**Title of Invention:** SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

**First Named Inventor/Applicant Name:** JONG HO KIM

**Filer:** Yoon Ham/Fui Yeong KIM

**Attorney Docket Number:** 4900-0037

Filed as Large Entity

**U.S. National Stage under 35 USC 371 Filing Fees**

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**Claims:**

**Miscellaneous-Filing:**

**Petition:**

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<td>JONG HO KIM</td>
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- **Submitted with Payment:** yes
- **Payment Type:** Credit Card
- **Payment was successfully received in RAM:** $980
- **RAM confirmation Number:** 4027
- **Deposit Account:** 071337
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.
SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Disclosed is a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment where broadcast information can be automatically modified in response to device replacement. The method includes: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.
Description
SYSTEM FOR MAINTAINING THE BROADCASTING INFORMATION IN USIM UNLOCK ENVIRONMENT AND METHOD THEREOF

Technical Field

[1] The present invention relates to a system and a method for maintaining broadcasting chip information even when a mobile terminal device having the broadcasting chip information is replaced by a new mobile terminal, and more particularly to a system and a method for maintaining broadcasting chip information in a Universal Subscriber Identity Module (USIM) unlock environment, in which, when a mobile terminal device is replaced by a new mobile terminal, information that a new USIM has been mounted in the new mobile terminal is reported to a broadcast information management server of a broadcasting company, so that broadcasting chip information of the new mobile terminal can be easily replaced by broadcasting chip information of the existing mobile terminal.

Background Art

[2] A USIM refers to a single module, which includes a Subscriber Identity Module (SIM) card loaded with subscriber information and a Universal Integrated Circuit Card (UICC) are combined with each other, and has various functions, such as user authentication, global roaming, electronic commerce, etc. While a SIM stores personal information in order to provide various services, such as authentication, the charging of price, and security function, to subscribers of a mobile communication service, the USIM has both a subscriber authentication function one-step evolved from the subscriber authentication function of the SIM and the functions of a Universal IC Card (UICC), such as a transportation card, a credit card, etc.

[3] Meanwhile, a USIM unlock environment signifies an environment where a USIM having information on a mobile communication subscriber can be moved between and used for multiple terminals. In the USIM unlock environment, by carrying the USIM, it is possible to use a voice mobile phone service, including international roaming, and an electronic commerce service, regardless of the types of terminals and communication providers.

[4] Meanwhile, in association with Digital Multimedia Broadcasting (DMB), active research has recently been conducted in order to integrate a broadcast receiving function into a mobile communication terminal, so that an infrastructure has been recently constructed, in which it is possible to view a DMB broadcast upon receiving the DMB broadcast with the configuration of a terrestrial DMB receiving unit or a
satellite DMB receiving unit in a mobile communication terminal.

[5] In the case of viewing a DMB broadcast by using a mobile communication terminal, not only the viewer information but also information on the terminal, i.e. terminal information provided from a USIM card or a SIM card, is necessary. That is, since not only personal information on a viewer but also terminal information is required in order to view a DMB broadcast, each of recently produced terminals is equipped with a USIM card or a SIM card.

[6] Also, a broadcast receiving chip is mounted within the terminal. The broadcast receiving chip may have various forms, such as a Subscriber Identity Module (SIM), a Surface Mounted Device (SMD), a Multiple Chip Package (MCP), and the like. The broadcasting chip as described above is usually a HardWare (H/W) module loaded with broadcast subscriber information, which has a stable structure. Differently from the USIM, the broadcasting chip is usually fixedly embedded in a terminal, and restricts broadcast reception by exchanging a broadcast recipient’s personal information with a broadcasting system, e.g., a broadcast conditional access system.

[7] In a broadcasting system, satellite DMB from among various DMB services restricts broadcast reception such that only paying subscribers can receive a relevant broadcast, like other types of satellite broadcasting services. Such a system as described above in which only subscribers can selectively receive broadcasts is called a Conditional Access System (CAS) and is applied to the satellite DMB.

[8] Representative examples of receivers, to which the CAS is applied, include a set-top box for receiving pay channels of satellite broadcasting or cable broadcasting. Generally, a broadcast to which the CAS is applied, is sent in a state where images, sounds, and the like of the broadcast have been scrambled according to a prescribed algorithm or processed according to other schemes so that it is impossible to view the broadcast by itself. Then, the scrambled broadcast information can be restored to its original state by analyzing the relevant algorithm through the set-top box, thereby enabling normal viewing of the broadcast. Therefore, only subscribers are allowed to view the relevant broadcast. Hence, in the case of satellite DMB where subscriber-based broadcasting is considered, even a mobile communication terminal equipped with a DMB receiving unit for receiving a DMB broadcast requires a means for supporting the CAS.

[9] The abovementioned CAS corresponds to such a system that a user’s receiver determines if it is possible to receive a particular broadcast program. The CAS is intended to allow only those who pay a legitimate receiving fee to view programs, and viewing of digital broadcasting can become charged through the CAS. On this account, it can be said that the CAS is an element essential to commercialize digital broadcasting. The CAS having a conditional access function (or the reception re-
striction function) is configured to include scrambling technology of mixing voice data, image data, and the like for the protection from an unauthenticated reception, encryption technology of delivering data by using a control word key so as to view a broadcast only with a specific receiver, and the user service support function of providing users with various forms of services based on the scrambling technology and the encryption technology. A conventional CAS employs a fixed-type disc descrambler device in which a decoding algorithm and secret keys are stored, but recently, it is generalized to deliver, by a smart card loaded with unique personal information of a subscriber, a secret key to a user in consideration of the charging of price, convenience property, security, and others.

As illustrated in FIG. 1, the CAS as described above includes: an Entitlement Control Message (ECM) generator for generating an ECM upon receiving program information, package information, etc., from a TCS (i.e., a broadcast schedule generator); an Entitlement Management Message (EMM) generator for generating an EMM upon receiving subscriber information and purchase information from an SCIS (i.e., a subscriber management system); and a security/authentication server for carrying out encryption with the application of a reliable security algorithm so as to safely deliver a control word.

Also, the CAS is assigned a digital signature which authenticates a message, such as an ECM, an EMM, etc., as a legal message sent from a broadcasting center and can then confirm the transformation of a relevant message, and includes receiver CA SoftWare (S/W) equipped within a receiver, which takes charge of authentication and filtering in regard to a message, such as an ECM, an EMM and the like, and carries out a mutual authentication between a smart card and a receiver. In addition, the above smart card corresponds to a card having a built-in chip equipped with its own processor and memory, which is provided to a subscriber so as to view satellite broadcasting, and both physical and electrical characteristics and a transfer protocol of the smart card comply with a definition of ISO 7816-1, 2, and 3.

Therefore, the CAS receives an input ECM from a receiver, and then makes a comparison between conditional access properties (i.e., a viewing right, reception area restriction, reception age restriction, etc.) of the ECM and the contents of the smart card, thereby determining if a broadcast can be received. If it is determined that a broadcast can be received, the CAS generates a control word corresponding to a key capable of descrambling a scrambled broadcasting signal to provide the generated control word to the receiver, and performs a command delivered by the EMM, thereby modifying or producing information (i.e., subscriber information, purchase information, etc.) within the smart card.

Along with the SCIS, the CAS so configured as described above corresponds to a
core system of a broadcasting system required for a pay digital satellite broadcasting service, enables each subscriber to be provided with desired services in an accurate and convenient manner, prevents illegal viewing for the sake of broadcasters, and provides various marketing data, such as each subscriber’s viewing propensity and others, thereby providing a system which enables a viewer-oriented broadcasting service on the basis of the various marketing data.

[14] However, the CAS as described above is used as a system for restricting broadcast reception. Therefore, in the case of DMB-receiving mobile terminals that have recently been widely used, replacement of a terminal device may restrict reception of broadcast programs, which causes inconvenience in the use of the mobile terminal. That is, since it is usual that a broadcasting chip is fixed to a terminal differently from a USIM, a broadcasting chip of the new terminal cannot be replaced by a broadcasting chip of an existing terminal even when the existing terminal is replaced by the new terminal and a USIM of the existing terminal is mounted in the new terminal. Then, the CAS cannot recognize correlation between recipient information and the new terminal, and cannot provide proper control to the pay digital satellite broadcasting service.

**Disclosure of Invention**

**Technical Problem**

[15] Accordingly, the present invention has been made to solve the above-stated problems occurring in the prior art, and it is an object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which information on movement of a USIM to a new terminal is reported to an information management server of a broadcasting company, and the user’s broadcast-related information is moved from an existing terminal to the new terminal having the moved USIM on the basis of broadcasting chip information of the new terminal and broadcasting chip information of the existing terminal, so that Conditional Access (CA) information can be automatically changed in accordance with user’s actual circumstances.

[16] It is another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment, in which an information management server of a broadcasting company changes the type of an existing terminal and transmits a CA message according to the change through a broadcasting network or a mobile communication network, so that it is possible to easily construct a system by means of a service employing the existing broadcasting infrastructure.

[17] It is still another object of the present invention to provide a system and a method for maintaining broadcasting chip information regardless of device replacement in a
USIM unlock environment, in which, when a USIM user replaces an existing terminal by a new terminal and terminates a broadcasting chip of the existing terminal, and a USIM card of another subscriber of the broadcasting service is mounted in the existing terminal, the two users’ relevant broadcast-related information is maintained according to an existing scheme, so as to increase the convenience of each user.

Technical Solution

[18] In accordance with a first aspect of the present invention for achieving the above objects, there is provided a system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system including: a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information; a broadcast information management server for making a request of modification regarding broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

[19] In accordance with a second aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a
request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information on the first broadcasting chip.

In accordance with a third aspect of the present invention for achieving the above objects, there is provided a method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method including the steps of: receiving terminal information on the second terminal and subscriber information corresponding to the first USIM card from the second terminal; extracting broadcast information corresponding to the subscriber information from previously stored broadcast information on each subscriber; and generating EMM information based on the broadcast information, and transmitting the EMM information to the second terminal corresponding to the terminal information.

**Advantageous Effects**

In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

**Brief Description of the Drawings**

The above and other exemplary features, aspects, and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

**FIG. 1** is a view illustrating the configuration of a conventional Conditional Access System (CAS);

**FIG. 2** is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention;

**FIG. 3** is a block diagram illustrating important functions of a Conditional Access System (CAS) according to the present invention; and
FIG. 4 is a flowchart showing essential operations of the present invention.

**Best Mode for Carrying Out the Invention**

Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings. In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

In embodiments of the present invention, a terminal_A is defined as an original terminal used by a user, and a terminal_B is defined as a new terminal by which the user replaces the original terminal. The terminal_A includes a broadcasting chip_A, and has a detachable USIM_A card. Also, the terminal_B includes a broadcasting chip_B, and has a detachable USIM_B card. Based on the structure as described above, two embodiments will be presented below for a case where a user replaces a terminal_A by a terminal_B.

According to the first embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is maintained while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

According to the second embodiment of the present invention, when a terminal_A is replaced by a terminal_B and a USIM_A card originally mounted within the terminal_A is detached from the terminal_A and is then mounted in the terminal_B, information on a broadcasting chip_A equipped within the terminal_A is deleted or removed while information on a broadcasting chip_B equipped within the terminal_B is replaced by information on the broadcasting chip_A.

The first embodiment is based on a presumption that another USIM card is not mounted in the terminal_A. On the same principle, the first embodiment is based on a state in which the USIM_B card used by the terminal_B has been removed, i.e. in a state where the USIM_B card is not mounted in any other terminal. Hence, according to the first embodiment, if a separate USIM card is mounted in the terminal_A while subscriber lines in regard to the broadcasting chip_A and the broadcasting chip_B are being used in a duplicate manner, an existing subscriber line in regard to the broadcasting chip_A is canceled, or subscriber information on the broadcasting chip_A is deleted.

FIG. 2 is a view illustrating the configuration of a system for maintaining broadcasting chip information regardless of device replacement in a USIM unlock en-
vironment according to the present invention. FIG. 2 is based on a system for maintaining broadcast information in a case where a USIM_A card mounted in an existing terminal_A having a broadcasting chip_A is separated from the existing terminal_A and is then mounted in a terminal_B having a broadcasting chip_B.

[33] As illustrated in FIG. 2, the system for maintaining broadcasting chip information includes: a mobile communication information management server 201 for managing subscriber information based on unique information of each terminal and USIM information on the relevant terminal, and for performing a notification procedure corresponding to device replacement by supposing that the device replacement occurs if unique information of a terminal and subscriber information are different from each other; a broadcast information management server 203 for making a request necessary to modify broadcast information on a relevant subscriber after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server 201; and a Conditional Access System (CAS) 205 for controlling the transfer, to a terminal_B, of an Entitlement Management Message (EMM) necessary to modify broadcasting chip information from information on a broadcasting chip_A of an existing terminal_A corresponding to the subscriber information to information on a broadcasting chip_B of the terminal_B, by which a user replaces the user’s existing terminal_A, in response to the request necessary to modify broadcast information (or the broadcast information modification request) of the broadcast information management server 203.

[34] The CAS 205 employs either broadcasting network including a satellite network and a terrestrial network, or a Out-Of-Band(OOB) network so as to modify information on the broadcasting chip_B of the terminal_B. Also, a subscription message (i.e. an EMM) provided by the CAS 205 is required to modify broadcasting chip information with which a receiving terminal is loaded, and since a broadcast receiving terminal has already been loaded with an algorithm for modifying information, a detailed description of the algorithm for modifying information will be omitted.

[35] Meanwhile, the CAS 205 can maintain a subscriber line of the existing terminal_A according to the first embodiment as described above, and can simultaneously provide a cancellation message (i.e. an EMM) necessary to cancel the subscription of the existing terminal_A besides the subscription message (i.e. the EMM) according to the second embodiment as described above.

[36] FIG. 3 is a block diagram illustrating important functions of the CAS according to the present invention.

[37] As illustrated in FIG. 3, the CAS includes: a database 301 for storing and managing broadcast information on each subscriber corresponding to a broadcasting chip; a com-
munication unit 305 for performing communication with the broadcast information management server 203 on the basis of a set protocol and for transferring a message (i.e. an EMM) through a broadcasting network or a mobile communication network; a data analysis unit 307 for performing analysis on data provided by the broadcast information management server 203; a control unit 309 for extracting the subscriber information and the terminal information on a relevant subscriber on the basis of the analysis results of the data analysis unit 307, for receiving input broadcasting chip_A information on the relevant subscriber from the database on the basis of the subscriber information, and then providing a message generation command in regard to a message including the broadcasting chip_A information and the terminal information; and a message generation unit 311 for providing the communication unit 305 with a subscription message (i.e. an EMM) necessary to modify the broadcasting chip_B information of the terminal_B corresponding to the terminal information to the broadcasting chip_A information in response to the message generation command from the control unit 309.

Herein, the control unit 309 can additionally generate a message cancelation command necessary to delete the broadcasting chip_A information of the existing terminal_A, or necessary to cancel a subscription line regarding the broadcasting chip_A of the existing terminal_A, and in response to the additionally generated message cancelation command, the message generation unit 311 provides a cancelation message (i.e. an EMM) necessary to delete or terminate the broadcasting chip_A information of the existing terminal_A.

Hereinafter, a detailed description of an operation of the present invention will be made based on the accompanying drawings as follows.

FIG. 4 is a flowchart showing essential operations of the present invention. As illustrated in FIG. 4, in step S401, a user removes a USIM_A card of an existing terminal_A having a built-in broadcasting chip_A from the existing terminal_A, and mounts the removed USIM_A card in a terminal_B having a built-in broadcasting chip_B, by which the user replaces the existing terminal_A. Accordingly, the terminal_B has the built-in broadcasting chip_B, and is equipped with the USIM_A card. In step S403, after a prescribed time unit passes, or after the terminal_B is equipped with the USIM_A card, when a power source is initially applied to the terminal_B, the terminal_B transfers, to the mobile communication information management server 201, subscriber information stored in the USIM_A card, including unique information of the relevant terminal (e.g., identity number information thereof) according to a communication protocol.

The mobile communication information management server 201 detects a registration status regarding currently received unique information of the relevant terminal
and subscriber information, and if the unique information of the relevant terminal and the subscriber information do not coincide with each other, the mobile communication information management server 201 senses the occurrence of device replacement. Accordingly, the mobile communication information management server 201 proceeds to step S405, where the mobile communication information management server 201 notifies the broadcast information management server 203 of the fact that device replacement regarding a subscriber occurs. At this time, the mobile communication information management server 201 transfers terminal information of the terminal_B and subscriber information corresponding to the USIM_A card to the broadcast information management server 203.

In step S407, the broadcast information management server 203 requests the CAS 205 to modify broadcast information in response to device replacement. Also, the broadcast information management server 203 provides the CAS 205 with the terminal information of the terminal_B and the subscriber information. Based on a preset protocol, the communication unit 305 receives communication data provided by the broadcast information management server 203. In step S409, the control unit 309 provides the data analysis unit 307 with the communication data received by the communication unit 305, and the data analysis unit 307 extracts terminal information and subscriber information from the currently received communication data.

Thereafter, the control unit 309 extracts broadcast information on each subscriber corresponding to a relevant subscriber from the database 301 on the basis of the extracted subscriber information. Herein, the extracted broadcast information corresponds to broadcast information, with which the broadcasting chip_A of the existing terminal_A is loaded, and the control unit 309 provides the message generation unit 311 with a command necessary to direct the generation of a subscription message (i.e. an EMM) including the relevant broadcast information.

In step S411, the message generation unit 311 generates a subscription message (i.e. an EMM) on the basis of the broadcast information and terminal information of the terminal_B in response to the direction command from the control unit 309, and in step S413, provides the subscription message (i.e. the EMM) to the communication unit 305. The communication unit 305 transfers the subscription message (i.e. the EMM) to the terminal_B through a broadcasting network or an Out-Of-Band (OOB) network 207.

After the terminal_B receives the subscription message (i.e. the EMM) transferred from the CAS 205, in step S415, the terminal_B updates the broadcast information included in the subscription message (i.e. the EMM) to the broadcasting chip_B equipped within the terminal_B. Hence, the user can be provided with a broadcasting service through the terminal loaded with the USIM_A card, by which the user has replaced the
existing terminal.

Meanwhile, in step S413, the CAS 205 can delete the broadcasting chip_A information of the existing terminal_A, or can additionally send a cancelation message (i.e. an EMM) necessary to cancel a subscription line of the broadcasting chip_A. The deletion of the broadcasting chip_A information or the additional transmission of the cancelation message can be selectively applied depending on a service environment according to the present invention. Consequently, the existing terminal_A receives the cancelation message (i.e. an EMM) in step S415, and then cancels a line in relation to the broadcasting chip_A information.

The merits and effects of exemplary embodiments, as disclosed in the present invention, and as so configured to operate above, will be described below.

In a system and a method for maintaining broadcasting chip information regardless of device replacement in a USIM unlock environment according to the present invention, if device replacement occurs in a terminal equipped with a broadcasting chip and having a built-in USIM card, relevant broadcast information is maintained by using a CAS, and accordingly, the same service as an existing service can be provided without performing a special information replacement task during broadcast reception.

**Industrial Applicability**

Consequently, even when an existing terminal is replaced by a new terminal, existing broadcast information is maintained through a mutual linkage between a mobile communication network and a broadcasting network system, thereby producing quality improvement in a communication service, which in turn increases value for industrial use.

While the invention has been shown and described with reference to exemplary embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention. Therefore, the spirit and scope of the present invention must be defined not by described embodiments thereof but by the appended claims and equivalents of the appended claims.
Claims

[1] A system for maintaining broadcast information regardless of device replacement when a first Universal Subscriber Identity Module (USIM) card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the system comprising:

a mobile communication information management server for managing unique information of a terminal and USIM-based subscriber information, and for determining and notifying device replacement when the unique information of the terminal is different from the subscriber information;

a broadcast information management server for making a request of modification of broadcast information related to the subscriber information after the unique information of the terminal and the subscriber information are provided according to the notification procedure of the mobile communication information management server; and

a Conditional Access System (CAS) for transmitting, to the second terminal, device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip of the first terminal corresponding to the subscriber information, in response to the request for modification of broadcast information by the broadcast information management server.

[2] The system as claimed in claim 1, wherein the CAS employs either a broadcasting network or an Out-Of-Band (OOB) network so as to modify the information on the second broadcasting chip of the second terminal.

[3] The system as claimed in claim 1, wherein the CAS transmits the device change information to the second terminal as Entitlement Management Message (EMM) information.

[4] The system as claimed in claim 3, wherein the EMM information includes information necessary to cancel the subscription of the first terminal.

[5] The system as claimed in claim 1, wherein the CAS comprises:

a database for storing and managing the broadcast information on the subscriber according to each of the information on the broadcasting chips;

a communication unit for communicating with the broadcast information management server and transmitting the device change information;

a data analysis unit for analyzing both the unique information of the terminal and the subscriber information provided by the broadcast information management server;
a control unit for extracting the subscriber information and the unique information of the terminal based on an analysis result of the data analysis unit, extracting broadcast information on the first broadcasting chip corresponding to the subscriber information from the database, and then providing a message generation command in regard to a message including the extracted broadcast information and the extracted unique information of the terminal; and a message generation unit for generating the device change information necessary in order to change information on the second broadcasting chip of the second terminal to information on the first broadcasting chip in response to the message generation command from the control unit, and then providing the generated device change information to the communication unit.

[6] A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of: transmitting terminal information on the second terminal and subscriber information corresponding to the first USIM card to a mobile communication information management server; when the terminal information is different from terminal information corresponding to the subscriber information, determining that there has been device replacement, and then providing the terminal information and the subscriber information to a broadcast information management server, by the mobile communication information management server; transmitting a request for modification of broadcasting chip information from the mobile communication information management server to a Conditional Access System (CAS), and extracting, by the CAS, broadcast information on the first broadcasting chip based on the subscriber information in response to the request; generating EMM information based on the broadcast information on the first broadcasting chip, and providing the generated EMM information to the second terminal corresponding to the terminal information; and modifying the information on the second broadcasting chip of the second terminal to information of the first broadcasting chip.

[7] A method for maintaining broadcast information regardless of device replacement when a first USIM card mounted in a first terminal having a first broadcasting chip is separated from the first terminal and is then mounted in a second terminal having a second broadcasting chip in a USIM unlock environment, the method comprising the steps of:
receiving terminal information on the second terminal and subscriber information
corresponding to the first USIM card from the second terminal;
extracting broadcast information corresponding to the subscriber information
from previously stored broadcast information on each subscriber; and
generating EMM information based on the broadcast information, and
transmitting the EMM information to the second terminal corresponding to the
terminal information.

[8]
The method as claimed in claim 6 or 7, wherein the EMM information includes a
cancellation message for cancelling subscription of the first terminal.
**Diagram:**

1. **S401:** Move Card
2. **S403:** Provide Terminal Information/Subscriber Information
3. **S405:** Give Notice of Device Replacement
4. **S407:** Request Broadcast Information Modification
5. **S409:** Provide Terminal/Subscriber Information
6. **S411:** Extract Broadcast Information on Relevant Subscriber Based on Broadcast Information
7. **S413:** Transfer Subscription Message (EMN) to Changed Terminal_B
8. **S415:** Modify Broadcasting Chip_B Information
9. **S417:** Delete Information and Cancel Line Regarding Broadcasting Chip_A

**Nodes:**
- Broadcasting Chip_B
- Broadcasting Chip_A
- Mobile Communication Information Management Server
- Broadcast Information Management Server
- CAS (Reception Restriction System)
- Changed Terminal_B
- Existing Terminal_A
- USIM A
- USIM A
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2008년 01월 24일

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【발명의 국문명칭】 유에스아이엠 언록 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 방법 및 시스템
【발명의 영문명칭】 METHOD FOR PRESERVING INFORMATION OF BROADCASTING CHIP BASED ON ALTERATION MOBILE IN USIM UNLOCK AND SYSTEM THEREOF
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대리인 남상선 (인)

【수수료】
【출원료】 0 면 38,000 원
【가산출원료】  24 면  0 원
【우선권주장료】  0 건  0 원
【심사청구료】  7 항  333,000 원
【합계】  371,000 원
【요약시】

본 발명에서 기기 변경에 따른 방송 정보를 자동으로 수정할 수 있는 유에스아이앤 엔록 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 방법 및 시스템을 개시한다. 본 발명에 따른 방송 정보 수정 방법은, a) 이동된 단말 B에 대한 단말 정보 및 USIM A에 대응하는 가입자 정보를 이동통신 정보관리 서비로 전송하는 단계; b) 이동통신 정보관리 서비가 방송 정보관리 서비로 단말기 변경에 따른 기기 변경을 통지하고, 단말 정보 및 가입자 정보를 제공하는 단계; c) 방송 정보관리 서비가 CAS로 방송용 칩 정보 수정을 요청하고, 이에 응답하여 CAS가 가입자 정보를 토대로 방송용 칩 A에 대한 기존 방송 정보를 추출하는 단계; d) 기존 방송 정보에 기초하여 가입 메시지(EMM)를 생성하고, 가입 메시지(EMM)를 단말 정보에 대응하는 이동된 단말 B로 제공하는 단계; 및 e) 이동된 단말 B에서 보유하는 방송용 칩 B의 정보를 방송용 칩 A의 정보로 수정하는 단계로 이루어진다. 따라서, 본 발명은 USIM 카드가 장착되는 단말기의 기기 변경 시 CAS를 이용하여 해당 방송 정보가 유지되도록 함에 따라, 방송 수신 시 별도의 정보 이관 작업을 하지 않고 기존 서비스와 동일한 서비스를 제공받을 수 있다.

【대표도】

도 1
【색인어】

USIM, 단말, 방송용 칩, CAS, EMM, 가입 메시지, 해지 메시지, OOB
【명세서】

【발명의 명칭】

유에스아이엠 언록 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지
방법 및 시스템{METHOD FOR PRESERVING INFORMATION OF BROADCASTING CHIP BASED
ON ALTERATION MOBILE IN USIM UNLOCK AND SYSTEM THEREOF}

【발명의 상세한 설명】

【기술분야】

본 발명은 방송용 칩 정보를 갖는 이동 단말기의 기기 변경에 따른 방송정보
유지방법에 관한 것으로, 보다 상세하게는 USIM의 이동에 대한 정보를 방송사의 정
보관리 서비로 연동하도록 하여, 단말기의 변경 시 사용자가 이동한 단말기의 방송
용 칩 정보와 기존에 사용하던 단말기의 방송용 칩 정보를 자동 교체할 수 있는 유
에스아이엠 언록 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 방법 및
시스템에 관한 것이다.

【배경기술】

일반적으로, 현재 사용자 단말기에서 무선 시스템 제공자 서버를 인증하고자
하는 경우에 있어서 휴대폰과 같은 휴대용 단말기에 장착되어 있는 USIM 카드 또는
SIM 카드를 착탈하여 사용자 단말기에 마련되어 있는 리더기에 삽입하여 인증하고
있다.
이러한 USIM 카드 또는 SIM 카드에 대한 인증은 GSM의 경우는 폰에 사용자 정보를 저장하는 것이 아닌 SIM(Subscriber Identity Module)이라는 곳에 사용자 정보를 저장한다. 즉, 기지국과 연결되는 순간 SIM에 저장되어 있는 IMSI(International Mobile Subscriber Identity)를 기지국에 보내어 기지국은 사용자에 대한 정보를 얻어낸다.

한편, 최근에 활기를 띄고 있는 개인용 디지털 멀티미디어 방송(Digital Multimedia Broadcasting: DMB) 수신 기능을 이동통신 단말기에 접목하고자 하는 연구가 진행됨에 따라 이동통신 단말기에 저장과 혹은 위성 DMB 수신부를 구성하여 DMB 방송을 수신하여 시청할 수 있는 인프라가 구축된 상태이다. 단말기를 이용하여 DMB 방송을 수신할 경우에는 시청자 정보 이외에 단말에 대한 정보 즉, USIM 또는 SIM 카드로부터 제공되는 단말기 정보가 필요하다.

즉, DMB 시청을 위해서는 시청자의 개인 정보를 포함하여, 해당 단말기에 대한 단말 정보가 필요하기 때문에, 근래에 생산되는 단말기는 외장형 USIM 카드 또는 SIM 카드를 보유하며, 단말기의 내부에는 방송 수신용 칩이 장착된다. 방송 수신용 칩은 SIM(Subscriber Identification Module), SMD(Surface Mounted Device), MCP(Multiple Chip Package) 형태 등 다양한 형태의 패키지 형태가 가능하다. 이러한 방송용 칩은 안정적인 구조의 방송 가입자 정보를 포함하는 H/W 모듈로서, 대체로 단말기에 고정된 형태로 존재하며, 방송 수신자의 개인정보를 방송 시스템 에런의 방송 제한 수신시스템과의 통신을 수행하여 방송 수신을 제한한다.

방송 시스템에서는, 이러한 DMB를 중 위성 DMB는 다른 종류의 위성 방송과
같이 유료 가입자만 해당 방송을 수신할 수 있도록 방송 수신을 제한하도록 하는데, 이렇게 가입자만 선택적으로 방송을 수신할 수 있도록 하는 시스템을 수신 제한 시스템, 즉 CAS(Conditional Access System)가 적용되고 있다.

CAS가 적용되는 수신기의 대표적인 경우는 대부분 위성 방송 셋톱박스나 케이블 방송의 유료채널 수신용 셋톱박스 등이 있다. 일반적으로, CAS가 적용된 방송은 소정의 알고리즘에 따라 화면, 음향 등을 스 크램블되거나 다른 방식으로 처리되어 시청이 불가능한 상태로 송출되며, 상기 셋톱박스를 통해 해당 알고리즘을 해석하여 시청이 불가능하도록 변형된 방송 정보를 원상 복구함으로써 정상적으로 시청가능하도록 하여 가입자만 해당 방송을 볼 수 있도록 한다. 따라서, 가입자 기반 방송이 고려되는 위성 DMB의 경우 이를 수신하는 DMB 수신부가 장착된 여동통신 단말기에서도 CAS를 지원하기 위한 수단이 필요하게 되었다.

전문의 CAS는 특정 방송 프로그램에 대한 수신 가능 여부를 사용자의 디지털 수신기가 결정하도록 하는 장치로서, 정당한 수신료를 지불하는 사람만이 프로그램을 시청할 수 있도록 하기 위한 것으로 디지털 방송 상업화의 기본 필수기능이다. 제한수신시스템은 수신제한기능 즉, 인증받지 않은 수신으로부터 보호하기 위해 음성, 비디오 등의 데이터를 뒤섞는 스 크램블링(scrambling)기술과 특정 수신기에서만 볼 수 있도록 제어워드(control word) 키로 전달하는 암호화(Encryption)기술, 그리고 이를 바탕으로 사용자에게 다양한 형태의 서비스를 제공하기 위한 사용자 서비스 지원기능으로 구성된다. 과거의 제한수신시스템은 복호화 알고리즘과 비밀키가 저장되어 있는 고정식 디스크램블러(descrambler) 장치를 사용하였으나 최근
에는 과급과 편리성, 안정성(security) 등을 고려하여 가입자의 고유개인정보를 가진 스마트 카드로 사용자에게 비밀키를 전달하는 것이 일반화되어 있다.

이러한 CAS 시스템은 도 1에 도시된 바와 같이, 프로그램 정보 및 페키지 정보 등을 방송 스케줄 생성기(TCS)로부터 입력받아 ECM을 생성하기 위한 ECM(Entitlement Control Message) 생성기를 포함하고, 가입자 정보 및 구매 정보를 가입자관리 시스템(SCIS)로부터 입력받아 EMM을 생성하기 위한 EMM(Entitlement Management Message) 생성기를, CW를 안전하게 전달하기 위하여 신뢰성 있는 보안 알고리즘을 적용하여 암호화를 수행하기 위한 보안/인증 서비스를 포함한다.

또한, ECM, EMM 등의 메시지에 대하여 방송센터에서 보내 적법한 메시지를 인증하고 해당 메시지의 변형을 확인할 수 있는 Digital Signature(Sig.)를 부여하고, 수신기에 내장하여 ECM, EMM 등의 메시지를 대한 인증 및 필터링을 담당하며 스마트카드와 수신기간의 상호 인증을 수행하는 수신기 CA 소프트웨어(S/W)를 포함한다. 그리고, 전송된 스마트 카드는 위성방송 시청을 위하여 가입자에게 제공되는 자체 프로세서와 메모리를 가진 접을 내장하고 있는 카드로써, 스마트카드의 물리적, 전기적 특성 및 전송 프로토콜은 ISO 7816-1,2,3의 정의에 따른다.

따라서, 수신기로부터 ECM을 입력받아 ECM의 제한수신 특성(시청 권한, 수신 지역 제한, 수신언어 제한 등)과 스마트카드의 내용을 비교하여 수신가능 여부를 판단하고 수신 가능한 경우, 스트림블론 방송신호를 디스트림블론 수 있는 Key인 Control Word(CW)를 생성하여 수신기에 제공하고, EMM에 의해 전달되는 명령을 수
행하여 스마트카드 내의 정보(가입자 정보, 구매 정보 등)를 수정 또는 생성한다.

이와 같이 구성된 CAS(제한수신시스템)는, 가입자관리 시스템과 함께 디지털 위성방송 유료서비스를 위한 방송시스템의 핵심 시스템으로 가입자가 원하는 서비스를 정확하고 원리하게 제공받을 수 있도록 하며, 방송사업자에게는 불법시청을 방지하며, 가입자의 시청성향 등 다양한 마케팅 자료를 제공하여 이를 바탕으로 시청자 위주의 방송을 가능케 하는 시스템을 제공한다.

그러나, 이러한 CAS 시스템은 방송 수신을 제한하기 위한 시스템 구조이기 때문에, 근래에 많이 사용되는 DMB 수신용 휴대폰에서 단말 교체시에는 방송 프로 그램 수신이 제한되어 사용상의 불편함이 발생되고 있다. 즉, 단말 교체 전에 해당 단말기로 장착된 방송용 칩의 교체가 이루어지지 못하기 때문에, CAS 시스템에서는 이러한 수신자 정보 및 단말기와의 상관관계를 파악하지 못하여 서비스가 이루어지지 못하게 된다.

【발명의 내용】
【해결하고자 하는 과제】

본 발명은 이와 같은 문제점을 해결하기 위해 창출된 것으로, 본 발명의 목적은 USIM의 이동에 대한 정보를 방송사의 정보관리 서버로 연동하여, 사용자가 이동한 단말기의 방송용 칩 정보와 기존에 사용하던 단말기의 방송용 칩 정보를 토대로, 사용자의 방송관련 정보를 신규 단말로 옮겨주므로써 CA 정보가 사용자의 설정에 맞게 자동 교체될 수 있는 유앤스마트카드 제품 환경에서 기기 변경에 따른 방송

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용침 정보에 대한 유지 방법 및 시스템을 제공함에 있다.

본 발명의 다른 목적은, 방송사의 정보관리 서비에서 기존 단말기를 유지하는 방법을 변경하고, 그에 따른 CA 메시지를 방송망을 통해 전송도록 함으로써, 기존 방송 인프라를 이용한 서비스로 시스템 구축이 용이한 유에스아이에이 연록 환경에서 기기 변경에 따른 방송용침 정보에 대한 유지 방법 및 시스템을 제공함에 있다.

본 발명의 또 다른 목적은, USIM 사용자가 신규 단말로 이동한 이후, 방송용침을 해지하고, 방송에 가입한 또 다른 사용자의 USIM 카드가 기존의 단말로 장착되는 경우, 상호 기존 방식에 따라 해당 방송관련 정보를 유지시켜 사용자의 권의성을 증대시킬 수 있는 유에스아이에이 연록 환경에서 기기 변경에 따른 방송용침 정보에 대한 유지 방법 및 시스템을 제공함에 있다.

【과제 해결 수단】

상기 목적을 달성하기 위한 본 발명의 제1 관점에 따른 유에스아이에이 연속 환경에서 기기 변경에 따른 방송용침 정보에 대한 유지 방법은, a) 이동된 단말 B에 대한 단말 정보 및 USIM A에 대응하는 가입자 정보를 이동통신 정보관리 서비로 전송하는 단계; b) 이동통신 정보관리 서비가 방송 정보관리 서비로 단말기 변경에 따른 기기 변경을 통지하고, 단말 정보 및 가입자 정보를 제공하는 단계; c) 방송 정보관리 서비가 CAS 방송용침 정보 수정을 요청하고, 이에 응답하여 CAS가 상기 가입자 정보를 도대로 상기 방송용침 A에 대한 기존 방송 정보를 추출하는 단계; d) 기존 방송 정보에 기초하여 가입 메시지(EMM)를 생성하고, 가입 메시지
(EMM)를 단말 정보에 대응하는 상기 이동된 단말 B로 제공하는 단계: 및 e) 이동된 단말 B에서 보유하는 방송용 칩 B의 정보를 상기 방송용 칩 A의 정보로 수정하는 단계로 이루어진 것을 특정으로 한다.

또한, 상기 목표를 달성하기 위한 본 발명의 제2 관점에 따른 유에스아이에MESS 상상 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 방법은, a) 이동된 단말 B로부터 해당 단말에 대한 단말 정보 및 USIM A에 대응하는 가입자 정보를 접수하는 단계: b) 가입자 정보를 토대로 기 저장된 가입자별 방송 정보로부터 USIM A에 대한 방송 정보를 추출하는 단계: 및 c) 방송 정보에 근거하여 가입 메시지 (EMM)을 생성하고, 가입 메시지(EMM)를 단말 정보에 대응하는 이동된 단말 B로 전송하는 단계로 이루어진 것을 특정으로 한다.

또한, 상기 목표를 달성하기 위한 본 발명의 제3 관점에 따른 유에스아이에MESS 상상 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 시스템은, 유에스아 이에MESS 상상(MESS Unlock) 환경에서 방송용 칩 A를 보유한 기존 단말 A로 탑재된 USIM A 카드가 방송용 칩 B를 보유한 이동된 단말 B로 탑재됨에 따라, 기존 방송 정보를 유지하기 위한 시스템에 있어서, 단말에 대한 단말 고유정보 및 해당 단말에 대한 USIM 정보를 토대로 한 가입자 정보를 관리하고, 상기 단말 고유정보와 가입자 정보가 상이할 경우, 기기 변경으로 상정하여 이에 대응하는 통지 절차를 수행하는 이동통신 정보관리 서비스: 상기 이동통신 정보관리 서비스의 통지 절차에 따라 상기 단말 고유정보 및 가입자 정보를 제공받은 후, 해당 가입자에 대한 방송정보를 수정 요청하기 위한 방송 정보관리 서비스: 및 상기 방송 정보관리 서비스의 방송정보

【효과】

본 발명에 따른 유비세이블 언론 환경에서 기기 변경에 따른 방송용 첩 정보에 대한 유지 방법 및 시스템은 방송용 첩을 구비하고, USIM 카드가 장착되는 단말기에의 기기 변경 시 CAS를 이용하여 해당 방송 정보가 유지되도록 함에 따라, 방송 수신 시 별도의 정보 이관 작업을 하지 않고 기존 서비스와 동일하게 서비스를 제공받을 수 있는 효과가 있다.

【발명의 실시를 위한 구체적인 내용】

이하, 본 발명의 바람직한 실시 예를 참조한 예시도면에 의거 상세히 설명하면 다음과 같다.

먼저, 본 발명에서의 실시 예에서 사용되는 단말 A는 사용자가 사용했던 최초 단말기이고, 단말 B는 사용자가 기기 변경한 단말기로 정의된다. 상기 단말 A에는 방송용 첩 A를 포함하고, 착탈 가능한 USIM A 카드를 보유한다. 또한, 상기 단말 B에는 방송용 첩 B를 포함하고, 착탈 가능한 USIM B 카드를 보유한다. 이와 같
은 구조에서 사용자는 단말 A에서 단말 B로 기기 변경에 있어, 두 가지의 실시 예를 제시한다.

첫 번째 실시 예로, 단말 A에서 단말 B로 기기 변경 시 단말 A에 존재하던 USIM A 카드가 단말 B로 장착될 경우, 단말 A로 내장된 방송용 칩 A의 정보를 유지 하고, 단말 B로 내장된 방송용 칩 B의 정보를 방송용 칩 A의 정보로 교체하는 경우이다.

두 번째 실시 예로, 단말 A에서 단말 B로 기기 변경 시 단말 A에 존재하던 USIM A 카드가 단말 B로 장착될 경우, 단말 A로 내장된 방송용 칩 A의 정보를 삭제 또는 해지하고, 단말 B로 내장된 방송용 칩 B의 정보를 방송용 칩 A의 정보로 교체 하는 경우이다.

여기서, 첫 번째 실시 예는 단말 A로 또 다른 USIM 카드가 탑재되지 않고 있음을 전체로 하는 것이다. 동일한 원리로 상기 단말 B에서 사용된 USIM B 카드는 이탈된 상태 즉, USIM B 카드가 어느 하나의 타 단말로 탑재되지 않은 상태를 전체 로 한다. 따라서, 첫 번째 실시 예에서, 방송용 칩 A, 방송용 칩 B에 대한 가입자 회원이 중복 사용 중, 단말 A로 별도의 USIM 카드가 장착되면 상기 방송용 칩 A에 대한 기존 가입자 회원이 해지되거나, 방송용 칩 A에 대한 가입자 정보가 삭제될 것이다.

도 2는 본 발명에 따른 유에스아이에이 연속 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 시스템을 나타낸 구성도이다. 이는 방송용 칩 A를 보유한 기존 단말 A로 탑재된 USIM A 카드가 방송용 칩 B를 보유한 이동된 단말 B로 탑재
뫼에 따른 방송 정보 유지 시스템을 도시한다.

도시된 바와 같이, 단말에 대한 단말 고유정보 및 해당 단말에 대한 USIM 정보를 토대로 한 가입자 정보를 관리하고, 상기 단말 고유정보와 가입자 정보가 상이할 경우, 기기 변경으로 상정하여 이에 대응하는 통지 절차를 수행하는 이동통신 정보관리 서버(201)와, 상기 이동통신 정보관리 서버(201)의 통지 절차에 따라 상기 단말 고유정보 및 가입자 정보를 제공받은 후, 해당 가입자에 대한 방송정보를 수정 요청하기 위한 방송 정보관리 서버(203)와, 상기 방송 정보관리 서버(203)의 방송정보 수정 요청에 응답하여 상기 가입자 정보에 대응하는 기존 단말 A에 대한 방송용 접 A의 정보를 상기 이동된 단말 B에 대한 방송용 접 B의 정보로 수정하기 위한 가입 메시지(EMM) 정보를 상기 이동된 단말 B로 전송 제어하기 위한 CAS(205: Conditional Access System: 제한 수신 시스템)으로 구성된다.

상기 CAS(205)는 이동된 단말 B의 방송용 접 B의 정보를 수정하기 위해 접속되는 방송망은 위성망, 지상파 망을 포함하여 OOB 망을 이용한다. 또한, 상기 CAS(205)에서 제공되는 가입 메시지(EMM:Entitlement Management Message)는 수신 단말로 내실되는 방송용 접 정보를 수정하기 위한 것으로, 정보 수정을 위한 알고리즘은 방송 수신 단말로 이미 탑재되어 있어 이에 대한 구체적인 설명은 생략한다.

한편, 상기 CAS(205)는 전술된 첫 번째 실시 예에 따라 상기 기존 단말 A에 대한 방송용 접 A의 가입 제한을 유지할 수 있으며, 전술된 두 번째 실시 예에 따라 상기 가입 메시지(EMM) 이외에 기존 단말 A의 가입 제한을 위한 해제 메시지
(EMM)를 동시에 제공할 수 있다.

도 3은 본 발명에 따른 CAS의 주요 기능을 설명하기 위한 구성도이다.

도시된 바와 같이, 방송용 점에 대응하는 가입자별 방송 정보를 저장 관리하는 데이터베이스(301)와, 설정된 프로토콜에 기반하여 상기 방송 정보관리 서버(203)와의 통신을 수행하고, 방송망을 통해 메시지(EMM)를 전송하기 위한 통신부(305)와, 상기 방송 정보관리 서버(203)에서 제공되는 데이터에 대한 분석을 수행하는 데이터 분석부(307)와, 상기 데이터 분석부(307)의 분석 결과에 기초하여 상기 가입자 정보, 해당 가입자에 대한 단말 정보를 추출하고, 상기 가입자 정보를 도대로 상기 데이터베이스로부터 해당 가입자에 대한 방송용 점 A 정보를 입력받고, 상기 방송용 점 A 정보와 상기 단말 정보를 포함하여 메시지 생성 명령을 제공하는 제어부(309)와, 상기 제어부(309)의 메시지 생성 명령에 응답하여 상기 단말 정보에 대응하는 이동된 단말 B의 방송용 점 B 정보를 상기 방송용 점 A 정보로 수정하기 위한 가입 메시지(EMM)를 상기 통신부(305)로 제공하는 메시지 생성부(311)로 구성된다.

이기사, 상기 제어부(309)는 기존 단말 A의 방송용 점 A 정보를 삭제 또는 회전 헤지를 위한 메시지 헤지 명령을 추가 생성할 수 있으며, 이에 대응하여 상기 메시지 생성부(311)는 상기 기존 단말 A의 방송용 점 A 정보에 대한 삭제 또는 헤지를 위한 헤지 메시지(EMM)를 제공한다.

이하, 본 발명의 동작은 첨부된 예시도면에 의거 상세히 설명하면 다음과 같
도 4는 본 발명의 주요 동작을 설명하기 위한 플로우차트이다. 도시된 바와 같이, S401 단계에서 사용자는 방송용 접 A가 내장된 기존 단말 A의 USIM A 카드를 이탈시켜 방송용 접 B가 내장된 이동된 단말 B로 장착한다. 따라서, 상기 이동된 단말 B에는 방송용 접 B가 내장되고, USIM A 카드가 장착된다. S403 단계에서 상기 이동된 단말 B는 통신 프로토콜에 따라 소정 시간 단위 또는 USIM A 카드가 장착된 후, 최초 전원 인가 시 해당 단말에 대한 고유정보 예견대, 단말의 고유번호 정보를 포함하여 상기 USIM A 카드로 저장된 가입자 정보를 상기 이동통신 정보관리 서버(201)로 전송한다.

상기 이동통신 정보관리 서버(201)는 현재 수신된 단말의 고유정보 및 가입자 정보에 대한 등록 상태를 검출하며, 상기 단말의 고유정보 및 가입자 정보가 상호 매칭되지 않을 경우 기기 변경으로 인지한다. 따라서, 상기 이동통신 정보관리 서버(201)는 S405 단계로 전입하여, 상기 방송 정보관리 서버(203)로 가입자에 대한 기기 변경 사항을 통지한다. 이때, 상기 방송 정보관리 서버(203)는 상기 방송 정보관리 서버(203)로 이동된 단말 B에 대한 단말 정보 및 USIM A에 대응하는 가입자 정보를 전송한다.

상기 방송 정보관리 서버(203)는 S407 단계에서, 상기 CAS(205)로 사용자의 기기 변경에 따른 방송정보 수정을 요청한다. 더불어, 상기 방송 정보관리 서버(203)는 상기 CAS(205)로 이동된 단말 B에 대한 단말 정보 및 가입자 정보를 제공한다. 상기 통신부(305)는 방송 정보관리 서버(203)로부터 제공되는 통신 데이터를
기 설정된 프로토콜에 기반하여 수신한다. 상기 제어부(309)는 S409 단계에서, 상기 통신부(305)의 수신 데이터를 상기 데이터 분석부(307)로 제공하고, 상기 데이터 분석부(307)는 현재 수신된 통신 데이터로부터 단말 정보 및 가입자 정보를 추출한다.

이후, 상기 제어부(309)는 상기 가입자 정보를 토대로 상기 데이터베이스(301)로부터 해당 가입자에 대응하는 가입자별 방송정보를 제공한다. 여기서 상기 방송정보는 기존 단말 A의 방송용 클 A로 담겨되어 있던 방송 정보로서, 상기 제어부(309)는 해당 방송 정보를 포함하여 가입 메시지(EMM) 생성을 지시하는 명령을 상기 메시지 생성부(311)로 제공한다.

S411 단계로 진입하여, 상기 메시지 생성부(311)는 제어부(309)의 지시 명령에 응답하여 상기 방송 정보 및 이동된 단말 B에 대한 단말 정보를 토대로 가입 메시지(EMM)를 생성하고 S413 단계에서, 상기 가입 메시지(EMM)를 통신부(305)로 제공한다. 상기 통신부(305)는 가입 메시지(EMM)를 방송망(207)을 통해 상기 이동된 단말 B로 전송한다.

상기 이동된 단말 B는 CAS(205)로부터 전송되는 가입 메시지(EMM)를 수신한 후, S415 단계에서 가입 메시지(EMM)에 포함된 상기 방송 정보를 이동된 단말 B로 내장된 방송용 클 B로 업데이트한다. 따라서, 사용자는 USIM A가 탑재된 이동된 단말 B를 통해 방송 서비스를 제공받을 수 있다.

한편, S413 단계에서 상기 CAS(205)는 기존 단말 A의 방송용 클 A 정보를 삭제하거나, 방송용 클 A의 제한을 해지하기 위한 해지 메시지(EMM)를 추가적으로 송
출할 수 있다. 이는 본 발명에 따른 서비스 환경에 따라 선택적으로 적용될 수 있음 것이다. 따라서, 기존 단말 A는 S415 단계에서 해지 메시지(EMM)를 수신하고, 상기 방송용 첩 A 정보에 대한 회선을 해지한다.

【산업상용가능성】

전술된 바와 같이 본 발명에 따른 유에스아이엠 연속 환경에서 기기 변경에 따른 방송용 첩 정보에 대한 유지 방법 및 시스템은, 이동통신망과 방송망 시스템을 상호 연동시키는 단말에 대한 기기 변경시에도 기존의 방송 정보가 유지되도록 함에 따라, 통신 서비스의 질적 향상을 도모하여 산업적 이용 가치가 높은 것이다.
【특허청구범위】

【청구항 1】

유에스아이엠 연속(USIM Unlock) 환경에서 방송용 칩 A를 보유한 기존 단말 A로 탑재된 USIM A 카드가 방송용 칩 B를 보유한 이동된 단말 B로 탑재됨에 따라, 기존 방송 정보를 유지하기 위한 시스템에 있어서.

단말에 대한 단말 고유정보 및 해당 단말에 대한 USIM 정보를 토대로 한 가입자 정보를 관리하고, 상기 단말 고유정보와 가입자 정보가 상이할 경우, 기기 변경으로 상정하여 이에 대응하는 동지 절차를 수행하는 이동통신 정보관리 서버;

상기 이동통신 정보관리 서버의 동지 절차에 따라 상기 단말 고유정보 및 가입자 정보를 제공받은 후, 해당 가입자에 대한 방송정보를 수정 요청하기 위한 방송 정보관리 서버; 및


【청구항 2】

제 1 항에 있어서,
상기 CAS는 이동된 단말 B의 방송용 접 B의 정보를 수정하기 위해 접속되는 방송망은 위성망, 지상파 맵을 포함하여 OOB 맵 중 어느 하나를 이용하는 것을 특징으로 하는 유에스아이에 억속 환경에서 기기 변경에 따른 방송용 접 정보에 대한 유지 시스템.

【청구항 3】

제 1 항에 있어서.

상기 CAS는 상기 기기 메시지(EMM) 이외에 기존 단말 A의 기기 해지를 위한 해지 메시지(EMM)를 더 포함하여 전송하는 것을 특징으로 하는 유에스아이에 억속 환경에서 기기 변경에 따른 방송용 접 정보에 대한 유지 시스템.

【청구항 4】

제 1 항 내지 제 3 항 중 어느 한 항에 있어서.

상기 CAS는 방송용 접에 대응하는 가입자별 방송 정보를 저장 관리하는 데이터베이스;

설정된 프로토콜에 기반하여 상기 방송 정보관리 서버와의 통신을 수행하고, 방송망을 통해 메시지(EMM)를 전송하기 위한 통신부;

상기 방송 정보관리 서버에서 제공되는 데이터에 대한 분석을 수행하는 데이터 분석부;

상기 데이터 분석부의 분석 결과에 기초하여 상기 가입자 정보, 해당 가입자에 대한 단말 정보를 추출하고, 상기 가입자 정보를 토대로 상기 데이터 베이스로
부터 해당 가입자에 대한 방송용 칩 A 정보를 입력받고, 상기 방송용 칩 A 정보와 상기 단말 정보를 포함하여 메시지 생성 명령을 제공하는 제어부: 및

상기 제어부의 메시지 생성 명령에 응답하여 상기 단말 정보에 대응하는 이동된 단말 B의 방송용 칩 B 정보를 상기 방송용 칩 A 정보로 수정하기 위한 가입 메시지(EMM)를 상기 통신부로 제공하는 메시지 생성부로 구성되는 것을 특징으로 하는 유에스아이엠 연독 환경에서 기기 변경에 따른 방송용 칩 정보에 대한 유지 시스템.

【정구항 5】

유에스아이엠 연독(USIM Unlock) 환경에서 방송용 칩 A를 보유한 기존 단말 A로 탑재된 USIM A 카드가 방송용 칩 B로 보유한 이동된 단말 B로 탑재됨에 따라, 기존 방송 정보를 유지하기 위한 방법에 있어서,

a) 상기 이동된 단말 B에 대한 단말 정보 및 상기 USIM A에 대응하는 가입자 정보를 이동통신 정보관리 서버로 전송하는 단계;

b) 상기 이동통신 정보관리 서버가 방송 정보관리 서버로 단말기 변경에 따른 기기 변경을 통지하고, 상기 단말 정보 및 가입자 정보를 제공하는 단계;

c) 상기 방송 정보관리 서버가 CAS로 방송용 칩 정보 수정을 요청하고, 이에 응답하여 상기 CAS가 상기 가입자 정보를 토대로 상기 방송용 칩 A에 대한 기존 방송 정보를 추출하는 단계;

d) 상기 기존 방송 정보에 기초하여 가입 메시지(EMM)를 생성하고, 상기 가입 메시지(EMM)를 상기 단말 정보에 대응하는 상기 이동된 단말 B로 제공하는
단계: 끝

e) 상기 이동된 단말 B에서 보유하는 방송용 접 B의 정보를 상기 방송용 접 A의 정보로 수정하는 단계로 이루어진 것을 특정으로 하는 유에스아이엠 언록 환경에서 기기 변경에 따른 방송용 접 정보에 대한 유지 방법.

【청구항 6】

유에스아이엠 언록(USIM Unlock) 환경에서 방송용 접 A를 보유한 기존 단말 A로 탑재된 USIM A 카드가 방송용 접 B를 보유한 이동된 단말 B로 탑재됨에 따라, 기존 방송 정보를 유지하기 위한 방법에 있어서,

a) 상기 이동된 단말 B로부터 해당 단말에 대한 단말 정보 및 상기 USIM A에 대응하는 가입자 정보를 접수하는 단계

b) 상기 가입자 정보를 토대로 기 저장된 가입자별 방송 정보로부터 상기 USIM A에 대한 방송 정보를 추출하는 단계: 끝

c) 상기 방송 정보에 근거하여 가입 메시지(EMM)을 생성하고, 상기 가입 메시지(EMM)를 상기 단말 정보에 대응하는 이동된 단말 B로 전송하는 단계로 이루어진 것을 특정으로 하는 유에스아이엠 언록 환경에서 기기 변경에 따른 방송용 접 정보에 대한 유지 방법.

【청구항 7】

제 5 항 또는 제 6 항에 있어서,

상기 CAS는 상기 가입 메시지(EMM) 이외에 기존 단말 A의 가입 해지를 위한
해지 메시지(EMM)를 더 포함하여 전송하는 것을 특징으로 하는 유예스아이엠 언급 환경에서 기기 변경에 따른 방송용 집 정보에 대한 유지 방법.

【도면의 간단한 설명】

<42>  
도 1은 중대 제한 수신 시스템(CAS)을 나타낸 구성도이다.

<43>  
도 2는 본 발명에 따른 유예스아이엠 언급 환경에서 기기 변경에 따른 방송용 집 정보에 대한 유지 시스템을 나타낸 구성도이다.

<44>  
도 3은 본 발명에 따른 제한 수신 시스템(CAS)의 주요 기능을 설명하기 위한 구성도이다.

<45>  
도 4는 본 발명의 주요 동작을 설명하기 위한 플로우차트이다.

<46>  
<주요 도면에 대한 부호의 설명>

<47>  
101 : 이동통신 정보관리 서버  
103 : 방송 정보관리 서버

<48>  
105 : CAS  
107 : 방송망
【도면】
【도 3】
# PATENT APPLICATION FEE DETERMINATION RECORD

**Effective October 2, 2008**

**Application or Docket Number:**

## CLAIMS AS FILED - PART I

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## CLAIMS AS AMENDED - PART II

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## CLAIMS AS AMENDED - PART II

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* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than "2", enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than "3", enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.
### MULTIPLE DEPENDENT CLAIM

**FEE CALCULATION SHEET**

*(FOR USE WITH FORM PTO-875)*

#### CLAIMS

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**TOTAL IND.**

**TOTAL DEP.**

**TOTAL CLAIMS**

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**U.S. DEPARTMENT of COMMERCE**

**Patent and Trademark Office**
**PATENT APPLICATION FEE DETERMINATION RECORD**

Substitute for Form PTO-875

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* If the difference in column 1 is less than zero, enter “0” in column 2.

**APPLICATION AS AMENDED – PART II**

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Legal Instrument Examiner: TRINA L. RIDDICK

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 37 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.