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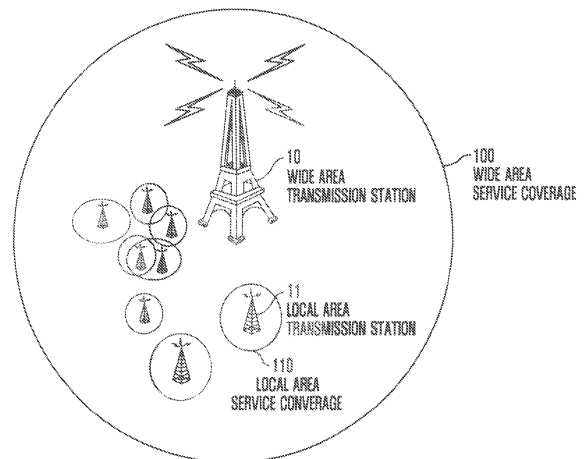
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(54) **Method for Providing Area-Based Broadcasting Service Using Digital Multimedia Broadcasting, and Apparatus and Method for Receiving Area-Based Broadcasting Service according to the same**

(57) Disclosed are a method for providing an area-based broadcasting service based on Digital Multimedia Broadcasting (DMB), and an apparatus and method for receiving the area-based broadcasting service according to the same by dividing service data for each relevant area, which may be a wide area or a local area, and transmitting the divided data through different sub-channels of a Main Service Channel (MSC). Accordingly, a terminal of a reception part receives only service data associated with the position of the terminal and provides the received data to a user to provide the area-based broadcasting service. The method for providing the area-based broadcasting service using DMB includes receiving a DMB transmission frame broadcasted from a DMB transmission server and a middle step to insert local area service-related data in the received DMB transmission frame to retransmit the frame.

FIG. 1



Description

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] The present invention claims priority of Korean Patent Application Nos. 10-2008-0044174 and 10-2003-0130544, filed on May 13, 2008, and December 19, 2008, respectively, which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to an area-based broadcasting service using a digital multimedia broadcasting (DMB); and more particularly, to a method for providing an area-based broadcasting service based on DMB, and an apparatus and method for receiving the area-based broadcasting service according to the same by dividing service data for each relevant area, which may be a wide area or a local area, and transmitting the divided data through different sub-channels of a Main Service Channel (MSC). Accordingly, a terminal of a reception part receives only service data associated with the position or the terminal and provides the received data to a user to provide the area-based broadcasting service.

Description of Related Art

[0003] The development and standardization of a mobile broadcasting technology are now actively under the progress all over the world. This is for providing various types of multimedia services including a television (TV) broadcasting service or a radio broadcasting service to a moving user, for example, a walking user or an user at a fixed location through a mobile device without requiring a specific place.

[0004] To provide the various multimedia services, Korea has developed a Terrestrial-Digital Multimedia Broadcasting (T-DMB) technology and is providing a common service for it. European countries have developed a Digital Video Broadcasting Handheld (DVB-H) technology as a system similar to T-DMB and is providing a common service for it. Some European countries are preparing the providing of a DVB-H service. Moreover, America has developed a Forward Link Only (FLO) system for the same purpose and is already in the providing stage of it. Herein, the FLO is a portable digital broadcasting standard proposed by Qualcomm, which is a Code Division Multiple Access (CDMA) modem-chip manufacturer, and is a transmission technology sending broadcasting contents to mobile devices by using a Very High Frequency (VHF) band and an Ultra High Frequency (UHF) band which are frequency bands for broadcasting.

[0005] The standard technology of each country is for providing various types of services without stopping even in the middle of moving at high speed, and particularly the FLO system provides an area-based service.

5 [0006] To provide the detailed concept description of the FLO, the FLO system divides services into a wide area service and a local area service according to the coverage of a broadcasting signal, and uses a method of separately providing the services at different service bands. In order for a user terminal to receive service data that are separately transmitted by an area, the FLO system uses a method that separately constructs service-related information which is wide area overhead symbol information and local area overhead symbol information, and transmits them.

15 [0007] In a case where a service is provided based on the above-described FLO concept, the FLO system can very efficiently provide a wide area service which is common to all areas and a local area service which is confined to a specific area while efficiently using a frequency under Single Frequency Network (SFN).

20 [0008] In a case of the T-DMB, position information for an area-based service and service information for interworking a corresponding position and a relevant service are standardized. However, a separate local area service channel for a local area service is not defined, and a local channel segmentation scheme of a local area service channel for an efficient transmission is also not defined. That is, in a case of present T-DMB, any regulation related to channel definition or local channel segmentation in association with the providing of a local area service is not established.

25 [0009] In transmitting multimedia data by using a specific frequency, a present Digital Audio Broadcasting (DAB)/Digital Multimedia Broadcasting (DMB) service, moreover, uses a broadcasting system that transmits the same service, which is the same program, to all areas to which a corresponding DAB/DMB signal is transmitted. That is, there is a limitation that the DAB/DMB system must provide the same program to all areas to which a corresponding broadcasting signal is transmitted.

30 [0010] Particularly, in a case of SFN, since a DMB signal must be identical within an area which pertinent broadcasting covers in terms of characteristics of the SFN, the present DAB/DMB standard makes it impossible to transmit a service which is a program or data confined to only any local area which is within a corresponding coverage, and the SFN is also very inefficient in terms of using a frequency.

SUMMARY OF THE INVENTION

35 [0011] An embodiment of the present invention is directed to a method for providing an area-based broadcasting service based on digital multimedia broadcasting (DMB), and an apparatus and method for receiving the area-based broadcasting service according to the same, which can provide a broadcasting service associated with

a corresponding area by a segmented area.

[0012] In accordance with an aspect of the present invention, there is provided a method for providing an area-based broadcasting service using a DMB including a step to receive a DMB transmission frame broadcasted from a DMB transmission server and a middle step to insert a local area service-related data in the received DMB transmission frame to retransmit the frame.

[0013] In accordance with another aspect of the present invention, there is provided an apparatus for receiving an area-based broadcasting service including a position information acquiring unit configured to acquire position information of the reception apparatus; a broadcasting reception processing unit configured to receive a broadcasting signal to acquire service/multiplexing information, and divide local area service data related to a current position from the broadcasting signal using the acquired position information and service/multiplexing information; and a area-based service processing unit configured to provide a corresponding area-based service by position with divided local area service data.

[0014] Other objects and advantages of the present invention can be understood by the following description, and become apparent with reference to the embodiments of the present invention. Also, it is obvious to those skilled in the art to which the present invention pertains that the objects and advantages of the present invention can be realized by the means as claimed and combinations thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Fig. 1 is a conceptual diagram of a wide/local area service in accordance with an embodiment of the present invention.

[0016] Fig. 2 is a configuration diagram of a transmission frame for a local area service in accordance with an embodiment of the present invention.

[0017] Fig. 3 is a block diagram of a system for providing an area-based broadcasting service based on Digital Multimedia Broadcasting (DMB) in accordance with an embodiment of the present invention.

[0018] Fig. 4 is a flowchart illustrating a method for registering a new area provider in a local broadcasting network management system in accordance with an embodiment of the present invention.

[0019] Fig. 5 is a block diagram illustrating a system for providing a area-based broadcasting service based on DMB in accordance with another embodiment of the present invention.

[0020] Fig. 6 is a block diagram of an apparatus and terminal for receiving an area-based broadcasting service in accordance with an embodiment of the present invention.

[0021] Fig. 7 is a flowchart illustrating a method for receiving an area-based broadcasting service in an auto announcement mode in accordance with an embodiment of the present invention.

[0022] Fig. 8 is a flowchart illustrating a method for receiving an area-based broadcasting service upon a user's request in accordance with an embodiment of the present invention.

[0023] Fig. 9 illustrates a business model provided in accordance with an embodiment of the present invention.

DESCRIPTION OF SPECIFIC EMBODIMENTS

[0024] Embodiments of the present invention divide service data by relevant area which is a wide area or a local area to transmit the divided data at the different sub-channels of a Main Service Channel (MSC), and receive only service data associated with the position of a terminal to provide received data to a user in a reception position, in providing an area-based broadcasting service.

[0025] That is, embodiments of the present invention divide MSC for transmission of area-based service data into a wide area service channel and a local area service channel, and separately transmit area-based service data through the wide area service channel and the local area service channel.

[0026] The advantages, features and aspects of the invention will become apparent from the following description of the embodiments with reference to the accompanying drawings, which is set forth hereinafter. Accordingly, those skilled in the art will easily be capable of embodying the spirit and scope of the present invention. In the following description, when the detail description of the relevant known function or configuration is determined to unnecessarily obscure the important point of the present invention, the detail description will be omitted. Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0027] Fig. 1 is a conceptual diagram of a wide/local area service in accordance with an embodiment of the present invention.

[0028] To provide the area-based broadcasting service, as illustrated in Fig. 1, an embodiment of the present invention divides a broadcasting area, which is a broadcasting service coverage, into a wide area service coverage 100 and a local area service coverage 110. Herein, the local area denotes a small area disposed in any area capable of being called the wide area 100.

[0029] A wide area transmission station 10 of Fig. 1 is a transmission station transmitting a DMB signal for the wide area service corresponding to the conventional DMB service, and there may be one or more local area transmission stations 11 in the coverage.

[0030] A service common to the wide area may be provided through the wide area transmission station 10, and a position-based service or an area-based service confined to a corresponding area may be provided through the local area transmission station 11.

[0031] To provide the above-described service, a DAB/DMB system divides services by an area, classifies the divided service as a separate band which is a seg-

ment, and transmits it. For this, service information is also divided and provided by the area. Alternatively, although the service information is constructed together, the DAB/DMB system must divide and provide services according to the divided areas.

[0032] Moreover, service data, which are divided according to areas, must separately be divided and transmitted in a data channel, which is an MSC channel, assigning and transmitting an actual service data.

[0033] Fig. 2 is a configuration diagram of a transmission frame for a local area service in accordance with an embodiment of the present invention. Hereinafter, a method for providing the area-based broadcasting service illustrated in Figs. 3 and 5 will be described with reference to the configuration of a DMB transmission frame.

[0034] As illustrated in Fig. 2, the DMB transmission frame 20 is composed of a plurality of Orthogonal Frequency Division Multiplexing (OFDM) symbols, and the each symbol includes an actual data for a service. As illustrated in Fig. 2, the actual data is divided into a Fast Information Channel (FIC) 21 and a Main Service Channel (MSC) 22. Herein, FIC 21 includes multiplexing information and the service information for actual transmitted services, and MSC 22 includes an actual service data.

[0035] An embodiment of the present invention divides MSC 22 into a wide area channel 221, which is the wide area service channel, and a local area service channel 222, which is the local area service channel, for the area-based broadcasting service, and each of the divided channels includes service data divided by the area.

[0036] Moreover, the local area service channel (band) 222 is divided into a plurality of local segments on the basis of a frequency and a time slot, and the respective local segments are individually allocated on respective local areas for the local area service. At this point, different segments are allocated on adjacent local area. Service data confined to a corresponding local area are inserted in the allocated segment.

[0037] An embodiment of the present invention is to provide the area-based broadcasting service by using DMB (see Figs. 3 and 5), and a local broadcasting service provider 32 (for example, SK Telecom, Korea Telecom and the like) or a local provider 52 receives the DMB transmission frame 20 broadcasted from the DMB transmission servers 300 and 500 of T-DMB providers 30 and 50, for example, Korea Broadcasting System (KBS), Munhwa Broadcasting Corporation (MBC) and the like), and thereafter inserts a local area service data and pertinent local area service/multiplexing information, which is multiplexing information and service information associated with the local area service, for the area-based service in the received DMB transmission frame 20 and retransmits it (see Figs. 3 and 5).

[0038] Herein, only data which are service data, the service information, and the multiplexing information associated with the wide area service are included in the DMB transmission frame 20 transmitted from the DMB transmission servers 300 and 500 of T-DMB providers

30 and 50 (i.e., data related to the local area service is not included), but an area, in which data which is service data, service information, and multiplexing information associated with the local area service are inserted later, has been already allocated to the DMB transmission frame 20.

[0039] Accordingly, when the local broadcasting service provider 32 or the local provider 52 receives the DMB transmission frame which is an area to which data associated with the local area service are inserted is allocated the local broadcasting service provider 32 or the local provider 52 inserts data which are service data, the service information, and the multiplexing information associated with the local area service in the received DMB transmission frame 20 and retransmits it.

[0040] The local broadcasting service provider 32 or the local provider 52 inserts a local area service data in the corresponding area (segment) of the local area service channel 222, and the local area service information and/or the multiplexing information may be inserted in three types below.

[0041] A first type is a case where the local area service information and/or the multiplexing information are inserted in FIC 21, a second type is a case where the local area service information and/or the multiplexing information are inserted in the corresponding area (segment) of the local area service channel 222 which is a case where both the service data and the service/multiplexing information are inserted in MSC 22, and a third type is a case where the local area service information and/or the multiplexing information are separately inserted in FIC 21 and the corresponding area (segment) of the local area service channel 222.

[0042] To provide a detailed description of the separate insertion case being the third type, the local broadcasting service provider 32 or the local provider 52 may divide into the service information and the multiplexing information to thereby insert them, or may insert the service information and the multiplexing information in FIC 21 without dividing them and may insert the remaining information in the corresponding area (segment) of the local area service channel 222.

[0043] Fig. 3 is a block diagram of a system for providing a area-based broadcasting service using DMB in accordance with an embodiment of the present invention. Hereinafter, the following description will be made on both the system for providing an area-based broadcasting service using DMB in accordance with an embodiment of the present invention and a method for providing a area-based broadcasting service using DMB in the same.

[0044] The DMB transmission server 300 of the T-DMB provider 30 includes an encoder 301 individually encoding T-DMB audio, video, or data and an ensemble multiplexer 30 multiplexing the encoded result to generate a wide area ensemble, which includes a DMB transmission stream for the wide area service, is included in the wide area ensemble). The T-DMB provider 30 transmits the

generated wide area ensemble to a wide area transmission station and/or the local broadcasting service provider 32.

[0045] The local broadcasting service provider 32 (for example, SKT, KTF and the like) is a subject providing local broadcasting in place of the local providers 33, and takes charge of local broadcasting subscription, billing, management, local broadcasting distribution and transmission. That is, the local broadcasting service provider 32 takes charge of the subscription of the local provider 33, billing and management through the local broadcasting network management system 322, and allocates local area segments on the basis of Geographic Information System (GIS) information (see Fig. 2). The following description will be made with reference to Fig. 4 on the detailed operation process of the local broadcasting management system 322.

[0046] The local broadcasting service provider 32 includes an ensemble multiplexer 320, a local broadcasting server 321, the local broadcasting network management system 322, and a local broadcasting distribution system 323. Hereinafter, each element will be described in detail below.

[0047] The ensemble multiplexer 320 inserts the multiplexing information or service information associated with the local area service and the local area service data transmitted from the local broadcasting server 321 in the wide area ensemble, which is the DMB transmission stream, transmitted from the T-DMB provider 30. That is, the ensemble multiplexer 320 inserts data related to a corresponding local area service in each segment (see Fig. 4) for a plurality of local providers registered through the local broadcasting network management system 322.

[0048] The local broadcasting server 321 receives local broadcasting contents, which are local area service data, from the local broadcasting content provider 31, compresses and multiplexes the local broadcasting contents, which are local area service data, to be suitable for a local broadcasting service standard, and transfers the compressed and multiplexed data to the ensemble multiplexer 320.

[0049] The local broadcasting network management system 322 controls the multiplexing of the ensemble multiplexer 320, and the local broadcasting distribution system 323 transmits and distributes an ensemble, which is the DMB transmission stream, generated by the ensemble multiplexer 320 to local area transmitters through a distribution network.

[0050] Then, the local broadcasting transmission system 330 of the each local provider 33 transmits and relays the transmitted ensemble to a corresponding local area through the distribution network.

[0051] Fig. 4 is a flowchart illustrating a method for registering a new area provider in the local broadcasting network management system in accordance with an embodiment of the present invention.

[0052] Referring to Fig. 4, the local broadcasting net-

work management system 322 allocates the sub-channels of MSC for the local area service in operation S400, and divides the allocated sub-channel into a plurality of local area segments in operation S402.

[0053] When there exists a new area provider, which is a local area provider, in operation S404, and the local broadcasting network management system 322 allocates the divided local area segments to the new area provider by the area in operation S406, wherein allocation is not a set state but a temporary allocated state. The allocation of the local area segment is performed using information stored in a local area segment database (DMB).

[0054] When the temporary allocated local area segment is a segment pre-allocated to an adjacent area in operation S408, the local area segment is reallocated via the operation S406.

[0055] In operations S406 and S408, the local broadcasting network management system 322 allocates the segment to the new area provider by the area. Herein, the operations S406 and S408 represent an operation where the local broadcasting network management system 322 allocates the segment not to duplicate the segment in adjacent areas by using the local area segment DB (see Fig. 2).

[0056] When the local area segment allocated to the new area provider is not the same as a segment of the adjacent area, the segment allocated in operation S406 is finally set, and consequently a corresponding new area provider is registered in the local area segment DB in operation S410.

[0057] Fig. 5 is a block diagram illustrating a system for providing an area-based broadcasting service using DMB in accordance with another embodiment of the present invention, and represents an embodiment type different from the system of Fig. 3. Hereinafter, the following description will be made on both the system for providing an area-based broadcasting service using DMB in accordance with another embodiment of the present invention and a method for providing an area-based broadcasting service using DMB in the same.

[0058] The T-DMB global provider 50 includes a DMB transmission server 500 including an encoder 501 and an ensemble multiplexer 502, and a broadcasting stream distributor 503. Herein, the functions of the encoder 501 and the ensemble multiplexer 502 are the same as those described above with reference to Fig. 3, and the broadcasting stream distributor 503 transmits a broadcasting stream to a local area transmission station as well as a wide area transmission station.

[0059] In providing the local broadcasting service, Fig. 5 represents a case where each local provider, which is the local area provider, individually provides an area-based service without a local broadcasting service provider. This is a case where the local provider 52 performs up to the function of the local broadcasting service provider, and the content encoding of an encoder 521, the multiplexing of a local broadcasting service multiplexer

522 and the transmission of a local broadcasting transmitter 523 and a base station 524 are individually performed in a place where the local provider 52 is.

[0060] That is, the each local provider 52 receives the broadcasting stream, which is the DMB transmission stream, transmitted by the T-DMB global provider 50, and inserts data for example, service data and service/multiplexing information, associated with a corresponding local area service in the received broadcasting stream, which is the DMB transmission stream, and transmits it. At this point, the each local provider 52 inserts a corresponding local area service data in a specific area which is a specific segment of the MSC allocated to it. Consequently, a user in each local area receives a corresponding local area service as well as the wide area service through its DMB reception terminal.

[0061] To efficiently provide the above-described service, the multiplexing information and the service information which correspond the wide area service and the local area service must be provided, whereas the multiplexing information and the service information may be included in the FIC and may be transmitted together with it in general.

[0062] In short, the multiplexing/service information associated with the wide area service and the multiplexing/service information associated with the local area service, which are included in FIC, are transmitted together with FIC, or the multiplexing and service information related to the wide area service may be included in the FIC (reference numeral 21 of Fig. 2) to thereby be provided together with it and the multiplexing and service information associated with the local area service may be included in a separate local area service channel 222 of MSC 22 to thereby be provided together with it. As another example, in a case where all service information cannot be provided through FIC 21, the system may allocate a separate MSC and may provide the service information as one service data.

[0063] Fig. 6 is a block diagram of an apparatus and terminal for receiving an area-based broadcasting service in accordance with an embodiment of the present invention.

[0064] Referring to Fig. 6, the apparatus and terminal for receiving an area-based broadcasting service in accordance with an embodiment of the present invention, referred to as DMB reception terminal hereafter, includes a broadcasting reception processing unit 61, an area-based service processing unit 62, and a position information acquiring unit 63. The following description will be made on each element. Since the function of a general DMB reception terminal is the same as that of the DMB reception terminal which receives a broadcasting signal, separates/recovers a wide area service data from the received signal and provides a corresponding wide area broadcasting service, the following description will be focused on a local area service.

[0065] The broadcasting reception processing unit 61 corresponds to a general DAM/DMB signal processing

module, and receives wide area service data and local area service data transmitted according to the method for providing the area-based broadcasting service and recovers the received data into the original data. Moreover, the broadcasting reception processing unit 61 supports function modules such as a tuner, a baseband processing module, a data decoder and audio/video (AV) which are necessary for the existing DAB/DMB terminal, and divides the broadcasting service data which are a separate transmitted area-based broadcasting service data in the MSC for the area-based broadcasting service.

[0066] More specifically, the broadcasting reception processing unit 61 receives a broadcasting signal to thereby acquire Service Information (SI) and/or Multiplexing Configuration Information (MCI), referred to as multiplexing information hereinafter, for the area-based broadcasting service, and separates a service data which are wide area service data or local area service data associated with a corresponding position from the received broadcasting signal by using the acquired multiplexing/service information.

[0067] Herein, the separating function means a function that extracts only a corresponding slot which is divided into the frequency axis and the time axis and is assigned, and constructs a corresponding service data. In relation to the local area service, the broadcasting reception processing unit 61, particularly, separates and extracts a corresponding local area service data from a segment associated with a current position among the local area channels.

[0068] Subsequently, the area-based service processing unit 62 receives position information transferred from the position information acquiring unit 63 or service data related to position information desired by a user from the broadcasting reception processing unit 61, and provides a corresponding service to the user. In relation to the local area service, the area-based service processing unit 62 provides a corresponding area-based service by position with a local area service data separated from the broadcasting reception processing unit 61.

[0069] Moreover, when there is a user's request, the area-based service processing unit 62 may separately provide the service information or program guide information by pertinent position. This is a type similar to the existing Electronic Program Guide (EPG), but embodiments of the present invention construct the service information and the program guide information by pertinent position.

[0070] The area-based service processing unit 62 has a function that automatically announces the presence of the area-based broadcasting service or provides it upon a user's request. The auto announcement function denotes a function in which a terminal autonomously measures its position even in the absence of a separate user's request, and automatically announces the user of a service and contents related to the corresponding position when the service and the contents exist.

[0071] The position information acquiring unit 63

measures the position information of a corresponding terminal, which is the DMB reception terminal, by a signal transmitted from a Global Positioning System (GPS) satellite or a DMB transmission station, wherein the position information includes altitude, latitude and longitude. The position information acquired through the position information acquiring unit 63 is transferred to the area-based service processing unit 62.

[0072] Fig. 7 is a flowchart illustrating a method for receiving an area-based broadcasting service in an auto announcement mode in accordance with an embodiment of the present invention, and represents the operation process of the DMB reception terminal of Fig. 6.

[0073] A case of an auto announcement mode, the DMB reception terminal of Fig. 6 measures the position information of a corresponding terminal through the position information acquiring unit 63 in operation S700. The DMB reception terminal acquires position-based service information via an MCI/SI reception process in operation S702.

[0074] Subsequently, the DMB reception terminal compares the acquired position information with the acquired service information to check whether a service corresponding to the position information exists in operation S704.

[0075] When the service related to the position information exists as a result of the check, the DMB reception terminal receives corresponding position-based service data through the broadcasting reception processing unit 61 in operation S706. Then, the DMB reception terminal provides a program or contents associated with a corresponding service to a user through a monitor or a speaker in operation S708.

[0076] Fig. 8 is a flowchart illustrating a method for receiving the area-based broadcasting service upon a user's request in accordance with an embodiment of the present invention, and represents the operation process of the DMB reception terminal of Fig. 6.

[0077] When there is a user's request, the DMB reception terminal measures position information through the position information acquiring unit 63 or directly receives specific position information from the user in operation S800. The DMB reception terminal performs an MCI/SI reception process in operation S802, and constructs the service information of position-based broadcasting provided through a separate channel in operation S804.

[0078] The DMB reception terminal compares the acquired position information with the constructed service information, constructs a service corresponding to the position information, and provides the constructed service to the user. When the user selects a specific service, the DMB reception terminal receives only a service data for the selected service in operation S808. When there exists only one independent service in relation to a corresponding position as a construction result of the position-based service in operation S804, some embodiments of the present invention may allow the DMB reception terminal to receive a corresponding service data

without a user's selection.

[0079] Subsequently, the DMB reception terminal provides a program or contents associated with a corresponding service to the user through a monitor or a speaker in operation S810.

[0080] Embodiments of the present invention provide a position-based broadcasting service at a separate segmented service channel, and thus can simultaneously provide a wide area-based service and a local area service even without allocating an additional frequency in SFN environments.

[0081] That is, embodiments of the present invention can maintain a broadcasting coverage for a wide area service by the T-DMB of SFN as it is, and simultaneously can provide a local area service even while maintaining backward compatibility to the existing broadcasting reception terminal.

[0082] Embodiments of the present invention can also provide DMB, which provides only a service corresponding to a wide area at present, to a small area as a position-based broadcasting or an area-based broadcasting, thereby expanding the broadcasting coverage of a wide area service.

[0083] Embodiments of the present invention can lead to the activation of an area-based service, and can provide useful life information and various services to users by area/position.

[0084] Embodiments of the present invention maintain free of viewing fee according to the characteristics of the T-DMB service which is no fee in principle, and simultaneously can lead to the creation of the above-described business model by the new broadcasting service of a new area broadcasting provider (see Fig. 9).

[0085] First, embodiments of the present invention expand the service coverage for a fringe area, for example, the insides of buildings and subway, other than the existing broadcasting area, thereby increasing the advertisement revenue of the T-DMB provider, for example, KBS, MBS and the like. Moreover, embodiments of the present invention can increase the additional revenue of the T-DMB provider which means sharing a profit with a local broadcasting service provider by the allocation of a resource and the providing of a service within the minimum frequency band.

[0086] Second, embodiments of the present invention provide a new revenue model to the local broadcasting service provider (for example, SKT, KTF and the like) by the linking service with the T-DMB provider, and also provide a promising broadcasting communication combination service business model to it in a case where the local broadcasting service is provided using the infra of the existing communication provider.

[0087] Third, embodiments of the present invention can increase the revenue of the local provider by providing an additional service in the existing business.

[0088] Fourth, embodiments of the present invention enable consumers to receive various data service based on or associated with a position. Moreover, embodiments

of the present invention provide information, which is specialized in an area or is related with a specific position, to the consumers, thereby improving user's satisfaction.

[0089] The methods in accordance with the embodiments of the present invention can also be realized as computer programs. Codes and code segments constituting the programs can be easily derived by computer programmers skilled in the art to which the present invention pertains. Furthermore, the programs are stored in computer-readable recording media, which is a data storage media, are read, and are executed by a computer. The recording media may include any storage device that can be read by a computer.

[0090] While the present invention has been described with respect to the specific embodiments, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the following claims.

[0091] According to exemplary embodiments, disclosed are a method method for providing an area-based broadcasting service based on Digital Multimedia Broadcasting (DMB), and an apparatus and method for receiving the area-based broadcasting service according to the same by dividing service data for each relevant area, which may be a wide area or a local area, and transmitting the divided data through different sub-channels of a Main Service Channel (MSC). Accordingly, a terminal of a reception part receives only service data associated with the position of the terminal and provides the received data to a user to provide the area-based broadcasting service. The method for providing the area-based broadcasting service using DMB includes receiving a DMB transmission frame broadcasted from a DMB transmission server and a middle step to insert local area service-related data in the received DMB transmission frame to retransmit the frame.

Claims

1. A method for providing an area-based broadcasting service using Digital Multimedia Broadcasting (DMB), the method comprising:

receiving a DMB transmission frame broadcasted from a DMB transmission server; and
inserting a local area service-related data in the received DMB transmission frame to retransmit the frame.

2. The method of claim 1, wherein in the DMB transmission frame, a main service channel is divided into a wide area service channel and a local area service channel and the local area service channel is divided into a plurality of segments on the basis of a frequency and a time slot.

3. The method of claim 2, wherein the segment is individually allocated to each local area for a local area service, wherein different segments are allocated to adjacent local areas.

4. The method of claim 2 or 3, wherein the local area service-related data include a local area service data and corresponding local area service/multiplexing information.

5. The method of claim 4, wherein said inserting a local area service-related data in the received DMB transmission frame to retransmit the frame includes inserting the local area service data in the segment of the local area service channel.

6. The method of claim 4 or 5, wherein said inserting a local area service-related data in the received DMB transmission frame to retransmit the frame includes inserting the local area service/multiplexing information in a fast information channel of the DMB transmission frame.

7. The method of one of claims 4 to 6, wherein said inserting a local area service-related data in the received DMB transmission frame to retransmit the frame includes inserting the local area service/multiplexing information in the segment of the local area service channel.

8. The method of one of claims 4 to 7, wherein said inserting a local area service-related data in the received DMB transmission frame to retransmit the frame includes dividing the local area service/multiplexing information, and inserting the divided information in the fast information channel of the DMB transmission frame and the segment of the local area service channel.

9. An apparatus for receiving an area-based broadcasting service, the apparatus comprising:

a position information acquiring unit configured to acquire position information of the reception apparatus;
a broadcasting reception processing unit configured to receive a broadcasting signal to acquire service/multiplexing information, and divide a local area service data related to a current position from the broadcasting signal using the acquired position information and service/multiplexing information; and
a area-based service processing unit configured to provide a corresponding area-based service by position with the divided local area service data.

10. The apparatus of claim 9, wherein the broadcasting

reception processing unit divides the local area service data from a segment related to a current position among a plurality of local area service channels.

11. The apparatus of claim 9 or 10, wherein the area-based service processing unit provides an area-based service according to a user's request or an auto announcement function. 5
12. The apparatus of one of claims 9 to 11, wherein the position information acquiring unit measures the position information of the reception apparatus by a signal transmitted from a Global Positioning System (GPS) satellite or a Digital Multimedia Broadcasting (DMB) transmission station. 10
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13. A method for receiving an area-based broadcasting service, the method comprising:

receiving a broadcasting signal to acquire service/multiplexing information; 20
dividing a local area service data related to a current position from the broadcasting signal using the acquired position information and service/multiplexing information; and 25
providing a corresponding area-based service by position with the divided local area service data.

14. The method of claim 13, wherein said dividing the local area service data includes dividing the local area service data from a segment related to a current position among a plurality of local area service channels. 30
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15. The method of claim 13 or 14, wherein said providing the area-based service includes providing an area-based service according to a user's request or an auto announcement function. 40

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FIG. 1

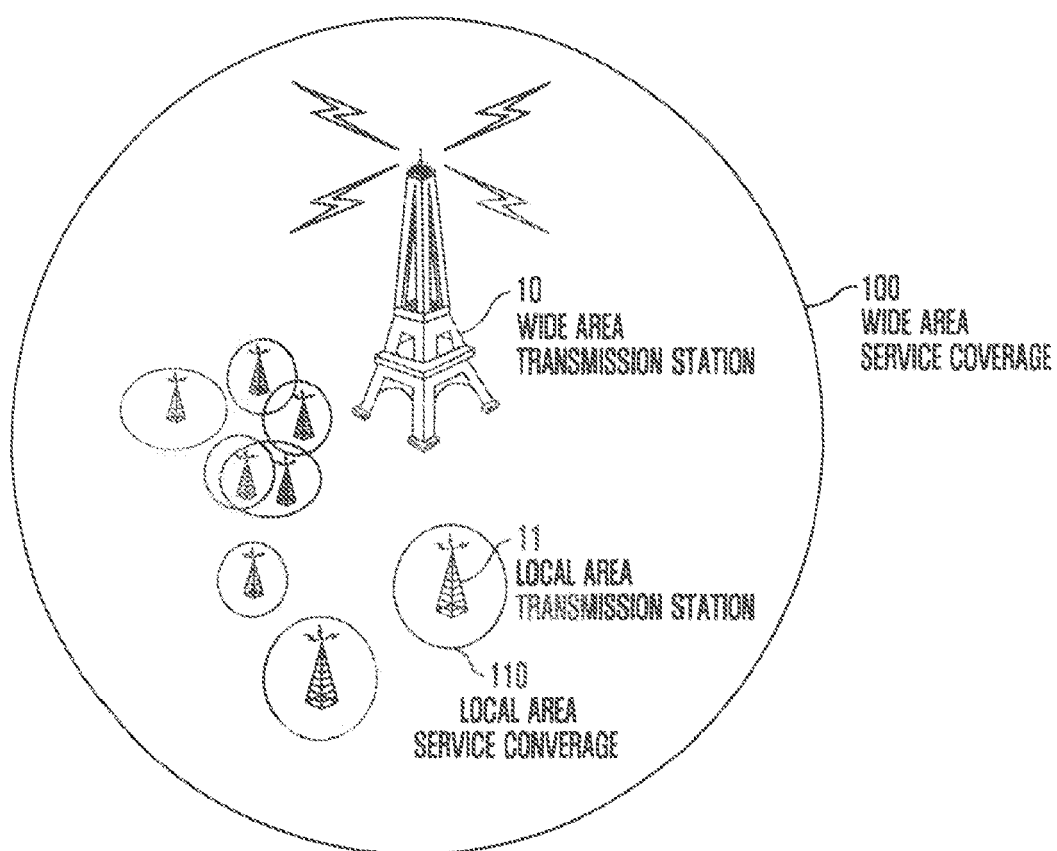


FIG. 2

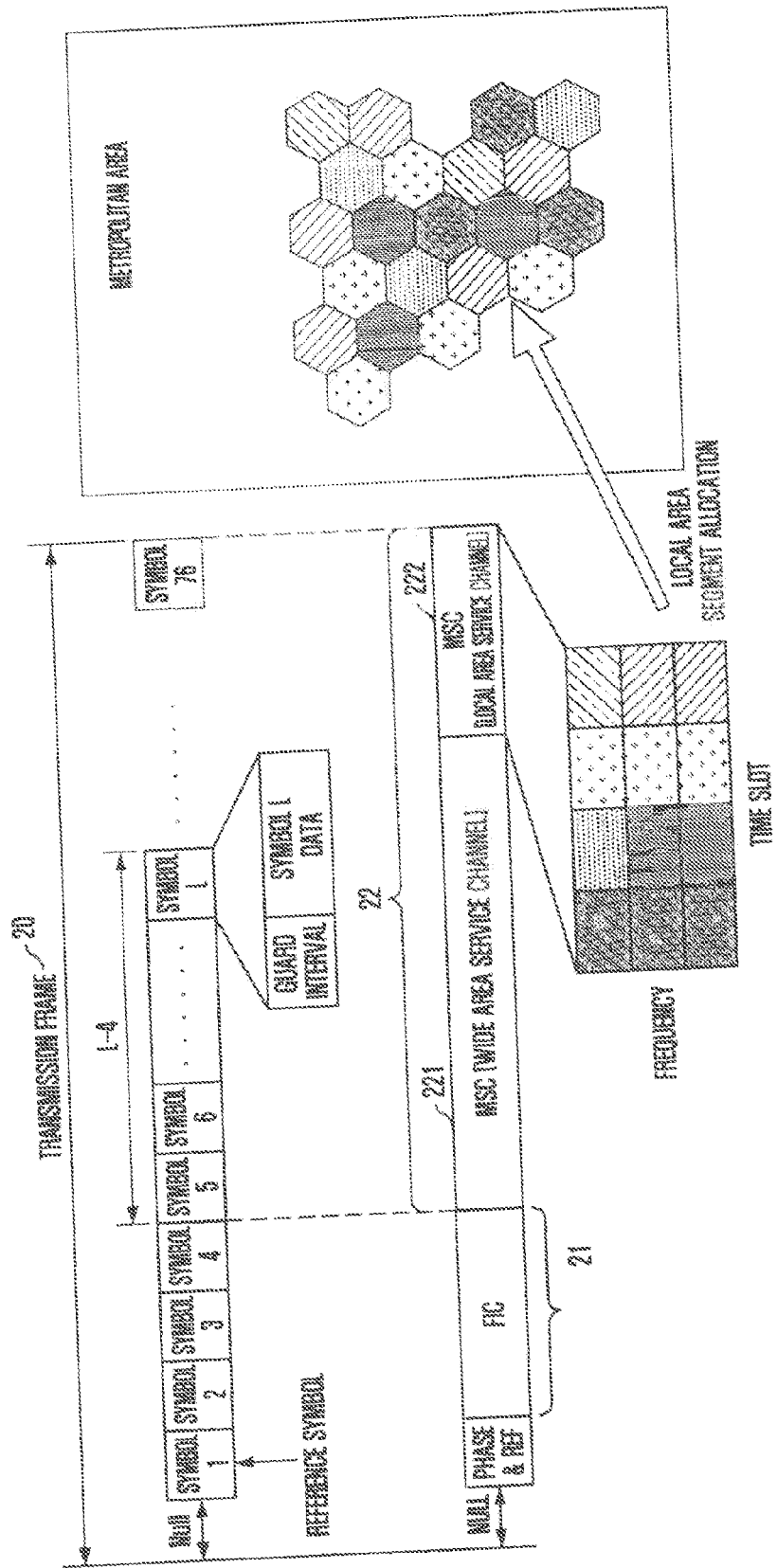


FIG. 3

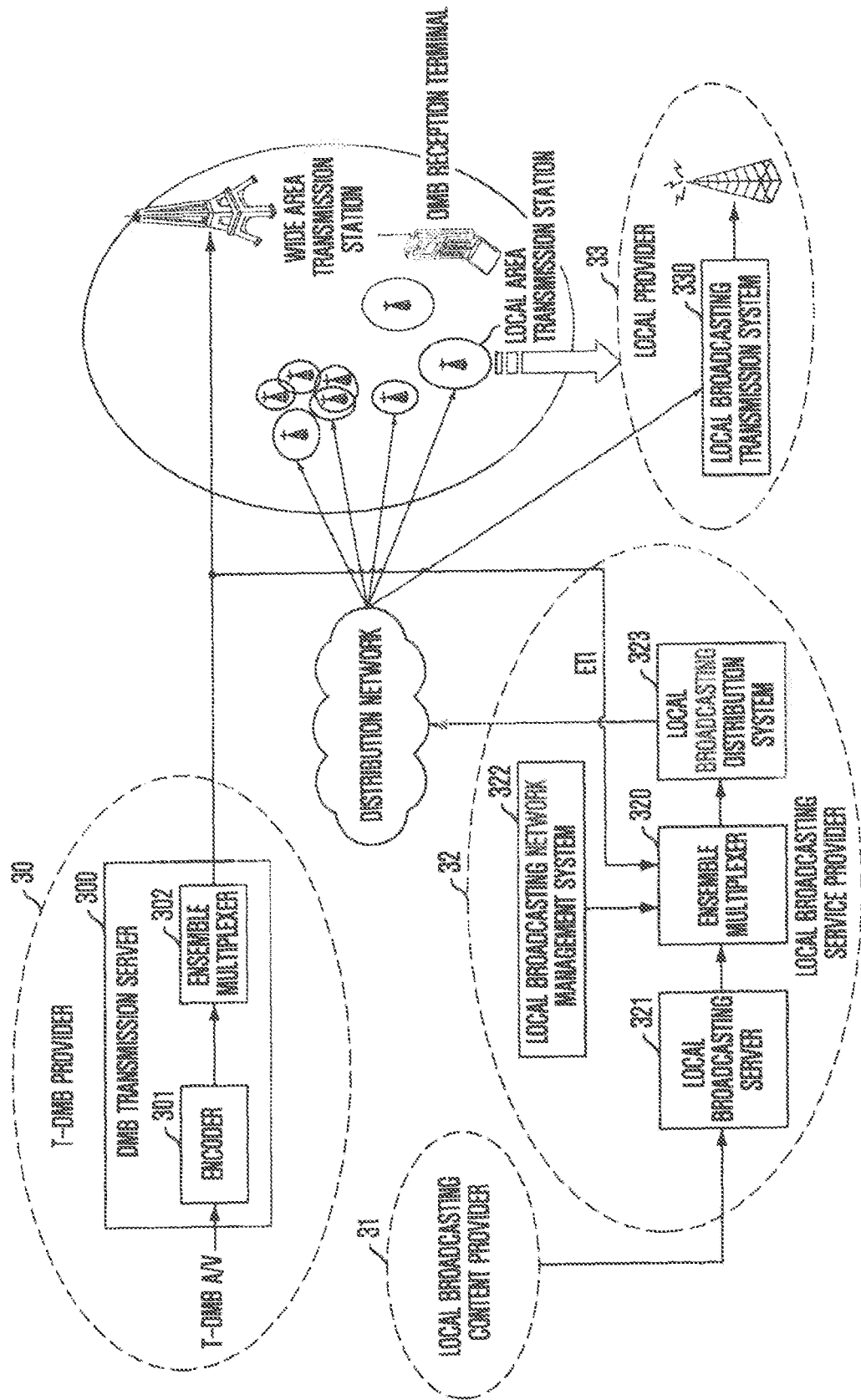


FIG. 4

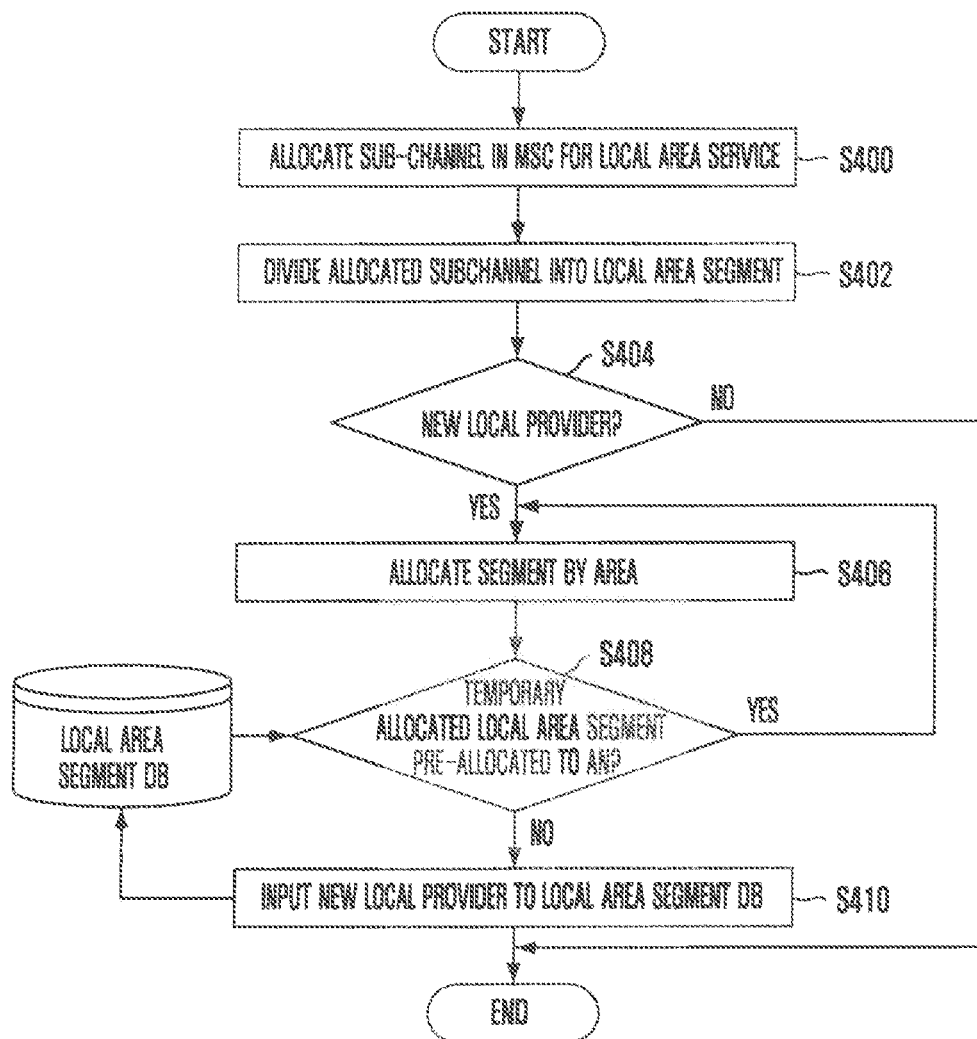


FIG. 5

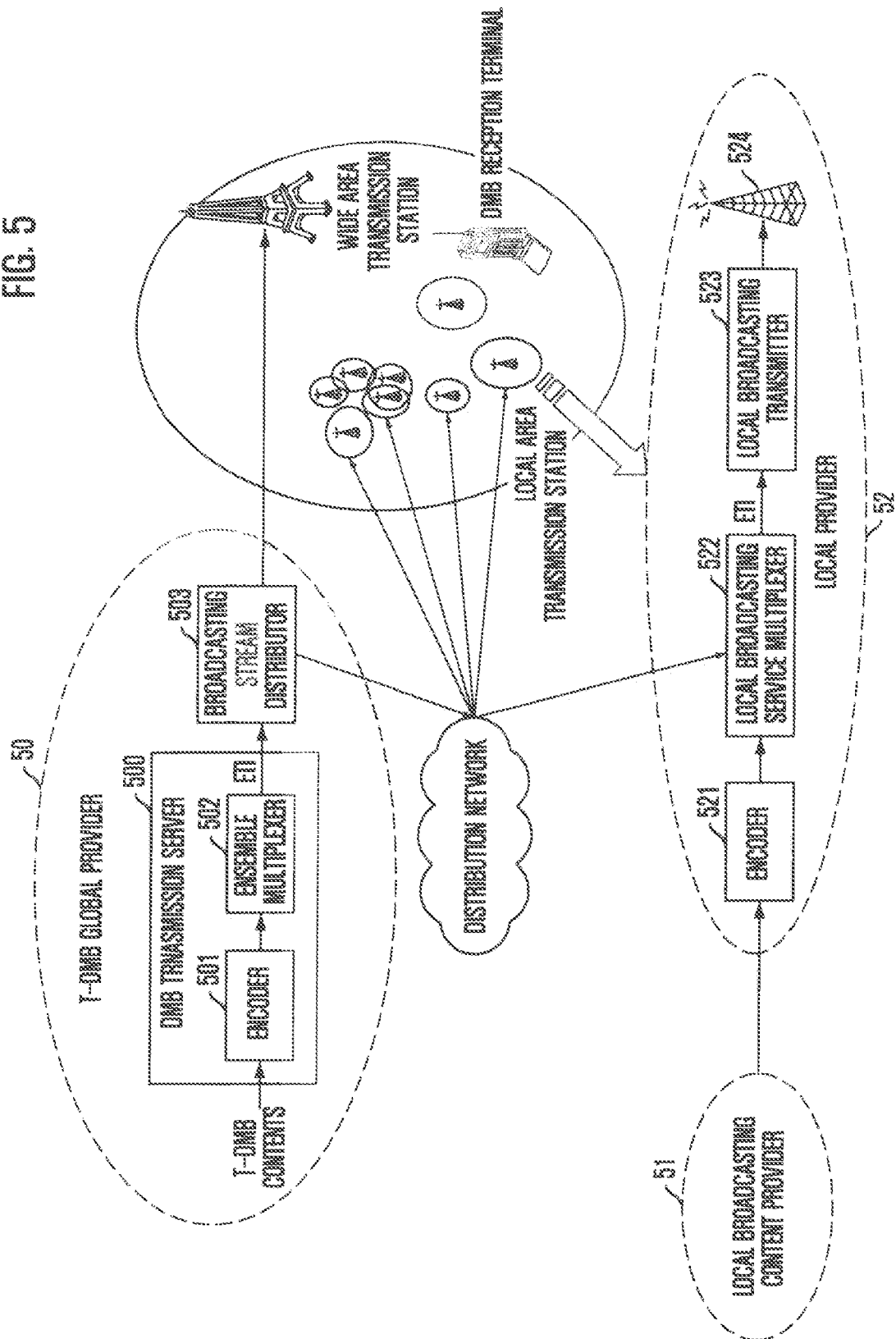


FIG. 6

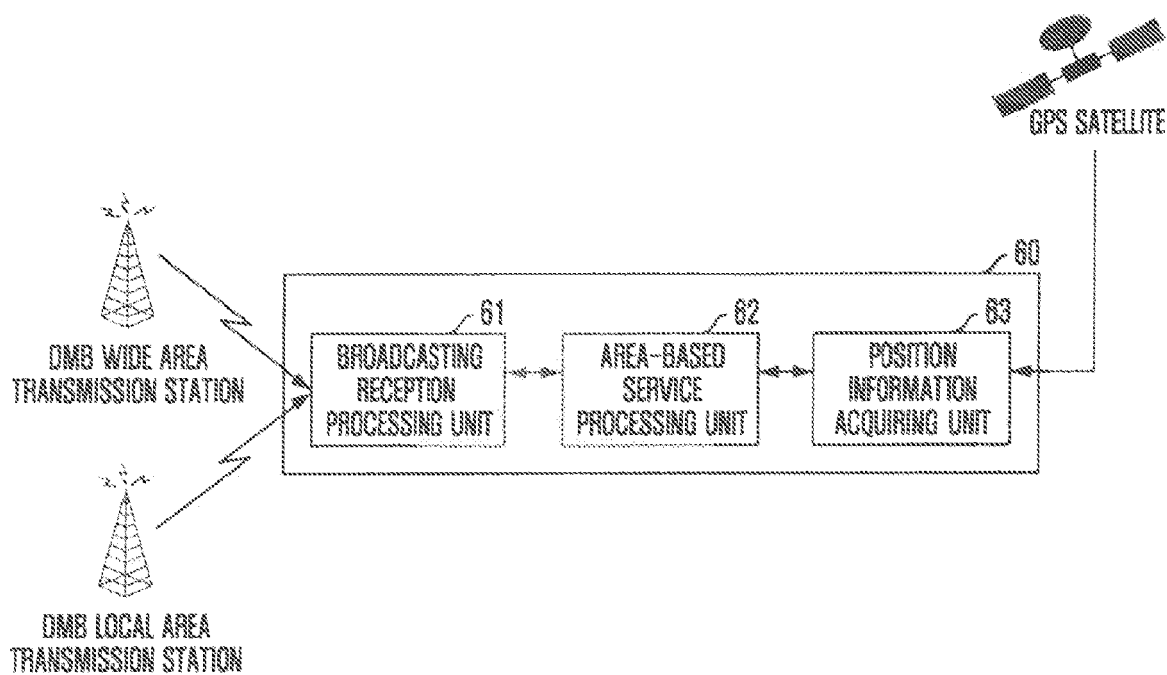


FIG. 7

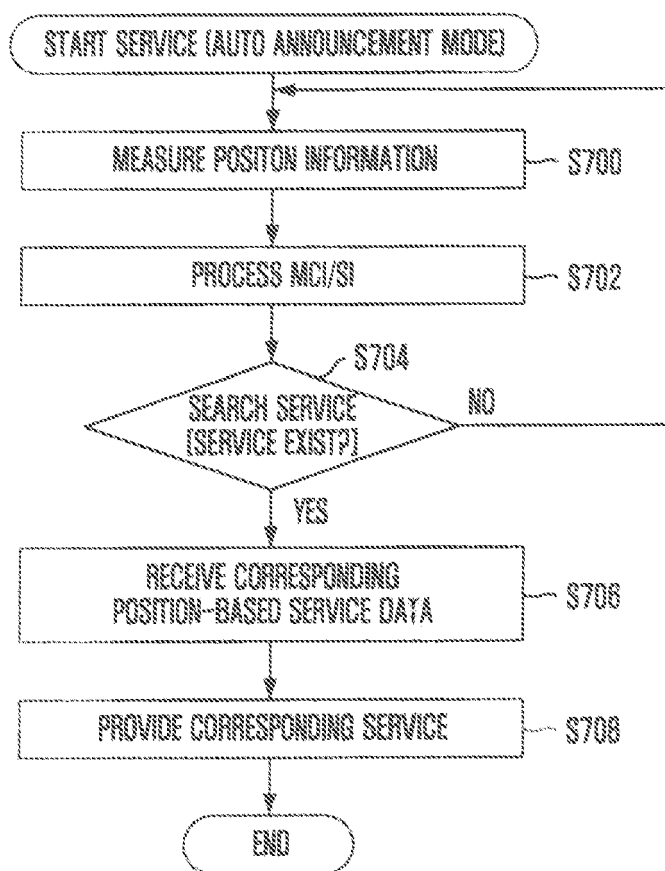


FIG. 8

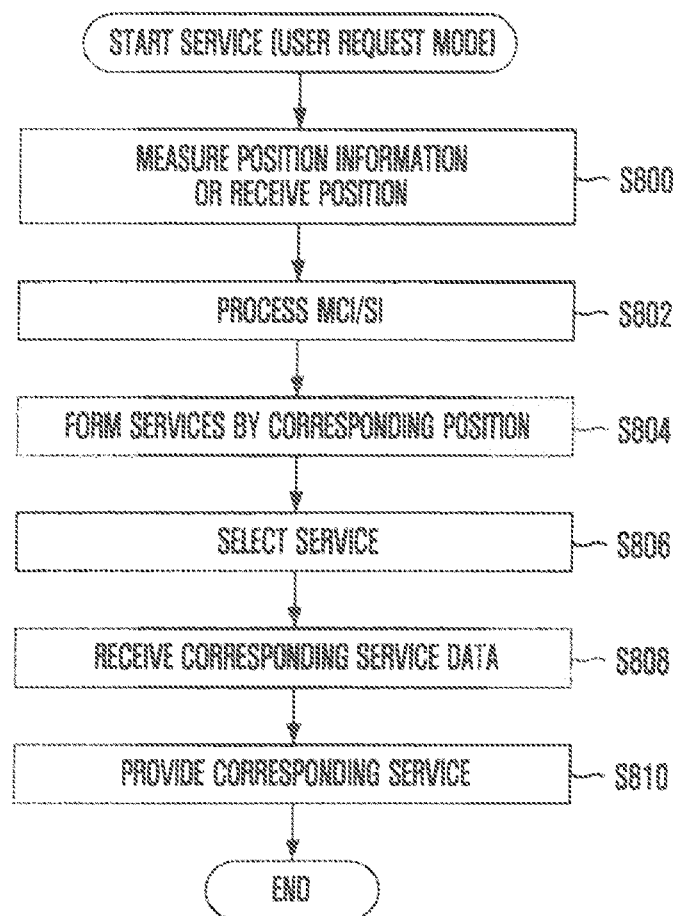
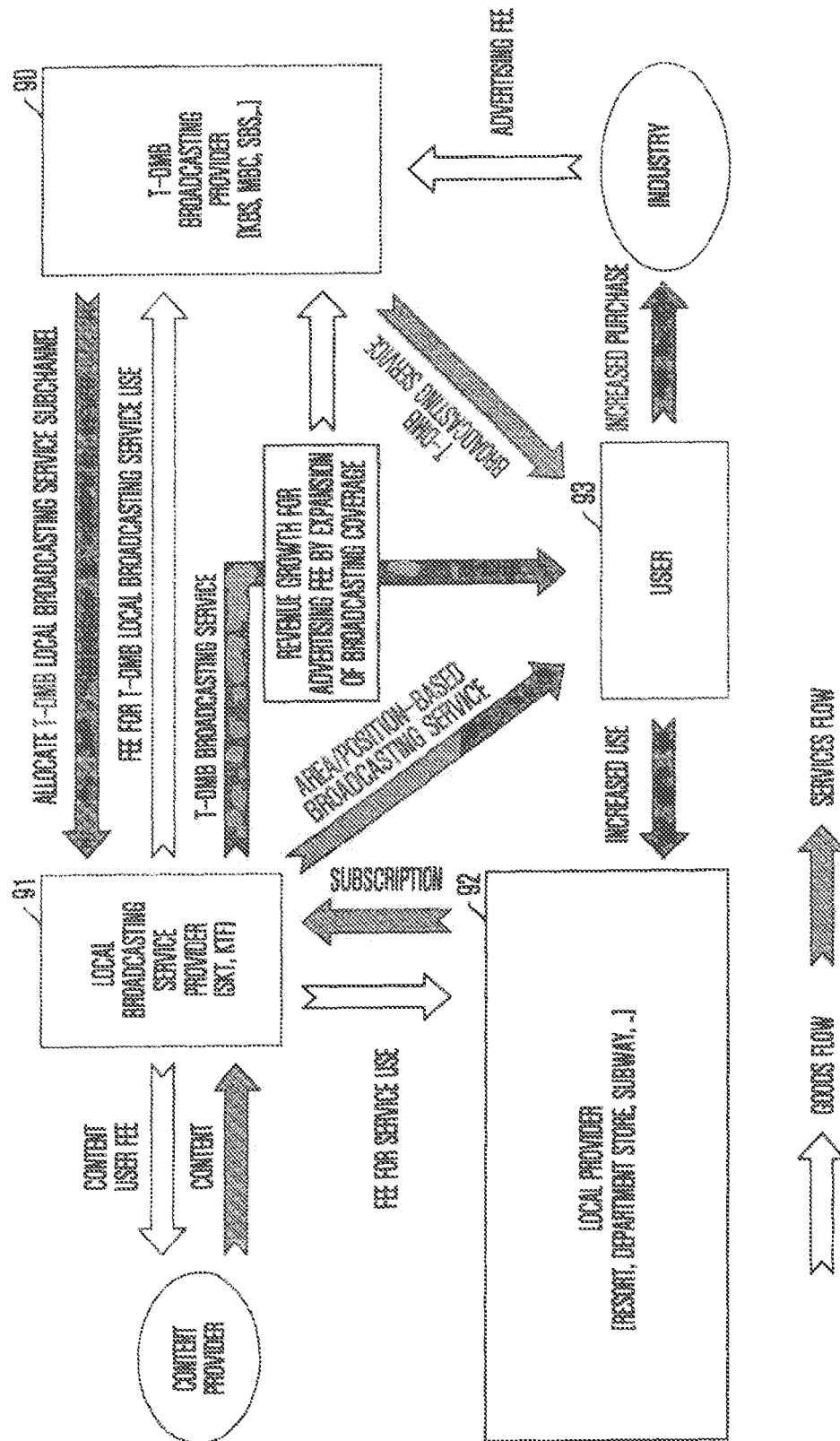


FIG. 9



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 1020080044174 [0001]
- KR 1020030130544 [0001]