



(51) International Patent Classification:

H04N 21/458 (2011.01) *H04L 12/16* (2006.01)
G06Q 30/02 (2012.01) *H04N 5/445* (2011.01)

(21) International Application Number:

PCT/IB2013/000870

(22) International Filing Date:

14 March 2013 (14.03.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/641,115 1 May 2012 (01.05.2012) US

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,

BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU,
RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ,
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

(54) Title: A SERVICE FOR PRESENTING SECONDARY CONTENT DURING A COMMERCIAL BREAK

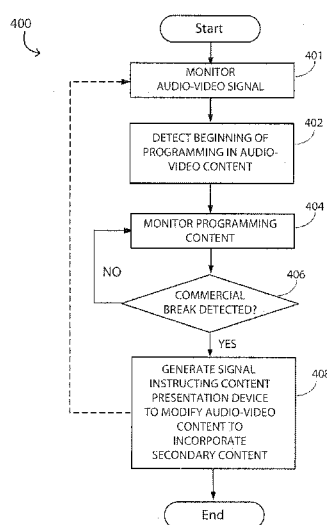


FIG. 4

(57) Abstract: A service automatically displays secondary content during commercial breaks of a TV program in conjunction with audio- video content of the commercial break. Presentation of the audio-video content of the commercial break may be de-emphasized. The service may monitor, in real time, a signal indicating a status of display of commercials on a given channel to a content presentation device, such as an Internet Protocol Television (IPTV) device, to alert the service about the commercial break. Commercial content to be displayed during the commercial break is not blocked but supplemented with the secondary content of user's choice. Such a system may provide benefits to a viewer, a TV programming service provider, and/or an advertiser by increasing enjoyment for the viewer, increasing the likelihood that an advertisement will be viewed, and decreasing the likelihood that a user will tune out from a TV program during a commercial break.

A SERVICE FOR PRESENTING SECONDARY CONTENT DURING A COMMERCIAL BREAK

RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional
5 Application No. 61/641,115, filed May 1, 2012, entitled “A Service for Presenting Secondary
Content During A Commercial Break,” the entire contents of which is incorporated by reference
herein.

BACKGROUND

Television (TV) has become a ubiquitous form of entertainment. A vast volume of
10 information is available to viewers, and many people can hardly imagine their lives without their
favorite television shows, movies, news and other television content. Television content is made
available to viewers in many media, including broadcast and through cable distribution systems.
More recently, television content has become available over the Internet, supporting Internet
TV.

15 Regardless of the medium in which it is distributed, most TV programming includes
commercial breaks. During a commercial break, an advertisement or other message, which is
often commercial in nature, may be presented to a viewer instead of the TV programming.
Advertisements presented during a commercial break are used to promote goods and services,
disseminate ideas, solicit donations and provide various other information to viewers.
20 Frequently, advertisements are a source of revenue for an entity providing TV programming
and, in some instances, are the major financial support that makes provision of the TV
programming feasible.

SUMMARY

25 The inventor has recognized and appreciated that experience of a user viewing television
(TV) programming content may be improved if the user is provided, during a commercial break,
with content other than commercial break content. Accordingly, when a commercial break is
detected in programming content comprising a TV program, secondary content is presented in
conjunction with the programming content.

30 A content presentation device, such as a set-top box or an Internet-enabled device of any
suitable type, may modify the presentation of the audio-video content during a commercial break

to present the secondary content simultaneously with presenting the audio-video content. For example, the content presentation device may present audio-video content representing the commercial break content in one portion of a display while presenting secondary content in the remainder of the display.

5 The secondary content may be any suitable content and may be in any suitable format. This secondary content may retain the viewer's interest during the commercial break. A viewer may provide preferences to a system that selects the secondary content for a viewer.

Any suitable mechanism may be used to determine when a commercial break is ongoing for particular television programming. That mechanism may be in a viewer's set top box.

10 Though, in some embodiments, a set-top box may communicate with a server that analyzes audio-video streams and provides an indication to step-top boxes rendering those streams when a commercial break is ongoing.

Accordingly, in some embodiments, the invention relates to a system for controlling presentation of content on content presentation devices, the system comprising at least one
15 computing device configured to: receive a signal from one or more sources indicating that a commercial break has begun or ended in at least one audio-video signal conveying audio-video content; and when it is determined, based on the received signal, that the commercial break is detected in an audio-video signal from the at least one audio-video signal, transmit an indication to at least one respective content presentation device associated with the audio-video signal that
20 a commercial break is ongoing.

In other embodiments, the invention relates to a method of operating a content presentation device comprising at least one processor to display audio-video content comprising programming and at least one commercial break, the method comprising, with the at least one processor: displaying audio-video content in a received audio-video signal in a first presentation
25 format while the programming is ongoing; receiving a signal indicating that a commercial break in the programming is ongoing; and, automatically in response to the signal, modifying the first presentation format to present the audio-video signal in a second presentation format, and simultaneously with displaying the audio-video content in the second presentation format, presenting secondary content.

30 The foregoing is a non-limiting summary of the invention, which is defined by the attached claims.

BRIEF DESCRIPTION OF DRAWINGS

The accompanying drawings are not intended to be drawn to scale. In the drawings, each identical or nearly identical component that is illustrated in various figures is represented by a like numeral. For purposes of clarity, not every component may be labeled in every drawing. In
5 the drawings:

FIG. 1 is a sketch of an environment in which some embodiments may be implemented;

FIG. 2 is a flowchart of an exemplary method of providing a service for detecting a commercial break in a TV program to present secondary content during the commercial break in
10 accordance with some embodiments;

FIG. 3 is a sketch of a system comprising a mobile device and a content presentation device in which some embodiments may be implemented;

15 FIG. 4 is a flowchart schematically illustrating a method of monitoring an audio-video signal for a commercial break in accordance with some embodiments;

FIG. 5 is a flowchart illustrating a method of executing the service in accordance with some embodiments by a content presentation device;
20

FIG. 6 is a flowchart illustrating a method of providing secondary content to a content presentation device by a secondary content server in accordance with some embodiments;

25 FIGs. 7A-7C are sketches illustrating an exemplary scenario of modifying an audio-video content of a TV program to incorporate secondary content during a commercial break in accordance with some embodiments;

FIG. 8 is a sketch of an exemplary user interface for setting user preferences relating to presenting secondary content during a commercial break in accordance with some embodiments;
30 and

FIGs. 9A and 9B are sketches of an exemplary user interface in a mobile device for controlling presentation of secondary content during a commercial break on a content presentation device in accordance with some embodiments.

DETAILED DESCRIPTION

5 Many viewers find commercial breaks an unwanted interruption of their more preferred activity of viewing TV programming. A TV viewer may not be fully engaged in content of a commercial and may thus engage during the commercial break in what is referred to as a “channel surfing” as the viewer switches to one or more other channels in hope to find a more interesting program.

10 The inventor has recognized and appreciated that this viewer behavior during commercial breaks is undesirable for providers of TV programming as well as advertisers paying for content to be presented to viewers. The viewer may “tune out” from the program during a break and not return to viewing the TV programming after the commercial break. Losing viewers can decrease the amount a provider of TV programming can charge for
15 advertising. Advertisements provide a source of revenue for entities providing TV programming such that loss of viewers through disinterest is undesirable for them, and can even impact the quality and quantity of TV programming that they can provide.

The inventor has recognized and appreciated significant benefit – for the viewer, the entity providing the TV programming and an advertiser – that can be obtained if alternative
20 content is presented to a viewer watching a TV program during a commercial break that interrupts the program. The alternative content may be selected to match an interest of the user, which decreases the likelihood that the viewer will tune out of a program during a commercial break. Such an approach improves viewership for the entity providing the TV programming, which may improve advertising revenue. Though a user may not be fully engaged in an
25 advertisement, because the advertisement is nonetheless available, in the vicinity of content that is likely engaging the user, the likelihood that the viewer will see and be impacted by the advertisement is increased.

In some embodiments, secondary content may be presented automatically during a commercial break. In this way, the need for a user to take action, which could lead to channel
30 surfing, may be avoided. Alternatively or additionally, the need for a user to revert to the TV programming at the end of a commercial break is also avoided.

Any suitable information may be provided as secondary content. The secondary content may be obtained from any suitable source. In some embodiments, for example, the secondary content may be stored locally or may be retrieved from a remote location over a network, such as the Internet. In some embodiments, the secondary content may be from a dynamic source, such as from Twitter®, Google®, Facebook®, or any other suitable Internet service. Such a source may provide different information each time secondary content is requested. In other embodiments, the secondary content may be static such that each time the content is requested, the displayed secondary content reverts to information as was displayed at the end of a prior commercial break.

Accordingly, some embodiments provide techniques that enable any suitable content presentation device, such as a set-top box, computer, cell phone, etc., that receives and presents content to determine that a commercial break in a program is ongoing and to present secondary content to a user of the content presentation device in conjunction with the content during the commercial break. In some embodiments, the secondary content may be presented automatically when a commercial break is detected, without requiring any input from the user to trigger modification of the display. However, in some embodiments, the secondary content may be presented to the user in conjunction with audio-video content presenting an ongoing commercial in a format that enables the user to adjust a way of presenting the secondary content and the commercial. For example, the content presentation device may receive user input indicating that the user chooses to view the commercial, rather than the secondary content, or vice versa.

The secondary content presented during the commercial break may be selected based on user preferences regarding the secondary content and may comprise any suitable textual, audio and/or video content and any combination thereof. Accordingly, the user may be more likely to view the secondary content, which may decrease a likelihood of the user engaging into the “channel surfing” and missing a part of the program that follows the commercial. The preferences may be provided by the user in advance of a commercial break. Upon detection of a commercial break, secondary content in accordance with the user’s preference may be identified and displayed. Though, in some embodiments, the secondary content will be non-commercial, and the secondary content, additionally or alternatively, may comprise an advertisement that is different from content of the commercial break.

Such a system for presenting secondary content may be implemented in any suitable way. The system may be implemented, for example, in a content presentation device, such as a set-top box with adequate computing resources to identify commercial breaks, determine appropriate secondary content and modify the presentation of audio-video content during the commercial break. Though, in other embodiments, some or all of these functions may be performed on other devices.

In other embodiments, for example, a control server may be provided separate from the viewer's content presentation device. A content presentation device, or, in some embodiments content presentation devices of multiple viewers, may access the control server. Interaction between the content presentation device and the control server may identify an audio-video stream containing TV programming being rendered by the content presentation device. The control server may use this information to aggregate, in real time, information about the same audio-video stream to detect commercial breaks. The control server may then communicate to each content presentation device rendering the audio-video stream that a commercial break is ongoing. Such communications may occur, for example, over a network, such as the Internet.

A component for obtaining secondary content in accordance with user's preferences similarly may be implemented in any suitable way, either within a content presentation device or an external device. The external device, for example, may be a secondary content server accessible over a network, such as the Internet. In some embodiments, the same physical device or devices may be used to implement a control server and a secondary content server.

Communication between the secondary content server and other components of the system may occur in any suitable way. In some embodiments, for example, a content presentation device displaying a TV program to its user may transmit to the secondary content server a request for secondary content to display during the commercial break. Though, in other embodiments, a request for secondary content may be initiated from outer sources, such as from the control server that has identified that a commercial break is on-going for a specific content presentation device.

Regardless of the component that implements the secondary content server, when secondary content is requested for a user, that content may be selected based on preferences previously supplied by the user. Preferences may be of any suitable type, with respect to any characteristic of the secondary content. For example, the user preferences may comprise a

source of the secondary content, a type of the secondary content, parameters relating to displaying the secondary content and other information.

FIG. 1 illustrates an exemplary computing environment 100 in which some embodiments of the invention may be implemented. In this exemplary embodiment, a separate control server and content server interact with multiple content presentation devices, which, in this example are
5 set-top boxes, of multiple users. These interactions occur over a network, such as the Internet.

Here, environment 100 may comprise a server, shown by way of example as a control server 102, which may communicate with one or more content presentation devices 104, shown as set-top boxes (STBs) STB1 104A, STB2 104B, STB3 104C, and STB4 104D. Components
10 shown in FIG. 1 may operate on a suitable network. Accordingly, control server 102 may communicate with content presentation devices 104 via the network.

Each of content presentation devices 104 may receive audio-video content comprising programming and display the audio-video content on a suitable display. Thus, FIG. 1 shows by way of example that STB1 104A, STB2 104B, STB3 104C, and STB4 104D are each associated
15 with a respective display 106A, 106B, 106C and 106D. Each display, for example, may be a conventional television set. Though, embodiments of the invention are not so limited, and the displays may be of any suitable type, including a display on a computer.

It should be appreciated that content presentation devices 104 are shown as set-top boxes by way of example only, as system 100 may comprise any suitable number of content
20 presentation devices of any suitable type. For example, one or more of content presentation devices 104 may be an Internet-enabled device (e.g., an Internet Protocol television device), a cell phone, a tablet, or any other suitable device configured to receive audio-video content and present the content on a display. In the example of FIG. 1, each of the content presentation devices and associated displays are illustrated to have the same format. However, this
25 illustration is for simplicity only. It should be appreciated that each of the content presentation devices may be owned by a different user, such that the content presentation devices and associated displays may have different formats

Regardless of the specific construction of the content presentation devices and their associated displays, each may receive an audio video signal conveying TV programming with
30 commercial breaks. The specific audio-video signal received at each content presentation device may be received using techniques as are known in the art. For example, in a broadcast TV setting, a user may tune to a specific channel. For Internet TV, a user may select a specific feed.

The audio-video signals conveying audio-video content comprising programming may be received by the content presentation devices as one or more broadcast, cable or any other types of channels. The channels may be provided over the Internet.

In this example, the audio-video signals comprise multi-media data streams
5 communicated over the Internet. FIG. 1 illustrates that control server 102 may receive information about multiple channels 107 from network connected sources monitoring one or more broadcast servers 108. Here, broadcast servers 108 represent servers operated by entity is providing audio-video content over the Internet. Accordingly, it should be appreciated that, in this context, “broadcast” does not necessarily indicate audio-video information that is conveyed
10 wirelessly using electromagnetic signals. Likewise, “channels” does not necessarily mean that different frequency spectra are used to communicate audio-video streams. Rather, signals in different channels may be distinguished by a receiving device in any suitable way. In the example of FIG. 1, each of the set-top boxes STB1 104A, STB2 104B, STB3 104C, and STB4 104D is tuned to a channel, selected by its respective user, such that TV programming being
15 communicated in that channel is presented for the user.

Control server 102 may comprise one or more video analysis source 110 and signal control server 112, and channels 107 may be analyzed by video analysis source 110. In some embodiments, video analysis source 110 may comprise a cluster of servers, with each server assigned to programmatically analyze a particular channel of channels 107. Though, it should
20 be appreciated that other implementations of video analysis source 110 may be substituted, as embodiments are not limited in this respect.

Each of the content presentation devices 104 may be configured to implement display techniques described herein. In this example, control server 102 determines when a commercial break occurs in the TV programming for each of the content presentation devices. To enable
25 control server 102 to make such a determination for each of the content presentation devices, the content presentation devices may register with control server 102. Such registration may be performed in any suitable way, including through communications over a network, using known network protocols. Regardless of the format of the registration communications, as a result of the registration, as shown in FIG. 1, signal control server 112 may store information 113 on each
30 of the content presentation devices STB1 104A, STB2 104B, STB3 104C, and STB4 104D registered with control server 102.

Information 113 on content presentation devices 104 registered with control server 102 may be stored in any suitable manner. For example, registration information 113 may be stored in a conventional database connected to control server 102. Information 113 may include information about the content presentation device, such as addressing information to enable
5 control messages and/or secondary content to be directed to the content presentation device. Alternatively or additionally, information 113 may include an indication of the channel selected by the content presentation device. As yet a further example, information 113 may also include information identifying a viewer or viewers actively using the content presentation device.

Control server 102 may use information 113 to determine the set of channels being
10 viewed on each of the registered content presentation devices. Each of these channels may be monitored (e.g., via video analysis source 110 or other suitable component) to detect a commercial break in that signal. In response to detecting a commercial break in a channel received by a device of content presentation devices 104 being monitored, control server 102 may send a signal to that content presentation device indicating that a commercial break is
15 ongoing. Such indication may serve as an instruction to the device to modify content of the audio-video signal to present secondary content in conjunction with the audio-video content on the channel being presented by that content presentation device.

Secondary content may be selected and/or formatted in accordance with user preferences, which may be stored in user preferences store 114. In this example, secondary content is
20 selected by a secondary content server 116 and user preferences store 114 may be a database or other data store associated with the secondary content server. However, it should be appreciated that the specific components used to implement each of the functions described herein are not critical to the invention.

User preferences may be obtained in any suitable way. In the example of figure 1, user
25 preferences with respect to the secondary content may be provided by a user of each of the content presentation devices 104. For example, a user's content presentation device is configured for automatic presentation of secondary content as described herein, a user interface may be rendered on a display of the content presentation device to set up the user preference. Such an interface is not shown in FIG. 1 for the sake of simplicity, but any suitable interface
30 format may be used. The user interface may be configured to receive input indicating any type of preference, including preferences relating to the secondary content selected, the manner in which the secondary content is displayed in conjunction with the audio – video information

containing a TV program, the timing of the display or removal of secondary content from the display and/or conditions under which secondary content is displayed. However, it should be appreciated that user preferences may be obtained other than by direct user input. For example, user preferences may be inferred from television programs selected by a user or other
5 information revealing user preferences.

User preferences may be stored in a suitable data store, such as user preferences store 114. In some embodiments, user preferences store 114 may store user preferences received from the user in association with a user identifier identifying the user. For example, user preferences store 114 may comprise multiple entries, each associated with a user identifier and storing
10 preferences of the user identified by that user identifier. In some embodiments, these user preferences may be stored for a user when initially accessing a service as described herein. These preferences may be updated from time to time. When a user accesses a content presentation device, the user may provide identifying information to the content presentation device such that preferences may be associated with the specific user or users of each content
15 presentation device. Though, in other embodiments, the user preferences may be associated with a content presentation device, such that any user of the content presentation device may be associated with the same set of user preferences.

When a content presentation device from content presentation devices 104 receives a signal from control server 102 instructing the content presentation device to modify presentation
20 of the audio-video content to incorporate the secondary content, the content presentation device may send a request to a secondary content server 116 for secondary content. The request may be received in conjunction with a user identifier identifying the user of the content presentation device. The user identifier may be used to locate user preferences set by the user and stored in user preferences store 114.

25 Content presentation devices 104 may obtain the secondary content, in accordance with the user preferences identified using the user identifier, from secondary content server 116.

Secondary content server 116 may obtain the secondary content from any suitable source. The secondary content may be stored locally to secondary content server 116 or may be retrieved from a remote location (e.g., via the Internet). In some embodiments, secondary
30 content server 116 may be configured to access the secondary content via the Internet from RSS feeds, Twitter®, Google®, Facebook®, or any other suitable source. It should be appreciated that embodiments are not limited with respect to a type or source of the secondary content that

may be presented in conjunction with audio-video content on a received audio-video signal, and any suitable secondary content may be received from any content source.

It should be appreciated that components of environment 100 in FIG. 1 are illustrated by way of example only. Thus, control server 102 and secondary content server 116 may each
5 include one or more of any suitable devices. In some embodiments, either or both control server 102 and secondary content server 116 may communicate with content presentation devices 104 via a network.

User preferences store 114 may be associated with content presentation devices 104 in any suitable manner. Further, while user preferences store 114 is shown as a component
10 separate from secondary content server 116, user preferences store 114 may be maintained at secondary content server 116, or may otherwise be associated with secondary content server 116.

FIG. 2 illustrates an exemplary process 200 of utilizing the service in accordance with some embodiments that modifies presentation of audio-video content to incorporate secondary
15 content in conjunction with the audio-video content. In this example, the service is executed by an exemplary computing device comprising a mobile device that may communicate with an IPTV device. For example, the mobile device may be paired with the IPTV device. The IPTV device may receive an audio-video signal conveying audio-video content. The audio-video content may be displayed on a display, such as a television screen or other suitable display. It
20 should be appreciated that the IPTV device communicating with the mobile device is only an example of the content presentation device and any other suitable device may be substituted, as embodiments are not limited in this respect.

At block 202, a suitable paired mobile and IPTV device combination may be configured to enable the service. The mobile/IPTV device combination may be configured to execute the
25 service in any suitable manner. For example, application software implementing the service may be stored and activated in a suitable manner on the mobile device. The application software may be downloaded from a suitable source (e.g., via the Internet) or otherwise received by the mobile device.

Configuring the mobile device to enable the service may comprise storing the enabled
30 state of the service in a suitable location in the device in conjunction with information used to select secondary content. For example, as shown at block 204, the mobile device may save the enabled state to a user configuration settings file in conjunction with user preferences about

secondary content to display. As a result, once the service is enabled and activated at the mobile device, it remains active even if the mobile or IPTV device has been turned off and then brought back on. The service thus may remain active until a suitable explicit trigger is received to deactivate the service at the device. The trigger may comprise, for example, user input.

5 Though, other triggers may be substituted, such as an expiration of a service agreement with a provider of the server or other triggers.

At block 206, the audio-video signal of a channel currently selected by the user of the content presentation device may be monitored, to detect indicators of a start of a commercial break. The audio-video signal may comprise a television show or any other type of
10 programming. The audio-video stream may be monitored by a computing device configured to monitor input of a number of users who are concurrently viewing the same channel, or by suitable software executed on a processor within the IPTV device or other suitable computing device that has access to the audio-video stream being presented.

Next, at block 208, it may be determined, based on the monitoring, that the commercial
15 break has begun. In response to the determination, the computing device monitoring for the signal indicating that a commercial break has begun may provide the signal to the mobile device to indicate that the commercial break is ongoing.

Based on an indication that the commercial break is ongoing, the display format of the audio-video stream may be modified. The modification may reduce the prominence of the
20 presentation of the audio-video stream during the commercial break. The presentation of the audio-video stream may be reduced in prominence by altering audio characteristics and/or video characteristics or in any other suitable way. In this example, process 200 optionally may include an act of muting or reducing a volume of the audio-video signal, based on the signal from the control server indicating the start of the commercial break. Whether such a step is performed
25 may depend on user preferences for display format of secondary content or any other suitable criteria. Additionally, a level of the volume of the audio-video signal set prior to the detection of the commercial break may be stored so that the level may be restored when the commercial break ends.

In response to identifying that a commercial break has begun at block 208, an IPTV
30 device's interactive layer may be activated, at block 212. An interactive layer may be implemented using techniques as are known in the art for constructing presentation devices and may allow a user or programs executing on the presentation device to control the presentation of

audio-video information on a display coupled to the presentation device. The interactive layer may be presented in conjunction with the presentation of the audio-video content in any suitable manner. For example, the interactive layer may overlay a portion or the entirety of the audio-video content or may be presented in any other suitable relation to the audio-video content.

5 Once the interactive layer has been displayed at block 212, secondary content may be obtained for presentation on the IPTV device, based on user preferences with respect to the secondary content, as shown at block 214. The user preferences may be stored in a data store in the mobile device or in any other suitable location. The data store may comprise a user preferences file storing the user preferences of a user that may operate the mobile/IPTV device
10 combination. The user preferences may comprise a source, a type of the secondary content and any other characteristics of the secondary content. Alternatively or additionally, the user preferences may identify a program or service executing on the IPTV device that can obtain information for display. Any suitable type of a program or service may be accessed as a source of secondary content, including, for example, a user calendar, or a book reader.

15 At block 214, the secondary content obtained in accordance with the user preferences may be presented within the interactive layer on the display associated with the IPTV device in conjunction with the audio-video content. A format of the presentation of the audio-video content may be modified to incorporate the secondary content in any suitable manner – for example, the secondary content may overlay a portion or the entirety of the audio-video content,
20 a size of the presentation of the audio-video content may be reduced to a smaller portion of the display, etc. The secondary content may be presented within the interactive layer in a manner that allows modifying its presentation during the commercial break.

 At block 216, a determination may be made that the commercial break has ended. The determination may be done based on monitoring of the commercial break and may be made by
25 the same components that determined that a commercial break had started. When the end of the commercial break is detected, such a component may generate a signal indicating the end of the commercial break. In response to the signal, the interactive layer comprising the secondary content during the commercial break may be deactivated, or hidden, at block 218. As a result, the format of the presentation of the audio-video content may be modified to remove the
30 secondary content. For example, if, during the commercial break, the audio-video content was presented in a smaller portion of the display, when the end of the commercial break is detected, the presentation of the audio-video content may revert to the entire display. As another

example, additionally or alternatively, if a volume of the audio-video signal was decreased or muted during the commercial break, the volume may be returned to its previously saved state when the commercial break ends.

Any other modifications to the presentation of the audio-video content that took place
5 during the commercial break for the audio-video content to incorporate the secondary content may be canceled so that the audio-video content (e.g., a television show) may be presented without the secondary content. In some embodiments, hiding or deactivating the interactive layer at block 218 may entail reverting to a full-screen presentation of television programming.

As shown at block 220, once the end of one commercial break is identified, monitoring
10 the audio-video signal of the currently selected channel may resume to detecting another commercial break, at block 208. When another commercial break is detected, process 200 may repeat as described above. Process 200 may operate continuously, until the service is deactivated at the content presentation device.

In some embodiments, a service for presenting secondary content during a commercial
15 break may be commercially provided. A provider of that service may operate equipment to detect commercial breaks and supply secondary content as appropriate. In some embodiments of such a service, a user may obtain a specially configured content presentation device. Though, in other scenarios, the configuration of a content presentation device may be performed by loading a program on the content presentation device or in any other suitable way.

20 In some embodiments, a service for presenting secondary content during a commercial break may be implemented by use of a software application that is run on a personal mobile device. The mobile device may send commands to an IPTV set-top box client in order to present secondary content.

FIG. 3 illustrates an exemplary system 300 comprising a server, a mobile device, and a
25 content presentation device in which some embodiments may be implemented. In this example, an audio-video signal, such as a television signal, may be delivered to a content presentation device as a digital transmission using an internet protocol (IP) as a transmission carrier. The audio-video signal may originate at a service provider 301 and may be distributed over a service provider's network to an IPTV set-top box client 312 of a user, located at a residential location
30 or any other location. Service provider 301 may comprise as a broadcast channel provider, cable channel provider, IPTV channel provider and any other suitable type of a service provider, as embodiments are not limited in this respect.

The audio-video signal transmitted in accordance with the IP may be received (303) by a set-top box which may translate the signal into analog data that can be displayed on a display associated with the set-top box, such as a television. As another example, the audio-video signal may be received by an IPTV television that integrates capabilities of receiving signals in accordance with the IP and translating the signal into analog signals.

In system 300, an audio-video signal 302 conveying audio-video content comprising programming may originate at service provider 301. Audio-video signal 302 may comprise video and audio information transmitted over a channel. Audio-video signal 302 also may be delivered (303) to a content presentation device which is, in this example, set-top box 312 configured to display the audio-video content conveyed by the received audio-video at a suitable display, such as a television 316. Though a single set-top box 312 is shown in FIG. 3, it should be appreciated that system 300 may comprise more than one set-top-box or other types of content presentation devices. Moreover, a single TV signal 302 is illustrated by way of example only. It should likewise be appreciated that service provider 301 may provide multiple channels of TV signals such that each set-top box may select from among the multiple channels available. Though, for simplicity, processing on a single signal is shown by way of example only.

At service provider 301, audio-video signal 302 may also be monitored (304) by a process that can identify the beginning and end of a block of commercials in real time, shown as the commercial detection process 305. This process may involve processing by one or more suitable computing devices configured to process audio-video signals, or the process may comprise a method to monitor human users as they signal the beginning and end of a commercial break, or other methods. Commercial detection process 305 may be, for example, similar to video analysis source 110 (FIG. 1).

Commercial detection process 305 may monitor suitable characteristic of audio-video signal 302 to detect a commercial break. The detection may comprise detecting a start and an end of the commercial break. When a start or an end of the commercial break is detected by commercial detection process 305, commercial detection process 305 provides an indication indicating the start or the end of the commercial break to signal control server 306.

In some embodiments, a mobile device 310 that is paired in such a way as to communicate with the set-top box 312 may communicate (307) with signal control server 306 through the use of IPTV remote control software 308 to provide an indication to signal control server 306 of the channel to which set-top box 312 is currently tuned. When commercial

detection process 305 detects that the commercial break is ongoing, it may indicate this to signal control server 306 that may send (307) a signal to IPTV remote control software 308 indicating that the commercial break is ongoing. The signal may be in any suitable format – e.g., a message indicating a start of the commercial break and a separate message indicating the end of the commercial break.

Though not shown in FIG. 3, system 300 may comprise multiple other content presentation devices, each of which may similarly communicate with signal control server 312. Accordingly, when signal control server 306 receives an indication of the commercial break in the channel to which set-top box 312 is tuned to, signal control server 306 may also send the signal indicating the detection of the commercial break to any other mobile devices that are registered with signal control server 306. Furthermore, signal control server 306 may monitor a current state of a channel in which a commercial break is ongoing for all of mobile devices registered with signal control server 306, so that content presentation devices that switch to that channel during the commercial may receive the signal indicating that the commercial break is ongoing.

In response to receiving a signal indicating a start of a commercial break by mobile device 310, set-top box 312 may enable its interactive layer as shown, for example, at block 212 of FIG. 2. Invoking the interactive layer 314 may result in presenting secondary content in any suitable way, including, for example, displaying a web browser such that information obtained (318) over the Internet – e.g., from an Internet content providing service 320, may be presented.

The secondary content may be obtained by set-top box 312 through interaction with IPTV remote control software 308. In this example, IPTV remote control software 308 interacts with preferences file 309 stored on mobile device 310, which may store previously set user preferences with respect to secondary content. User preferences file 309, like user preferences store 114 (FIG. 1), may store user preferences in any suitable manner.

The user preferences may be stored at user preferences file 309 in association with identification information of mobile device 310, such as a device and/or user identifier. A request for the secondary content may be sent (319) from IPTV remote control software 308 to Internet content providing service 320, such as an RSS server, a video server, a social networking server, or any other suitable server, in conjunction with a user identifier identifying mobile device 310 and/or its user. Accordingly, when a match exists between the user identifier provided in conjunction with the request and an identifier in Internet content providing service

320, preferred content stored in association with the matching user identifier may be accessed from Internet content providing service 320.

Internet content providing service 320 may obtain the secondary content, in accordance with the user preferences, from a suitable local or remote location. The secondary content may be of any suitable type and may comprise, for example, text, still or moving images, video, audio, advertisements, or any other suitable content. The secondary content may be transmitted (311) from the mobile device 310 to the set-top box 312, and in turn to its interactive layer 314. The interactive layer 314 may in turn use the transmitted secondary content to access (318) additional content from the Internet content providing service 320. One example of such a situation would be a URL for a video sent to the interactive layer 314 from the mobile device 310, where the interactive layer in turn accesses the Internet content providing service 320 directly in order to display the associated streaming video clip. Such secondary content would be displayed (315), in conjunction with the audio-video content (313), on television 316.

In some embodiments, when an end of the commercial break is detected and IPTV remote control software 308 receives a signal indicating the end of the commercial break from signal control server 306, IPTV remote control software 308 may transmit a signal to set-top box 312 causing it to cease presenting the interactive layer. Thus, the secondary content presented during the commercial break in conjunction with the audio-video content may be removed from the audio-video content. Presentation of the audio/video stream conveying the TV programming may revert to its format prior to the commercial break. For example, an appearance and a volume of the audio-video content may be returned to its state prior to the commercial break. As a result, the user of content presentation device 317 may be enabled to resume watching of the television program in the manner in which it was presented on television 316 prior to the commercial break.

It should be appreciated that the mobile device 310 and elements contained within the category of content presentation device 317 as described in FIG. 3 are shown by way of example only, as embodiments of the invention are not limited with respect to specific content presentation devices. The control and display functions performed by the mobile device 310, the set-top box 312 and the television 316 may be performed by any one or more devices, such as, for example, a television set connected to the Internet, a personal computer, a web/TV viewing device, a tablet computer, a mobile computing device, and any other suitable type of device.

Regardless of the architecture of a system configured to present secondary content during a commercial break, the system may include a component that detects an ongoing commercial break. FIG. 4 illustrates generally a process 400 of monitoring an audio-video signal for a commercial break in accordance with some embodiments. Process 400 may start at any suitable time. For example, process 400 may start when the content presentation device is configured to implement the service. In some embodiments, such as that described in connection with FIG. 3, the content presentation device may register with a server to implement the service in accordance with some embodiments and may receive input instructing activation of the service on the content presentation device. In other embodiments, the service may be activated on the content presentation device so that the content presentation device is itself configured to detect a commercial break.

Once activated, in some embodiments, the service may continuously execute on the content presentation device to instruct the content presentation device to display secondary content in response to detecting a commercial break.

At block 401, multiple characteristics of the audio-video signal may be monitored. Next, at block 402, based on the monitoring, a beginning of programming in the monitored audio-video content may be detected. The audio-video content may comprise any suitable television program and the beginning of the programming may comprise a beginning of the television program. When the beginning of the programming is detected, at block 404, the programming may be monitored for a commercial break. Any suitable characteristics of the programming may be monitored. The monitoring may be performed by video analysis source 110 (FIG. 1), commercial detection process 305 (FIG. 3), or by any other suitable software or hardware component, or by a combination of software and hardware monitoring human generated signal input.

At decision block 406, it may be determined whether the commercial break is detected, based on the monitoring of the programming at block 404. If the commercial break is detected, process 400 may follow to block 408 where a signal may be generated instructing the content presentation device to modify presentation of the audio-video content to incorporate the secondary content. If it is determined at block 406 that the commercial break is not detected, process 400 may return to block 401 where the audio-video content may be monitored for a beginning of the programming content. For example, if the television program is finished and no

commercial break is detected, the control server may continue monitoring the commercial detection source for commercial break cues.

In some embodiments, a content presentation device executing the service in accordance with some embodiments may communicate with a control server to provide to the control server
5 information on a channel to which the device is tuned and to receive, from the server, a signal indicating that a commercial break is detected in an audio-video signal in the channel. FIG. 5 shows a process 500 of executing the service by a content presentation device.

Process 500 may begin, for example, when the content presentation device is configured (e.g., registers with a control server) to execute the service and the service is activated on the
10 content presentation device. Once activated, the service may continuously run on the content presentation device. As a result, when the signal indicating that a commercial break is detected in audio-video content conveyed by the audio-video signal is received at the content presentation device, no user input may be required to start the service that modifies the presentation of the audio-video content to incorporate the secondary content.

At block 502, process 500 may display audio-video content conveyed by the audio-video
15 signal received by the content presentation device. The audio-video signal may comprise, for example, a multi-media data stream communicated over a network. However, it should be appreciated that any type of an audio-video signal may be received by the content presentation device.

The audio-video signal may be received by the content presentation device in a channel
20 to which the content presentation device is tuned. The channel may be a conventional broadcast channel, a cable channel, an Internet protocol channel, or any other suitable type of channel.

Next, at block 504, information on the channel currently being watched at the content presentation device may be sent to the control server. Any suitable indicator of the channel may
25 be sent. For example, the channel may be identified by a network address or by station call letters.

A signal indicating a start of a commercial break detected in the audio-video signal may then be received at block 506. As described in connection with FIG. 3, the control server in concert with a commercial detection process may monitor one or more characteristics of the
30 audio-video signal received by the content presentation device. The control server may detect the start of the commercial break based on the monitoring and generate the signal (block 408, FIG. 4) indicating the start of the commercial break. The signal received at block 506 may

instruct the content presentation device to modify presentation of the audio-video content to incorporate secondary content displayed simultaneously with the audio-video content.

Accordingly, in response to the received signal, at block 508, a request for the secondary content may be sent to a suitable computing device, such as, in some embodiments, the internet
5 content providing service. The request may be sent in conjunction with a user identifier identifying a user of the content presentation device. The control server may control another computing device, such as a user's paired mobile device (e.g., mobile device 310 in FIG. 3), to access user preferences stored for the user of the content presentation device in association with the user identifier. The secondary content obtained in accordance with the user preferences may
10 be received by the content presentation device.

It should be appreciated that, in some embodiments, the secondary content desired to be presented during the commercial break may be stored on or in association with the content presentation device. In such cases, "receiving" the secondary content may be taken as receiving an indication of what content was identified as the secondary content, based on the user
15 preferences. Moreover, in some embodiments, the content presentation device may itself retrieve the secondary content.

Once the secondary content to be presented during the commercial break is identified, the presentation of the audio-video content may be modified to incorporate the secondary content in conjunction with the audio-video content. The audio-video content may be modified
20 in any suitable manner. For example, one or more of a size of its presentation, a position on a display, a volume or other audio characteristics, a type and size of a font, a brightness or other visual characteristics, as well as any other characteristics and any combination thereof may be modified. The audio-video content may be modified to focus the user's attention on the secondary content. However, if the user chooses to view the audio-video content, user input
25 may be received instructing the content presentation device to modify the audio-video content in a manner that would bring the user's focus to the audio-video content. This may be possible even if the secondary content overlays the entire area of the presentation of the audio-video content – suitable controls may be provided that may receive user input instructing the content presentation device to focus on the audio-video content.

30 Presenting the secondary content simultaneously with the audio-video content does not negatively affect efforts of providers of advertisements presented during the commercial break, as would be the case if the audio-video content were blocked during the commercial break.

Because the audio-video content is displayed, albeit in a modified format, advertisement(s) presented during the commercial break may still be viewed by the user. In some embodiments, display of secondary content may include a mechanism for a user to obtain more information about an advertisement presented during a commercial break. The mechanism may include
5 controls to revert the advertisement to a “full-screen” mode. Alternatively or additionally, the mechanism may include Internet links or other controls within the secondary content. Moreover, additional revenues may be generated for the advertisers, because the secondary content may also include advertisements.

However, in the embodiments described herein, no user input is required to modify the
10 audio-video content and the secondary content may thus be presented automatically, in response to the signal indicating that the commercial break is ongoing, received at block 506. Such a manner of modification of the audio-video content during the commercial break may improve user experience, since the user simply continues to watch the programming, with the secondary content of the user’ choice presented during the commercial break.

Referring back to FIG. 5, at block 512, a signal indicating an end of the commercial
15 break may be received. The signal may be received from the control server (or a suitable component of the content presentation device) that generates (e.g., at block 408 of FIG. 4) the signal based on the monitoring of the audio-video content during the commercial break.

Regardless of a manner of receiving the signal, in response to the signal, at block 514,
20 the presentation of the audio-video content may be modified to present the audio-video content in the same format as was used to present the audio-video content before the commercial break. Accordingly, the secondary content may be removed from the audio-video content and the audio-video content may be presented in the same manner as before the commercial break. For example, if, during the commercial break, the audio-video content was presented in a smaller
25 portion of the display than before the break, the presentation of the audio-video content may revert to a size occupying a larger portion of the display, or the entire display. Though, it should be appreciated that the embodiments are not limited with respect to a manner of modification of the audio-video content.

After the secondary content may be removed from the audio-video content, at block 514,
30 process 500 may end. Though, process 500 may execute continuously, as long as the service that modifies the audio-video content to incorporate the secondary content during a commercial break is active on the content presentation device. Accordingly, process 500 may return to block

502 where the same or different audio-video content conveyed by an audio-video signal received by the content presentation device may be displayed.

In some embodiments, a content presentation device that detects a commercial break and presents secondary content during the commercial break may request a server to provide the
5 secondary content to the device. The server may control a secondary content server to provide the requested secondary to the content presentation device. FIG. 6 illustrates a process 600 of presenting secondary content to a content presentation device by a secondary content server, in accordance with some embodiments.

Process 600 may start at any suitable time, such as when the secondary content server
10 operates to obtain, upon a request, suitable secondary content. At block 602, a request to provide secondary content to the content presentation device may be received. The request may be received when a commercial break is detected in an audio-video signal received by the content presentation device.

As discussed above, input may be received from a user of the content presentation device
15 with respect to user preferences regarding the secondary content. An example of a user interface for setting the user preferences is shown in FIG. 8. Additionally or alternatively, the user preferences may be obtained in other manner - for example, inferred based on a user's viewing behavior or determined in other different ways. Regardless of the way in which the user preferences were obtained, they may be stored in a suitable data store (e.g., user preferences 114
20 in FIG. 1) in association with a user identifier identifying the user that set the user preferences. Accordingly, the request to provide secondary content may be received in conjunction with a user identifier identifying a user of the content presentation device, at block 602.

Next, at block 604, process 600 may access one or more user preferences previously set for the user of the content presentation device, based on the user identifier received in
25 conjunction with the request to provide the secondary content. For example, an entry in the data store storing multiple user preferences may be accessed based on the user identifier when the entry is associated with that identifier. The entry may store the user preferences associated, via the user identifier, with the user of the content presentation device. Though, it should be appreciated that the user preferences may be stored in any suitable format in one or more data
30 storages, as embodiments of the invention are not limited in this respect.

After the user preferences are accessed, at block 604, the secondary content may be obtained from a suitable source, at block 606. The user preferences may be preferences with

respect to any characteristic of the secondary content and may comprise, for example, a source of the secondary content, a type of the secondary content, parameters relating to displaying the secondary content and any other information.

Accordingly, at block 606, the secondary content of a desired type may be obtained from
5 a suitable source, based on the type and the source indicated in the user preferences. The source of the secondary content may be any suitable remote or local source. In some embodiments, the secondary content may be obtained via the Internet. The secondary content may comprise text, one or more images, animations, video content, audio content and any other suitable type of information. For example, the secondary content may comprise images stored on or otherwise
10 associated with the content presentation device. Further, the secondary content may comprise advertisements, which may be different from advertisements in the programming presented during the commercial break.

At block 608, the secondary content may be provided to the content presentation device. The user preferences accessed at block 604 may indicate a manner of presenting the secondary
15 content on a display of the content presentation device. The secondary content provided to the content presentation device may then be displayed based on the user preferences. Process 600 may then end.

In some embodiments, when secondary content is presented to a content presentation device during an ongoing commercial break in conjunction with audio-video content comprising
20 the commercial break, a presentation of the audio-video content may be modified. The modification may help focus user's attention on the secondary content. At the same time, the secondary content is presented in conjunction with the audio-video content comprising the commercial break, so that a user may simultaneously view the audio-video content representing commercial break and the secondary content, and may select to focus on either of the contents.

Any suitable format may be used to present the secondary content along with the audio-
25 video content representing TV programming during a commercial break. FIGs. 7A-7C illustrate an exemplary scenario of modifying an audio-video content of a TV program to incorporate secondary content during a commercial break, in accordance with some embodiments.

FIG. 7A shows an example of presenting the audio-video content including TV
30 programming prior to detection of the commercial break in the content. As an example, prior to the commercial break, while the programming in the audio-video content is ongoing, a content presentation device may display the audio-video content on a display 700 of the received audio-

video signal in a first presentation format. The first presentation format may be, as shown in FIG. 7A, a “full screen” display 702 of the audio-video content. Though, any other format of presenting a TV program on user’s device prior to the commercial break may be substituted.

Once the signal indicating the detected commercial break is received, the presentation of the audio-video content may be modified so that the audio-video content may be presented in a second presentation format so as to incorporate the secondary content. Any suitable audio and/or video characteristics may be modified to create the second presentation format. For example, in the second presentation format, the audio-video content may be presented reduced in size and no longer occupying the full screen of a display, while the secondary content is presented in conjunction with the audio-content.

Thus, FIG. 7B illustrates that, during the commercial break, the audio-video content may be modified so that a size and a position on display 700 of its presentation is modified. In this example, the audio-video content may be displayed as reduced screen display 704 located in an upper right corner of display 700. It should be appreciated that the audio-video content displayed as a “reduced screen” display 704 is shown in FIG. 7B to include the same image as the audio-video content shown as full screen display 702 only for the purpose of illustrating that a size of the audio-video content is modified. When a commercial break is ongoing, such as in the example in FIG. 7B, the audio-video content may include programming comprising an advertisement, which is different from programming displayed prior to the detection of the commercial break.

It should be appreciated that the audio-video content is shown in the upper right corner of display 700 by way of example only, as the audio-video content may be displayed on any suitable location on display 700. The specific size and location in which the audio-video content is displayed may be controlled, for example by user input provided as part of specifying user preferences. Further, it should be appreciated that any suitable modification of the audio-video content to incorporate the secondary content may be implemented. Thus, additionally or alternatively, the audio-video content may be modified so that a volume, brightness, and any other audio and/or video characteristics of the audio-video content are modified.

The characteristics of the audio-video content may be modified when the secondary content is presented during the commercial break to bring user’s attention to the secondary content. For example, a size of the audio-video content may be reduced to focus on the

secondary content. Additionally or alternatively, a volume of the audio-video content may be reduced so that user's attention is brought to the secondary content.

The secondary content may be presented in any relation to the audio-video content. FIG. 7C illustrates an exemplary scenario where secondary content, such as text 706 and images or animation 708, is presented in addition to a reduced-in-size presentation 704 of the audio-video content. Though, it should be appreciated that the secondary content may be presented in any other suitable relation to the audio-video content, as embodiments are not limited in this respect. For example, in some scenarios, the secondary content may overlay the entire audio-video content or any portion of the audio-video content. Further, the secondary content may comprise text, one or more images, animations, video content, audio content and any other suitable type of information. The information may comprise advertisements, news feeds, cartoons, games, etc.

In some embodiments, secondary content may be presented in accordance with user preferences. The user preferences may be stored in a suitable store, such as user preferences store 114 (FIG. 1), and may be received from a user of a content presentation device in any suitable manner. For example, when the service in accordance with some embodiments is enabled to execute on a user's content presentation device, a user interface may be rendered on a display of the content presentation device to set up the user preference. The user interface may be configured to receive input indicating preferences with respect to receiving the signal indicating the ongoing commercial break and/or displaying on the display the secondary content in conjunction with the audio-video content.

FIG. 8 illustrates an example of a user interface 800 which may receive user preferences regarding secondary content. User interface 800 may be rendered on a display associated with a mobile device communicating with the content presentation device of the user or with any other device suitable for setting user preferences, including a separate computing device connected to the Internet. In other scenarios, user interface 800 may be presented by an application executing on the content display device.

As shown in FIG. 8, user interface 800 may display general information 802, such as an indication of a purpose of the user interface – “Set Up Commercial Break,” in this example. A welcome message and/or any other suitable information may be presented as part of general information 802 as well.

User interface 800 may include suitable controls, such as check-box, buttons, text boxes and any other controls which may receive user input instructing a set-up of different user preferences. Thus, in the example illustrated, user interface 800 may comprise a menu option 804 for activating the service in accordance with some embodiments on the user's content presentation device. Option 804 may comprise a control, such as a button 806, configured to receive user input with respect to activating and deactivating the service. In this example, option 804 indicates that the service is currently activated ("CommercialBreak is currently ON." Thus, in this state, button 806 may be used to deactivate, or to "turn off," the service.

User interface 800 may also be used to adjust a manner of presentation of secondary content during a commercial break. Thus, FIG. 8 illustrates that user interface 800 may comprise menu option 808 comprising controls for setting the size of a font of a text of the secondary content.

User preferences may also comprise one or more sources of the secondary content. The sources may comprise, for example, any suitable sources of information obtained over the Internet, such as RSS feeds, Twitter®, Google®, Facebook®, or any other suitable source. In the example of FIG. 8, user interface 800 allows a user to set preference for a source of the secondary content as a Google Reader™ RSS feed. Parameters associated with this preference, such as an email and password, may be received from the user, as shown by menu option 810.

In the example illustrated, user preferences may also indicate a source of the secondary content comprising a Twitter® feed. Parameters for the Twitter® feed may comprise an email and password received via menu option 812. It should be appreciated that the user interface for setting user preferences with respect to the secondary content may comprise any other suitable controls, which may be used to adjust any parameters of different types of secondary content.

Although user interface 800 for setting user preferences is shown in FIG. 8, it should be appreciated that embodiments are not limited to setting user preferences for presentation of secondary content during a commercial break via a user interface, and the preferences may be specified in any suitable manner. Moreover, in some scenarios, user preferences may not be available, in which case suitable default secondary content may be presented during a commercial break.

In some embodiments, when the secondary content is displayed on a display associated with a content presentation device and the primary controller is a paired mobile device, one or more suitable controls for controlling the presentation of the secondary content may also be

presented on the display of the mobile device. The controls may be configured to receive user input instructing the content presentation device to modify a manner of presenting the secondary content on the display. For example, a position on the display of the secondary content may be modified. When the secondary content includes information that cannot be presented on a single
5 screen in its entirety (e.g., multiple news feeds), the controls may be provided that receive user input instructing a next or a previous screen to be displayed. Any other parameters of presentation of the secondary content may be modified using the controls, such as its volume, font, speed of display, etc.

FIG. 9A shows an example of a user interface 900 presented on a content presentation
10 device and FIG. 9B shows a user interface 910 that may be presented on a mobile device communicating with the content presentation device. For example, the mobile device may be paired with the content presentation device. In the user interface 900, audio-video content, such as audio-video content 704 (FIGs. 7B and 7C) that is modified by incorporating secondary content. In this example, secondary content comprises a text, such as news feed 902, and an
15 advertisement 904 (FIG. 9A). The secondary content may be presented automatically, in response to the detection of the commercial break.

In the example illustrated, content of news feed 902 may be displayed with a certain speed (e.g., a default speed), which may be adjusted by the user. For this purpose, as shown in FIG. 9B, mobile user interface 910 may include controls 915 and 916 for slowing down and
20 speeding up, respectively, the speed with which news feed 902 may be displayed user interface 900 of the content presentation device.

When the secondary content includes information that cannot be presented on a single screen in its entirety (e.g., multiple news feeds), the controls may be provided that receive user input instructing a next or a previous screen to be displayed. User interface 910 includes control
25 912 that may receive user input instructing the content presentation device to display a previous news feed and control 914 that may receive user input instructing the content presentation device to display a next news feed.

In some embodiments, the entirety or a portion of the secondary content presented during a commercial break may be stored in a suitable location. Accordingly, additionally or
30 alternatively, user interface 910 may include control 913, referred to by way of example only as "Star This Item," which may enable the user to indicate that the currently displayed news feed (e.g., news feed 902) may be stored for future access. It should be appreciated that any other

parameters of presentation of the secondary content may be modified using the controls, such as its volume, font, size, etc. Furthermore, different controls may be presented when the secondary content is presented, based on a type of the secondary content, and other factors.

Furthermore, in some embodiments, while the secondary content is presented in
5 conjunction with the audio-video content, controls may be displayed on a mobile device that allow modifying a way of presenting the audio-video content on a content presentation device. For example, the user may be interested in content of the commercial and user input may thus be received instructing the content presentation device to display the audio-video content in a manner that focuses user's attention to the audio-video content rather than to the secondary
10 content. It should be appreciated that embodiments are not limited with respect to a manner of presenting the secondary content in conjunction with the audio-video content and a manner of modifying the presentation.

Having thus described several aspects of at least one embodiment of this invention, it is to be appreciated that various alterations, modifications, and improvements will readily occur to
15 those skilled in the art.

In some embodiments, a method of operating a computing device to process audio-video content of the type presented by a content presentation device may be implemented. The audio-video content may comprise programming and at least one commercial break in the programming content. The method may comprise, with at least one processor, monitoring a
20 plurality of characteristics of an audio-video signal conveying the audio-video content, and detecting the at least one commercial break based on the monitoring of the plurality of characteristics. The method may further comprise, in response to the detection, generating a signal instructing the content presentation device to modify presentation of the audio-video content to incorporate second content in conjunction with the audio-video content.

25 The monitoring may comprise monitoring the audio-video signal in real time as the audio-video signal is being provided to the content presentation device. The plurality of characteristics may comprise at least one audio characteristic and at least one video characteristic.

The audio-video content may be a television program, and the method may further comprise receiving from the content presentation device an identification of the television
30 program. The identification of the television program may comprise a channel assignment of the television program, the channel assignment comprising at least one of a broadcast channel, a cable channel or a network address.

In some embodiments, the method of operating the computing device to process the audio-video may comprise receiving a request for the second content in conjunction with a user identifier, accessing a user preference relating to the second content, the user preference being associated with the user identifier, obtaining the second content in accordance with the user
5 preference, and providing the obtained second content at the content presentation device. The second content may be obtained via the Internet and may comprise at least one image, at least one animation, video content, and/or audio content.

In some embodiments, the computing device comprises a server connected to a network, the audio-video signal comprises a multi-media data stream communicated over the network,
10 and the generated signal is sent over the network. The method may further comprise receiving from a plurality of content presentation devices indications of a plurality of audio-video signals, each of the plurality of content presentation devices being associated with a respective audio-video signal, monitoring the plurality of characteristics of the audio-video signal comprises
15 monitoring the plurality of audio-video signals to detect a commercial break, and when a commercial break is detected in any of the plurality of audio-video signals, sending a signal to a respective content presentation device associated with the audio-video signal indicating that the commercial break is ongoing.

In some embodiments, the generated signal may comprise a signal indicating to the content presentation device a beginning of the at least one commercial break. Additionally or
20 alternatively, the generated signal may comprise a signal instructing the content presentation device to start a service that modifies the presentation of the audio-video content to incorporate the second content in conjunction with the audio-video content.

In some embodiments, the method of operating the computing device to process the audio-video may further comprise monitoring of the plurality of characteristics during the at
25 least one commercial break, detecting an end of the at least one commercial break based on the monitoring of the plurality of characteristics, and in response to detecting the end, generating a second signal instructing the content presentation device to modify the presentation of the audio-video content comprising the second content presented in conjunction with the audio-video content by removing the second content from the representation of the audio-video content.

The plurality of characteristics may comprise: a first indicator of movement between at
30 least one first frame of a video signal of the audio-video signal and at least one second frame of the video signal, a second indicator of at least one blank frame in the video signal, a third

indicator of a zero audio signal in an audio signal of the audio-video signal, and/or a fourth indicator of at least one change in the audio signal in a proximity of the zero audio signal indicative of a beginning or an end of a commercial break.

In some embodiments, the described techniques may be implemented as at least one computer-readable medium comprising computer executable instructions that, when executed by at least one processor on a content presentation device, control the content presentation device to perform a method of displaying audio-video content, the audio-video content comprising programming and at least one commercial break. The method comprises displaying the audio-video content in a received audio-video signal in a first presentation format while the programming is ongoing and receiving a signal indicating that a commercial break is ongoing. The method may further comprise, automatically in response to the signal, modifying the first presentation format to present the audio-video signal in a second presentation format, and simultaneously with displaying the audio-video content in the second presentation format, presenting secondary content.

The method of displaying the audio-video content may further comprise receiving a second signal indicating an end of the commercial break, and, in response to the second signal, modifying the second presentation format to present the audio-video signal in the first presentation format.

In some embodiments, a set-top box, such as the content presentation device, may comprise the at least one computer-readable medium as described above.

In other embodiments, an Internet Protocol television device, such as the content presentation device, may comprise the at least one computer-readable medium as described above.

In some embodiments, receiving the signal indicating that the commercial break is ongoing may comprise receiving a signal indicating a start of the commercial break.

In some embodiments, the method of displaying the audio-video content may further comprise receiving a second signal indicating an end of the commercial break, and, in response to the second signal, ceasing displaying the secondary content, and displaying the audio-video content in the first presentation format.

Modifying the first presentation format to present the audio-video signal in the second presentation format may comprise presenting the audio-video signal in a smaller portion of a display in a second presentation format than in the first presentation format.

In some embodiments, the method of displaying audio-video content may further comprise rendering on a display of the content presentation device a user interface configured to receive input indicating preferences with respect to receiving the signal indicating the ongoing commercial break and/or displaying on the display the secondary content.

5 In some embodiments, the secondary content may be presented based on the preferences. The preferences may comprise a source of the secondary content and/or a type of the secondary content.

10 In some embodiments, the described techniques may be implemented as a method of controlling presentation of content on content presentation devices, the method comprising, with at least one server, receiving a preference from each of a plurality of users, and maintaining a data store comprising a plurality of entries each indicating for an identifier of a user of the plurality of users a preference for secondary content for presentation during a commercial break, receiving a request from a content presentation device from the content presentation devices for secondary content to display during a commercial break, the request comprising an identifier, and, based on a preference in an entry in the data store associated with the identifier received in the request, controlling a secondary content source to provide the secondary content to the content presentation device.

The preference for the secondary content may comprise a type and/or a source of the secondary content.

20 In some embodiments, controlling, by the at least one server, the secondary content source to provide the secondary content to the content presentation may comprise controlling the secondary content source to provide the secondary content to the content presentation device for a duration of the commercial break.

25 The secondary content source may comprise information obtained over the Internet. In some embodiments, the secondary content comprises at least one of textual or graphical content.

30 Such alterations, modifications, and improvements are intended to be part of this disclosure, and are intended to be within the spirit and scope of the invention. Further, though advantages of the present invention are indicated, it should be appreciated that not every embodiment of the invention will include every described advantage. Some embodiments may not implement any features described as advantageous herein and in some instances. Accordingly, the foregoing description and drawings are by way of example only.

The above-described embodiments of the present invention can be implemented in any of numerous ways. For example, the embodiments may be implemented using hardware, software or a combination thereof. When implemented in software, the software code can be executed on any suitable processor or collection of processors, whether provided in a single
5 computer or distributed among multiple computers. Such processors may be implemented as integrated circuits, with one or more processors in an integrated circuit component. Though, a processor may be implemented using circuitry in any suitable format.

Further, it should be appreciated that a computer may be embodied in any of a number of forms, such as a rack-mounted computer, a desktop computer, a laptop computer, or a tablet
10 computer. Additionally, a computer may be embedded in a device not generally regarded as a computer but with suitable processing capabilities, including a Personal Digital Assistant (PDA), a smart phone or any other suitable portable or fixed electronic device.

Also, a computer may have one or more input and output devices. These devices can be used, among other things, to present a user interface. Examples of output devices that can be
15 used to provide a user interface include printers or display screens for visual presentation of output and speakers or other sound generating devices for audible presentation of output. Examples of input devices that can be used for a user interface include keyboards, and pointing devices, such as mice, touch pads, and digitizing tablets. As another example, a computer may receive input information through speech recognition or in other audible format.

20 Such computers may be interconnected by one or more networks in any suitable form, including as a local area network or a wide area network, such as an enterprise network or the Internet. Such networks may be based on any suitable technology and may operate according to any suitable protocol and may include wireless networks, wired networks or fiber optic networks.

25 Also, the various methods or processes outlined herein may be coded as software that is executable on one or more processors that employ any one of a variety of operating systems or platforms. Additionally, such software may be written using any of a number of suitable programming languages and/or programming or scripting tools, and also may be compiled as executable machine language code or intermediate code that is executed on a framework or
30 virtual machine.

In this respect, the invention may be embodied as a computer readable storage medium (or multiple computer readable media) (e.g., a computer memory, one or more floppy discs,

compact discs (CD), optical discs, digital video disks (DVD), magnetic tapes, flash memories, circuit configurations in Field Programmable Gate Arrays or other semiconductor devices, or other tangible computer storage medium) encoded with one or more programs that, when executed on one or more computers or other processors, perform methods that implement the various embodiments of the invention discussed above. As is apparent from the foregoing examples, a computer readable storage medium may retain information for a sufficient time to provide computer-executable instructions in a non-transitory form. Such a computer readable storage medium or media can be transportable, such that the program or programs stored thereon can be loaded onto one or more different computers or other processors to implement various aspects of the present invention as discussed above. As used herein, the term “computer-readable storage medium” encompasses only a computer-readable medium that can be considered to be a manufacture (i.e., article of manufacture) or a machine. Alternatively or additionally, the invention may be embodied as a computer readable medium other than a computer-readable storage medium, such as a propagating signal.

The terms “program” or “software” are used herein in a generic sense to refer to any type of computer code or set of computer-executable instructions that can be employed to program a computer or other processor to implement various aspects of the present invention as discussed above. Additionally, it should be appreciated that according to one aspect of this embodiment, one or more computer programs that when executed perform methods of the present invention need not reside on a single computer or processor, but may be distributed in a modular fashion amongst a number of different computers or processors to implement various aspects of the present invention.

Computer-executable instructions may be in many forms, such as program modules, executed by one or more computers or other devices. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Typically the functionality of the program modules may be combined or distributed as desired in various embodiments.

Also, data structures may be stored in computer-readable media in any suitable form. For simplicity of illustration, data structures may be shown to have fields that are related through location in the data structure. Such relationships may likewise be achieved by assigning storage for the fields with locations in a computer-readable medium that conveys relationship between the fields. However, any suitable mechanism may be used to establish a relationship

between information in fields of a data structure, including through the use of pointers, tags or other mechanisms that establish relationship between data elements.

Various aspects of the present invention may be used alone, in combination, or in a variety of arrangements not specifically discussed in the embodiments described in the foregoing and is therefore not limited in its application to the details and arrangement of components set forth in the foregoing description or illustrated in the drawings. For example, aspects described in one embodiment may be combined in any manner with aspects described in other embodiments.

Also, embodiments of the invention may be embodied as a method, of which an example has been provided. The acts performed as part of the method may be ordered in any suitable way. Accordingly, embodiments may be constructed in which acts are performed in an order different than illustrated, which may include performing some acts simultaneously, even though shown as sequential acts in illustrative embodiments.

Use of ordinal terms such as “first,” “second,” “third,” etc., in the claims to modify a claim element does not by itself connote any priority, precedence, or order of one claim element over another or the temporal order in which acts of a method are performed, but are used merely as labels to distinguish one claim element having a certain name from another element having a same name (but for use of the ordinal term) to distinguish the claim elements.

Also, the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having,” “containing,” “involving,” and variations thereof herein, is meant to encompass the items listed thereafter and equivalents thereof as well as additional items.

What is claimed is:

25

CLAIMS

1. A system for controlling presentation of content on content presentation devices, the
5 system comprising:
at least one computing device configured to:
receive a signal from one or more sources indicating that a commercial break has
begun or ended in at least one audio-video signal conveying audio-video content; and
when it is determined, based on the received signal, that the commercial break is
10 detected in an audio-video signal from the at least one audio-video signal, transmit an
indication to at least one respective content presentation device associated with the
audio-video signal that a commercial break is ongoing.
2. The system of claim 1, wherein the at least one computing device is further configured
15 to:
receive a request from a content presentation device for secondary content to display,
during the commercial break, the request comprising an identifier; and
based on a preference associated with the identifier, control a secondary content source
to provide the secondary content to the content presentation device.
- 20 3. The system of claim 2, wherein the at least one computing device is configured to
control the secondary content source to begin providing the secondary content to the content
presentation device at a beginning of the commercial break and to end providing the secondary
content to the content presentation device at an end of the commercial break.
- 25 4. The system of claim 2, wherein the at least one computing device is configured to
control the secondary content source to provide the secondary content to the content presentation
device in conjunction with the commercial break.
- 30 5. The system of claim 2, further comprising the secondary content source, the secondary
content source comprising a server configured to access the secondary content via the Internet
from at least one of Twitter®, Google®, and/or Facebook®.

6. The system of claim 2, wherein the at least one computing device is further configured to:

5 receive from a user a preference for the secondary content; and
store the preference in connection with an identifier of the user.

7. The system of claim 6, wherein the at least one computing device is configured to control the secondary content source to provide the secondary content to the content presentation device by controlling the secondary content source to provide the secondary content in
10 accordance with the preference identified based on the identifier.

8. The system of claim 1, wherein the at least one computing device is further configured to:

15 monitor for and accept an incoming signal indicating that a commercial break is
currently being displayed to the user; and
transmit information to a client to indicate the beginning and the end of the commercial break.

9. The system of claim 1, wherein the content presentation device is configured to, in
20 response to receiving the indication, start a service that modifies the presentation of the audio-video content to incorporate secondary content in conjunction with the audio-video content.

10. A method of operating a content presentation device comprising at least one processor to display audio-video content comprising programming and at least one commercial break, the
25 method comprising, with the at least one processor:

displaying audio-video content in a received audio-video signal in a first presentation format while the programming is ongoing;

receiving a signal indicating that a commercial break in the programming is ongoing; and
automatically in response to the signal:

30 modifying the first presentation format to present the audio-video signal in a second presentation format, and

simultaneously with displaying the audio-video content in the second presentation format, presenting secondary content.

11. The method of claim 10, further comprising:

5 receiving user preferences relating to the secondary content.

12. The method of claim 11, further comprising:

transmitting a request to a server for the secondary content, the request being transmitted in conjunction with a user identifier.

10

13. The method of claim 11, wherein the user preferences comprise a source of the secondary content and/or a type of the secondary content.

14. The method of claim 10, wherein:

15 the first presentation format comprises a full screen display of the audio-video signal;
and

the second presentation format comprises a reduced screen display of the audio-video signal that is displayed in conjunction with the secondary content.

20 15. The method of claim 10, wherein:

displaying the audio-video content in the second presentation format simultaneously with presenting the secondary content comprises modifying a size of the audio-video content in the second presentation format.

25 16. The method of claim 10, wherein:

modifying the first presentation format to present the audio-video signal in the second presentation format comprises modifying a volume of the audio-video signal in the first presentation format.

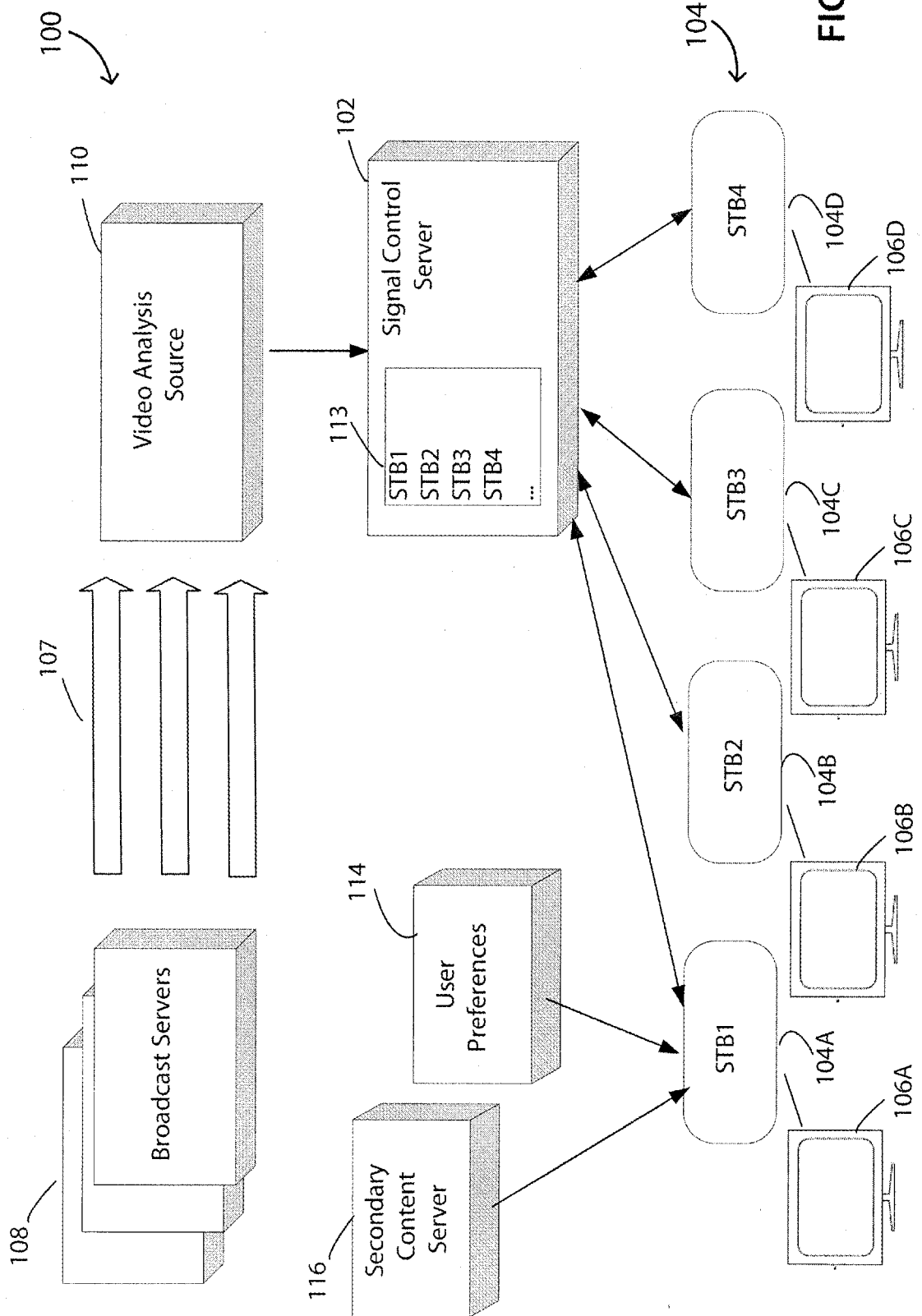
30 17. The method of claim 10, further comprising:

during displaying the audio-video content in the second presentation format simultaneously with presenting the secondary content, receiving user input instructing the

content presentation device to modify at least one of the audio-video content in the second presentation format and a representation of the secondary content.

18. The method of claim 10, wherein:

- 5 the signal indicating that the commercial break in the programming is ongoing
comprises a signal indicating a start of the commercial break, the method further comprising:
 receiving a second signal indicating an end of the commercial break; and
 in response to the second signal,
 ceasing displaying the secondary content, and
10 modifying the audio-video content in the second presentation format to
display the audio-video content in the first presentation format.



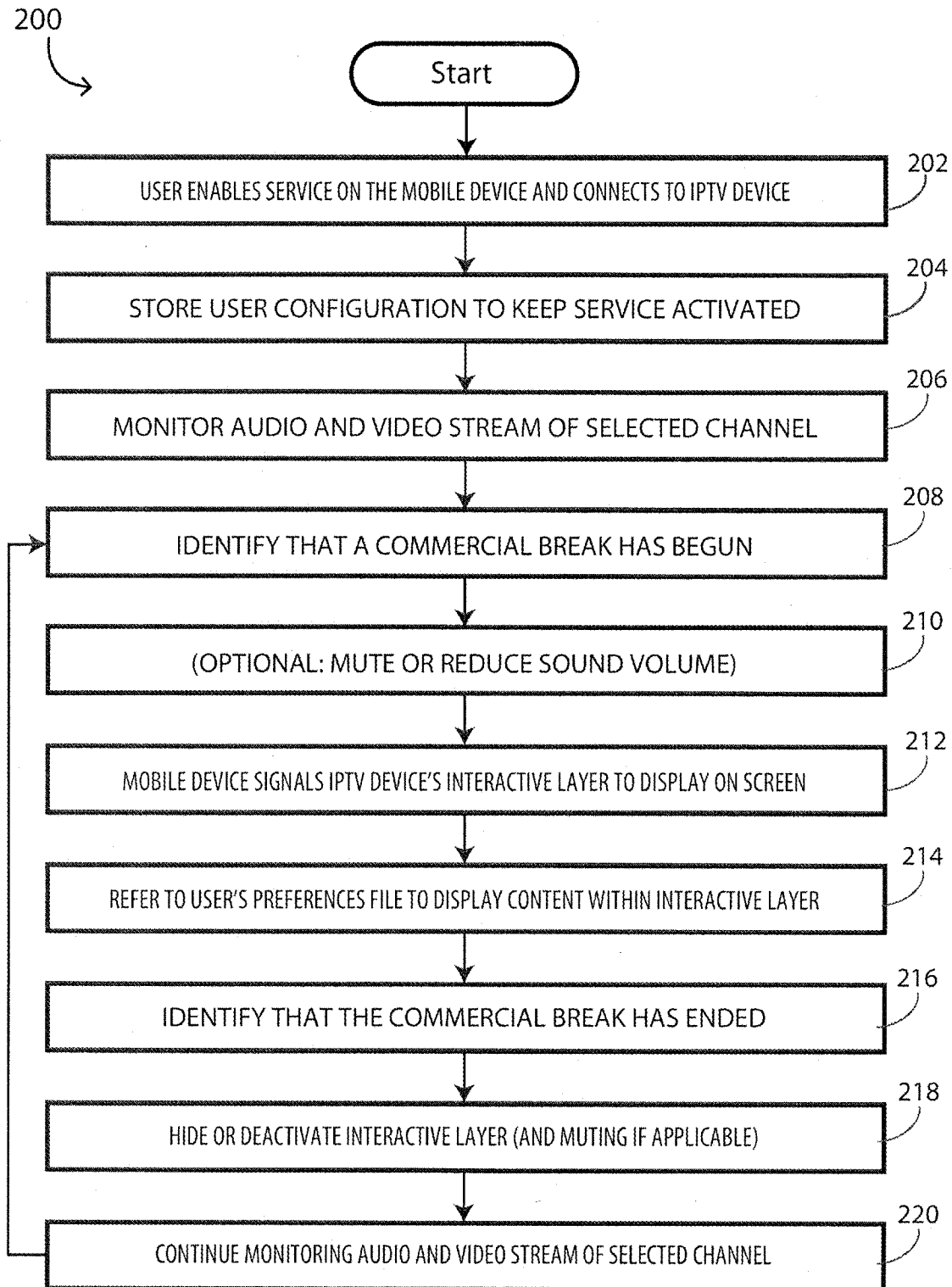


FIG. 2

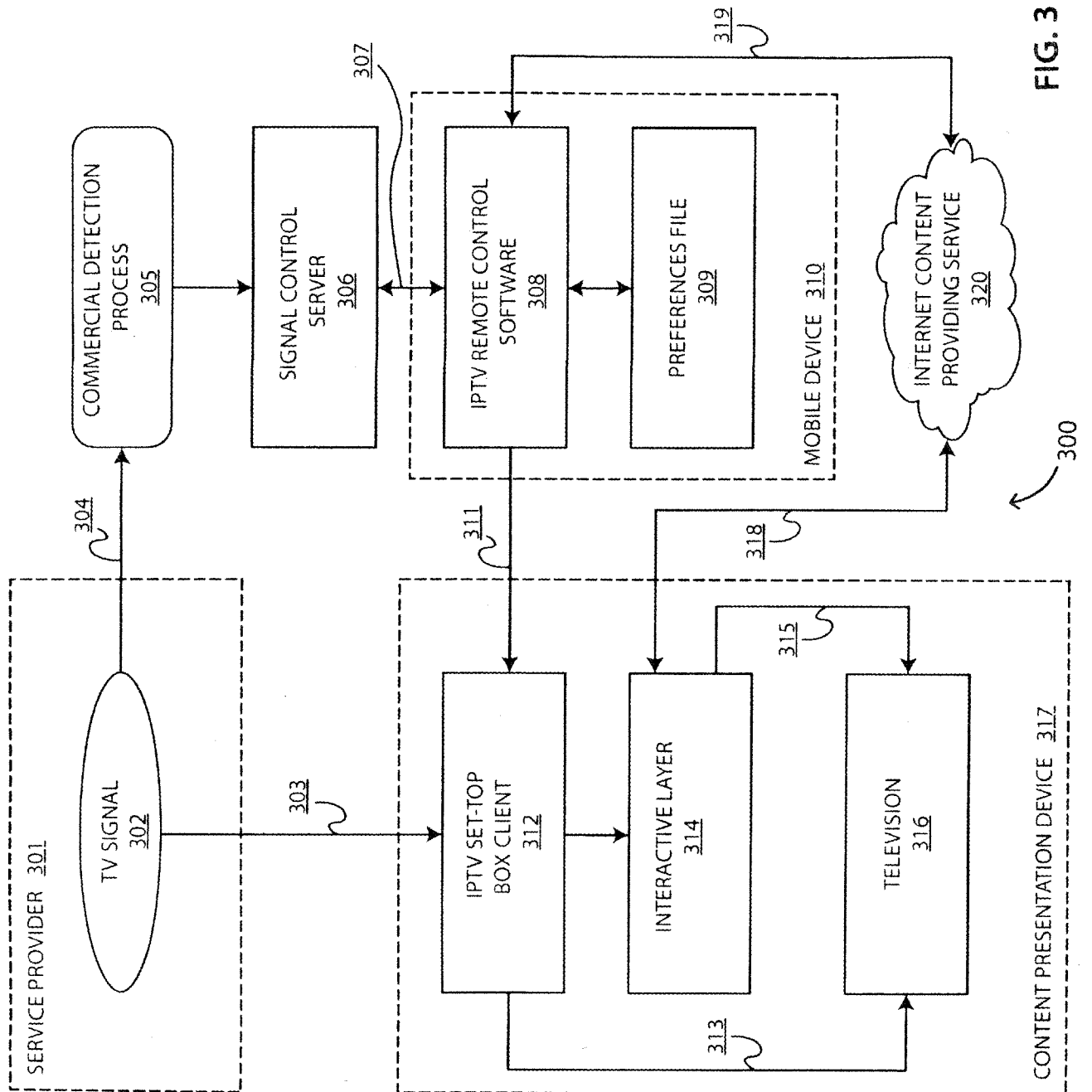


FIG. 3

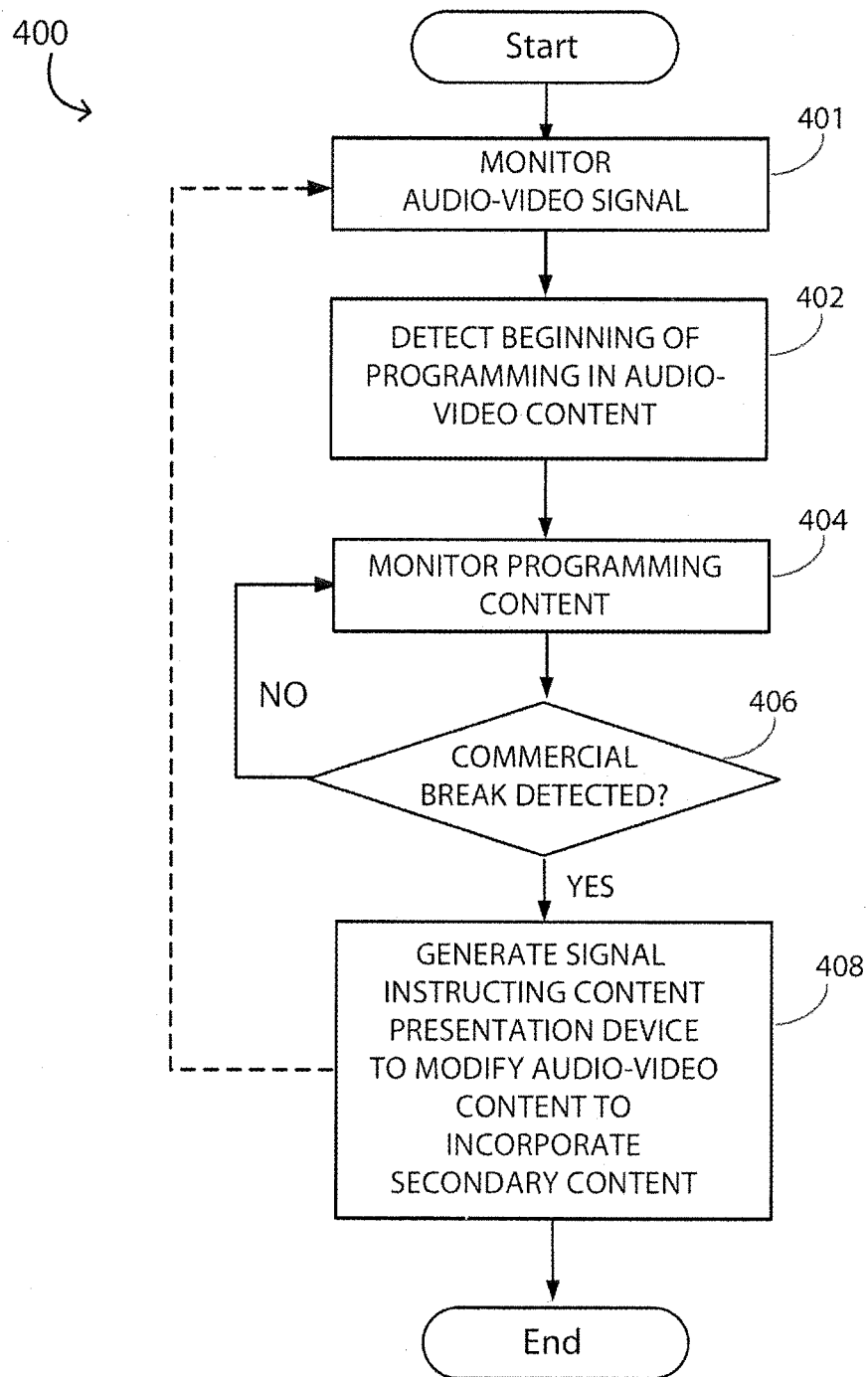


FIG. 4

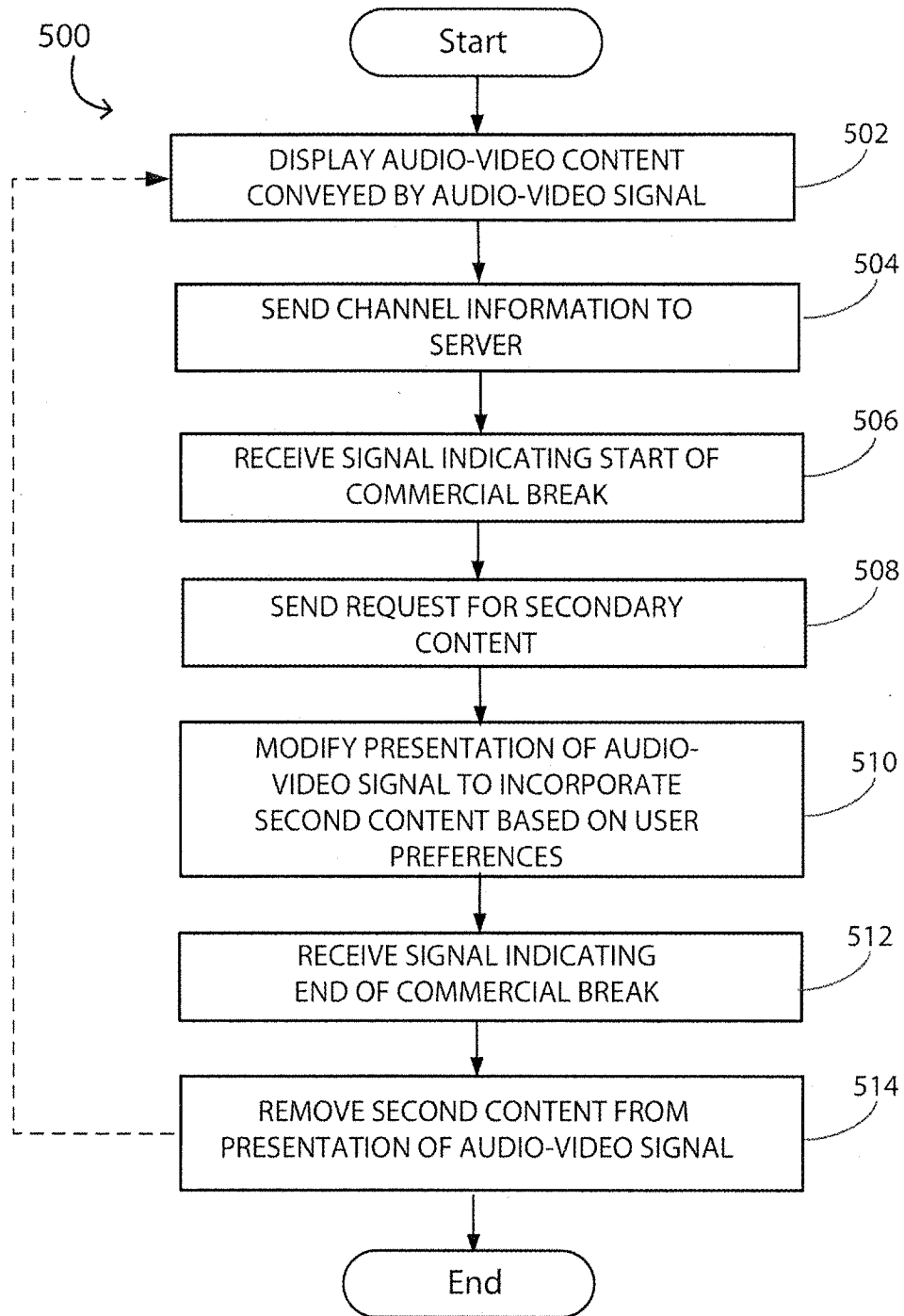


FIG. 5

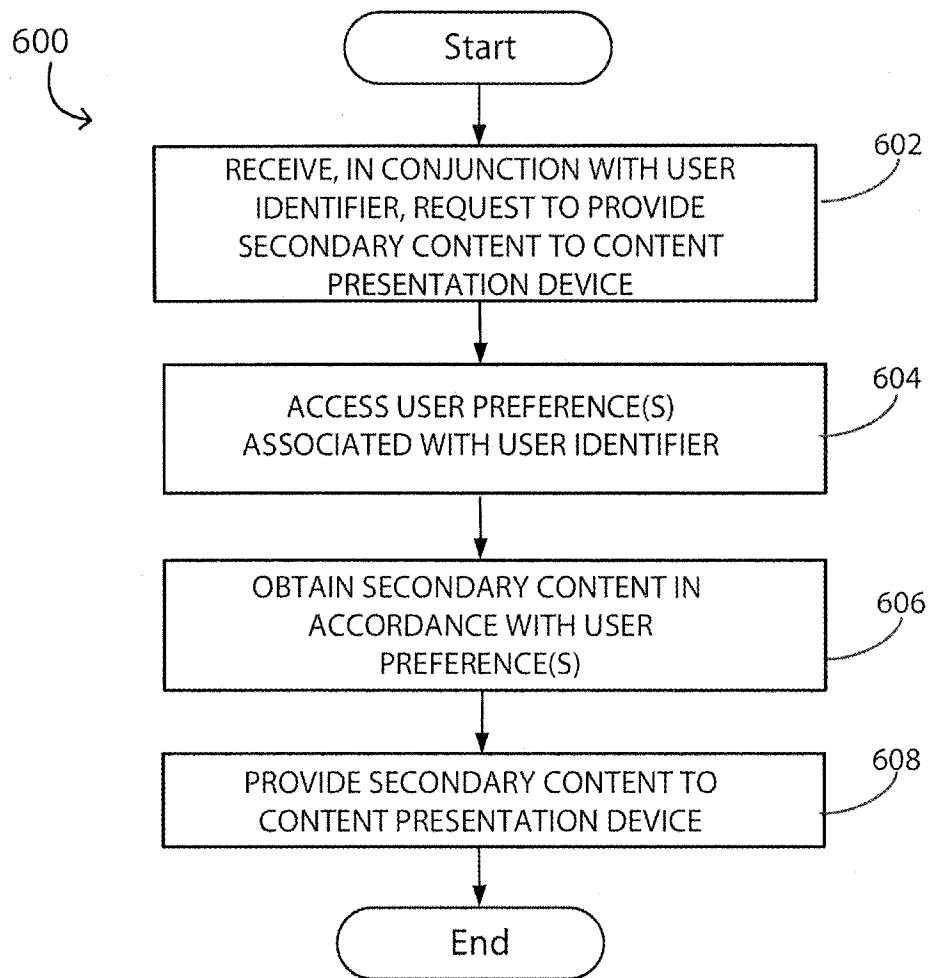


FIG.6

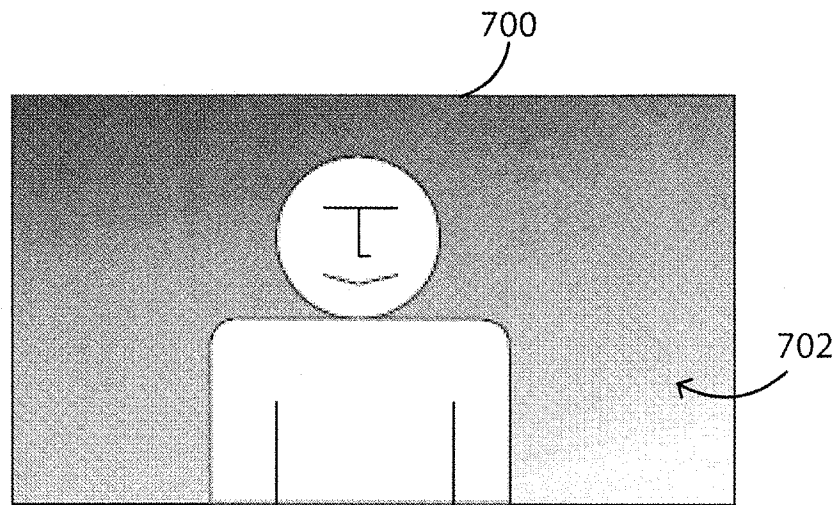


FIG. 7A

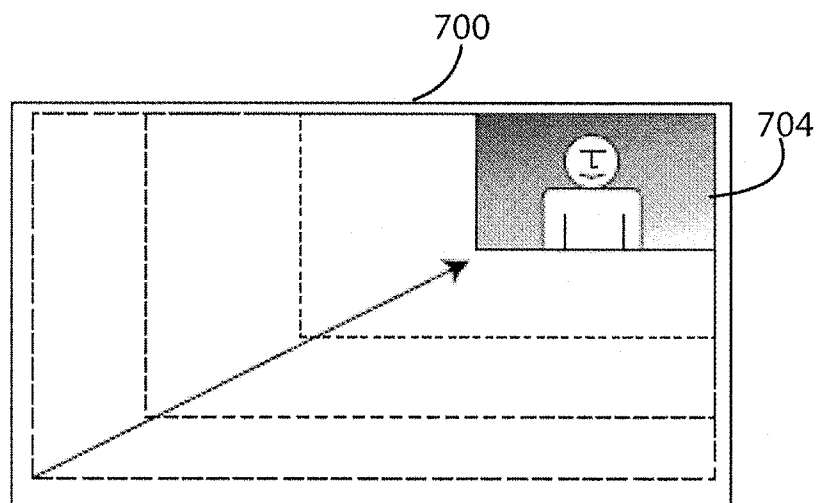


FIG. 7B

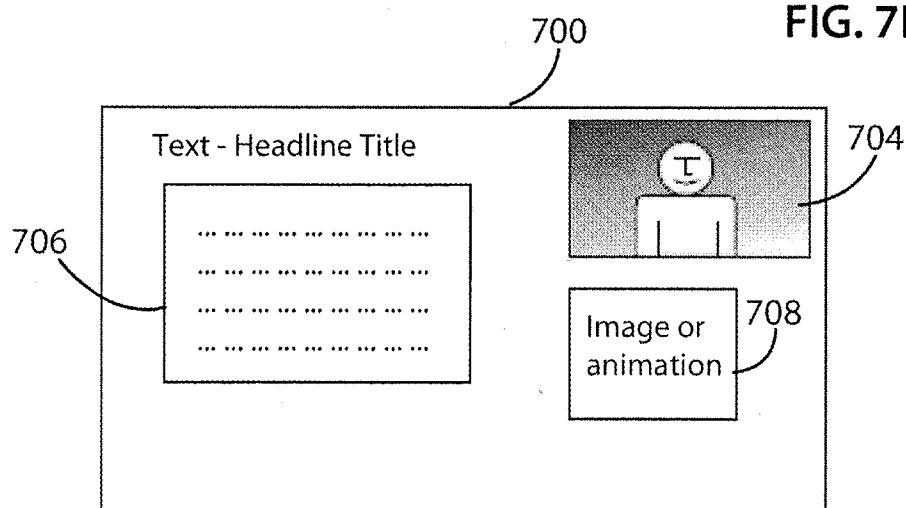


FIG. 7C

Set Up CommercialBreak
Welcome. This screen will allow you to set up the basics of your CommercialBreak software for use with your interactive TV device.

Activate CommercialBreak
CommercialBreak is currently ON.

TURN OFF

Font Size on interactive TV screen:

SMALLER **24** BIGGER

Add your Google Reader feed:

Username:

Password:

Add your Twitter feed:

Username:

Password:

FIG. 8

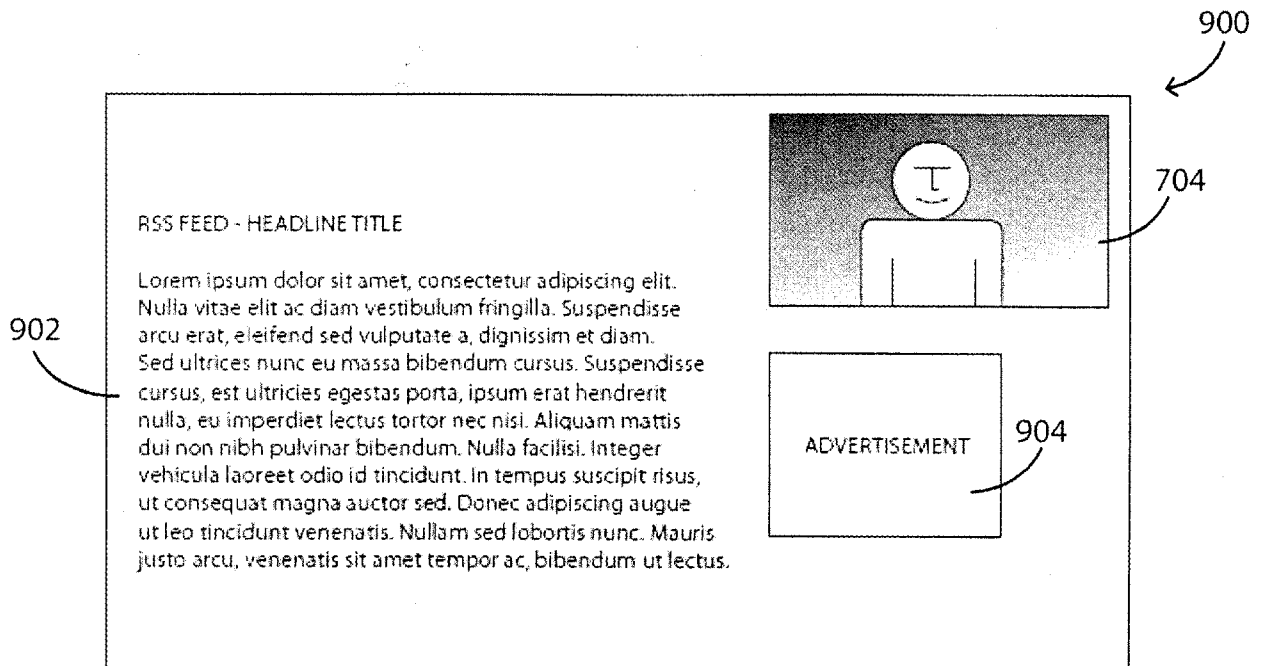


FIG. 9A

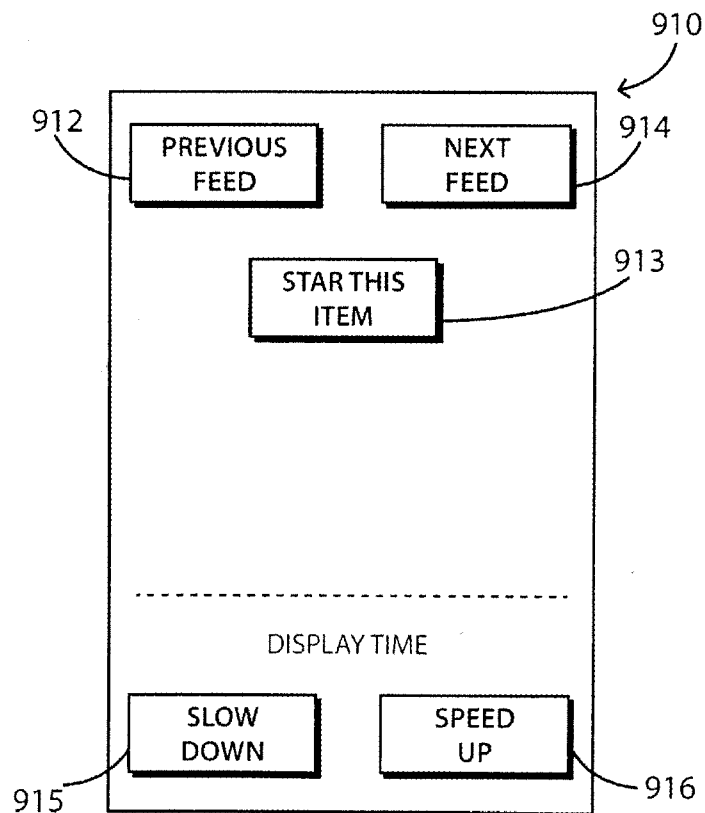


FIG. 9B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2013/000870

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **H04N 21/458** (2011.01) , **G06Q 30/02** (2012.01) , **H04L 12/16** (2006.01) , **H04N 5/445** (2011.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: **H04N 21/458** (2011.01) , **G06Q 30/02** (2012.01) , **H04L 12/16** (2006.01) , **H04N 5/445** (2011.01)

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

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

database: totalPatent, Epoque, Canadian Patent Database (Intellect)

keywords: commercial, content presentation, Google/Twitter/Facebook, Preference, audio-video display, monitor, IPTV

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/0023060 A1 (Dmitriev et al.) 27 January 2011 (27-01-2011) *the whole document, especially: Figs. 2A-2C, 3, 4A-4B; Paragraphs 0006-0013; 0039-0043; 0055-0061; 0070-0073; 0079-0083; 0089-0099; 0129-0147	1-18
A	US 2008/0109843 A1 (Ullah) 08 May 2008 (08-05-2008) *the whole document*	1-18
A	US 2012/0096485 A1 (Andres Del Valle et al.) 19 April 2012 (19-04-2012) *the whole document*	1-18
P, A	WO 2012/150972 A1 (Badawiyeh et al.) 08 November 2012 (08-11-2012) *the whole document*	1-18

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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

Date of the actual completion of the international search

31 July 2013 (31-07-2013)

Date of mailing of the international search report

05 September 2013 (05-09-2013)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 001-819-953-2476

Authorized officer

Ning Huang (819) 934-7877

International application No.
PCT/IB2013/000870

[illegible]

INTERNATIONAL SEARCH REPORT

International application No. PCT/IB2013/000870

US2008133359A1	05 June 2008 (05-06-2008)
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US2008133363A1	05 June 2008 (05-06-2008)
US2008133364A1	05 June 2008 (05-06-2008)
US2008220760A1	11 September 2008 (11-09-2008)
US2009298514A1	03 December 2009 (03-12-2009)
US2012136721A1	31 May 2012 (31-05-2012)
US2012323685A1	20 December 2012 (20-12-2012)
US2013128755A1	23 May 2013 (23-05-2013)
WO2008034072A2	20 March 2008 (20-03-2008)
WO2008034072A3	31 July 2008 (31-07-2008)
WO2009094397A2	30 July 2009 (30-07-2009)
WO2009094397A3	22 October 2009 (22-10-2009)
WO2009094397A8	30 December 2009 (30-12-2009)

US2012096485A1	19 April 2012 (19-04-2012)	EP2447901A1	02 May 2012 (02-05-2012)
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WO2012150972A1	08 November 2012 (08-11-2012)	None
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