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(71) Applicant *(for all designated States except US)*: **TU MEDIA CORP.** [KR/KR]; 267, Namdaemunno 5ga Jung-gu, Seoul 100-711 (KR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **CHOI, JU YOUNG** [KR/KR]; 22-65, Yeouido Sibeom Apt. 50 Yeouido-dong Yeongdeungpo-gu, Seoul 150-761 (KR). **PARK, HEON JU** [KR/KR]; 309-403, Raemian 3-cha Apt. Sangdo-dong Dongjak-gu, Seoul 156-030 (KR).

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

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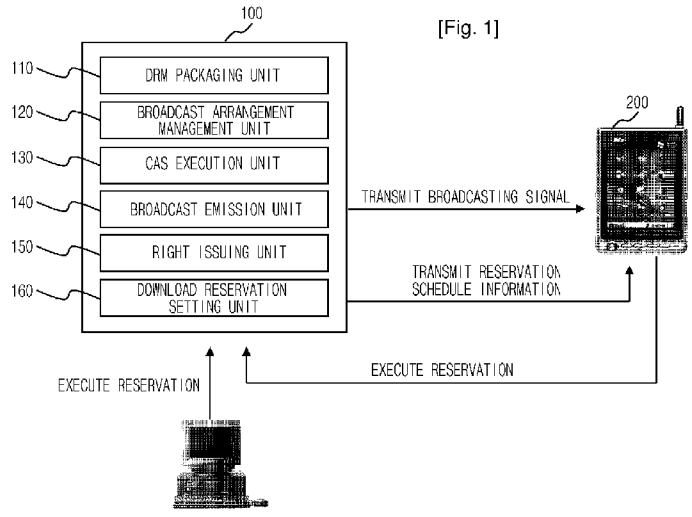
(54) Title: METHOD AND SYSTEM FOR STORAGE AND PLAYBACK OF BROADCASTING CONTENTS, RIGHTS ISSUER APPLIED TO THE SAME

[Fig. 1]



(57) Abstract: Disclosed is a method and a system for storing and playing broadcasting contents, as well as a right issuing device applied to the same. The system includes a download reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; a video/audio recording reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a PVR and PAR reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; a broadcast arrangement management unit for managing broadcast arrangement information regarding the broadcasting schedule; a DRM packaging unit for executing DRM packaging with regard to the broadcasting contents; a CAS execution unit for executing CAS processing with regard to the broadcasting contents to set CAS information corresponding to the broadcasting contents; and a broadcast emission unit for executing scrambling with regard to the broadcasting contents subjected to DRM packaging and the CAS information, and multiplexing and broadcasting the scrambled broadcasting contents and CAS information together with the broadcast arrangement information. A service is realized based so that a terminal, which is adapted to receive broadcasting signals broadcasted according to a broadcasting schedule, downloads and stores corresponding broadcasting contents according to a preset reservation schedule or executes video/audio recording of broadcasting contents that are currently watched, and a playback right is separately given to the broadcasting contents so that, when the right expires or when the broadcasting contents are solely copied and circulated, the contents are not played, thereby encouraging purchase of the playback right.

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Description

METHOD AND SYSTEM FOR STORAGE AND PLAYBACK OF BROADCASTING CONTENTS, RIGHTS ISSUER APPLIED TO THE SAME

Technical Field

[1] The present invention relates to delivery and playback of broadcasting contents, and more particularly to a method and a system for storing and playing broadcasting contents, wherein a service is realized based on combination of a CAS system and DRM technology so that a terminal, which is adapted to receive broadcasting signals broadcasted according to a broadcasting schedule, downloads and stores corresponding broadcasting contents according to a preset reservation schedule or executes video/ audio recording of broadcasting contents that are currently watched, and a playback right is separately given to the broadcasting contents so that, when the right expires or when the broadcasting contents are solely copied and circulated, the contents are not played, thereby encouraging purchase of the playback right, as well as a right issuing device applied to the same.

Background Art

[2] In general, digital broadcasting is characterized by multiple channels, high quality, and multiple functions. Particularly, development of multiplexing technology has made it possible to bundle images, sounds, data, etc. regardless of the content and size and transmit them simultaneously. In addition, a return channel is established via a modem, and an interactive service is possible. As such, digital broadcasting can overcome the limit of conventional analog broadcasting and provide audience with a multimedia service having a high added value. However, if no mutual security is guaranteed between the transmitting and receiving sides in the case of combined broadcasting of digital data, the commercial structure of the broadcasting collapses. Based on active use of multiple and professional channels, broadcast providers can provide subscribers with a high-quality broadcasting service and collect the watching fee from them (i.e. pay broadcasting service), instead of the conventional service relying on advertisement incomes. In addition, broadcast providers want protection of various multimedia data that has been broadcasted so that authenticated subscribers, who are entitled to receive the data, can solely receive it. A CAS (Conditional Access System) has been developed to solve these problems.

[3] The CAS has introduced the concept of subscribers into broadcasting so that only entitled subscribers can receive specific programs. According to this system, each digital broadcast receiver determines whether or not the recipient is entitled to receive

a specific broadcasting program through a series of processes. According to the CAS, the transmitter sends an encrypted program signal and entitlement, which has been given to each recipient or to a specific group. On the receiving side, only an entitled subscriber can receive a program after decryption using a smart card, which is mounted on the receiver of the subscriber.

[4] In general, the CAS scrambles an A/V stream into a CW (Control Word), encrypts the CW into an ECM and an EMM, multiplexes them, and transmits them. The receiving side decrypts the ECM and EMM to obtain the CW by using a smart card, and descrambles the A/V stream.

[5] Furthermore, in order to protect the copyright regarding broadcasting contents provided during a broadcasting service, DRM is applied to the broadcasting contents. As a result, broadcasting services tend to combine the CAS and DRM and provide a highly-advanced system satisfying the requests of both contents providers and service users.

[6] In line with such a trend, broadcasting service users request that desired broadcasting contents be stored according to a schedule reserved for each user so that they can be watched when free. Users also request that, when they watch broadcasts in a channel, broadcasting contents in another channel be stored to be watched later. Contents providers also want to create a profit model capable of satisfying user demands.

[7]

Disclosure of Invention

Technical Problem

[8] Therefore, the present invention has been made in view of the above-mentioned problems, and the present invention provides a method and a system for storing and playing broadcasting contents, wherein a service is realized based on combination of a CAS system and DRM technology so that a terminal, which is adapted to receive broadcasting signals broadcasted according to a broadcasting schedule, downloads and stores corresponding broadcasting contents according to a preset reservation schedule or executes video/audio recording of broadcasting contents that are currently watched (i.e. watched through the terminal screen or in the background), and a playback right is separately given to the broadcasting contents so that, when the right expires or when the broadcasting contents are solely copied and circulated, the contents are not played, thereby encouraging purchase of the playback right, as well as a right issuing device applied to the same.

[9]

Technical Solution

[10] In accordance with a first aspect of the present invention, there is provided a method

for storing and playing broadcasting contents, the method including the steps of (a) creating reservation schedule information for each subscriber based on information inputted via a user interface based on a broadcasting system providing a download reservation service with regard to at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; (b) executing ERM packaging by the broadcasting system to set use control information regarding the broadcasting contents and executing CAS processing to set and scramble CAS information regarding the broadcasting contents; (c) multiplexing and broadcasting scrambling data together with broadcast arrangement information, the scrambling data containing the broadcasting contents subjected to DRM packaging and the CAS information, the broadcast arrangement information being created from the broadcasting schedule; and (d) receiving the broadcasted signal based on the reservation schedule information by the broadcast-watching terminal to download corresponding broadcasting contents.

[11] Preferably, the method further includes a step of (e) playing the broadcasting contents after determining whether or not a corresponding subscriber is entitled to play the broadcasting contents based on subscriber information stored in a smart card of the broadcast-watching terminal.

[12] According to a second aspect of the present invention, there is provided a system for storing and playing broadcasting contents, the system including a download reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; a broadcast arrangement management unit for managing broadcast arrangement information regarding the broadcasting schedule; a DRM packaging unit for executing DRM packaging with regard to the broadcasting contents; a CAS execution unit for executing CAS processing with regard to the broadcasting contents to set CAS information corresponding to the broadcasting contents; and a broadcast emission unit for executing scrambling with regard to the broadcasting contents subjected to DRM packaging and the CAS information, and multiplexing and broadcasting the scrambled broadcasting contents and CAS information together with the broadcast arrangement information.

[13] Preferably, the system further includes a right issuing unit for issuing a playback right when a right of the broadcast-watching terminal to play the broadcasting contents expires.

[14] According to a third aspect of the present invention, there is provided a right issuing device for issuing a playback right at a request of a broadcast-watching terminal, the

terminal downloading and playing broadcasting contents when a broadcasting time arrives, the broadcasting time having been set by a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, the terminal requesting issuance of the playback right via a communication network when a right to play the broadcasting contents expires.

[15] According to a fourth aspect of the present invention, there is provided a method for storing and playing broadcasting contents, the method including the steps of (a) creating reservation schedule information for each subscriber based on information inputted via a user interface based on a broadcasting system providing a PVR and PAR reservation service with regard to at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; (b) executing compressing/multiplexing with regard to the broadcasting contents by the broadcasting system to create compressed/multiplexed broadcasting contents, and executing CAS processing to set and scramble CAS information regarding the broadcasting contents; (c) multiplexing and broadcasting scrambling data together with broadcast arrangement information, the scrambling data containing the compressed/multiplexed broadcasting contents and the CAS information, the broadcast arrangement information being created from the broadcasting schedule; and (d) receiving the broadcasted signal by the broadcast-watching terminal to conduct video/audio recording of corresponding broadcasting contents based on additionally set video/audio recording setting or based on the reservation schedule information.

[16] Preferably, the method further includes a step of (e) playing the broadcasting contents after determining whether or not a corresponding subscriber is entitled to play the broadcasting contents based on subscriber information stored in a smart card of the broadcast-watching terminal.

[17] Preferably, the method further includes a step of (f) having a right to play the broadcasting contents issued from the broadcasting system after the right to play the broadcasting contents expires.

[18] According to a fifth aspect of the present invention, there is provided a system for storing and playing broadcasting contents, the system including a video/audio recording reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a PVR and PAR reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal; a broadcast arrangement management unit for managing broadcast arrangement information regarding the broadcasting schedule; a compressing/multiplexing unit for executing compressing/multiplexing with regard to

the broadcasting contents; a CAS execution unit for executing CAS processing to set CAS information corresponding to the broadcasting contents; and a broadcast emission unit for executing scrambling with regard to the compressed/multiplexed broadcasting contents and the CAS information, and multiplexing and broadcasting the scrambled broadcasting contents and CAS information together with the broadcast arrangement information.

[19] Preferably, the system further includes a right issuing unit for issuing a playback rig ht when a right of the broadcast-watching terminal to play the broadcasting contents expires.

[20] According to a sixth aspect of the present invention, there is provided a right issuing device for issuing a playback right at a request of a broadcast-watching terminal, the terminal conducting video/audio recording and playback of broadcasting contents when a broadcasting time arrives, the broadcasting time having been set by a PVR and PAR reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, or the terminal conducting video/audio recording and playback of the broadcasting contents based on additional video/audio recording setting while executing the broadcasting contents, and the terminal requesting issuance of the playback right via a communication network when a right to play the broadcasting contents expires.

Advantageous Effects

[21] As mentioned above, the present invention provides a method and a system for storing and playing broadcasting contents, wherein a service is realized based on combination of a CAS system and DRM technology so that a terminal, which is adapted to receive broadcasting signals broadcasted according to a broadcasting schedule, downloads and stores corresponding broadcasting contents according to a preset reservation schedule or executes video/audio recording of broadcasting contents that are currently watched, and a playback right is separately given to the broadcasting contents so that, when the right expires or when the broadcasting contents are solely copied and circulated, the contents are not played, thereby encouraging purchase of the playback right, as well as a right issuing device applied to the same. This advantageously creates new services, including a download reservation service and a PVR and PAR reservation service, and improves the competitiveness over other services related to broadcasting contents provision. In addition, an additional profit model is created in connection with broadcasting contents circulation, based on the entitlement to play broadcasting contents.

Brief Description of the Drawings

[22] 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:

[23] FIG. 1 shows the construction of a system for storing and playing broadcasting contents according to an embodiment of the present invention;

[24] FIG. 2 is a conceptual diagram showing a procedure for downloading broadcasting contents by a broadcast-watching terminal shown in FIG. 1;

[25] FIG. 3 is a conceptual diagram showing a procedure for playing broadcasting contents by the broadcast-watching terminal shown in FIG. 1;

[26] FIG. 4 is a conceptual diagram showing issuance of a playback right to the broadcast-watching terminal shown in FIG. 1;

[27] FIG. 5 shows the detailed construction of the system for storing and playing broadcasting contents shown in FIG. 1;

[28] FIG. 6 is a flowchart showing the operation process of the system for storing and playing broadcasting contents shown in FIG. 1;

[29] FIG. 7 shows the construction of a system for storing and playing broadcasting contents according to another embodiment of the present invention;

[30] FIG. 8 is a conceptual diagram showing a procedure for video/audio recording of broadcasting contents by a broadcast-watching terminal shown in FIG. 7;

[31] FIG. 9 is a conceptual diagram showing a procedure for playing broadcasting contents by the broadcast-watching terminal shown in FIG. 7;

[32] FIG. 10 is a conceptual diagram showing issuance of a playback right to the broadcast-watching terminal shown in FIG. 7;

[33] FIG. 11 shows the detailed construction of the system for storing and playing broadcasting contents shown in FIG. 7; and

[34] FIG. 12 is a flowchart showing the operation process of the system for storing and playing broadcasting contents shown in FIG. 7.

Best Mode for Carrying Out the Invention

[35] Hereinafter, a system and a method for storing and playing broadcasting contents according to exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[36] FIG. 1 shows the construction of a system for storing and playing broadcasting contents according to an embodiment of the present invention. As shown in FIG. 1, the system for storing and playing broadcasting contents is adapted to realize a service enabling a terminal to download and store broadcasting contents, which are emitted according to broadcasting arrangement, according to a pre-stored reservation schedule (hereinafter, referred to as a download reservation service).

[37] The system includes a download reservation setting unit 160 for creating reservation

schedule information for each service subscriber via a user interface (e.g. home page), which provides a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the information to a broadcast-watching terminal 200 of the corresponding service subscriber; a broadcast arrangement management unit 120 for managing broadcast arrangement information regarding broadcasting contents; a DRM packaging unit 110 for executing DRM packaging with regard to broadcasting contents; a CAS execution unit 130 for executing CAS processing to set CAS information regarding the broadcasting contents; and a broadcast emission unit 140 for combining and scrambling the broadcasting contents subjected to DRM packaging and the CAS information, multiplexing the scrambled data and the broadcast arrangement information, and broadcasting them via a broadcasting network.

[38] Preferably, the system further includes a right issuing unit 150 so that when the right to play the broadcasting contents expires, another playback right is issued in response to a request of the broadcast-watching terminal 200.

[39] The reservation schedule information preferably includes the time point of initial download of broadcasting contents and the final download time point, and is preferably created as an SMS message among message transmission types and delivered to the broadcast-watching terminal 200.

[40] The download reservation setting unit 160 preferably creates the reservation schedule information by enabling the service subscriber to web-access the user interface via a wired terminal (e.g. personal computer) or by enabling the service subscriber to WAP-access the user interface via a wireless terminal capable of communication (e.g. broadcast-watching terminal 200).

[41] The reservation schedule information may be created by the user with reference to a reservation schedule menu, which is automatically executed by the broadcast-watching terminal based on the broadcast arrangement information. The broadcast-watching terminal adapted to automatically create the reservation schedule information is a terminal capable of communication via web or WAP access, or a terminal incapable of communication.

[42] The DRM packaging unit 110 executes DRM packaging with regard to broadcasting contents to set use control information regarding the broadcasting contents. The user control information includes at least one of information regarding whether or not broadcasting contents can be circulated, the number of times of possible playback, and the time of possible playback.

[43] The CAS execution unit 130 sets subscriber information by means of CAS processing. The subscriber information includes at least one of an ECM (Entitlement Control Message) for protecting broadcasting contents and an EMM (Entitlement

Management Message), which includes an encryption key of the ECM and information regarding the right to download the broadcasting contents, and which is used to authenticate subscribers.

[44] The ECM preferably includes at least one of information regarding whether or not broadcasting contents, which have been stored in an external memory, can still be played after service unsubscription, binding information regarding whether or not the external memory is bound and regarding whether or not a device is bound to a terminal capable of playing broadcasting contents, and the time (or number of times) of playback of broadcasting contents.

[45] The ECM preferably includes information regarding whether or not broadcasting contents, which have been stored in an internal memory, can still be played after service unsubscription.

[46] FIG. 2 is a conceptual diagram showing a procedure for downloading broadcasting contents by the broadcast-watching terminal 200 shown in FIG. 1. As shown in FIG. 2, the broadcast-watching terminal 200 receives a broadcasted signal, refers to reservation schedule information, and receives corresponding broadcasting contents. Then, it is determined whether the broadcasting contents are being watched via the terminal or not, and processing for storing contents is conducted for each case.

[47] When the broadcasting contents are being watched via the broadcast-watching terminal 200, the received broadcasting signal is matched with information regarding the list of broadcasting contents corresponding to the broadcasting time point that has arrived based on reservation schedule information to obtain a matching result. Broadcasting contents confirmed as matching by the result are regarded as previously-reserved contents and are downloaded.

[48] When the broadcasting contents are not being watched via the broadcasting watching terminal 200, it switches from a sleep mode to an active mode upon receiving a broadcasting signal, and the above-mentioned downloading process is conducted in the active mode.

[49] Although it has been assumed that switching from the sleep mode to the active mode is triggered by receiving a broadcasting signal, it is also possible to switch from the sleep mode to the active mode with reference to broadcasting time information included in the reservation schedule information.

[50] FIG. 3 is a conceptual diagram showing a procedure for downloading broadcasting contents by the broadcast-watching terminal 200 shown in FIG. 1. As shown in FIG. 3, in order to play stored broadcasting contents, the broadcast-watching terminal 200 reads the subscriber information stored in its smart card and determines whether or not the user of the terminal 200 has subscribed to the service for playback. In other words, the terminal 200 determines whether or not the user is entitled to receive broadcasting

contents, and decides whether or not to play the broadcasting contents based on the result. If it is confirmed that the user is entitled to play the broadcasting contents, contents playback is executed, and the time (or the number of times) of playback execution is checked. Information regarding this is also stored.

[51] If it is confirmed that the user has not subscribed to the service, the terminal 200 determines whether or not to play the contents based on control information, which is included in the CAS information, regarding whether or not broadcasting contents can be played in the case of service unsubscription.

[52] When the broadcast-watching terminal 200 stores broadcasting contents in an external memory, the external memory may be delivered to another broadcast-watching terminal (hereinafter, referred to as a second broadcast-watching terminal) 300. In this case, it is determined whether or not to play the broadcasting contents with reference to the binding information, which is included in the CAS information, regarding whether or not the external memory is bound and regarding whether or not a device is bound to a terminal capable of playing broadcasting contents.

[53] Similarly, when the second broadcast-watching terminal 300 plays broadcasting contents, the playback is based on the remaining playback time. After the pre-determined playback time (or the number of times of playback) expires, an additional playback right must be issued.

[54] Besides delivering the broadcasting contents to the second broadcast-watching terminal 300 via an external memory, it is also possible to copy the broadcasting contents and deliver them to the second broadcast-watching terminal 300. In this case, the second broadcast-watching terminal 300 can play the broadcasting contents only after having a right to play the contents issued by the right issuing unit 150 of the broadcasting system 100.

[55] FIG. 4 is a conceptual diagram showing issuance of a playback right to the broadcast-watching terminal 200 shown in FIG. 1. As shown in FIG. 4, the broadcast-watching terminal 200, which is adapted to play provided broadcasting contents, or the second broadcast-watching terminal 300, which is adapted to receive the broadcasting contents via the external memory and play them, executes playback within the limit of the playback time (or the number of times of playback), which has been set in the CAS information provided together with the broadcasting contents. After the playback time (or the number of times of playback) is reached, the terminal 200 or 300 accesses the right issuing unit 150 of the broadcasting system 100 via a communication network (e.g. a mobile communication network or Internet), has a right to play the broadcasting contents issued to it, and executes the playback.

[56] When the broadcasting contents are copied and delivered to the second broadcast-watching terminal 300, it can execute playback only after having a playback right

issued to it.

[57] FIG. 5 shows the detailed construction of the system for storing and playing broadcasting contents shown in FIG. 1. As shown in FIG. 5, the system for storing and playing broadcasting contents includes a download reservation setting unit 160, a broadcast arrangement unit 120, a DRM packaging unit 110, a CAS execution unit 130, a broadcast emission unit 140, and a right issuing unit 150.

[58] The right issuing unit 150 includes a DRM right issuer for managing a right issuance authentication key based on a table for identifying broadcasting contents and issuing the right issuance authentication key through a process of authenticating the broadcast-watching terminal 200 at a playback right issuance request of the broadcast-watching terminal 200, and a presentation server for delivering the playback right issuance request of the broadcast-watching terminal 200 to the DRM right issuer and delivering a provided right issuance authentication key to the broadcast-watching terminal 200.

[59] Preferably, the right issuing unit 150 further includes a CA server for newly creating and modifying a certificate of the right to play the broadcasting contents.

[60] The download reservation setting unit 160 includes an application server for providing a user interface to communicate with service subscribers, and a message transmission server for delivering reservation schedule information, which is created based on broadcast arrangement settings of service subscribers, to the broadcast-watching terminal 200 in a message type. The application server may be realized as a web server, and the message transmission server is preferably realized as a SMS server based on mobile communication networks.

[61] The broadcast arrangement management unit 120 includes a schedule management server for creating broadcast arrangement information according to the broadcasting schedule, and an EPG server for receiving the broadcast arrangement information and converting it into an EPG format.

[62] The DRM packaging unit 110 includes a DRM packager for executing DRM packaging with regard to broadcasting contents, and a broadcasting contents server for storing the broadcasting contents subjected to DRM packaging.

[63] The CAS execution unit 130 includes an ECM creation module for creating an ECM (Entitlement Control Message) for protecting broadcasting contents, and an EMM creation module for creating an EMM (Entitlement Management Message), which includes an encryption key of the ECM and information regarding the right to download the broadcasting contents, and which is used to authenticate subscribers.

[64] The broadcast emission unit 140 includes a CAS scrambler for combining and scrambling the broadcasting contents subjected to DRM packaging and the subscriber information, a multiplexer for multiplexing the scrambled data and the broadcast arrangement information, and a transmitter for broadcasting the multiplexed signal via a

broadcasting network. Preferably, the multiplexed signal is broadcasted via the broadcasting network through a dedicated channel for providing a download reservation service only.

[65] FIG. 6 is a flowchart showing the operation process of the system for storing and playing broadcasting contents shown in FIG. 1. The method for storing and playing broadcasting contents begins by accessing the user interface, which is based on the broadcasting system 100, via a personal computer of the subscriber or via the broadcast-watching terminal 200 capable of communication to execute download reservation service setting (S100).

[66] When the broadcast-watching terminal automatically executes a reservation schedule menu so that the user makes settings, the user can set the download reservation service even if the broadcast-watching terminal is not capable of communication.

[67] The setting step (S100) is followed by steps of creating reservation schedule information for each subscriber and delivering it to the corresponding broadcast-watching terminal 200 (S102 and S104).

[68] Then, the DRM packaging unit 110 of the broadcasting system 100 is used to execute DRM packaging with regard to predetermined broadcasting contents and set use control information regarding the broadcasting contents, and the CAS execution unit 130 is used to execute CAS processing to set CAS information (S106).

[69] Step S106 is followed by steps of combining and scrambling the broadcasting contents subjected to DRM packaging and the CAS information, and the resulting scrambled data and broadcast arrangement information are multiplexed and broadcasted (S108 to S112).

[70] If the broadcast-watching terminal 200 is in an inactive mode (i.e. sleep mode) at the point of time of receiving the broadcasted signal, steps for switching to an active mode are additionally conducted (S114 and S116). In the active mode, it is determined if broadcasting contents included in the broadcasting signal match with reserved contents with reference to reservation schedule information, which has been received and stored in advance (S118).

[71] If it is confirmed in step S118 that the broadcasting contents are reserved contents, they are instantly stored, or their storage is reserved (S120).

[72] Furthermore, when the broadcast-watching terminal 200 or the second broadcast-watching terminal 300 executes playback of the broadcasting contents (S122), subscriber information stored in the smart card of the broadcast-watching terminal 200 or the second broadcast-watching terminal 300 is read to determine whether or not the user has subscribed to the service for playback. In other words, it is determined whether or not the user of the broadcast-watching terminal 200 or the second broadcast-watching terminal 300 is entitled to receive broadcasts, and the result is used

to decide whether or not to play the contents. If it is confirmed that the user has unsubscribed from the service, the control information, which is included in the CAS information, regarding whether or not contents can be played even in the case of unsubscription is used to decide whether or not to play the contents (S124 and S126).

[73] Step S122 is followed by a step of determining whether or not the right to play the broadcasting contents has expired with reference to the CAS information provided together with the broadcasting contents. Particularly, the step of determining whether or not the right to play broadcasting contents has expired is based on information, which is stored when broadcasting contents are stored or downloaded, and playback right information, which is updated by counting the playback execution time or the number of times of playback execution for each time of playback. If the playback right given in the above process expires, a step of having another playback right issued is additionally conducted (S128 and S130).

[74] FIG. 7 shows the construction of a system for storing and playing broadcasting contents according to another embodiment of the present invention. As shown in FIG. 7, the system for storing and playing broadcasting contents is adapted to realize a service for real-time video/audio recording of broadcasting contents, which are being watched, or a service for reserved video/audio recording and storage of broadcasting contents according to a pre-stored reservation schedule (hereinafter, referred to as a PVR and PAR reservation service).

[75] The system includes a video/audio recording reservation setting unit 460 for creating reservation schedule information for each service subscriber via a user interface, which provides a PVR and PAR reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the information to a broadcast-watching terminal 500 of the corresponding service subscriber; a broadcast arrangement management unit 420 for managing broadcast arrangement information regarding broadcasting contents; a compressing/multiplexing unit 410 for executing compressing/multiplexing with regard to broadcasting contents; a CAS execution unit 430 for executing CAS processing to set CAS information regarding the broadcasting contents; and a broadcast emission unit 440 for combining and scrambling the compressed/multiplexed broadcasting contents and the CAS information, multiplexing the scrambled data and the broadcast arrangement information, and broadcasting them via a broadcasting network.

[76] Preferably, the system further includes a right issuing unit 450 so that when the right to play the broadcasting contents expires, another playback right is issued in response to a request of the broadcast-watching terminal 500.

[77] FIG. 8 is a conceptual diagram showing a procedure for video/audio recording of broadcasting contents by the broadcast-watching terminal 500 shown in FIG. 7. As

shown in FIG. 8, the broadcast-watching terminal 500 receives a broadcasted signal, refers to reservation schedule information, and receives corresponding broadcasting contents. Then, it is determined whether the broadcasting contents are being watched via the terminal or not, and processing for storing contents is conducted for each case. Alternatively, when the subscriber has additionally made video/audio recording settings, corresponding broadcasting contents are instantly subjected to video/audio recording and stored.

[78] When the broadcasting contents are being watched via the broadcast-watching terminal 500, the received broadcasting signal is matched with information regarding the list of broadcasting contents reserved/designated at the broadcasting time point that has arrived based on reservation schedule information to obtain a matching result. Broadcasting contents confirmed as matching by the result are regarded as reserved contents, which are downloaded and stored.

[79] When the broadcasting contents are not being watched via the broadcasting watching terminal 500, it switches from a sleep mode to an active mode upon receiving a broadcasting signal, and the above-mentioned downloading process is conducted in the active mode.

[80] Although it has been assumed that switching from the sleep mode to the active mode is triggered by receiving a broadcasting signal, it is also possible to switch from the sleep mode to the active mode with reference to broadcasting time information included in the reservation schedule information.

[81] FIG. 9 is a conceptual diagram showing a procedure for playing broadcasting contents by the broadcast-watching terminal 500 shown in FIG. 7. As shown in FIG. 9, in order to play stored broadcasting contents, the broadcast-watching terminal 500 reads subscriber information stored in its smart card and determines whether or not the user of the terminal 500 has subscribed to the service for playback. In other words, the terminal 500 determines whether or not the user is entitled to receive broadcasting contents, and decides whether or not to play the broadcasting contents based on the result. If it is confirmed that the user is entitled to play the broadcasting contents, contents playback is executed, and the time (or the number of times) of playback execution is checked. Information regarding this is also stored.

[82] If it is confirmed that the user has not subscribed to the service, the terminal 500 determines whether or not to play the contents based on control information, which is included in the CAS information, regarding whether or not broadcasting contents can be played in the case of service unsubscription.

[83] When the broadcast-watching terminal 500 stores broadcasting contents in an external memory, the external memory may be delivered to another broadcast-watching terminal (hereinafter, referred to as a second broadcast-watching terminal)

600. In this case, it is determined whether or not to play the broadcasting contents with reference to the binding information, which is included in the CAS information, regarding whether or not the external memory is bound and regarding whether or not a device is bound to a terminal capable of playing broadcasting contents.

[84] Similarly, when the second broadcast-watching terminal 600 plays broadcasting contents, the playback is based on the remaining playback time. After the pre-determined playback time (or the number of times of playback) expires, an additional playback right must be issued.

[85] Besides delivering the broadcasting contents to the second broadcast-watching terminal 600 via an external memory, it is also possible to copy the broadcasting contents and deliver them to the second broadcast-watching terminal 600. In this case, the second broadcast-watching terminal 600 can play the broadcasting contents only after having a right to play the contents issued by the right issuing unit 450 of the broadcasting system 400.

[86] FIG. 10 is a conceptual diagram showing issuance of a playback right to the broadcast-watching terminal 500 shown in FIG. 7. As shown in FIG. 10, the broadcast-watching terminal 500, which is adapted to play provided broadcasting contents, or the second broadcast-watching terminal 600, which is adapted to receive the broadcasting contents via the external memory and play them, executes playback within the limit of the playback time (or the number of times of playback), which has been set in the CAS information provided together with the broadcasting contents. After the playback time (or the number of times of playback) is reached, the terminal 500 or 600 accesses the right issuing unit 450 of the broadcasting system 400 via a communication network (e.g. a mobile communication network or Internet), has a right to play the broadcasting contents issued to it, and executes the playback.

[87] When the broadcasting contents are copied and delivered to the second broadcast-watching terminal 600, it can execute playback only after having a playback right issued to it.

[88] FIG. 11 shows the detailed construction of the system for storing and playing broadcasting contents shown in FIG. 7. As shown in FIG. 11, the system for storing and playing broadcasting contents includes a video/audio recording reservation setting unit 460, a broadcast arrangement management unit 420, a compressing/multiplexing unit 410, a CAS execution unit 430, a broadcast emission unit 440, and a right issuing unit 450.

[89] The right issuing unit 450 includes a right issuer for managing a right issuance authentication key based on a table for identifying broadcasting contents and issuing the right issuance authentication key through a process of authenticating the broadcast-watching terminal 500 at a playback right issuance request of the broadcast-watching

terminal 500, and a presentation server for delivering the playback right issuance request of the broadcast-watching terminal 500 to the right issuer and delivering a provided right issuance authentication key to the broadcast-watching terminal 500.

[90] Preferably, the right issuer 450 further includes a CA server for newly creating and modifying a certificate of the right to play the broadcasting contents.

[91] The video/audio recording reservation setting unit 460 includes an application server for acting as a user interface, i.e. providing a user interface to communicate with service subscribers, and a message transmission server for delivering reservation schedule information, which is created based on broadcast arrangement settings of service subscribers, to the broadcast-watching terminal 500 in a message type. The application server may be realized as a web server, and the message transmission server is preferably realized as a SMS server based on mobile communication networks.

[92] The broadcast arrangement management unit 420 includes a schedule management server for creating broadcast arrangement information according to the broadcasting schedule, and an EPG server for receiving the broadcast arrangement information and converting it into an EPG format.

[93] The compressing/multiplexing unit 410 includes a compressor/multiplexer for compressing/multiplexing broadcasting contents, and a broadcasting contents server for storing the compressed/multiplexed broadcasting contents.

[94] The CAS execution unit 430 includes an ECM creation module for creating an ECM for protecting broadcasting contents, and an EMM creation module for creating an EMM, which includes an encryption key of the ECM and information regarding the right to download the broadcasting contents, and which is used to authenticate subscribers.

[95] The broadcast emission unit 440 includes a CAS scrambler for combining and scrambling the compressed/multiplexed broadcasting contents and the subscriber information, a multiplexer for multiplexing the scrambled data and the broadcast arrangement information, and a transmitter for broadcasting the multiplexed signal via a broadcasting network.

[96] FIG. 12 is a flowchart showing the operation process of the system for storing and playing broadcasting contents shown in FIG. 7. As shown in FIG. 12, the method for storing and playing broadcasting contents begins by accessing the user interface, which is based on the broadcasting system 400, via a personal computer of the subscriber or via the broadcast-watching terminal 500 capable of communication to execute PVR and PAR reservation service setting (S200).

[97] The setting step (S200) is followed by steps of creating reservation schedule information for each subscriber and delivering it to the corresponding broadcast-watching terminal 500 (S202 and S204).

[98] Then, the compressing/multiplexing unit 410 of the broadcasting system 400 is used to compress/multiplex predetermined broadcasting contents and set use control information regarding the broadcasting contents, and the CAS execution unit 430 is used to execute CAS processing based on the reservation schedule information to set CAS information (S206).

[99] Step S206 is followed by steps of combining and scrambling of the compressed/multiplexed broadcasting contents and the CAS information, and the resulting scrambled data and broadcasting arrangement information are multiplexed and broadcasted (S208 to S212).

[100] If the broadcast-watching terminal 500 is in an inactive mode (i.e. sleep mode) at the point of time of receiving the broadcasted signal, steps for switching to an active mode are additionally conducted (S214 and S216). In the active mode, it is determined if broadcasting contents included in the broadcasting signals match with reserved contents with reference to reservation schedule information, which has been received and stored in advance (S218).

[101] If it is confirmed in step S218 that the broadcasting contents are reserved contents, they undergo video/audio recording (S220).

[102] Furthermore, when the broadcast-watching terminal 500 or the second broadcast-watching terminal 600 executes playback of the broadcasting contents (S222), subscriber information stored in the smart card of the broadcast-watching terminal 500 or the second broadcast-watching terminal 600 is read to determine whether or not the user has subscribed to the service for playback. In other words, it is determined whether or not the user of the broadcast-watching terminal 500 or the second broadcast-watching terminal 600 is entitled to receive broadcasts, and the result is used to decide whether or not to play the contents. If it is confirmed that the user has unsubscribed from the service, the control information, which is included in the CAS information, regarding whether or not contents can be played even in the case of unsubscription is used to decide whether or not to play the contents (S224 and S226).

[103] Step S222 is followed by a step of determining whether or not the right to play the broadcasting contents has expired with reference to the subscriber information provided together with broadcasting contents. Particularly, the step of determining whether or not the right to play broadcasting contents has expired is based on information, which is stored when broadcasting contents are stored or downloaded, and playback right information, which is updated by counting the playback execution time or the number of times of playback execution for each time of playback. If the playback right given in the above process expires, a step of having another playback right issued is additionally conducted (S228 and S230).

[104] When the broadcast-watching terminal 500 plays broadcasting contents through the

above-mentioned steps, the playback execution time or the number of times of playback execution is counted during the playback to create information regarding the remaining playback time or the number of times of remaining playback (S232 and S234).

[105] Although several exemplary 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.

[106]

Industrial Applicability

[107] As mentioned above, the present invention provides a method and a system for storing and playing broadcasting contents, wherein a service is realized based on combination of a CAS system and DRM technology so that a terminal, which is adapted to receive broadcasting signals broadcasted according to a broadcasting schedule, downloads and stores corresponding broadcasting contents according to a preset reservation schedule or executes video/audio recording of broadcasting contents that are currently watched, and a playback right is separately given to the broadcasting contents so that, when the right expires or when the broadcasting contents are solely copied and circulated, the contents are not played, thereby encouraging purchase of the playback right, as well as a right issuing device applied to the same. The inventive system and device have industrial applicability sufficient to be sold on the market and practiced in the field.

[108]

Claims

[1] A method for storing and playing broadcasting contents, the method comprising the steps of:
(a) creating reservation schedule information for each subscriber based on information inputted via a user interface based on a broadcasting system providing a download reservation service with regard to at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal;
(b) executing ERM packaging by the broadcasting system to set use control information regarding the broadcasting contents and executing CAS processing to set and scramble CAS information regarding the broadcasting contents;
(c) multiplexing and broadcasting scrambling data together with broadcast arrangement information, the scrambling data containing the broadcasting contents subjected to DRM packaging and the CAS information, the broadcast arrangement information being created from the broadcasting schedule; and
(d) receiving the broadcasted signal based on the reservation schedule information by the broadcast-watching terminal to download corresponding broadcasting contents.

[2] The method as claimed in claim 1, further comprising a step of:
(e) playing the broadcasting contents after determining whether or not a corresponding subscriber is entitled to play the broadcasting contents based on subscriber information stored in a smart card of the broadcast-watching terminal.

[3] The method as claimed in claim 1 or 2, further comprising a step of:
(f) having a right to play the broadcasting contents issued from the broadcasting system when the right to play the broadcasting contents expires.

[4] The method as claimed in claim 1 or 2, wherein, in step (b), the CAS information comprises at least one of an ECM and an EMM, the ECM being an entitlement control message for protecting the broadcasting contents, the EMM being an entitlement management message comprising an encryption key of the ECM and information regarding a right to download the broadcasting contents, the EMM being used for subscriber authentication.

[5] The method as claimed in claim 4, wherein, when the broadcasting contents are stored in an external memory, the ECM comprises at least one of information regarding whether or not the broadcasting contents can be played in the case of service unsubscription, binding information containing settings regarding whether or not the external memory is bound and regarding whether or not a device is bound to a terminal capable of playing the broadcasting contents, and

playback time (or number of times of playback) of the broadcasting contents, and when the broadcasting contents are stored in an internal memory, the ECM comprises information regarding whether or not the broadcasting contents can be played in the case of service unsubscription.

[6] The method as claimed in claim 1 or 2, wherein, in step (a), the reservation schedule information is created as an SMS message.

[7] The method as claimed in claim 1 or 2, wherein, in step (a), the reservation schedule information comprises an initial time point of download of the broadcasting contents and a final download time point.

[8] The method as claimed in claim 1 or 2, wherein, in step (a), the reservation schedule information is created through a wired terminal adapted for web access to the user interface based on the broadcasting system, through a wireless terminal adapted for WAP access to the user interface based on the broadcasting system, or through a reservation schedule menu automatically executed by the broadcast-watching terminal based on the broadcast arrangement information.

[9] The method as claimed in claim 1 or 2, wherein, in step (b), the use control information comprises at least one of information regarding whether or not the broadcasting contents can be circulated, the number of times of possible playback, and the time of possible playback.

[10] The method as claimed in claim 1 or 2, wherein step (d) comprises the steps of:
(d-1) matching the broadcasted signal with information regarding a list of broadcasting contents, the broadcasting contents having been reserved/designated at a broadcasting time arrived based on the reservation schedule information when the broadcast-watching terminal is executing broadcast watching; and
(d-2) downloading the broadcasting contents based on the matching result.

[11] The method as claimed in claim 1 or 2, wherein step (d) comprises:
(d-1) switching from a sleep mode to an active mode upon receiving the broadcasted signal when the broadcast-watching terminal is not executing broadcast watching;
(d-2) matching the broadcasted signal with information regarding a list of broadcasting contents, the broadcasting contents having been reserved/designated at a broadcasting time arrived based on the reservation schedule information in the active mode; and
(d-3) downloading the broadcasting contents based on the matching result.

[12] The method as claimed in claim 11, wherein step (d-1) further comprises a step of switching from the sleep mode to the active mode based on broadcasting time information contained in the reservation schedule information when the

broadcast-watching terminal is not executing broadcast watching.

[13] The method as claimed in claim 1 or 2, wherein step (d) further comprises a step of determining whether or not the broadcasting contents are to be played by a terminal, an external memory being coupled to the terminal, with reference to binding information regarding whether or not the external memory is bound and regarding whether or not a device is bound to a terminal capable of playing the broadcasting contents, the CAS information comprising the binding information, when the broadcasting contents are stored in the external memory.

[14] The method as claimed in claim 13, wherein the terminal, the external memory being coupled to the terminal, is one of the broadcast-watching terminal or a second broadcast-watching terminal corresponding to the broadcast-watching terminal.

[15] The method as claimed in claim 13, wherein step (d) further comprises a step of playing the broadcasting contents to determine and store the time of playback execution or the number of times of playback execution.

[16] The method as claimed in claim 15, wherein playback of the broadcasting contents is stopped when the time of playback execution or the number of times of playback execution reaches playback time or number of times of playback preset with regard to the broadcasting contents and contained in the CAS information.

[17] A system for storing and playing broadcasting contents, the system comprising:
a download reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal;
a broadcast arrangement management unit for managing broadcast arrangement information regarding the broadcasting schedule;
a DRM packaging unit for executing DRM packaging with regard to the broadcasting contents;
a CAS execution unit for executing CAS processing with regard to the broadcasting contents to set CAS information corresponding to the broadcasting contents; and
a broadcast emission unit for executing scrambling with regard to the broadcasting contents subjected to DRM packaging and the CAS information, and multiplexing and broadcasting the scrambled broadcasting contents and CAS information together with the broadcast arrangement information.

[18] The system as claimed in claim 17, further comprising a right issuing unit for

issuing a playback right when a right of the broadcast-watching terminal to play the broadcasting contents expires.

[19] The system as claimed in claim 18, wherein the right issuing unit comprises:
a DRM right issuer for managing a right issuance authentication key based on a table for identifying the broadcasting contents and issuing the right issuance authentication key at a playback right issuance request; and
a presentation server for delivering the playback right issuance request to the DRM right issuer and delivering the provided right issuance authentication key to the broadcast-watching terminal.

[20] The system as claimed in claim 17, wherein the download reservation setting unit comprises:
an application server for providing the user interface; and
a message transmission server for delivering the reservation schedule information to the broadcast-watching terminal in a message type.

[21] The system as claimed in claim 20, wherein the application server is realized as a web server.

[22] The system as claimed in claim 21, wherein the application server realizes the user interface as a home page.

[23] The system as claimed in claim 20, wherein the message transmission server is an SMS server based on a mobile communication network.

[24] The system as claimed in claim 17, wherein the broadcast-watching terminal is adapted to create the reservation schedule information by means of a reservation schedule menu executed automatically by the terminal based on the broadcast arrangement information.

[25] The system as claimed in claim 17, wherein the broadcast arrangement management unit comprises:
a schedule management server for creating the broadcast arrangement information; and
an EPG server for receiving the broadcast arrangement information and converting the information into an EPG format.

[26] The system as claimed in claim 17, wherein the DRM packaging unit comprises:
a DRM packager for executing DRM packaging with regard to the broadcasting contents; and
a broadcasting contents server for storing the broadcasting contents subjected to DRM packaging.

[27] The system as claimed in claim 17, wherein the CAS execution unit comprises:
an ECM creation module for an ECM, the ECM being an entitlement control message for protecting the broadcasting contents; and

an EMM creation module for creating an EMM, the EMM being an entitlement management message comprising an encryption key of the ECM and information regarding a right to download the broadcasting contents, the EMM being used for subscriber authentication.

[28] The system as claimed in claim 17, wherein the broadcast emission unit comprises:
a CAS scrambler for combining and scrambling the broadcasting contents subjected to DRM packaging and the CAS information;
a multiplexer for multiplexing the scrambled data and the broadcast arrangement information; and
a transmitter for broadcasting the multiplexed signal via a broadcasting network.

[29] A right issuing device for issuing a playback right at a request of a broadcast-watching terminal, the terminal downloading and playing broadcasting contents when a broadcasting time arrives, the broadcasting time having been set by a download reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, the terminal requesting issuance of the playback right via a communication network when a right to play the broadcasting contents expires.

[30] The right issuing device as claimed in claim 29, wherein the right issuing device comprises:
a DRM right issuer for managing a right issuance authentication key based on a table for identifying the broadcasting contents and issuing the right issuance authentication key at a playback right issuance request; and
a presentation server for delivering the playback right issuance request to the DRM right issuer and delivering the provided right issuance authentication key to the broadcast-watching terminal.

[31] A method for storing and playing broadcasting contents, the method comprising the steps of:
(a) creating reservation schedule information for each subscriber based on information inputted via a user interface based on a broadcasting system providing a PVR and PAR reservation service with regard to at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal;
(b) executing compressing/multiplexing with regard to the broadcasting contents by the broadcasting system to create compressed/multiplexed broadcasting contents, and executing CAS processing to set and scramble CAS information regarding the broadcasting contents;

(c) multiplexing and broadcasting scrambling data together with broadcast arrangement information, the scrambling data containing the compressed/multiplexed broadcasting contents and the CAS information, the broadcast arrangement information being created from the broadcasting schedule; and
(d) receiving the broadcasted signal by the broadcast-watching terminal to conduct video/audio recording of corresponding broadcasting contents based on additionally set video/audio recording setting or based on the reservation schedule information.

[32] The method as claimed in claim 31, further comprising a step of:
(e) playing the broadcasting contents after determining whether or not a corresponding subscriber is entitled to play the broadcasting contents based on subscriber information stored in a smart card of the broadcast-watching terminal.

[33] The method as claimed in claim 31 or 32, further comprising a step of:
(f) having a right to play the broadcasting contents issued from the broadcasting system after the right to play the broadcasting contents expires.

[34] A system for storing and playing broadcasting contents, the system comprising:
a video/audio recording reservation setting unit for creating reservation schedule information for each subscriber via a user interface providing a PVR and PAR reservation service regarding at least one piece of broadcasting contents arranged by a broadcasting schedule, and delivering the reservation schedule information to a corresponding broadcast-watching terminal;
a broadcast arrangement management unit for managing broadcast arrangement information regarding the broadcasting schedule;
a compressing/multiplexing unit for executing compressing/multiplexing with regard to the broadcasting contents;
a CAS execution unit for executing CAS processing to set CAS information corresponding to the broadcasting contents; and
a broadcast emission unit for executing scrambling with regard to the compressed/multiplexed broadcasting contents and the CAS information, and multiplexing and broadcasting the scrambled broadcasting contents and CAS information together with the broadcast arrangement information.

[35] The system as claimed in claim 34, further comprising a right issuing unit for issuing a playback right when a right of the broadcast-watching terminal to play the broadcasting contents expires.

[36] A right issuing device for issuing a playback right at a request of a broadcast-watching terminal, the terminal conducting video/audio recording and playback of broadcasting contents when a broadcasting time arrives, the broadcasting time having been set by a PVR and PAR reservation service regarding at least one

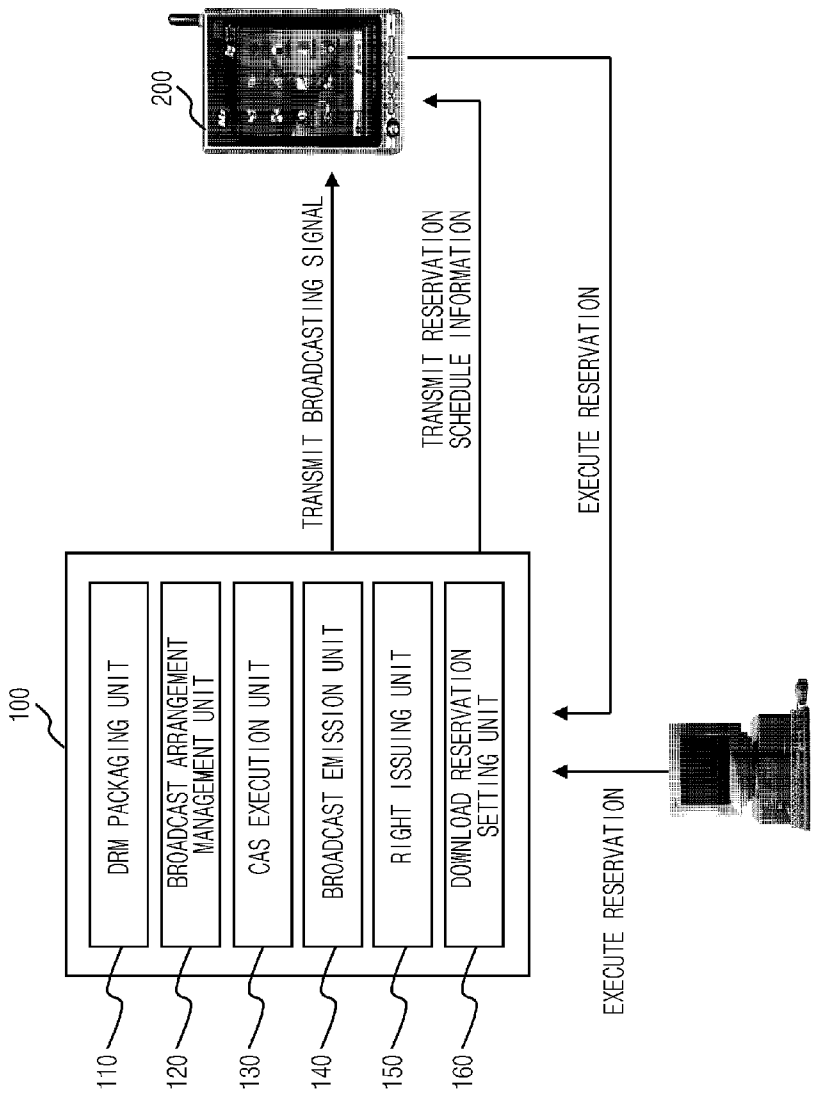
piece of broadcasting contents arranged by a broadcasting schedule, or the terminal conducting video/audio recording and playback of the broadcasting contents based on additional video/audio recording setting while executing the broadcasting contents, and the terminal requesting issuance of the playback right via a communication network when a right to play the broadcasting contents expires.

[37] The right issuing device as claimed in claim 36, wherein the right issuing device comprises:

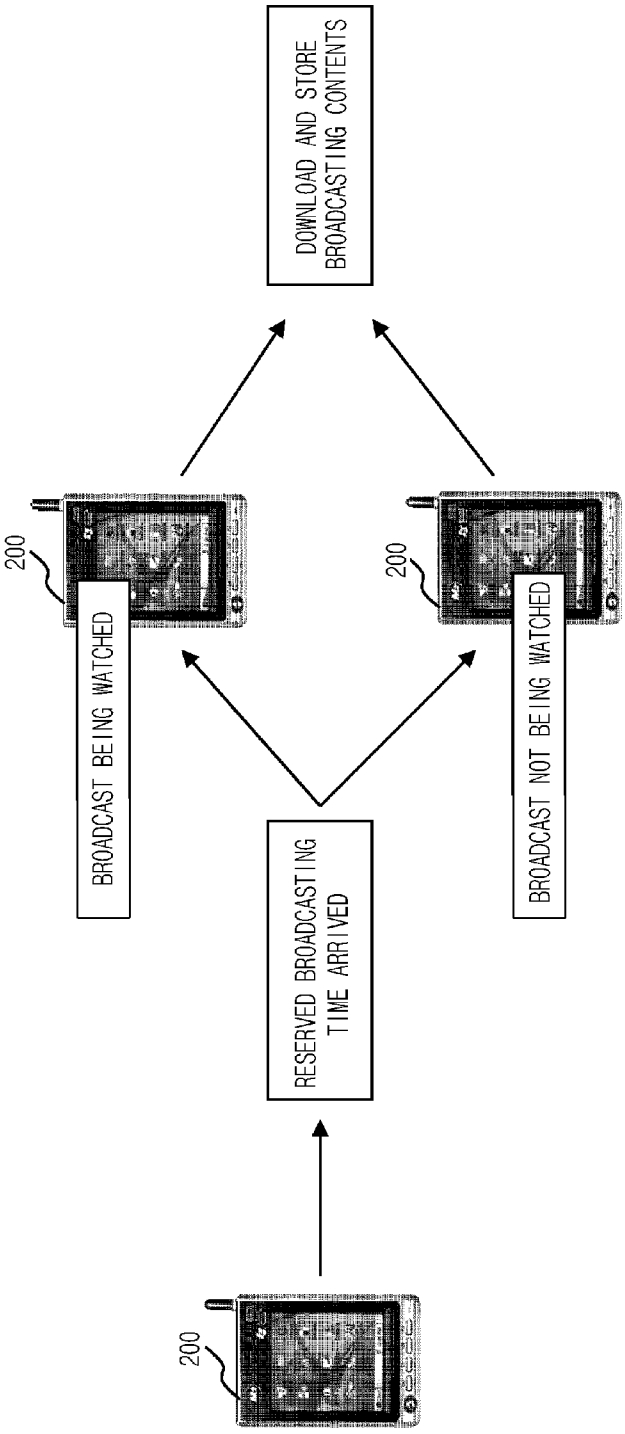
a right issuer for managing a right issuance authentication key based on a table for identifying the broadcasting contents and issuing the right issuance authentication key at a playback right issuance request; and

a presentation server for delivering the playback right issuance request to the right issuer and delivering the provided right issuance authentication key to the broadcast-watching terminal.

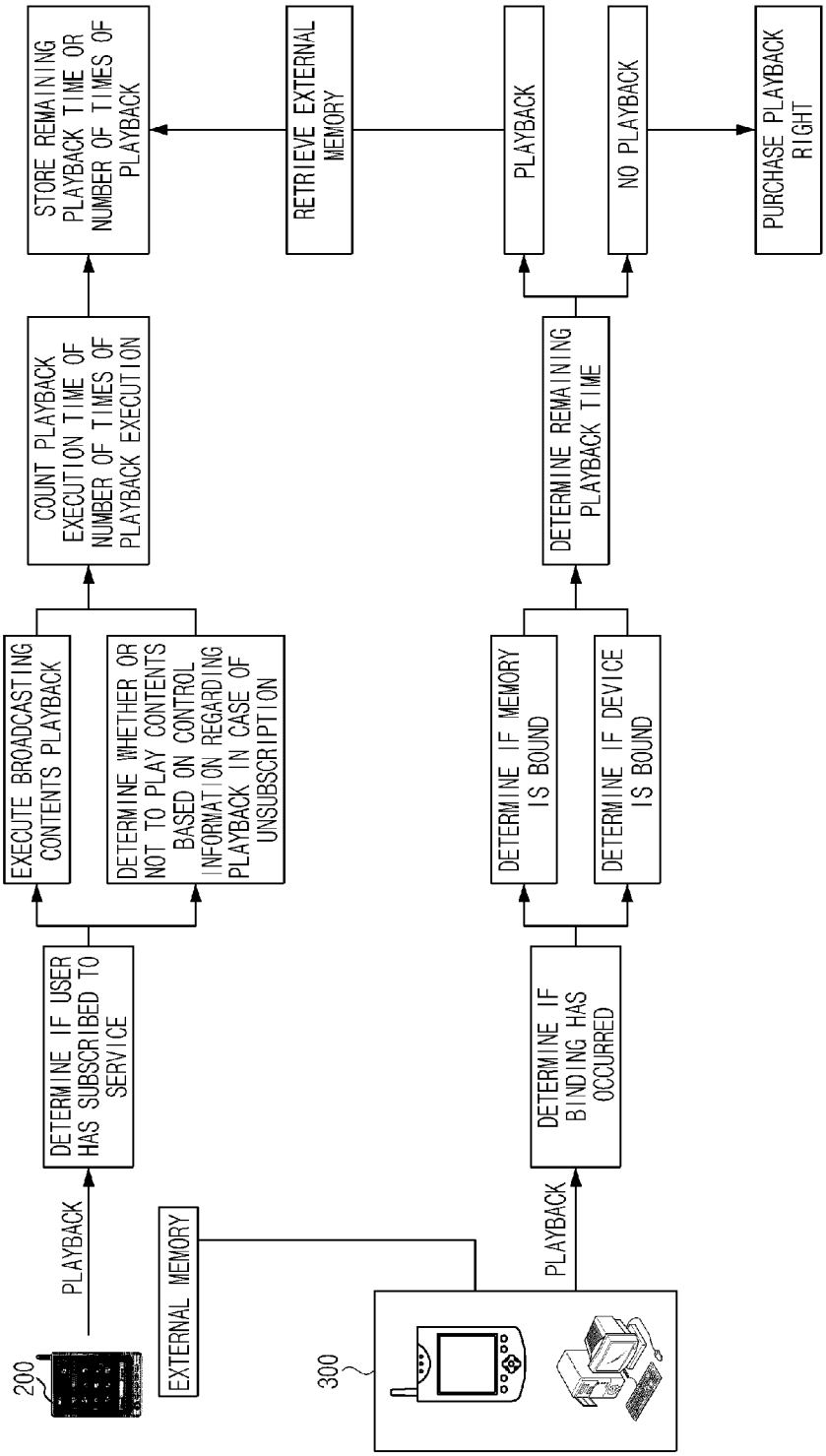
[Fig. 1]


200
TRANSMIT BROADCASTING SIGNAL
TRANSMIT RESERVATION SCHEDULE INFORMATION
EXECUTE RESERVATION
100
DRM PACKAGING UNIT
BROADCAST ARRANGEMENT MANAGEMENT UNIT
CAS EXECUTION UNIT
BROADCAST EMISSION UNIT
RIGHT ISSUING UNIT
DOWNLOAD RESERVATION SETTING UNIT
EXECUTE RESERVATION
110
120
130
140
150
160

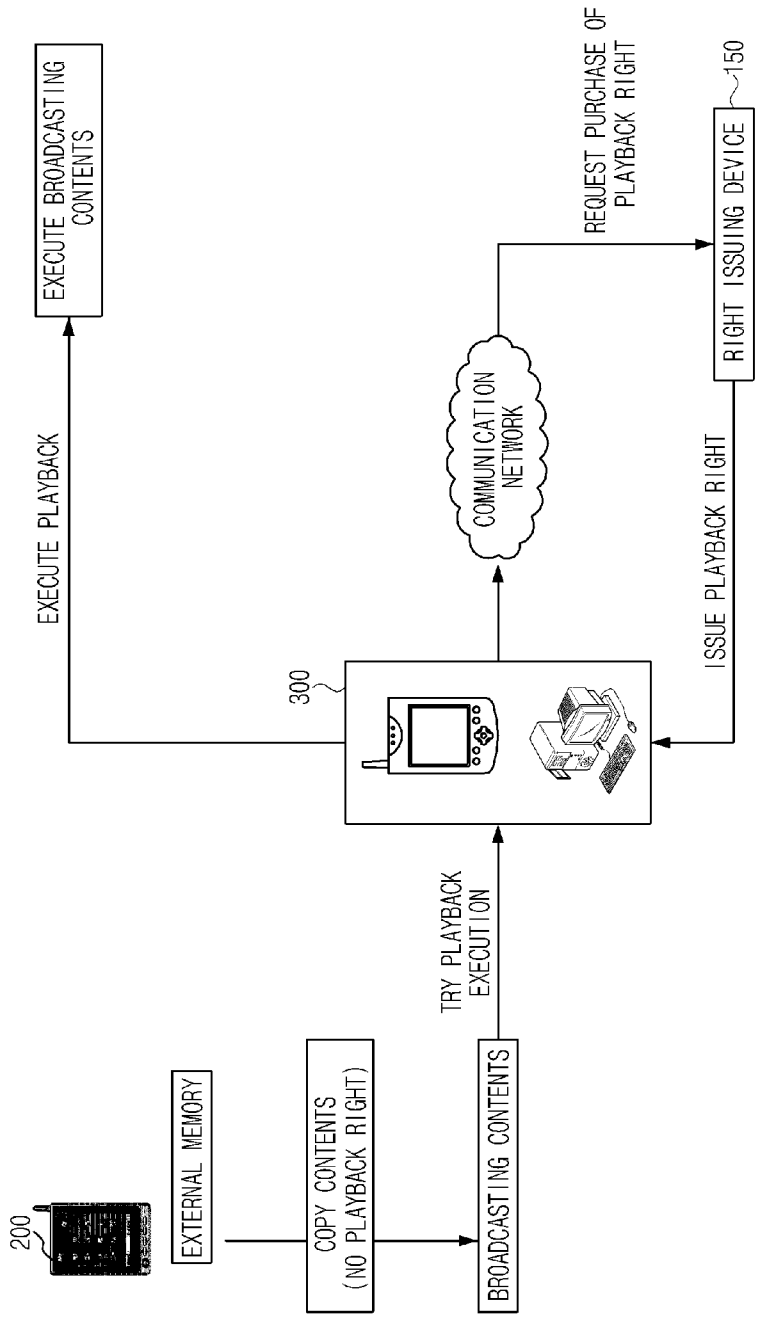
[Fig. 2]


DOWNLOAD AND STORE BROADCASTING CONTENTS
200
BROADCAST BEING WATCHED
200
BROADCAST NOT BEING WATCHED
RESERVED BROADCASTING TIME ARRIVED
200

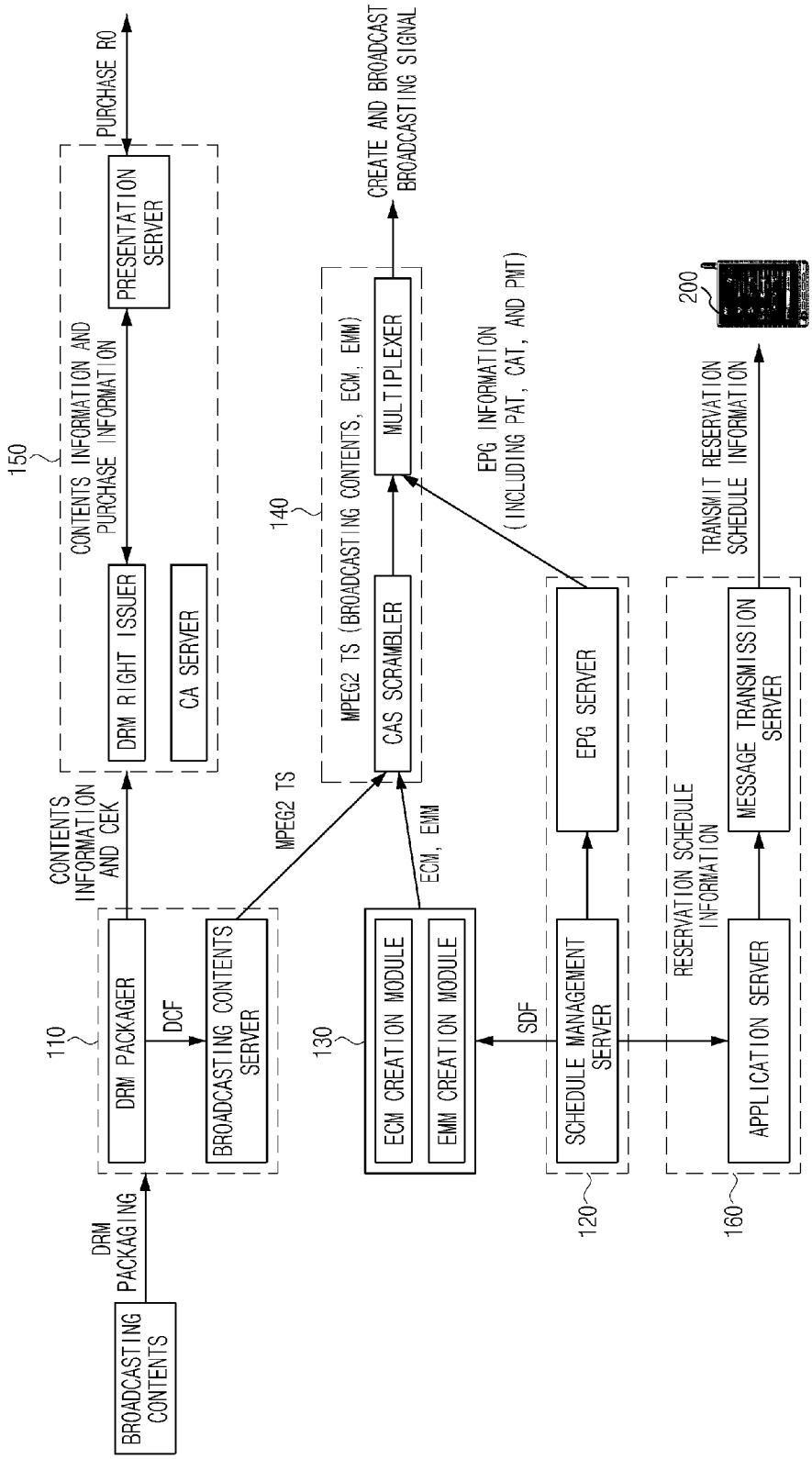
[Fig. 3]


STORE REMAINING PLAYBACK TIME OR NUMBER OF TIMES OF PLAYBACK
RETRIEVE EXTERNAL MEMORY
PLAYBACK
NO PLAYBACK
PURCHASE PLAYBACK RIGHT
COUNT PLAYBACK EXECUTION TIME OF NUMBER OF TIMES OF PLAYBACK EXECUTION
DETERMINE REMAINING PLAYBACK TIME
EXECUTE BROADCASTING CONTENTS PLAYBACK
DETERMINE WHETHER OR NOT TO PLAY CONTENTS BASED ON CONTROL INFORMATION REGARDING PLAYBACK IN CASE OF UNSUBSCRIPTION
DETERMINE IF MEMORY IS BOUND
DETERMINE IF DEVICE IS BOUND
DETERMINE IF USER HAS SUBSCRIBED TO SERVICE
DETERMINE IF BINDING HAS OCCURRED
PLAYBACK
PLAYBACK
EXTERNAL MEMORY
200
300

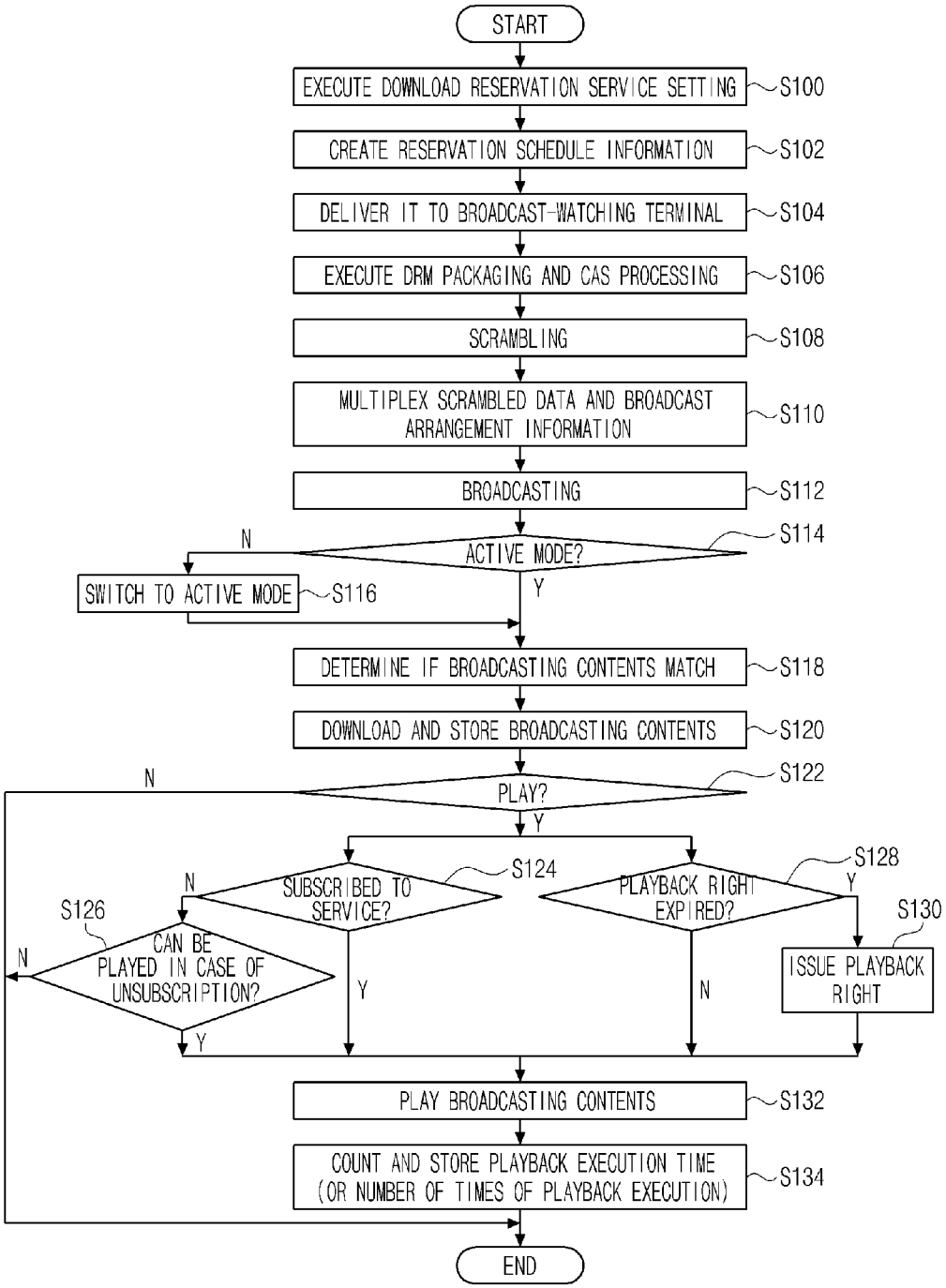
[Fig. 4]


EXECUTE BROADCASTING CONTENTS
REQUEST PURCHASE OF PLAYBACK RIGHT
150
RIGHT ISSUING DEVICE
COMMUNICATION NETWORK
EXECUTE PLAYBACK
300
ISSUE PLAYBACK RIGHT
TRY PLAYBACK EXECUTION
200
EXTERNAL MEMORY
COPY CONTENTS (NO PLAYBACK RIGHT)
BROADCASTING CONTENTS

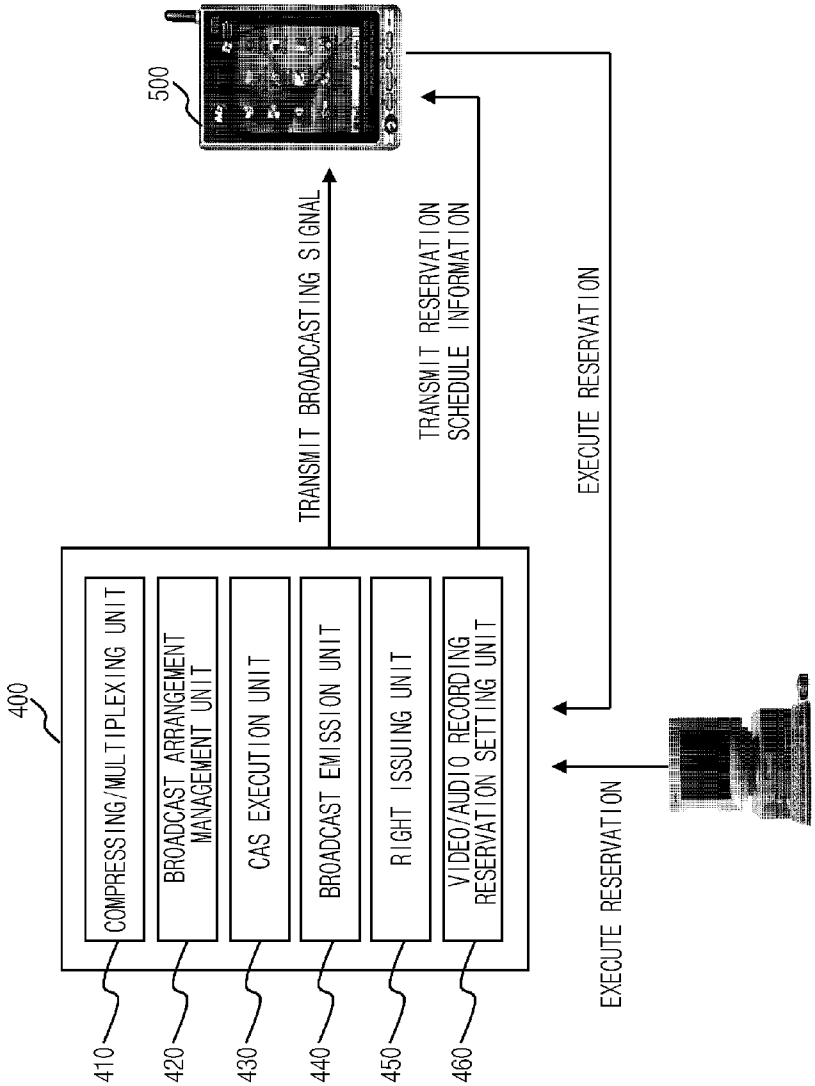
[Fig. 5]


BROADCASTING CONTENTS
DRM PACKAGING
DRM PACKAGER
DCF
BROADCASTING CONTENTS SERVER
110
CONTENTS INFORMATION AND CEK
MPEG2 TS
ECM CREATION MODULE
EMM CREATION MODULE
130
ECM, EMM
SDF
CAS SCRAMBLER
MULTIPLEXER
MPEG2 TS (BROADCASTING CONTENTS, ECM, EMM)
140
CREATE AND BROADCAST BROADCASTING SIGNAL
EPG INFORMATION (INCLUDING PAT, CAT, AND PMT)
SCHEDULE MANAGEMENT SERVER
EPG SERVER
120
RESERVATION SCHEDULE INFORMATION
APPLICATION SERVER
MESSAGE TRANSMISSION SERVER
160
TRANSMIT RESERVATION SCHEDULE INFORMATION
200
DRM RIGHT ISSUER
CA SERVER
CONTENTS INFORMATION AND PURCHASE INFORMATION
150
PRESENTATION SERVER
PURCHASE RO

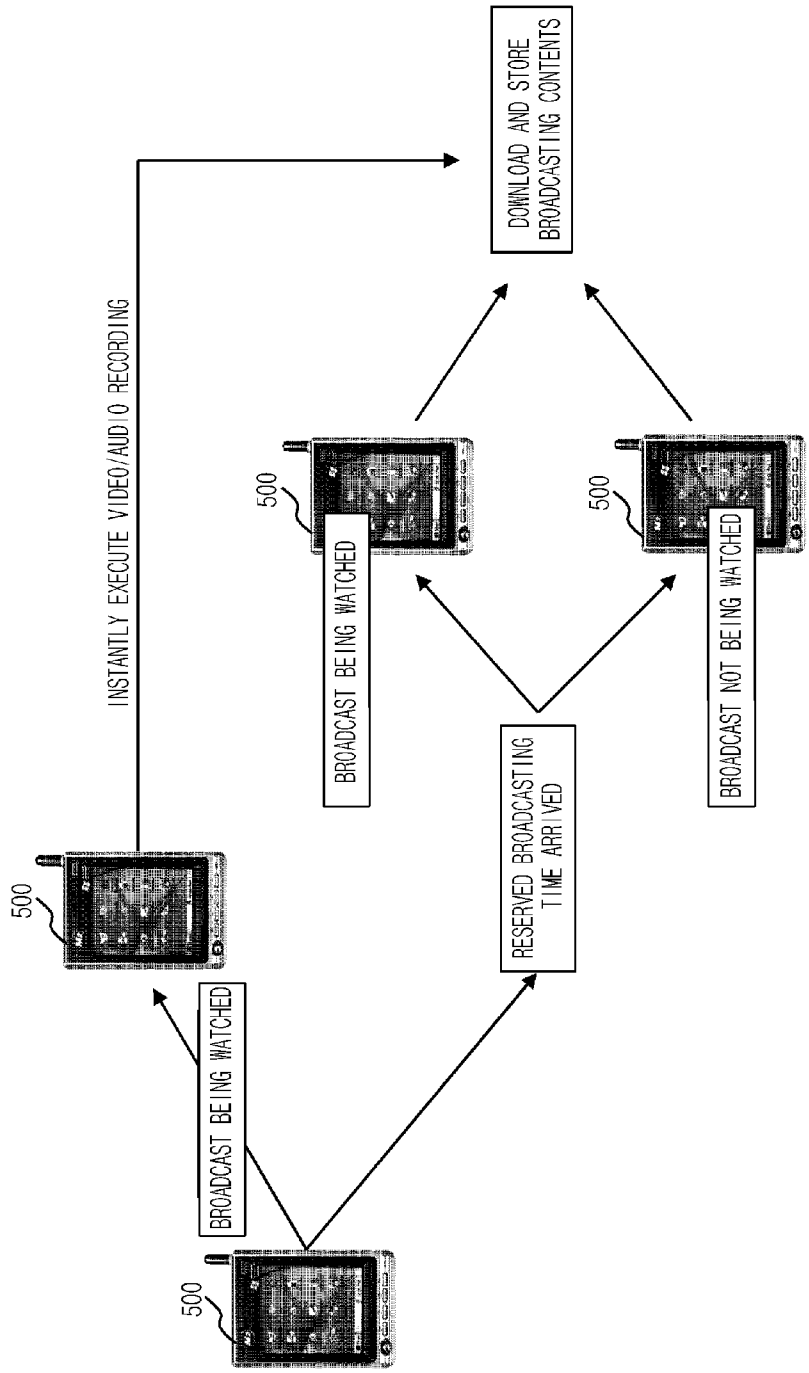
[Fig. 6]


START
EXECUTE DOWNLOAD RESERVATION SERVICE SETTING
S100
CREATE RESERVATION SCHEDULE INFORMATION
S102
DELIVER IT TO BROADCAST-WATCHING TERMINAL
S104
EXECUTE DRM PACKAGING AND CAS PROCESSING
S106
SCRAMBLING
S108
MULTIPLEX SCRAMBLED DATA AND BROADCAST ARRANGEMENT INFORMATION
S110
BROADCASTING
S112
ACTIVE MODE?
S114
N
Y
SWITCH TO ACTIVE MODE
S116
DETERMINE IF BROADCASTING CONTENTS MATCH
S118
DOWNLOAD AND STORE BROADCASTING CONTENTS
S120
PLAY?
S122
N
Y
SUBSCRIBED TO SERVICE?
S124
N
Y
PLAYBACK RIGHT EXPIRED?
S128
Y
N
CAN BE PLAYED IN CASE OF UNSUBSCRIPTION?
S126
N
Y
ISSUE PLAYBACK RIGHT
S130
PLAY BROADCASTING CONTENTS
S132
COUNT AND STORE PLAYBACK EXECUTION TIME (OR NUMBER OF TIMES OF PLAYBACK EXECUTION)
S134
END

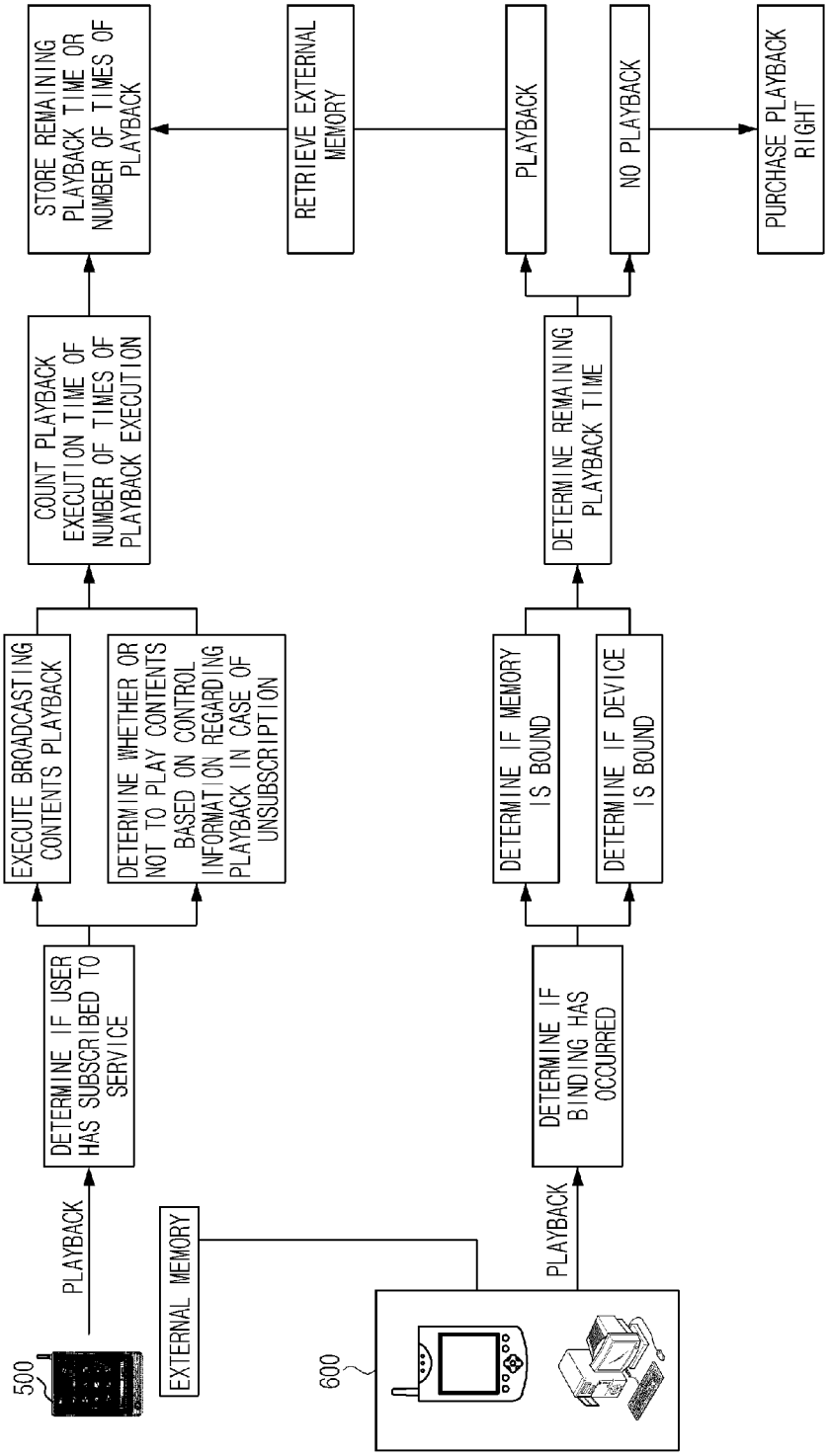
[Fig. 7]


500
TRANSMIT BROADCASTING SIGNAL
TRANSMIT RESERVATION SCHEDULE INFORMATION
EXECUTE RESERVATION
400
COMPRESSING/MULTIPLEXING UNIT
BROADCAST ARRANGEMENT MANAGEMENT UNIT
CAS EXECUTION UNIT
BROADCAST EMISSION UNIT
RIGHT ISSUING UNIT
VIDEO/AUDIO RECORDING RESERVATION SETTING UNIT
410
420
430
440
450
460
EXECUTE RESERVATION

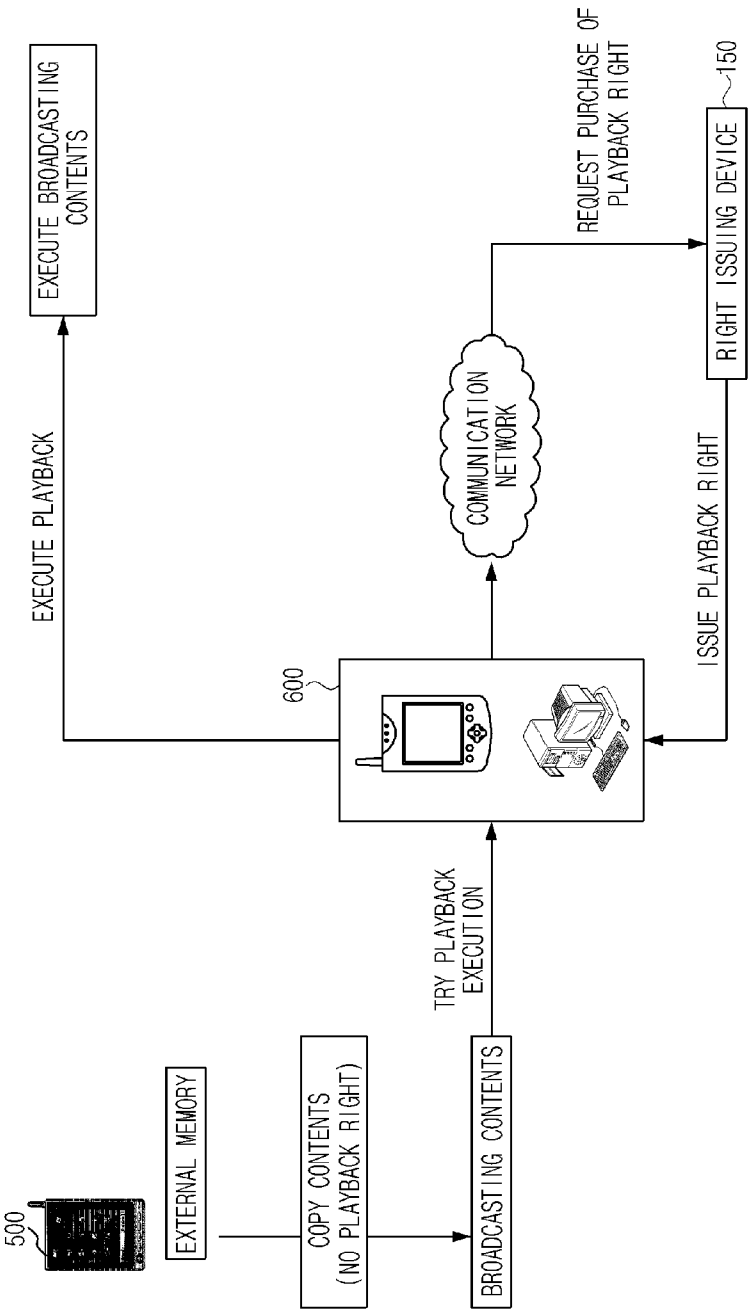
[Fig. 8]


DOWNLOAD AND STORE BROADCASTING CONTENTS
INSTANTLY EXECUTE VIDEO/AUDIO RECORDING
500
BROADCAST BEING WATCHED
500
BROADCAST NOT BEING WATCHED
RESERVED BROADCASTING TIME ARRIVED
500
BROADCAST BEING WATCHED
500

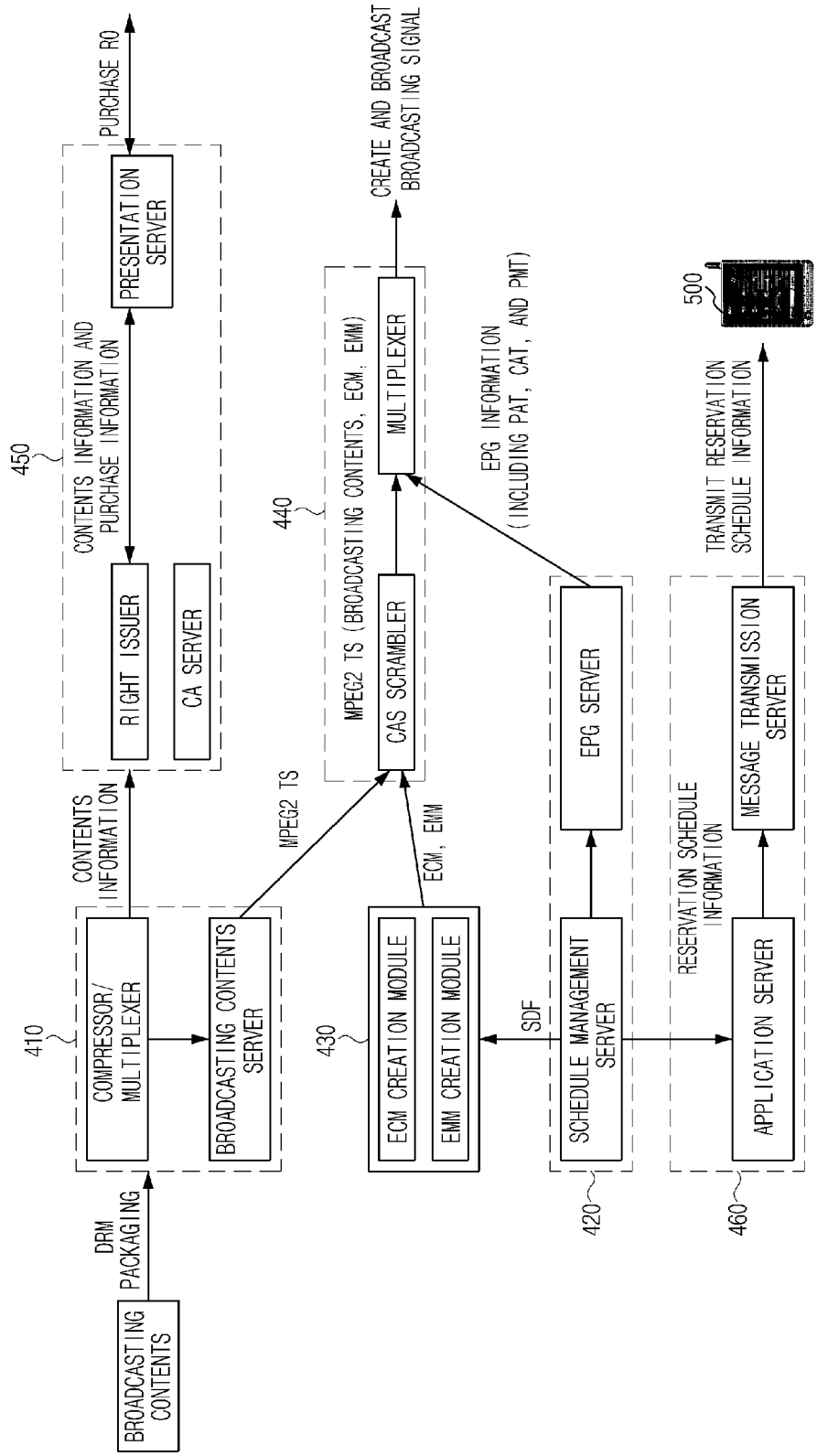
[Fig. 9]


500
PLAYBACK
DETERMINE IF USER HAS SUBSCRIBED TO SERVICE
EXECUTE BROADCASTING CONTENTS PLAYBACK
DETERMINE WHETHER OR NOT TO PLAY CONTENTS BASED ON CONTROL INFORMATION REGARDING PLAYBACK IN CASE OF UNSUBSCRIPTION
COUNT PLAYBACK EXECUTION TIME OF NUMBER OF TIMES OF PLAYBACK EXECUTION
STORE REMAINING PLAYBACK TIME OR NUMBER OF TIMES OF PLAYBACK
EXTERNAL MEMORY
600
PLAYBACK
DETERMINE IF BINDING HAS OCCURRED
DETERMINE IF MEMORY IS BOUND
DETERMINE IF DEVICE IS BOUND
DETERMINE REMAINING PLAYBACK TIME
RETRIEVE EXTERNAL MEMORY
PLAYBACK
NO PLAYBACK
PURCHASE PLAYBACK RIGHT

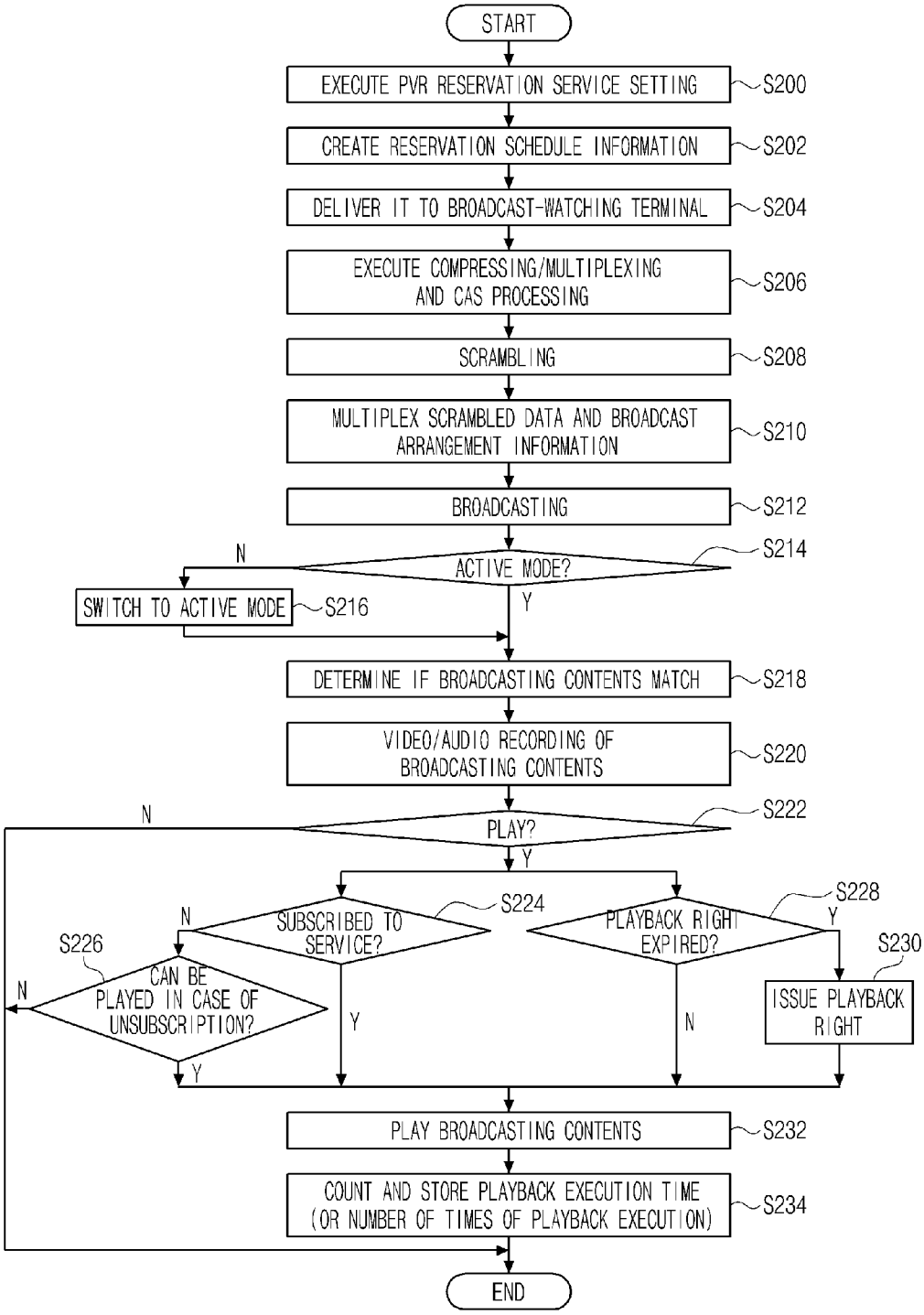
[Fig. 10]


EXECUTE BROADCASTING CONTENTS
REQUEST PURCHASE OF PLAYBACK RIGHT
150
RIGHT ISSUING DEVICE
COMMUNICATION NETWORK
EXECUTE PLAYBACK
ISSUE PLAYBACK RIGHT
600
TRY PLAYBACK EXECUTION
500
EXTERNAL MEMORY
COPY CONTENTS (NO PLAYBACK RIGHT)
BROADCASTING CONTENTS

[Fig. 11]


BROADCASTING CONTENTS
DRM PACKAGING
410
COMPRESSOR/ MULTIPLEXER
BROADCASTING CONTENTS SERVER
CONTENTS INFORMATION
MPEG2 TS
430
ECM CREATION MODULE
EMM CREATION MODULE
ECM, EMM
SDF
440
MPEG2 TS (BROADCASTING CONTENTS, ECM, EMM)
CAS SCRAMBLER
MULTIPLEXER
CREATE AND BROADCAST BROADCASTING SIGNAL
EPG INFORMATION (INCLUDING PAT, CAT, AND PMT)
420
SCHEDULE MANAGEMENT SERVER
EPG SERVER
RESERVATION SCHEDULE INFORMATION
460
APPLICATION SERVER
MESSAGE TRANSMISSION SERVER
TRANSMIT RESERVATION SCHEDULE INFORMATION
500
450
CONTENTS INFORMATION AND PURCHASE INFORMATION
RIGHT ISSUER
CA SERVER
PRESENTATION SERVER
PURCHASE RO

[Fig. 12]


START
EXECUTE PVR RESERVATION SERVICE SETTING
S200
CREATE RESERVATION SCHEDULE INFORMATION
S202
DELIVER IT TO BROADCAST-WATCHING TERMINAL
S204
EXECUTE COMPRESSING/MULTIPLEXING AND CAS PROCESSING
S206
SCRAMBLING
S208
MULTIPLEX SCRAMBLED DATA AND BROADCAST ARRANGEMENT INFORMATION
S210
BROADCASTING
S212
ACTIVE MODE?
S214
N
Y
SWITCH TO ACTIVE MODE
S216
DETERMINE IF BROADCASTING CONTENTS MATCH
S218
VIDEO/AUDIO RECORDING OF BROADCASTING CONTENTS
S220
PLAY?
S222
N
Y
SUBSCRIBED TO SERVICE?
S224
N
Y
PLAYBACK RIGHT EXPIRED?
S228
Y
N
CAN BE PLAYED IN CASE OF UNSUBSCRIPTION?
S226
N
Y
ISSUE PLAYBACK RIGHT
S230
PLAY BROADCASTING CONTENTS
S232
COUNT AND STORE PLAYBACK EXECUTION TIME (OR NUMBER OF TIMES OF PLAYBACK EXECUTION)
S234
END