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(54) **Method and system for utilizing a broadcast service in a communication network**

(57) A method and a system for utilizing a broadcast service in a communication network (110). The communication network includes a plurality of electronic devices. The method includes receiving a metadata file at a second electronic device from a first electronic device. The method further includes retrieving one or more reference

identifiers for the broadcast service from the metadata file. The method also includes locating at least one broadcast service, based on the one or more reference identifiers. Moreover, the method includes performing an action by the second electronic device based on preferences of a user of the first electronic device.

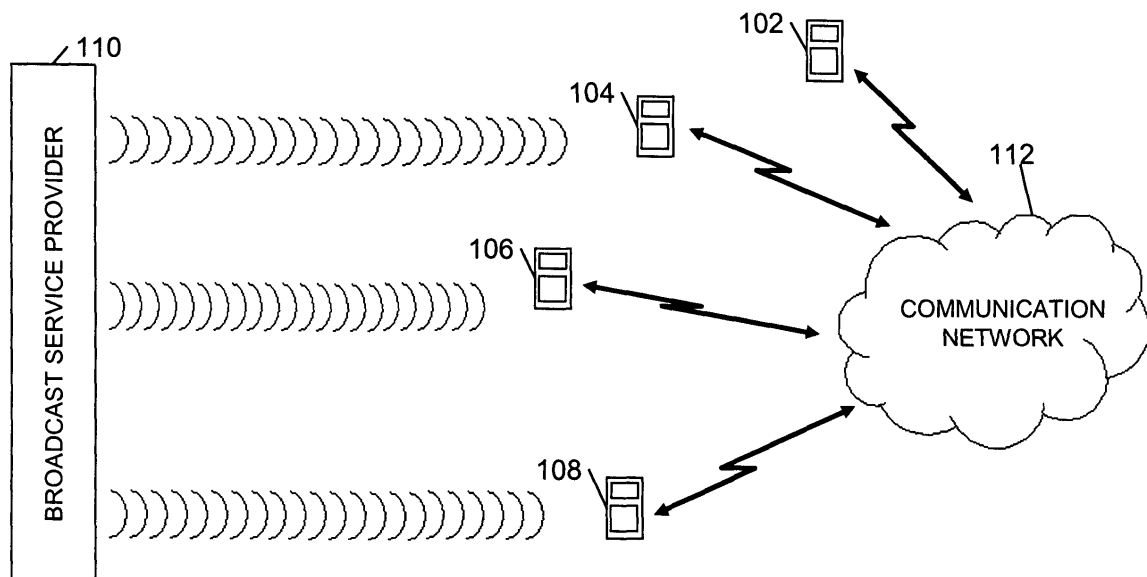


FIG. 1

Description

FIELD OF THE INVENTION

[0001] This invention relates in general to communication networks, and more specifically, to a method and system for utilizing a broadcast service in a communication network.

BACKGROUND OF THE INVENTION

[0002] A broadcast service provider relays broadcast services in a communication network. Examples of broadcast services include a music program relayed as a streaming audio, a football match relayed as a combination of a streaming video and a streaming audio, and so forth. These broadcast services are accessed by electronic devices in the communication network. Examples of electronic devices include a mobile phone, a set-top box, a computer, a laptop, a satellite phone, and so forth. Examples of the communication network include a Code Division Multiple Access (CDMA) network, a Global System for Mobile Communication (GSM) network, the Internet, a Local Area Network (LAN), and a Wide Area Network (WAN). When a user of an electronic device wants to access a desired broadcast service, the user may have to browse through multiple broadcast services to locate the desired broadcast service. When there are a large number of broadcast services, then searching for the desired broadcast service is a time-consuming and tiresome process for the user. Further, the user may not be able to search successfully for the desired broadcast service among a large number of broadcast services.

[0003] There are various methods for searching for a broadcast service in a communication network. One method includes connecting an electronic device to the Internet and searching for the desired service, using various search engines available on the Internet. The electronic device can connect to the Internet by using Wireless Application Protocol (WAP), General Packet Radio Service (GPRS), and so forth. In another such method, a broadcast service provider relays selective broadcast services. Thereafter, a list of the broadcast services is sent to an electronic device via General Packet Radio Service (GPRS). A user can select any broadcast service from the list, to access the broadcast service.

[0004] However, these methods have one or more of the following limitations. First, the methods can search a desired broadcast service when the electronic device is connected to the Internet. If the electronic device is not capable of connecting to the Internet then such methods cannot search for the desired broadcast service. The electronic device should have the capability of connecting to the Internet. This increases the cost of the electronic device. Second, the methods can fail to search for the desired broadcast service when broadcast services are broadcasted on a communication network other than the Internet. In this case, the information about the de-

sired broadcast service may not be available on the Internet. Third, the methods provide access to only a limited number of broadcast services included in the list sent across the electronic device. Fourth, the methods cannot search for a broadcast service on an electronic device, based on information forwarded by another electronic device.

BRIEF DESCRIPTION OF THE FIGURES

[0005] The present invention is illustrated by way of example and not limitation in the accompanying figures, in which like references indicate similar elements, and in which:

[0006] FIG. 1 is an exemplary environment illustrating communication between a plurality of electronic devices and a broadcast service provider, in accordance with the present invention.

[0007] FIG. 2 is a flowchart illustrating a method for utilizing a broadcast service in a communication network, in accordance with the present invention.

[0008] FIG. 3 is a flowchart illustrating another method for utilizing a broadcast service in a communication network, in accordance with the present invention.

[0009] FIG. 4 is a block diagram of a system for utilizing a broadcast service in a communication network, in accordance with the present invention.

[0010] FIG. 5 is a block diagram of an electronic device, in accordance with the present invention.

[0011] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] Before describing in detail the particular method and system for utilizing a broadcast service in a communication network, in accordance with the present invention, it should be observed that the present invention resides primarily in combinations of method steps and apparatus components related to the method and system for sharing broadcast service information in a communication network. Accordingly, the apparatus components and method steps have been represented where appropriate by conventional symbols in the drawings, showing only those specific details that are pertinent to understanding the present invention, so as not to obscure the disclosure with details that will be readily apparent to those of ordinary skill in the art, having the benefit of the description herein.

[0013] The present invention describes a method and a system for utilizing a broadcast service in a communication network. The method includes retrieving reference

identifiers from a metadata file sent across by a first electronic device to a second electronic device in a communication network. Further, at least one broadcast service is located and an action is performed in the second electronic device, based on the reference identifiers.

[0014] Referring to **FIG. 1**, there is shown an exemplary environment illustrating the communication between the plurality of electronic device devices, which include an electronic device **102**, an electronic device **104**, an electronic device **106**, an electronic device **108**, and a broadcast service provider **110**, in accordance with the present invention. A communication network **112** enables an electronic device such as the electronic device **104** to receive a metadata file from another electronic device such as the electronic device **106**. Examples of a communication network include, but are not limited to, a Code Division Multiple Access (CDMA), a Global System for Mobile Communication (GSM), an Internet, a Local Area Network (LAN), a Wide Area Network (WAN), and a Very Small Aperture Terminal (VSAT). A metadata file contains reference identifiers for a broadcast service. These reference identifiers include information about the broadcast service, as well as the preferences of a user of the electronic device **106**. The preferences of the user include, but are not limited to, the duration of the broadcast service, the channel of the broadcast service, the language, generic type associated with the broadcast service, and an action field specifying the action to be taken by the electronic device **104**. A generic type includes, but is not limited to, a football match, a movie, a music program, and a cartoon. An action field can contain instructions to record the broadcast service. Examples of the preferences of a user can include a movie, to be relayed between 09:00 AM to 09:00 PM in French. Based on the reference identifiers in the metadata file, the electronic device **104** locates at least one broadcast service matching the description from the one or more broadcast services relayed by the broadcast service provider **110**.

[0015] Referring to **FIG. 2**, there is shown an exemplary flowchart illustrating a method for utilizing a broadcast service in a communication network **112**, in accordance with the present invention. After initiating the process at step **202**, a metadata file, sent by a first electronic device, is received at a second electronic device from a plurality of electronic devices at step **204**. At step **206**, one or more reference identifiers for the broadcast service are retrieved from the metadata file. At step **208**, at least one broadcast service is located, based on the one or more reference identifiers. Further, at step **210**, an action is performed by the second electronic device, based on the preferences of a user of the first electronic device. Examples of an action include, but are not limited to, sending a message to the first electronic device in response to locating the at least one broadcast service, accessing the at least one broadcast service, scheduling a time for accessing the at least one broadcast service and recording a program corresponding to the at least one broadcast service in at least one file. The at least

one file is stored in a first format. In an embodiment of the present invention, the at least one file is transformed from the first format to a second format. For example, a video file, in a first format, may be converted from an MPEG 4 format to a H264 format, i.e., the second format. Thereafter, the process terminates at step **212**.

[0016] Referring to **FIG. 3**, there is shown an exemplary flowchart illustrating another method for utilizing a broadcast service in a communication network **112**, in accordance with the present invention. After initiating the process at step **302**, a metadata file sent by a first electronic device is received at a second electronic device, at step **304**. The metadata file is sent by a first electronic device from the plurality of electronic devices. At step **306**, one or more reference identifiers are retrieved from the metadata file. At step **308**, at least one broadcast service is located, based on the one or more reference identifiers. In an embodiment of the present invention, if the broadcast service provider does not relay the at least one broadcast service associated with the one or more reference identifiers, then the broadcast service provider contains a Resolving Authority Record (RAR) pointing to another broadcast service provider. The RAR is required to locate a broadcast service provider. Thereafter, the another broadcast service provider is located. If a broadcast service is relayed, it contains Internet Media Guide (IMG) Announce information. The IMG Announce information is a platform that supports various formats of metadata associated with a service and its identification. The IMG Announce information indicates the location of TV Anytime (TVA) metadata, associated with at least one broadcast service. TVA metadata contains information related to the content, quality, condition and location of the corresponding broadcast service. The at least one broadcast service is located based on the TVA metadata.

[0017] The located broadcast service matches the preferences of the user of the first electronic device specified in the one or more reference identifiers. In an embodiment of the present invention, the at least one broadcast service is located, based on a search algorithm. The located broadcast service is compatible with at least one of the first electronic devices and the second electronic device.

[0018] At step **310**, a broadcast service is selected from amongst the at least one broadcast service located by the second electronic device. In an embodiment of the present invention, a list of the at least one broadcast service matching the preferences of a user is displayed to the user of the first electronic device. Thereafter, the user selects a broadcast service from the list. At step **312**, an action is performed on the selected broadcast service in the second electronic device. Further, at step **314**, the metadata file is transmitted to at least one of the plurality of electronic devices through the communication network **112**, via Bluetooth, infrared, and so forth. The metadata file can be transmitted as an attachment in a Multimedia Messaging Service (MMS). In an embodiment of the present invention, a program corresponding

to at least one broadcast service is transmitted to at least one of the plurality of electronic devices. Thereafter, the process terminates at step 316.

[0019] Referring to FIG. 4, there is shown an exemplary block diagram illustrating a system for utilizing a broadcast service in a communication network 112, in accordance with the present invention. The system includes a retrieving module 402 and a service management module 404. In an embodiment of the present invention, the system is contained in a second electronic device. A metadata file is sent by a first electronic device to a second electronic device. The retrieving module 402 retrieves one or more reference identifiers for a broadcast service from the metadata file. The one or more reference identifiers include preferences of the user of the first electronic device. The service management module 404 locates at least one broadcast service, based on the one or more reference identifiers containing the preferences of the user of the first electronic device.

[0020] The system also includes a messaging module 406, which sends a message to at least one of the plurality of electronic devices. The message can be sent as a Short Message Service (SMS), MMS, and so forth. The message contains a list and description of the at least one broadcast service located by the service management module 404. For example, a message can contain the titles of at least one broadcast service, the channel on which the at least one broadcast service is relayed, the time of relay, and the names of the artists associated with it. The list is displayed to the user of the first electronic device. Thereafter, the user selects a broadcast service from the list.

[0021] The system also includes a service consumption module 408, which accesses the at least one broadcast service. The at least one broadcast service is accessed based on the preferences of the user of the first electronic device, contained in the reference identifiers retrieved from the metadata file. The at least one broadcast service is accessed when an action field, in the preferences, contains instruction to access the at least one broadcast service.

[0022] Further the system includes, a memory 410 that records a program corresponding to the at least one broadcast service. The program is recorded when the action field contains instruction to record the at least one broadcast service. In an embodiment of the invention, the program is recorded in at least one file, which is stored in a first format. For example, a set-top box locates a football match that is available in a Moving Picture Experts Group (MPEG 4) format. The memory 410 in a set-top box can record the football match in the MPEG-4 format.

[0023] Further, the system also includes a converter 412. The recorded program is transformed from the first format to a second format using the converter 412. For example, the converter 412 may transform the program from the MPEG 4 format to a H264 format.

[0024] The system also includes a scheduling module

414 that schedules an action to be performed on the at least one broadcast service at a specified time. In an embodiment of the present invention, the scheduling module 414 schedules a time for accessing the at least one broadcast service by the service consumption module 408. For example, the scheduling module 414 can schedule the service consumption module 408 to access a music program selected by a user from a list sent to the user, at 10:00 A.M. In another embodiment of the present invention, the scheduling module 414 schedules the memory 410 to record the at least one broadcast service. For example, the scheduling module 414 can schedule the memory 410 to record a speech, selected by a user from a list sent to the user, at 11:00 P.M. The action is scheduled when the action field in the preferences, contains instruction to schedule a specific action at a specified time.

[0025] Further, the system also include a transmitting module 416 that transmits the at least one broadcast service recorded by the memory 410 to at least one of the plurality of electronic devices. For example, the transmitting module 416, in a mobile phone, can transmit a video clip of the stored movie to another mobile phone via Bluetooth or infrared.

[0026] Referring to FIG. 5, there is shown the electronic device 104, in accordance with the present invention. The electronic device 104 includes a processor 502 and a match finder module 504. The processor 502 is a microprocessor chip that manages and controls the functioning of all the components and modules of the electronic device 104. The match finder module 504 is operatively coupled to the processor 502. The match finder module 504 locates at least one broadcast service, based on one or more reference identifiers retrieved from a metadata file sent by another electronic device.

[0027] The electronic device 104 also includes a decoder 506, which decompresses the at least one broadcast service, located by the match finder module 504, to enable the electronic device 104 to access the at least one broadcast service.

[0028] Further, the electronic device 104 includes a buffer 508, which temporarily stores the at least one broadcast service. The temporary storing equalizes the rate at which the at least one broadcast service is decompressed by the decoder 506 and rate at which the at least one broadcast service is viewed at the electronic device 104.

[0029] Further, the electronic device 104 also includes a synchronization module 510, which synchronizes one or more data streams corresponding to at least one broadcast service. For example, an audio stream and a video stream can correspond to a dance program. Both the streams should be synchronized to view the dance program on an electronic device properly.

[0030] Further, the electronic device 104 also includes a memory 512 for recording the at least one broadcast service.

[0031] The present invention provides method and

system for utilizing a broadcast service in a communication network. The method and system enables a first electronic device to locate the broadcast service, based on preferences specified in a metadata file sent across to it by a second electronic device in the communication network.

[0032] In this document, relational terms such as first and second, and the like may be used solely to distinguish one entity or action from another entity or action without necessarily requiring or implying any actual such relationship or order between such entities or actions. The terms "comprises," "comprising," "includes," "including," or any other variation thereof, are intended to cover a non-exclusive inclusion, such that a process, method, article, system or apparatus that comprises a list of elements does not include only those elements but may include other elements not expressly listed or inherent to such process, method, article, or apparatus. An element preceded by "comprises ... a" does not, without more constraints, preclude the existence of additional identical elements in the process, method, article, system, or apparatus that comprises the element.

[0033] It will be appreciated that the modules described herein may be comprised of one or more conventional processors and unique stored program instructions that control the one or more processors to implement, in conjunction with certain non-processor circuits, some, most, or all of the functions of the modules described herein. The non-processor circuits may include, but are not limited to, a radio receiver, a radio transmitter, signal drivers, clock circuits, power source circuits, and user input devices. As such, these functions may be interpreted as steps of a method for sharing broadcast service information in a communication network. Alternatively, some or all functions could be implemented by a state machine that has no stored program instructions, or in one or more application specific integrated circuits (ASICs), in which each function or some combinations of certain of the functions are implemented as custom logic. Of course, a combination of the two approaches could be used. Thus, methods and means for these functions have been described herein.

[0034] In the foregoing specification, the invention and its benefits and advantages have been described with reference to specific embodiments. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the present invention as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of present invention. The benefits, advantages, solutions to problems, and any element(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential features or elements of any or all the claims. The invention is defined solely by the appended claims including any amend-

ments made during the pendency of this application and all equivalents of those claims as issued.

5 Claims

1. A method for utilizing a broadcast service in a communication network, the communication network comprising a plurality of electronic devices, the method comprising:

receiving a metadata file sent by a first electronic device to a second electronic device;
retrieving, from the metadata file, one or more reference identifiers for the broadcast service;
locating at least one broadcast service based on the one or more reference identifiers; and
performing, by the second electronic device, an action specified in the metadata file based on user preferences of the first electronic device.

2. The method according to claim 1, wherein locating the at least one broadcast service comprises locating a format of the at least one broadcast service that is compatible with at least one of the first electronic device and the second electronic device, the locating being done by a search algorithm.

3. The method according to claim 1 further comprising selecting the broadcast service from amongst the at least one broadcast service located by the second electronic device, the selection being performed at a user interface of the first electronic device.

4. The method according to claim 1, wherein performing an action comprises sending a message to the first electronic device in response to locating the at least one broadcast service.

5. The method according to claim 1, wherein performing an action comprises accessing the at least one broadcast service.

6. The method according to claim 1, wherein performing an action comprises scheduling a time for accessing the at least one broadcast service.

7. The method according to claim 1, wherein performing an action comprises recording a program corresponding to the at least one broadcast service in at least one file.

8. The method according to claim 7 further comprising transforming the at least one file from a first format to a second format.

9. The method according to claim 7 further comprising transmitting the program to at least one of the plu-

rality of electronic devices.

10. The method according to claim 1 further comprising transmitting the metadata file to at least one of the plurality of electronic devices.

11. A system suitable for utilizing a broadcast service in a communication network, the communication network comprising a plurality of electronic devices, the system comprising:

a retrieving module capable of retrieving one or more reference identifiers for the broadcast service, the one or more reference identifiers being retrieved from a metadata file; and
a service management module capable of locating at least one broadcast service based on the one or more reference identifiers retrieved by the retrieving module.

12. The system according to claim 11 further comprising a messaging module capable of sending a message to at least one of the plurality of electronic devices.

13. The system according to claim 11 further comprising a service consumption module capable of accessing the at least one broadcast service.

14. The system according to claim 11 further comprising a scheduling module capable of scheduling an action at a specified time, the action being performed on the at least one broadcast service.

15. The system according to claim 11 further comprising a memory capable of recording a program corresponding to the at least one broadcast service.

16. The system according to claim 11 further comprising a transmitting module capable of transmitting the at least one broadcast service to at least one of the plurality of electronic devices.

17. The system according to claim 11 further comprising a converter capable of transforming the at least one broadcast service from a first format to a second format.

18. An electronic device comprising:

a processor; and
a match finder module operatively coupled to the processor, the match finder module locating at least one broadcast service based on one or more reference identifiers, wherein the one or more reference identifiers being retrieved from a metadata file, the metadata file being sent by another electronic device.

19. The electronic device according to claim 18 further comprising a decoder capable of decompressing the at least one broadcast service.

20. The electronic device according to claim 18 further comprising a buffer capable of temporarily storing the at least one broadcast service.

21. The electronic device according to claim 18 further comprising a synchronization module capable of synchronizing one or more data streams corresponding to the at least one broadcast service.

22. The electronic device according to claim 18 further comprising a memory capable of recording the at least one broadcast service.

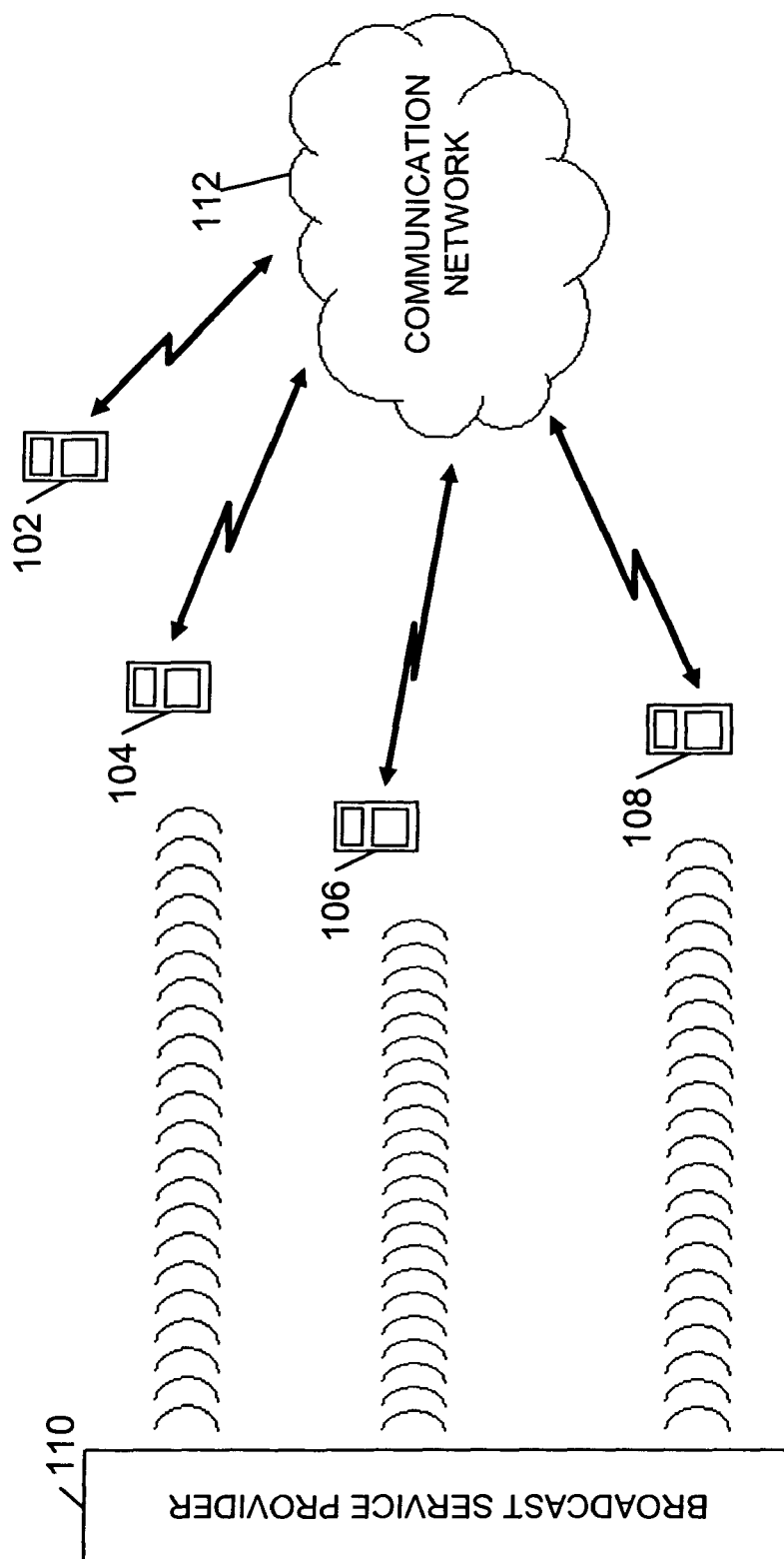


FIG. 1

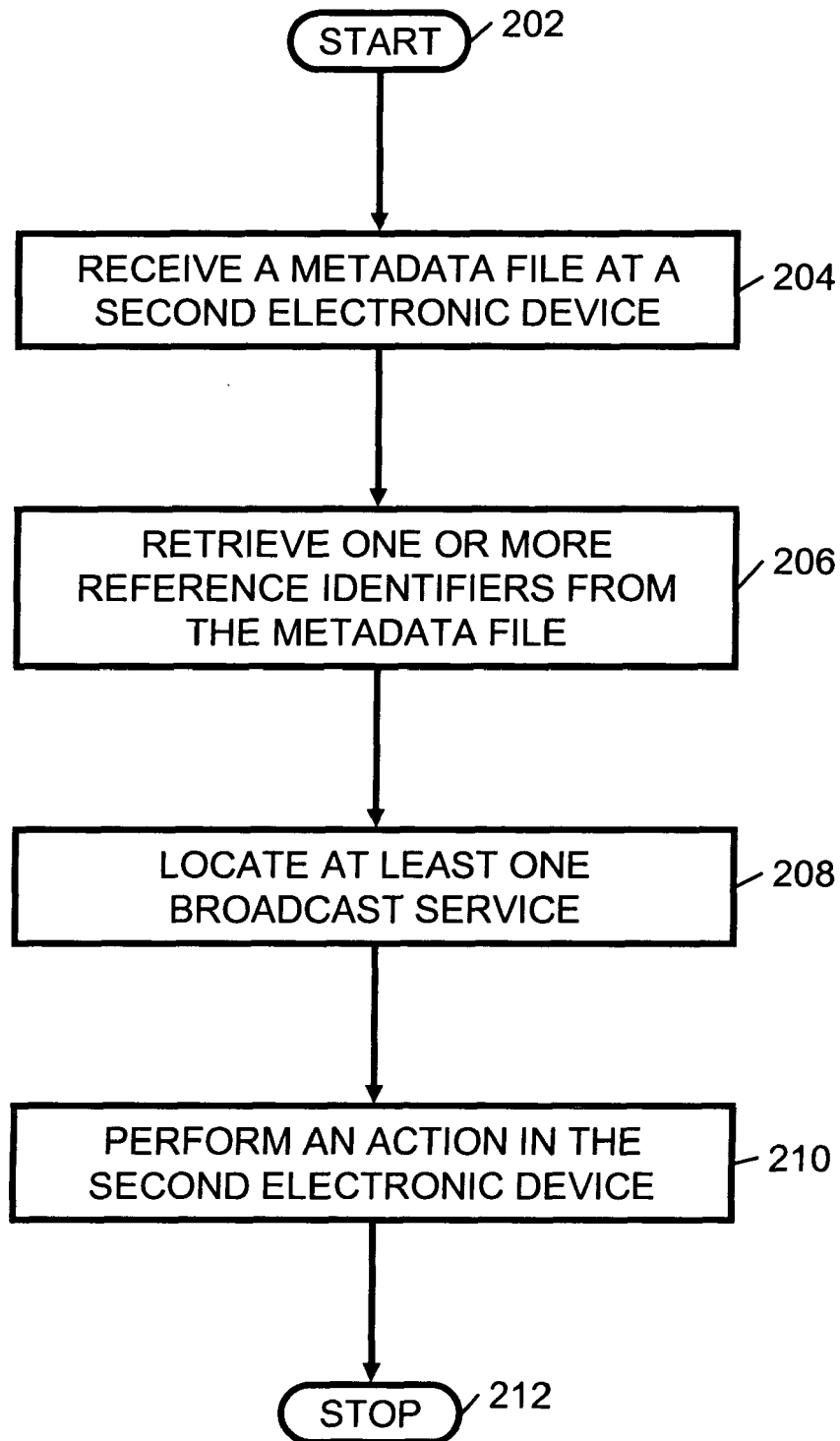


FIG. 2

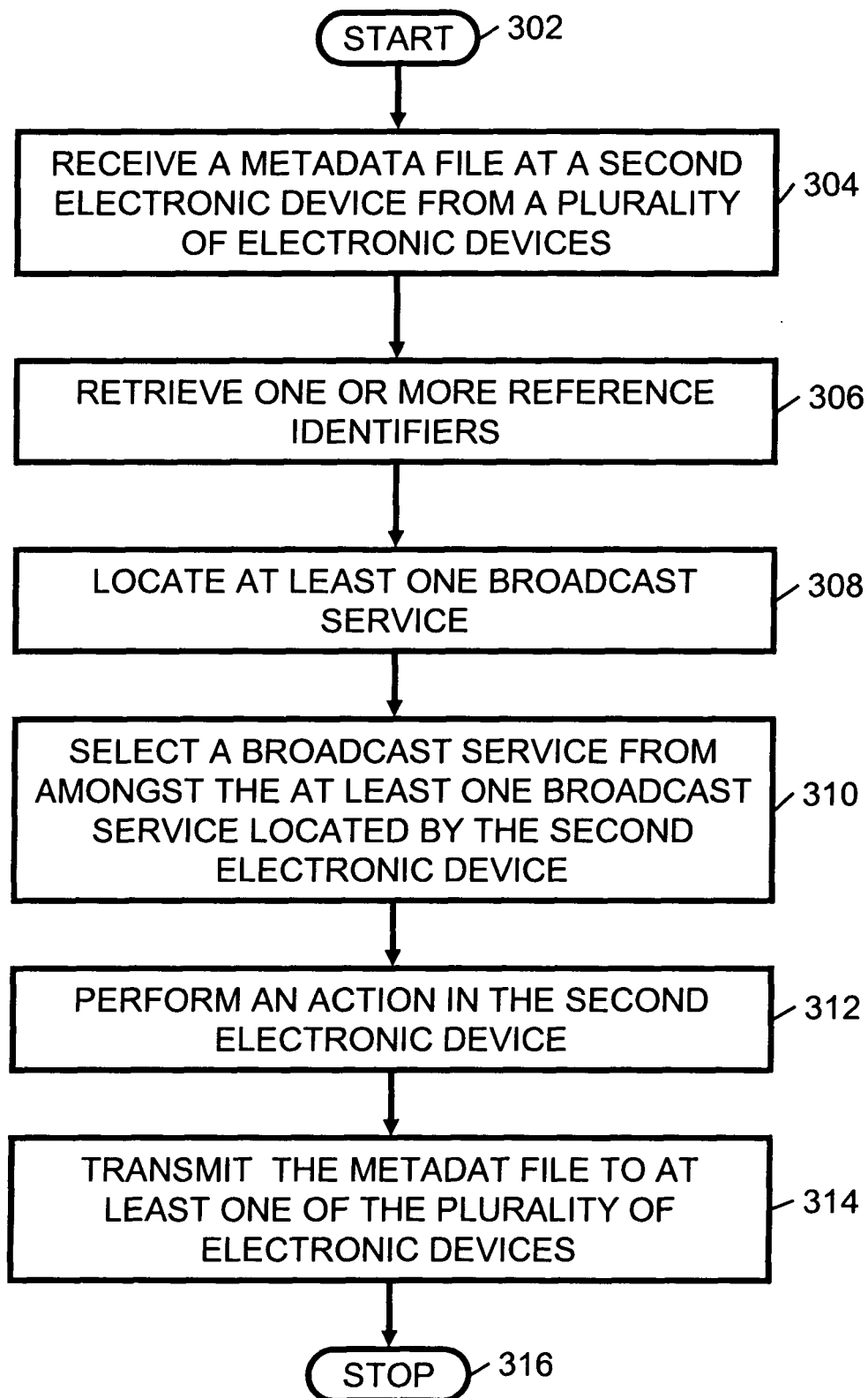


FIG. 3

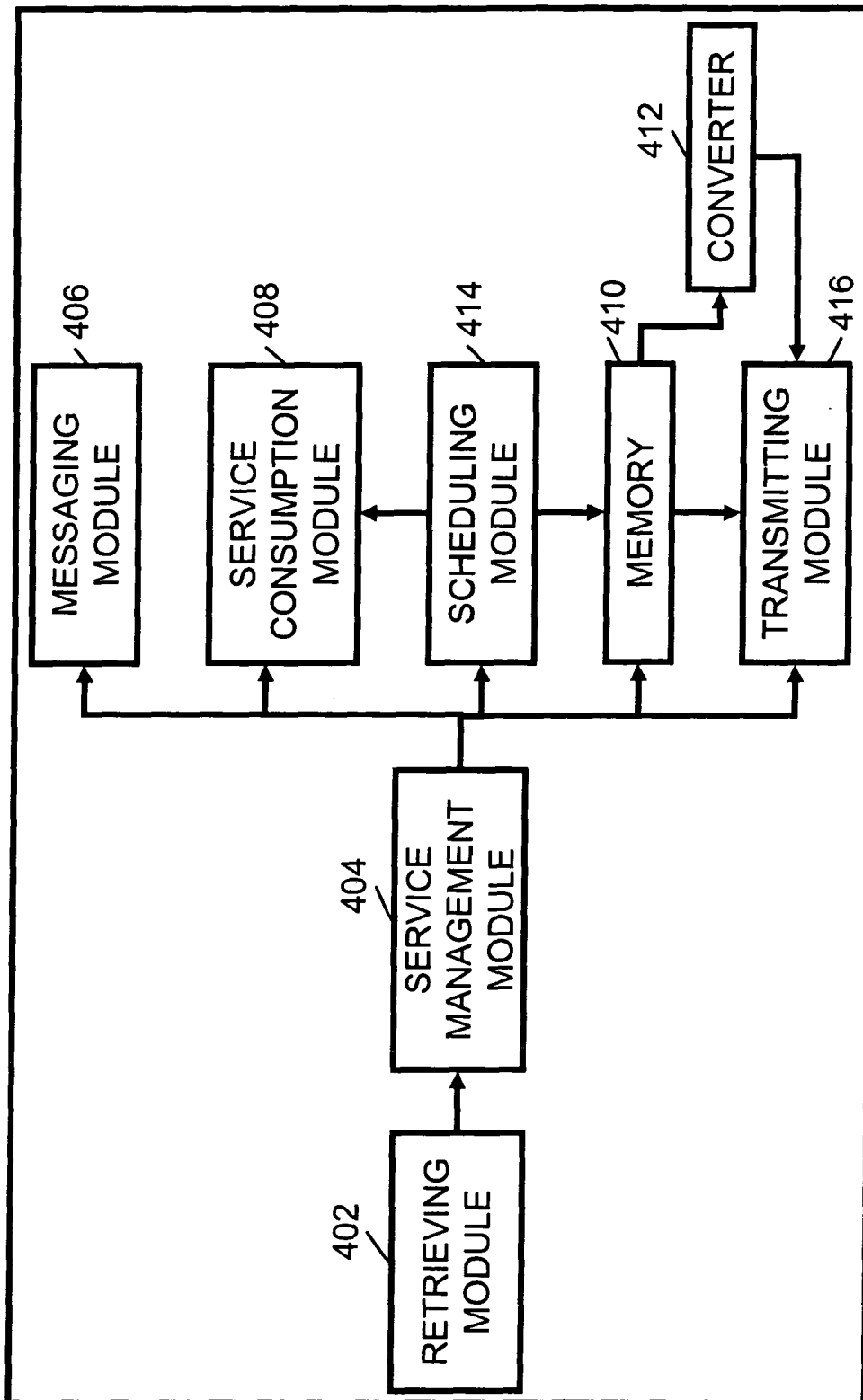


FIG. 4

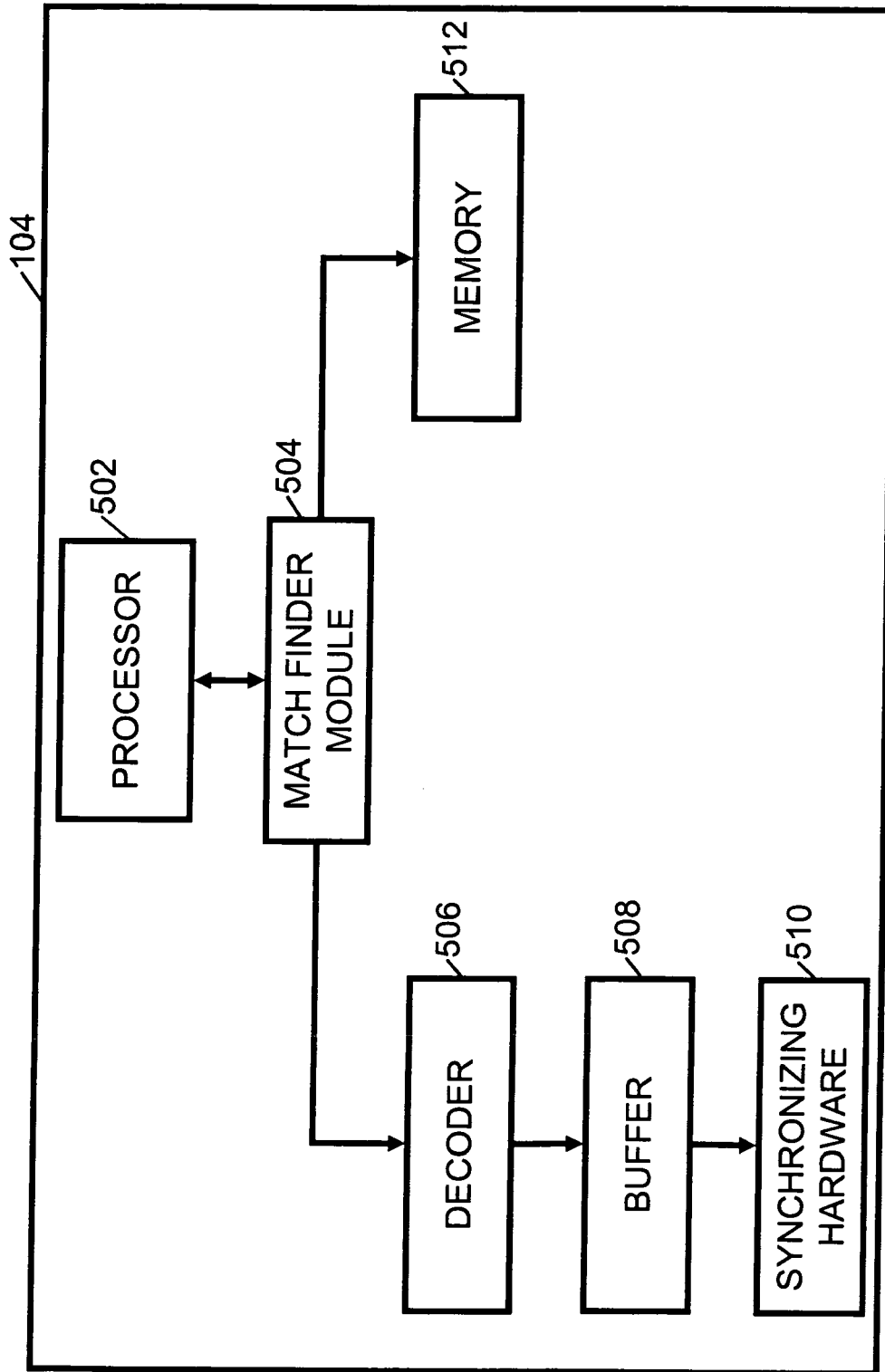


FIG. 5



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 03/047257 A (NDS LIMITED; O'TOOLE, HANNAH, CLARE; SILVER, YONATHAN) 5 June 2003 (2003-06-05) * page 2, lines 20-24 * * page 3, lines 26-28 * * page 4, lines 7,8 * * page 5, lines 21-30 * * page 6, lines 10,11 * * page 9, lines 7-10 * * page 9, lines 20,21 * * page 16, lines 6-16 * * page 30, lines 4,5 * * page 41, lines 29,30 * * page 44, lines 15,16 * * page 44, line 31 - page 45, line 11 * -----	1-22	H04H1/00
			TECHNICAL FIELDS SEARCHED (IPC)
			H04H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 February 2006	Examiner Torcal Serrano, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 29 2040

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-02-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03047257 A	05-06-2003	AU 2002353470 A1	10-06-2003

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82