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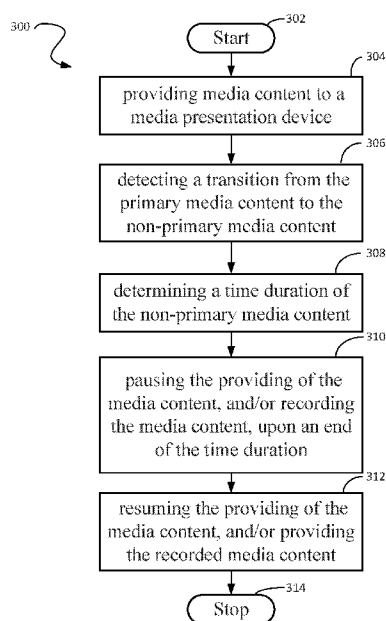


FIG. 3

(57) Abstract: Technologies are disclosed for controlling media content that may include primary media content and non-primary media content. The non-primary media content may include one or more advertisements, and/or like content. A media control device may provide media content to a media presentation device. A transition may be detected from the primary media content to the non-primary media content. A time duration of the non-primary media content may be determined. Perhaps for example upon an end of the time duration, the provision of the media content may be paused and/or the media content may be recorded. The provision of the media content to the media presentation device may be resumed, perhaps for example upon receipt of a command for resumption and/or the recorded media content may be provided to the media presentation device, perhaps for example upon receipt of a command to provide the recorded content.

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**METHOD AND SYSTEM FOR TECHNOLOGIES FOR
CONTROLLING PROVISION OF MEDIA CONTENT THAT
INCLUDES PRIMARY MEDIA CONTENT AND NON-PRIMARY
MEDIA CONTENT**

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BACKGROUND

[0001] Media content may be provided by a plurality of media content network operators to home and/or business subscribers/viewers. Media content network operators (*e.g.*, cable network operators, or satellite operators, etc.) may provide subscribers/viewers with various forms of media content, such as movies, concerts, premium media content, broadcast media content, and/or pay-per-view (PPV) media content, and/or the like.

[0002] Some of the media content may include and/or may be periodically interrupted by commercial advertising, fund raising requests, and/or like “supplemental” media content that may interrupt the “primary” media content of interest to the viewer. Media content viewers may choose to turn their attention away from the media content presentation during such “commercial breaks”, for example. Perhaps because of diverting their attention for too long, among other reasons, viewers may miss the primary media content that resumes after the commercial break.

20 **SUMMARY**

[0003] Technologies are disclosed for controlling media content that may include primary media content and non-primary media content. The non-primary media content may include one or more advertisements, and/or like content. A media control device may provide media content to a media presentation device. A transition may be detected from the primary media content to the non-primary media content. A time duration of the non-primary media

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content may be determined. Perhaps for example upon an end of the time duration, the provision of the media content may be paused and/or the media content may be recorded.

[0004] The provision of the media content to the media presentation device may be resumed, perhaps for example upon receipt of a command for resumption. The recorded
5 media content may be provided to the media presentation device, perhaps for example upon receipt of a command to provide the recorded content.

BRIEF DESCRIPTION OF DRAWINGS

[0005] The elements and other features, advantages and disclosures contained herein,
10 and the manner of attaining them, will become apparent and the present disclosure will be better understood by reference to the following description of various examples of the present disclosure taken in conjunction with the accompanying drawings, wherein:

[0006] FIG. 1 is a block diagram illustrating an example network environment operable to deliver video and/or audio content throughout the network via one or more
15 network devices, such as a consumer premises device (CPE) device, among other devices.

[0007] FIG. 2 is a block diagram illustrating an example CPE device of FIG. 1 that may be configured to deliver video and/or audio content to a subscriber.

[0008] FIG. 3 is an example flow diagram of at least one technique for providing media content that may include primary media content and non-primary media content.

20 [0009] FIG. 4 is a block diagram of a hardware configuration of an example device that may deliver video and/or audio content, such as the CPE device of FIG. 2.

[0010] FIG. 5 is a block diagram of a hardware configuration of an example device that may deliver video and/or audio content, such as a home gateway.

DETAILED DESCRIPTION

[0011] For the purposes of promoting an understanding of the principles of the present disclosure, reference will now be made to the examples illustrated in the drawings, and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of this disclosure is thereby intended.

5 [0012] FIG. 1 is a block diagram illustrating an example network environment 100 operable for a media content delivery network operator, or MSO, to deliver media content to subscribers/viewers. Media content may be provided via a consumer premise equipment (CPE) and/or network gateway device supported by the MSO, for example. In one or more scenarios, CPE devices 110a-d receive video service(s) and/or data service(s) from a wide area
10 network (WAN) 120 via a connection to a subscriber network 130. The one or more nodes of subscriber network 130 and/or the WAN 120 may communicate with one or more cloud-based nodes (not shown) via the Internet 124. The subscriber network 130 and/or WAN 120 may include a home gateway (not shown), that may be used to implement set-top box functionality, among other functions.

15 [0013] The CPE devices can include, for example, a modem 110a, a set-top box 110b, a wireless router including an embedded modem 110c, or a media gateway 110d, among many others (*e.g.*, digital subscriber line (DSL) modem, voice over internet protocol (VOIP) terminal adapter, video game console, digital versatile disc (DVD) player, communications device, hotspot device, etc.). The subscriber network 130, for example, can be a hybrid fiber-coaxial
20 (HFC) network, a local area network (LAN), a wireless local area network (WLAN), a cellular network, a personal area network (PAN), as well as others.

[0014] The CPE devices can facilitate communications between the WAN 120 and client devices 140a-d. A cable modem or embedded MTA (eMTA) 110 a can facilitate communications between the WAN 120 and a computer 140a. A set-top box 110b can facilitate
25 communications between the WAN 120 and a television/monitor 140b (*e.g.*, a media

presentation device) and/or a digital video recorder (DVR). A wireless router 110c can facilitate communications between a computer 140c and the WAN 120. A gateway 110d can facilitate communications between a mobile device 140d and the WAN 120.

[0015] The WAN network 120 and/or the subscriber network 130 may be implemented as any type of wired and/or wireless network, including a local area network (LAN), a wide area network (WAN), a global network (the Internet), etc. Accordingly, the WAN network 120 and/or the subscriber network 130 may include one or more communicatively coupled network computing devices (not shown) for facilitating the flow and/or processing of network communication traffic via a series of wired and/or wireless interconnects. Such network computing devices may include, but are not limited, to one or more access points, routers, switches, servers, compute devices, storage devices, etc.

[0016] FIG. 2 is a block diagram illustrating an example CPE device 110 operable to output audio/visual media content to one or more devices, such as for example, the television/monitor 140b. The CPE device 110 can include a subscriber interface 205, a routing module 210, a status detection module 215, a media content analysis module 220, and/or a network interface 225.

[0017] In one or more scenarios, the CPE device 110 may receive a communication from a subscriber or subscriber device (*e.g.*, subscriber device 140a-d of FIG. 1). For example, the communication can be a request for data or a service from a network (*e.g.*, WAN 120 of FIG. 1). A communication received from a subscriber or subscriber device can be received as a resource identifier (*e.g.*, URL, and/or an IP address, and/or other format).

[0018] In one or more scenarios, a routing module 210 may route a received communication to a network interface 225. The routing module 210 may route the communication to the network interface 225. The routing module may translate the received communication from a URL to an IP address.

[0019] Communications, requests, determinations, and/or detections may be made by the media content analysis module 220 to identify one or more transitions in the provided media content between “primary media” content and “non-primary” and/or supplemental media content. Primary media content may include the media content associated with the subject matter of the scheduled/purchased/streamed/broadcast media content presentation (e.g., the scheduled program). Non-primary media and/or supplemental media content may include commercial advertisements, contribution requests, and/or public service announcements, etc.

[0020] In one or more scenarios, the media content analysis module 220 may determine a transition in media content between primary media content and non-primary media content using one or more analysis techniques. One or more media content analysis techniques may include detection of one or more inline frames (IFrame) to determine a transition between primary media content and non-primary media content, for example. In certain media content, IFrames containing non-primary media content may be inserted into the primary media content. In one or more scenarios, IFrames may be used to mark a transition in media content between primary media content and non-primary media content. IFrames may also be used to mark transitions between more than one advertisement in the non-primary media content, for example.

[0021] In one or more scenarios, the media content analysis module 220 may determine a transition in media content between primary media content and non-primary media content by detecting if one or more, or multiple, frames of “black” content (e.g., and/or perhaps a lack of audio content in such frames) may be included in transitions. Such black and/or audio-less frames may also be used to mark transitions between more than one advertisement in the non-primary media content, for example

[0022] In one or more scenarios, the media content analysis module 220 may determine a transition in media content between primary media content and non-primary media content by detecting a presence and/or lack thereof of one or more logos and/or like displays in one or more predetermined areas of media content video (*e.g.*, an upper right corner of the visually interpretable video screen frames). Absences of such logos and/or like displays may indicate transitions from primary media content to non-primary media content.

[0023] In one or more scenarios, the media content analysis module 220 may determine a transition in media content between primary media content and non-primary media content by performing video analysis (*e.g.*, video frame content analysis) to ascertain activity levels and changes thereof in the media content. For example, advertisements may include a high frequency of cuts between video frames, perhaps for example as compared to the primary media content.

[0024] The routing module 210 can route communications, requests, determinations, and/or detections of transitions in the media content between primary media content and non-primary media content to/from the media content analysis module 220. For example, the routing module 210 can translate the communications, requests, determinations, and/or detections of transitions in the media content between primary media content and non-primary media content into an address (*e.g.*, IP address) associated with the media content analysis module 220. The status detection module 215 may monitor the network connection status of the CPE device 110.

[0025] The status detection module 215 may determine the status of the network connection for the CPE device 110. The status detection module 215 can monitor the network connection of the CPE device 110 through the network interface 225. The status detection module 215 can monitor one or more various components that are associated with the network connection for the CPE device 110. For example, the status detection module 215 can monitor

one or more hardware components (*e.g.*, internal hardware components of the CPE device 110, connection cables such as radio frequency cables, phone lines, digital subscriber lines, etc.) that are used in the connection of the CPE device 110 to a network. This may include physical status detection (*e.g.*, physical mapping to signal). If no signal is detected, a physical component may be broken (*e.g.*, broken line or disconnected plug, etc.). A prompt can instruct a subscriber to check an associated connector or line.

[0026] The status detection module 215 can monitor the status of the network and/or data link layer associated with the CPE device 110. For example, the status detection module 215 can monitor the CPE device's connection to a host server (*e.g.*, dynamic host configuration protocol server) and/or the status of configuration information received from the host server. For example, the status detection module 215 can monitor the CPE device's connection to a packet routing server (*e.g.*, a point-to-point protocol PPP server) and/or subscriber credentials such as a username and password associated with the packet routing server. Data link layer status may include failed (synchronization failure), connected, on-doing (synchronizing), and others. In response to a failure, a re-scan for a cable line and/or retraining for DSL line may be attempted.

[0027] The communications, requests, determinations, and/or detections of transitions in the media content between primary media content and non-primary media content may be transmitted and/or stored in one or more files, such as text files (*e.g.*, Hypertext Transfer Protocol (HTTP) files), among other type of files.

[0028] The CPE device 110 may store one or more, or multiple, files that may be ordered (*e.g.*, hierarchically according to a specific order) for carrying out one or more actions in the setup of a device (*e.g.*, set-top box 110b). The media content analysis module 220 may include a buffer 235. The buffer 235 can store a subscriber communication (*e.g.*, URL or IP address received from the subscriber) and/or the communications, requests, determinations,

and/or detections of transitions in the media content between primary media content and non-primary media content. In one or more scenarios, perhaps for example when the status detection module 215 determines that a network connection issue might no longer exist, the buffer 235 can output the subscriber communication and/or the communications, requests, determinations, and/or detections of transitions in the media content between primary media content and non-primary media content through the network interface 225.

[0029] In one or more scenarios, the media content analysis module 220 may determine a time duration of the non-primary media content and/or a timing associated with non-primary media content. In one or more scenarios, the time duration of the non-primary media content may be determined by capturing one or more images and/or frames of the non-primary media content. At least one time value may be recognized in at least one predetermined area of a first image/frame, perhaps for example in a coordinate-denoted area in the first image/frame. The time value (*e.g.*, a first time value) may be associated with the time duration of the non-primary media content. The media content may include one or more of: over-the-top (OTT) video, cable video, broadcast video, and/or satellite video.

[0030] In one or more scenarios, the time duration of the non-primary media content may be dynamically updated (*e.g.*, a countdown timer, etc.). A second image/frame of the non-primary content may be captured. A second time value may be recognized in one or more predetermined areas of the second image/frame. The first time value may be replaced with the second time value in the association with the time duration of the non-primary media content.

[0031] In one or more scenarios, metadata may be associated with the non-primary media content. The metadata may include information regarding the time duration or timing of the non-primary media content. The media content analysis module 220 may recognize metadata associated with the non-primary media content. A time value (*e.g.*, a first time value)

may be determined and/or recognized in the metadata. The time value may be associated with the time duration of the non-primary media content.

[0032] In one or more scenarios, the time value in the metadata may be dynamically updated. The media content analysis module 220 may recognize at least a first time value and a second time value in the metadata. The first time value may be associated with the time duration of the non-primary media content. The first time value may be replaced with the second time value in the association with the time duration of the non-primary media content.

[0033] In one or more scenarios, the non-primary media content may include one or more advertisements. The media content analysis module 220 may use one or more techniques described herein to detect and/or determine transitions inside the non-primary media content. For example, transitions between the one or more advertisements in the non-primary media content may be detected and/or determined.

[0034] In one or more scenarios, the media content analysis module 220 may use one or more techniques described herein to determine the time duration of the non-primary media content as a time value that corresponds to the time duration of one or more, or all, of the respective advertisements that may be included in the non-primary media content.

[0035] In one or more scenarios, the media content analysis module 220 may use one or more techniques described herein to determine the time duration of the non-primary media content as one or more time values (*e.g.*, and/or the total thereof) that may respectively correspond to the time durations of the one or more advertisements that may be included in the non-primary media content.

[0036] Perhaps for example upon an end of the time duration of the non-primary media content, the media content being provided to a media presentation device may be paused and/or recorded. Perhaps for example upon receipt of a command (*e.g.*, a first command) from a subscriber/viewer, the provision of the media content may be resumed to

the media presentation device. Perhaps for example upon receipt of a commend (*e.g.*, a second command) from a subscriber/viewer, the recorded media content may be provided to the media presentation device.

[0037] Referring now to FIG. 3, an example method 300 illustrates a technique for controlling delivery of media content performed by a media control device. The media content may include a primary media content and a non-primary media content. At 302, the process may start. At 304, the media control device may provide media content to a media presentation device (*e.g.*, a television or monitor).

[0038] At 306, the media control device may detect a transition from the primary media content to the non-primary media content. At 308, the media control device may determine a time duration of the non-primary media content.

[0039] At 310, the media control device may pause the providing of the media content, and/or may record the media content, upon an end of the time duration. At 312, the media control device may resume the providing of the media content to the media presentation device upon receiving a first command, and/or may provide the recorded media content to the media presentation device upon receiving a second command.

[0040] At 314 the process may stop or restart. In one or more scenarios, the media control device may be a set-top box and/or a media (*e.g.*, home) gateway.

[0041] FIG. 4 is a block diagram of a hardware configuration of an example device that may deliver media content (*e.g.*, video and/or audio content), such as the CPE device of FIG. 2. The hardware configuration 400 may be operable to facilitate delivery of information from an internal server of a device. The hardware configuration 400 can include a processor 410, a memory 420, a storage device 430, and/or an input/output device 440. One or more of the components 410, 420, 430, and 440 can, for example, be interconnected using a system bus 450. The processor 410 can process instructions for execution within the hardware configuration

400. The processor 410 can be a single-threaded processor or the processor 410 can be a multi-threaded processor. The processor 410 can be capable of processing instructions stored in the memory 420 and/or on the storage device 430.

[0042] The memory 420 can store information within the hardware configuration 400.

5 The memory 420 can be a computer-readable medium (CRM), for example, a non-transitory CRM. The memory 420 can be a volatile memory unit. The memory 420 can be a non-volatile memory unit.

[0043] The storage device 430 can be capable of providing mass storage for the hardware configuration 400. The storage device 430 can be a computer-readable medium
10 (CRM), for example, a non-transitory CRM. The storage device 430 can, for example, include a hard disk device, an optical disk device, flash memory and/or some other large capacity storage device. The storage device 430 can be a device external to the hardware configuration 400.

[0044] The input/output device 440 may provide input/output operations for the
15 hardware configuration 400. The input/output device 440 (*e.g.*, a transceiver device) can include one or more of a network interface device (*e.g.*, an Ethernet card), a serial communication device (*e.g.*, an RS-232 port), one or more universal serial bus (USB) interfaces (*e.g.*, a USB 2.0 port) and/or a wireless interface device (*e.g.*, an 802.11 card). The input/output device can include driver devices configured to send communications to, and receive
20 communications from one or more networks (*e.g.*, subscriber network 120 of FIG. 1).

[0045] FIG. 5 is a block diagram of a hardware configuration of an example device that may deliver media content (*e.g.*, video and/or audio content), such as a home gateway. The home gateway 500 may be constructed in a similar manner to set-top box 400 in that the architecture may be built around a general-purpose processor, processor 502, and/or an
25 application specific chip set such as designed for use in a Data Over Cable Service Interface

Specification (DOCSIS), a Gigabit Passive Optical Network (GPON), and/or a Digital Subscriber Line (DSL) modem. As with processor 402, the general-purpose processor 502 may also be an off-the-shelf processor. The functionality of the desired modem may be implemented through data processing software 506 stored in data storage 504 and/or may be run on processor 502.

[0046] Home gateway 500 may include signal input interface 508 and/or signal output interface 510. Signal input interface 508 may include, for example, circuitry to receive data input from a service provider at service provider input 514, *e.g.*, a cable and/or a fiber optic input.

[0047] Signal output interface 510 may provide the output of the home gateway 500. Signal output interface 510 may provide signals in formats for transmission over a datalink. For example, interface 510 may include one or more Ethernet ports 516 and/or a wireless access point 518. Data may be communicated over wired and/or wireless networks. The access point 518 may be located external to the home gateway 500. Video and/or audio content received at signal input interface 508 can be streamed from home gateway 500 to set top box 400, perhaps for example as another source of video and/or audio signal. This streaming may be accomplished over a reliable backhaul communication link (not shown) that may provide good video quality, perhaps for example for signals that are sensitive to latency in the signal (*e.g.*, live programming). The signal input interface 508 and the signal output interface 510 may operate together, such as for example as a transceiver device.

[0048] In operation, a data signal may be received at signal input interface 508 of home gateway 500. Processor 502 may operate data processing software 506 on general-purpose processor 502 to prepare the received signals (*e.g.*, code, decode, etc.). The output of the data processing software 506 may be output by signal output interface 510, *e.g.*, Ethernet port 516 and/or wireless access point 518.

[0049] Those skilled in the art will appreciate that the disclosed subject matter improves upon methods and apparatuses for providing a media content delivery to subscribers/viewers in such a way as to help the subscriber/viewer avoid missing primary media content in scenarios in which the subscriber/viewer may redirect their attention to avoid non-primary media content. The subject matter of this disclosure, and components thereof, can be realized by instructions that upon execution cause one or more processing devices to carry out the processes and functions described above. Such instructions can, for example, comprise interpreted instructions, such as script instructions, *e.g.*, JavaScript or ECMAScript instructions, or executable code, or other instructions stored in a computer readable medium.

[0050] Implementations of the subject matter and the functional operations described in this specification can be provided in digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them. The subject matter described in this specification can be implemented as one or more computer program products, *e.g.*, one or more modules of computer program instructions encoded on a tangible program carrier for execution by, or to control the operation of, data processing apparatus.

[0051] A computer program (also known as a program, software, software application, script, or code) can be written in any form of programming language, including compiled or interpreted languages, or declarative or procedural languages, and it can be deployed in any form, including as a stand-alone program or as a module, component, subroutine, or other unit suitable for use in a computing environment. A computer program does not necessarily correspond to a file in a file system. A program can be stored in a portion of a file that holds other programs or data (*e.g.*, one or more scripts stored in a markup language document), in a single file dedicated to the program in question, or in multiple coordinated files (*e.g.*, files that store one or more modules, sub programs, or portions of code). A computer program can be

deployed to be executed on one computer or on multiple computers that are located at one site or distributed across multiple sites and interconnected by a communication network.

[0052] The processes and/or logic flows described in this specification may be performed by one or more programmable processors executing one or more computer programs to perform functions by operating on input data and/or generating output thereby tying the process to a particular machine (*e.g.*, a machine programmed to perform the processes described herein). The processes and/or logic flows can also be performed by, and apparatus can also be implemented as, special purpose logic circuitry, *e.g.*, an FPGA (field programmable gate array) and/or an ASIC (application specific integrated circuit).

[0053] Computer readable media suitable for storing computer program instructions and/or data include all forms of non-volatile memory, media and memory devices, including by way of example semiconductor memory devices (*e.g.*, EPROM, EEPROM, and/or flash memory devices); magnetic disks (*e.g.*, internal hard disks or removable disks); magneto optical disks; and/or CD ROM and DVD ROM disks. The processor and/or the memory can be supplemented by, or incorporated in, special purpose logic circuitry.

[0054] While this specification contains many specific implementation details, these should not be construed as limitations on the scope of any invention or of what may be claimed, but rather as descriptions of features that may be specific to described implementations. Certain features that are described in this specification in the context of separate implementations can also be implemented in combination in perhaps one implementation. Various features that are described in the context of perhaps one implementation can also be implemented in multiple combinations separately or in any suitable sub-combination. Although features may be described above as acting in certain combinations and perhaps even initially claimed as such, one or more features from a claimed combination can in some cases

be excised from the combination, and the claimed combination may be directed to a sub-combination or variation of a sub-combination.

[0055] While operations may be depicted in the drawings in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. The described program components and/or systems can generally be integrated together in a single software product or packaged into multiple software products.

[0056] Examples of the subject matter described in this specification have been described. The actions recited in the claims can be performed in a different order and still achieve desirable results, unless expressly noted otherwise. For example, the processes depicted in the accompanying figures do not necessarily require the particular order shown, or sequential order, to achieve desirable results. Multitasking and parallel processing may be advantageous.

[0057] While the present disclosure has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only certain examples have been shown and described, and that all changes and modifications that come within the spirit of the present disclosure are desired to be protected.

CLAIMS

What is Claimed is:

1. A method for controlling media content performed by a media control device, the method comprising:

providing media content, by the media control device, to a media presentation device, the media content including a primary media content and non-primary media content;

detecting a transition from the primary media content to the non-primary media content;

determining a time duration of the non-primary media content by the media control device;

at least one of: pausing the providing of the media content, or recording the media content, by the media control device, upon an end of the time duration; and

at least one of: resuming the providing of the media content to the media presentation device upon receiving a first command, or providing the recorded media content to the media presentation device upon receiving a second command.

2. The method of claim 1, wherein the non-primary media content includes one or more advertisements.

3. The method of claim 1, wherein the determining the time duration of the non-primary media content further comprises:

capturing at least a first image of the non-primary media content;

recognizing at least a first time value in a predetermined area of the first image;
and
associating the first time value with the time duration of the non-primary media content.

4. The method of claim 3, wherein the time duration of the non-primary media content is dynamically updated, the method further comprising:

capturing a second image of the non-primary media content;
recognizing a second time value in a predetermined area of the second image;
and
replacing the first time value with the second time value in the association with the time duration of the non-primary media content.

5. The method of claim 1, wherein the determining the time duration of the non-primary media content further comprises:

recognizing metadata associated with the non-primary media content;
recognizing a time value in the metadata; and
associating the time value with the time duration of the non-primary media content.

6. The method of claim 5, wherein the time value in the metadata is dynamically updated, and the recognizing a time value in the metadata further comprises:

recognizing at least a first time value and a second time value in the metadata,
and the associating the time value with the time duration of the non-primary media content further comprises:

associating the first time value with the time duration of the non-primary media content; and

replacing the first time value with the second time value in the association with the time duration of the non-primary media content.

7. The method of claim 1, wherein the media content includes at least one of: over-the-top (OTT) video, cable video, broadcast video, or satellite video.

8. A media control device configured to control media content, the device comprising:

a memory;

a transceiver; and

a processor, the processor configured at least to:

provide media content to a media presentation device, the media content including a primary media content and non-primary media content;

detect a transition from the primary media content to the non-primary media content;

determine a time duration of the non-primary media content;

at least one of: pause the provision of the media content, or record the media content, upon an end of the time duration; and

at least one of: resume the provision of the media content to the media presentation device upon receipt of a first command, or provide the recorded media content to the media presentation device upon receipt of a second command.

9. The device of claim 8, wherein the non-primary media content includes one or more advertisements.

10. The device of claim 8, wherein the processor is further configured such that to determine the time duration of the non-primary media content further comprises:

capture at least a first image of the non-primary media content;

recognizing at least a first time value in a predetermined area of the first image;

and

associating the first time value with the time duration of the non-primary media content.

11. The device of claim 10, wherein the time duration of the non-primary media content is dynamically updated, and the processor is further configured to:

capture a second image of the non-primary media content;

recognize a second time value in a predetermined area of the second image; and

replace the first time value with the second time value in the association with the time duration of the non-primary media content.

12. The device of claim 8, wherein the processor is further configured such that to determine the time duration of the non-primary media content further comprises:

recognize metadata associated with the non-primary media content;

recognize a time value in the metadata; and

associate the time value with the time duration of the non-primary media content.

13. The device of claim 12, wherein the time value in the metadata is dynamically updated, and the processor is further configured such that to recognize the time value in the metadata further comprises:

recognize at least a first time value and a second time value in the metadata, and the processor is further configured such that to associate the time value with the time duration of the non-primary media content further comprises:

associate the first time value with the time duration of the non-primary media content; and

replace the first time value with the second time value in the association with the time duration of the non-primary media content.

14. The device of claim 8, wherein the device is a set-top box device, the set-top box device controlling media content provided via at least one of: the Internet, a cable-television provider, a broadcast-television provider, or a satellite-television provider.

15. A non-transitory computer readable medium having instructions stored thereon, the instructions causing at least one processor of a media control device to perform one or more operations, the one or more operations comprising at least:

providing media content to a media presentation device, the media content including a primary media content and non-primary media content;

detecting a transition from the primary media content to the non-primary media content;

determining a time duration of the non-primary media content;

at least one of: pausing the providing of the media content, or recording the media content, upon an end of the time duration; and

at least one of: resuming the providing of the media content to the media presentation device upon receiving a first command, or providing the recorded media content to the media presentation device upon receiving a second command.

16. The non-transitory computer readable medium of claim 15, wherein the one or more operations for the determining the time duration of the non-primary media content further comprise:

capturing at least a first image of the non-primary media content;

recognizing at least a first time value in a predetermined area of the first image;

and

associating the first time value with the time duration of the non-primary media content.

17. The non-transitory computer readable medium of claim 16, wherein the time duration of the non-primary media content is dynamically updated, and the one or more operations further comprise:

capturing a second image of the non-primary media content;

recognizing a second time value in a predetermined area of the second image;

and

replacing the first time value with the second time value in the association with the time duration of the non-primary media content.

18. The non-transitory computer readable medium of claim 15, wherein the one or more operations for the determining the time duration of the non-primary media content further comprise:

recognizing metadata associated with the non-primary media content;
recognizing a time value in the metadata; and
associating the time value with the time duration of the non-primary media content.

19. The non-transitory computer readable medium of claim 18, wherein the time value in the metadata is dynamically updated, and the one or more operations for the recognizing the time value in the metadata further comprises:

recognizing at least a first time value and a second time value in the metadata, and the one or more operations for the associating the time value with the time duration of the non-primary media content further comprise:

associating the first time value with the time duration of the non-primary media content; and

replacing the first time value with the second time value in the association with the time duration of the non-primary media content.

20. The non-transitory computer readable medium of claim 15, wherein the non-primary media content includes one or more advertisements, and the media content includes at least one of: over-the-top (OTT) video, cable video, broadcast video, or satellite video.

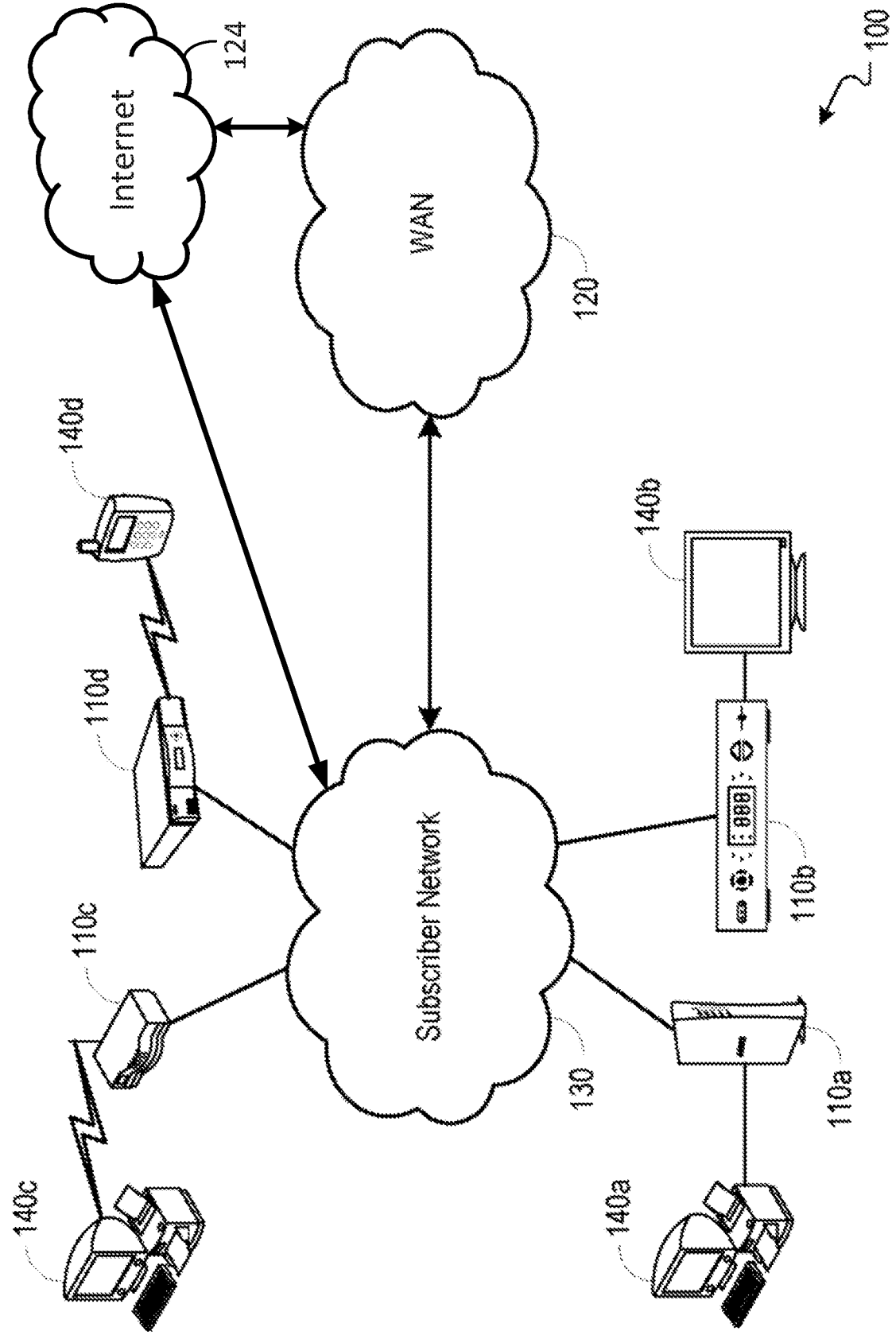


FIG. 1

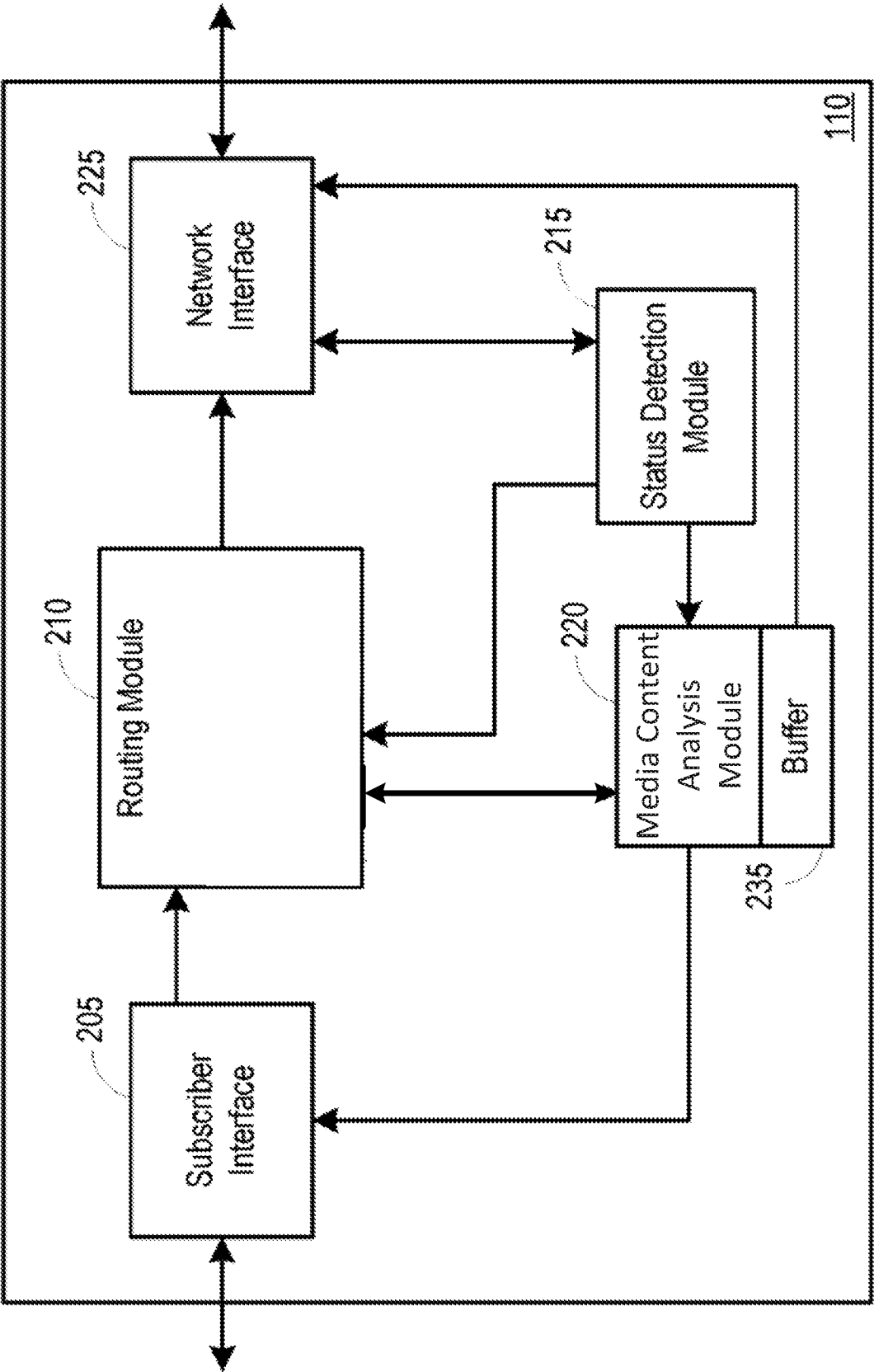


FIG. 2

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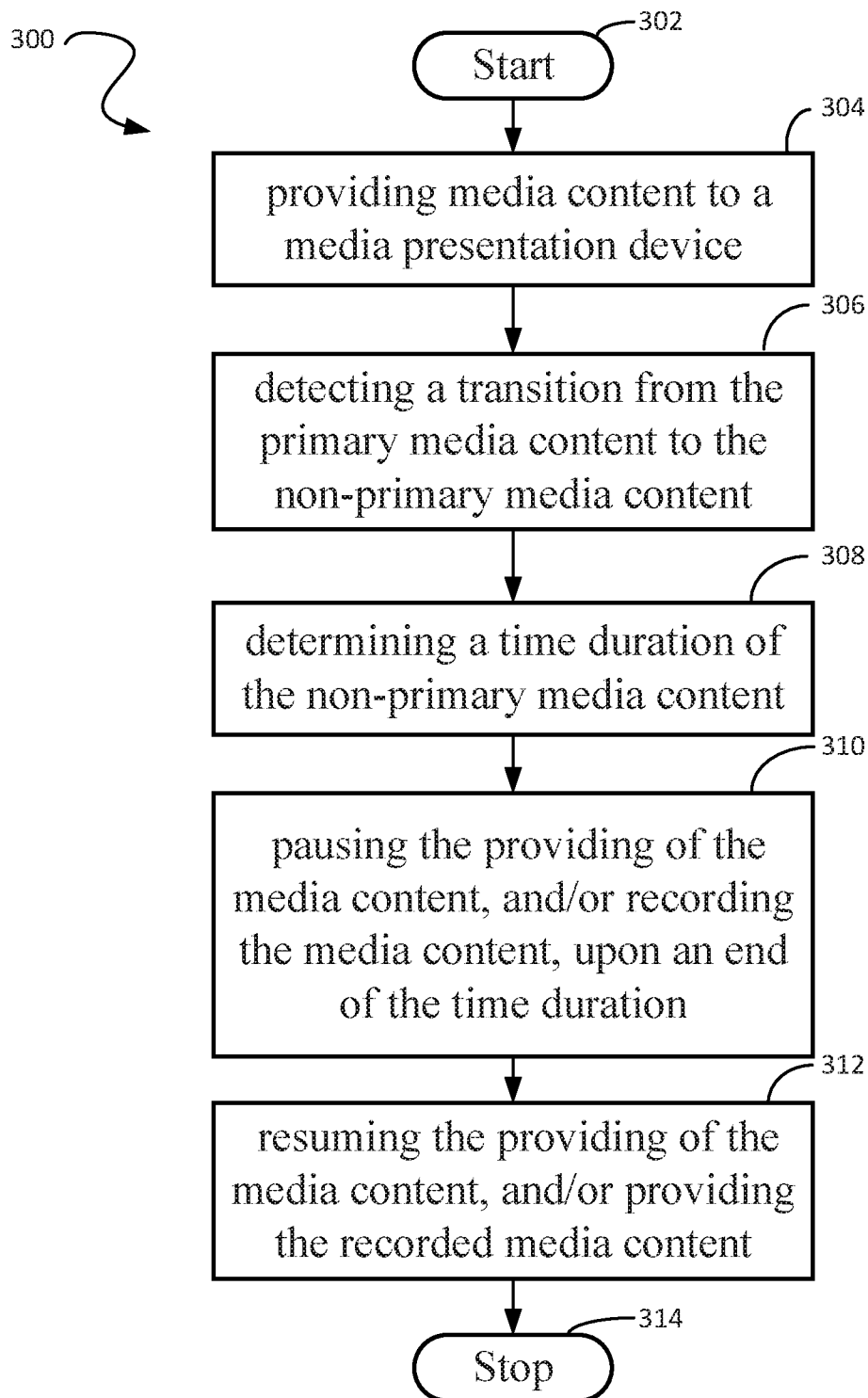


FIG. 3

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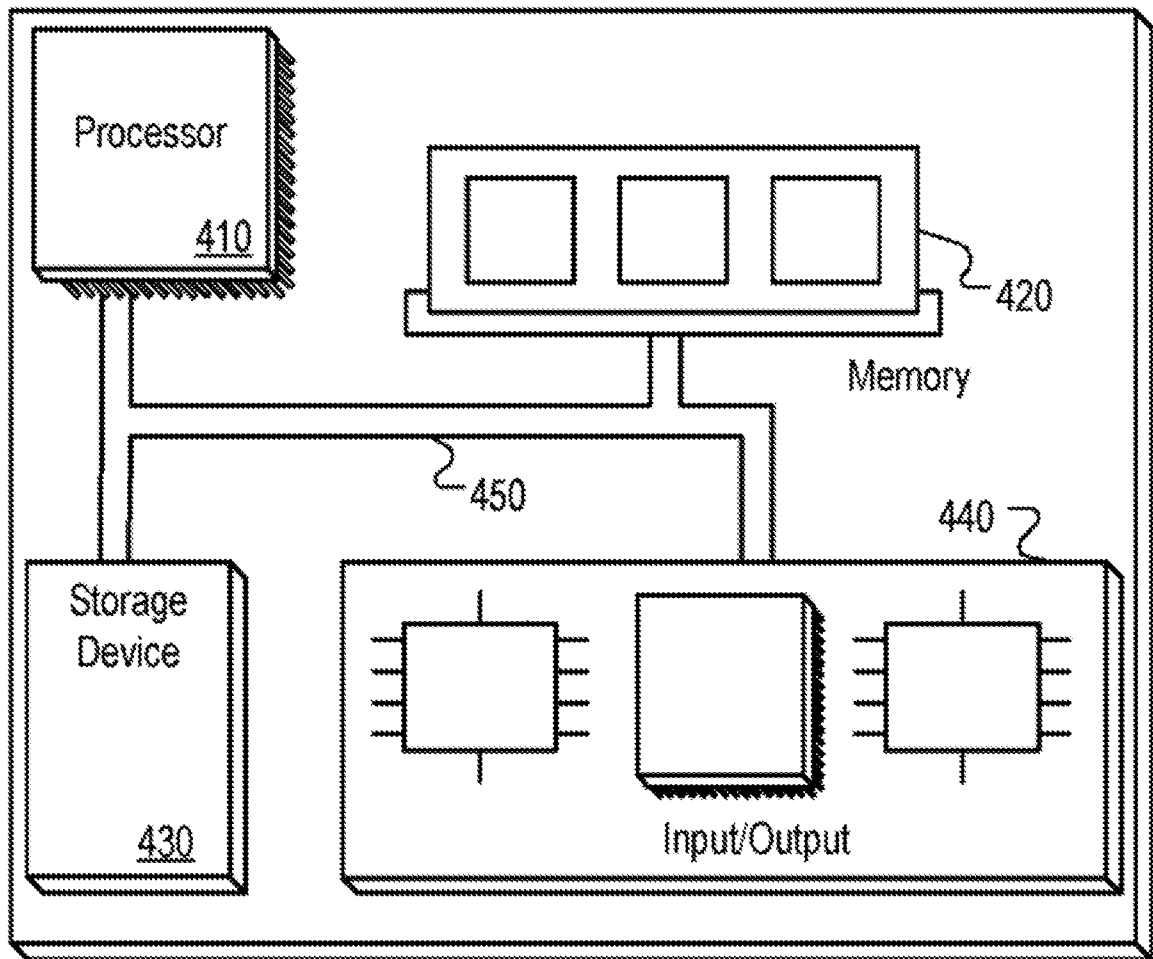


FIG. 4

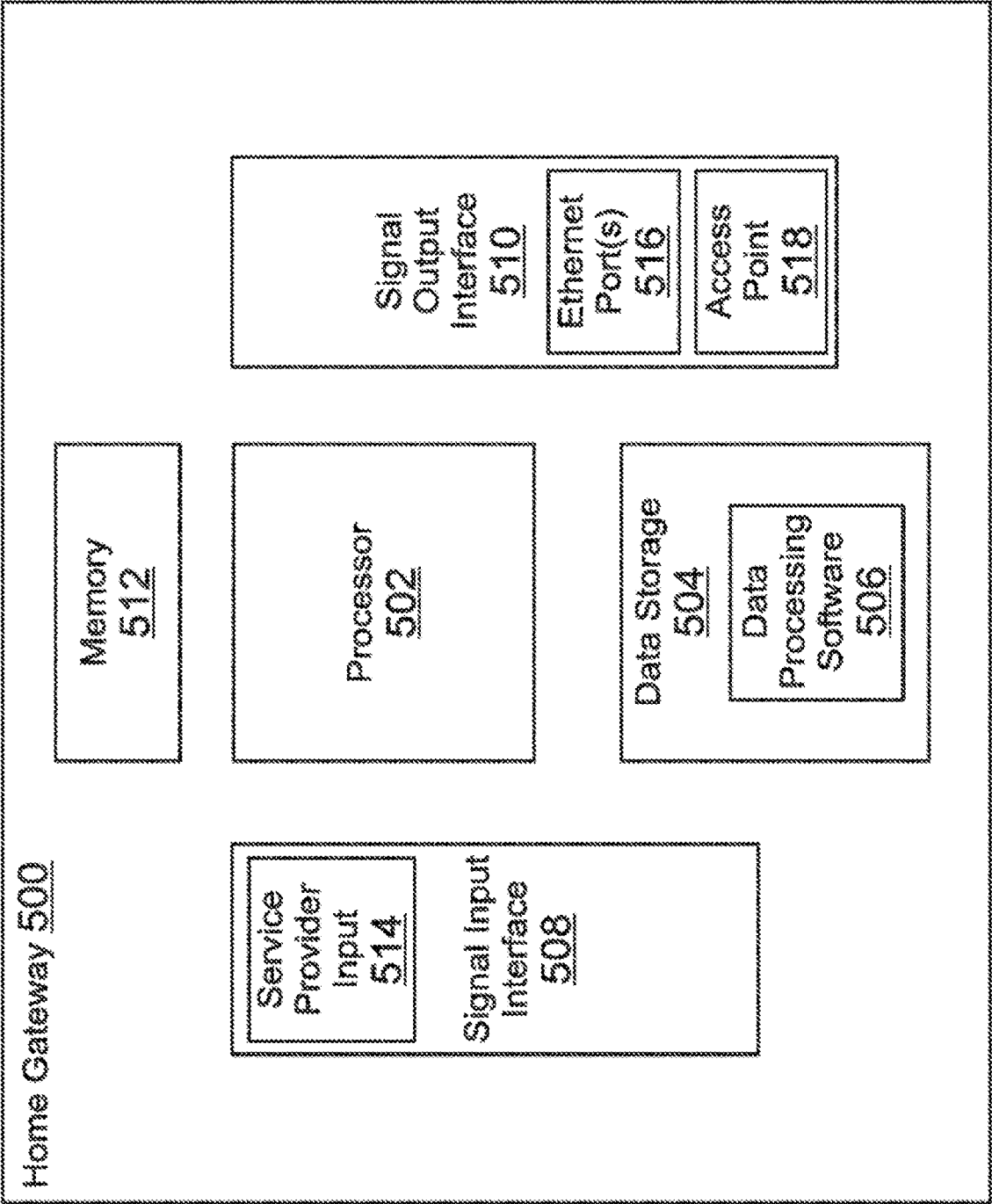


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/104497

A. CLASSIFICATION OF SUBJECT MATTER

H04N 21/442(2011.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS,CNKI,CNTXT,DWPI,USTXT,EPTXT,WOTXT:advertising, advertisement, commercial, detect, time, pause, record, resume, continue, break

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1986357 A2 (SONY CORP.) 29 October 2008 (2008-10-29) the description, paragraphs 0021, 0058-0060	1-3,5,7-10,12, 14-16,18,20
Y	CN 104967905 A (BEIJING QIYI CENTURY TECHNOLOGY CO., LTD.) 07 October 2015 (2015-10-07) the description, paragraphs 0019-0065	1-3,5,7-10,12, 14-16,18,20
A	EP 3151549 A1 (ADVANCED DIGITAL BROADCAST SA) 05 April 2017 (2017-04-05) the whole document	1-20
A	JP 2007043403 A (FUNAI ELECTRIC CO.) 15 February 2007 (2007-02-15) the whole document	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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

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

“&” document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/104497

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
EP	1986357	A2	29 October 2008	US	2008266460	A1	30 October 2008
				KR	20080096464	A	30 October 2008
				EP	1986357	A3	26 June 2013
				JP	2008277967	A	13 November 2008
				CN	101296345	B	14 December 2011
				CN	101296345	A	29 October 2008
CN	104967905	A	07 October 2015	CN	104967905	B	07 August 2018
EP	3151549	A1	05 April 2017	US	2017094370	A1	30 March 2017
JP	2007043403	A	15 February 2007	US	8081867	B2	20 December 2011
				JP	4501807	B2	14 July 2010
				US	2007031120	A1	08 February 2007