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(54) Title: SYSTEMS FOR IDENTIFYING AUDIO INFORMATION FROM A TELEVISION DATA STREAM AND RELATED METHODS

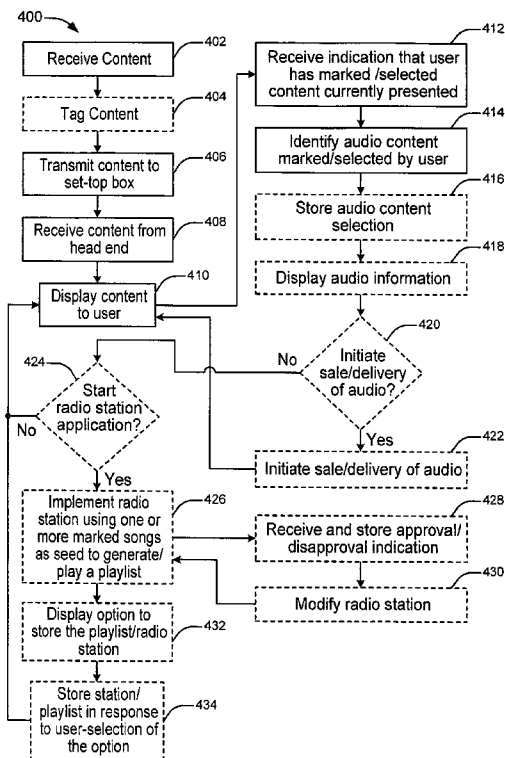


FIG. 4

(57) Abstract: Systems and methods for identifying audio content in television media streams to provide a variety of services are described. The systems and methods enable a user to select or mark a song while viewing a television broadcast or program to prompt the display of the title, artist and album of the song. In addition, a radio station application can utilize the marked song as a seed to generate and play a playlist of songs that are similar to the marked song. Further, the systems and methods permit a user to purchase and download songs selected or marked during a television broadcast or program.

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SYSTEMS FOR IDENTIFYING AUDIO INFORMATION FROM A TELEVISION DATA STREAM AND RELATED METHODS

5 BACKGROUND

A wide variety of services related to the distribution of media streams are currently available. For example, cable and satellite service providers enable users to select and receive music and music videos on-demand. Other services permit users to select music heard on the radio for purposes of purchasing and downloading the music. For example,
10 devices, such as Microsoft's Zune, permit a user to tag a song heard on an FM radio and to subsequently purchase the tagged song from an associated music store. Other services include Internet Radio sites, which employ complex algorithms to determine the type of music that a listener prefers based on songs specified by the user and to play music of that type to the user. These algorithms require a seed in the form of an artist, a genre or a
15 particular song to determine similar songs to play for the user.

SUMMARY

Known, currently available systems fail to exploit a large sector of media distribution services that introduce consumers to a considerable variety of music. For example,
20 oftentimes, when a user views a television program, broadcast content or a movie and hears an unknown song during the presentation that she likes, currently available systems do not provide a convenient means for a user to identify the song or to utilize related services while viewing the presentation. To address the problem, exemplary embodiments of the present principles can provide users with a novel means to enable the display of information about a
25 song as it is played during the presentation and can provide other services, such as enabling the user to listen to a playlist of music that is similar to the song and to purchase and download the song.

One embodiment is directed to a method in which broadcast content can be received for display of the broadcast content to a user. The method further includes receiving an
30 indication that the user has selected audio content that is played in a portion of the broadcast content as the portion of the broadcast content is displayed. The audio content can be identified and employed as a seed to determine and insert entries in a playlist that are deemed to be similar to the selected audio content. In addition, the playlist can be played for the user.

An alternative embodiment is drawn toward a system. The system can include a storage medium that is configured to store broadcast content for display to a user. The broadcast content includes audio identifier codes that identify audio content included in respective portions of the broadcast content. The system can further include a code table that relates the audio content identifier codes to a set of songs. In addition, the system can include a processor that is configured to identify a particular song corresponding to audio content played in a given portion of the broadcast content using the code table in response to user-selection of the corresponding audio content.

Another embodiment is directed to a method. In the method, a television program can be received for display of the program to a user. Further, an indication that the user has selected audio content that is played in a given portion of the television program can be received as the given portion of the television program is displayed. Moreover, the audio content can be identified and information identifying the audio content can be displayed in response to user-selection of the audio content.

BRIEF DESCRIPTION OF THE DRAWINGS

The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings, in which:

FIG. 1 is a block diagram of a cable/satellite service provider network system in accordance with an exemplary embodiment.

FIG. 2 is a block diagram of a head end system in accordance with an exemplary embodiment.

FIG. 3 is a block diagram of a set top box system in accordance with an exemplary embodiment.

FIG. 4 is a block/flow diagram of a method for identifying audio data in broadcast or on-demand content and for performing related services in accordance with an exemplary embodiment.

It should be understood that the drawings are for purposes of illustrating the concepts of the invention and are not necessarily the only possible configuration for illustrating the invention. To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common to the figures.

DETAILED DESCRIPTION

The present principles provide systems and methods that can identify audio content included in television media streams to enable a user to obtain information about the audio content and to avail himself of related services. For example, as indicated above, while watching broadcast content, a television program or a movie transmitted from a cable or satellite service provider, a user can select or mark audio content while viewing the presentation. In turn, information about the audio content, such as the artist, title and album of a song, can be displayed to permit the user to discover songs that he likes. Furthermore, other related services can be provided, such as a radio station service. Here, any selected songs, or a combination of them, can be employed as a seed to generate a playlist of related music that a user is likely to enjoy. Moreover, method and system embodiments can enable the user to purchase and download selected songs that the user hears during the presentation.

Referring now in specific detail to the drawings in which like reference numerals identify similar or identical elements throughout the several views, and initially to FIG. 1, an exemplary system 100 for delivering audio/video streams is provided. The system 100 can include a television content provider 102 that can provide any one of a variety of data for distribution among a plurality of subscribers of a cable/satellite television service. For example, the television content provider 102 can be a network television station that can produce and render television programs to a head end 104 of a cable/satellite service provider. Such television programs can be television shows or movies. In addition, the television content provider 102 can be a film or motion picture producer. Further, it should be understood that the system 100 can include a plurality of different television content providers 102, which are not shown for purposes of brevity. The television content provider system 102 can include a storage medium 112, a controller 114 and an encoder 116, which can implement a novel system of codes that can be employed by a cable/satellite television service provider to identify songs played during a television program, as discussed in more detail below.

As stated above, the system 100 can further include a head end 104 of a cable or television satellite service provider. The head end 104 can be configured to compile, format and encode television programs for transmission to a plurality of subscribers, which are represented in FIG. 1 as user-premise equipment 108-1 to 108-N. Referring to FIG. 2, with continuing reference to FIG. 1, the head end 104 can include a receiver 202, an optional tagging module 204, a storage medium 206, a controller 208, an encoder/multiplexer 210 and a transmitter 212. The receiver 202 can be configured to receive television programs from

the television content provider 102. Alternatively or additionally, the receiver 202 can be configured to receive audio data from an audio content provider 103. For example, the audio content can be songs provided for distribution to user-premise equipment (UPE) 108-1 to 108-N in the context of an audio-on demand scenario, as discussed in more detail below.

5 Further, the content received from the audio content provider 103 can also include video content, such as music videos, which can also be distributed to user equipment 108-1 to 108-N in an on-demand scenario. It should be understood that the content from the television content provider 102 and/or the audio content provider 103 can be received at the receiver 202 in any of a wide variety of ways. For example, the content can be received over a wide
10 area network, such as the internet, which can include wired and wireless portions. In addition, the receiver 202 can be configured to decode and demodulate the content in accordance with a wide variety of standards, such as Movie Pictures Experts Group (MPEG) coding or Advanced Audio Coding (AAC), and any applicable modulation standard. The received content can be buffered (e.g., for live content) and/or stored in the storage medium
15 206 for further processing.

For example, the optional tagging module 204 can process the content stored in the storage medium 206 to identify audio data in the content and insert tags to permit the identification of songs while, for example, a television program is played at a subscriber, as discussed in more detail below. The head end 104 can further include a controller 208,
20 which can be configured to manage the operation of other elements of the head end 104, as discussed in more detail below. The encoder/multiplexer 210 can be configured to encode, format and multiplex content for transmission to the user-premise equipment 108-1 to 108-N via the transmitter 212, which in turn can apply a modulation scheme for the transmission. The encoder/multiplexer 210 can encode the content for transmission in accordance with any
25 of a variety of coding standards, such as MPEG coding or AAC. The transmission can be performed through a wide area network 106, which can be part of the cable or satellite network of the cable or satellite network provider, respectfully. The network 106 can include wired and/or wireless portions in either case.

With reference now to FIG. 3, with continuing reference to FIGS. 1 and 2, an
30 exemplary set top box system 300 which can be included in any one or more of the user-premise equipment 108-1 to 108-N is illustrated. The set top box 300 can include a receiver 302, a decoder/demodulator 304, an optional code/tag table 318, a storage medium 306, a processor 308, an audio/video encoder 310, a television interface 312, a user-interface 314 and one or more optional device interfaces 316. Here, the receiver 302 can be configured to

receive signals from the network 106 that include content transmitted from the transmitter 212. The decoder/demodulator 304 can be configured to decode/demodulate the signals received in accordance with the coding/modulation scheme applied by the head end 104 and can be configured to store the content in the storage medium 306. The storage medium 306 can also act as a buffer for live content. The processor 308 can be configured to manage elements of the set top box 300, as discussed in more detail below. In addition, the optional code/tag table 318 can be employed by the processor 308 in accordance with methods described herein to identify audio content selected or marked by a user during the presentation of a television program. The audio/video encoder 310 can be configured to encode and format content in the storage medium 306 for output to a television or display via a television interface 312, which can be a High-Definition Multimedia Interface (HDMI) interface. For example, the audio/video encoder 310 can format the content in accordance with an HDMI standard. The user-interface 314 can be a remote control interface while the optional device interfaces 316 can be an interface for a variety of devices, such as a personal computer, a media player and/or a smart phone. For example, a device interface 316 can be a Universal Serial Bus (USB) interface or can be a wireless interface, such as a wireless interface in accordance with Institute of Electrical and Electronics Engineers (IEEE) 802.11 standards. Further, the set top box system 300 can also include a radio station application 320, which can employ one or more seeds selected by a user in accordance with the methods described herein below to generate play lists including songs that a user would likely prefer. For example, the songs selected by the application can be audio content received by the head end 104 from the audio content provider 103 and can be retrieved from the storage medium 206 for transmission to the set top box 300. Alternatively, as opposed to including a radio station application, the set top box 300, or the head end 104, can communicate with an internet radio station site 110 to permit the generation of a radio station, as discussed in more detail below.

It should be understood that the functions of the various elements shown in the figures can be provided through the use of dedicated hardware as well as hardware capable of executing software in association with appropriate software. When provided by a processor or controller, the functions can be provided by a single dedicated processor, by a single shared processor, or by a plurality of individual processors, some of which can be shared. Moreover, explicit use of the term "processor" or "controller" should not be construed to refer exclusively to hardware capable of executing software, and can implicitly include, without limitation, digital signal processor ("DSP") hardware, read-only memory ("ROM")

for storing software, random access memory (“RAM”), and non-volatile storage. Moreover, all statements herein reciting principles, aspects, and embodiments of the invention, as well as specific examples thereof, are intended to encompass both structural and functional equivalents thereof. Additionally, it is intended that such equivalents include both currently
5 known equivalents as well as equivalents developed in the future (i.e., any elements developed that perform the same function, regardless of structure).

Thus, for example, it will be appreciated by those skilled in the art that the block diagrams presented herein represent conceptual views of illustrative system components and/or circuitry embodying the principles of the invention. Similarly, it will be appreciated
10 that any flow charts, flow diagrams, state transition diagrams, pseudocode, and the like represent various processes which can be substantially represented in computer readable media and so executed by a computer or processor, whether or not such computer or processor is explicitly shown.

With reference now to FIG. 4, with continuing reference to FIGS. 1-3, an exemplary
15 method 400 for identifying audio data in broadcast or on-demand content to display information identifying the audio data, to permit the purchase of the audio data, to enable the download of the audio data and/or to seed a Radio Station with the identified audio data is illustrated. The method 400 can begin at step 402, in which the head end 104 can receive content via the receiver 202, as discussed above. For example, as stated above, the content
20 received by the head end 104 can be stored in the storage medium 206 and can include broadcast content and on-demand content. It should be understood that “broadcast” content is distinguished herein from “on-demand” content. “Broadcast” content is transmitted from the head end to one or more set top boxes regardless of whether a user specifically requested the content. For example, although a user can tune to a channel that includes the broadcast
25 content, the broadcast content is present on that channel regardless of the user’s tuning to the channel. In contrast, “on-demand” content is transmitted from the head-end in response to a specific user-request for the “on-demand” content. For example, a set top box 300 can display the name of a television show, the name of a movie or the name of a music video on a user’s television and the user can select an option to receive the specific content identified
30 in the display. Then, in response to the user selection, the “on-demand” show, movie or music video is transmitted from the head end 104 to the set top box 300 for presentation to the user.

It should also be understood that a “television program” is distinguished herein from an “audio program.” For example, a “television program” is a program that can include both

audio and video content and is not primarily identified by the audio content. Examples of television programs include a television show, such as “CSI,” a movie or a news program. In contrast, an “audio program” can include both audio and video content and is primarily identified by the audio content. Examples of audio programs include music videos, which are identified by a song title, an artist and/or an album, and streaming audio content, which is also identified by a song title, an artist and/or an album. Another example of an audio program is a program that is played on a dedicated music channel, which typically displays still frames related to a song being played, and is identified by a genre of music associated with the dedicated music channel, such as Reggae, Classical, Rock, Alternative, etc. It should be noted that both television programs and audio programs can be broadcast or on-demand content.

Here, at step 402, television program content can include audio content codes that identify the audio content in the television program. For example, television program content, such as a television show, a movie or a news program can be stored at the television content provider 102 after or as the television program content is produced. Under the control of the controller 114, the content can be encoded and formatted for distribution, for example over a network, as discussed above, or on a storage medium, such as a digital video disc (DVD) or Blu-ray disc. Here, the encoder 116 can encode the content data so that the content data comprise codes identifying any music that is included in the television program. The codes can, for example, be associated with various time markers or ranges of time markers in the television program content so that when the television program is played, the music playing at a particular time from the start of the program can be identified by the code associated with that particular time. In addition, the codes can identify an artist, title and/or album of music included in the television program.

Ordinarily, the television program content provider would not have any motivation to insert codes that identify the music played in the television program content. However, in accordance with an aspect of the present principles, the insertion of codes can be required under a license agreement between the copyright owners of the music and the television program content provider that permits the use of the music in the television program content. Alternatively, or additionally, the music copyright owner can provide the television program content provider with a discount on using the music in the television program if the television program content provider inserts the codes into the television program content. The music copyright owner itself can have an incentive to have the codes inserted, as the code insertion can lead to additional purchases of the music by subscribers of the cable/satellite service

provider, as discussed in more detail below. In accordance with another exemplary aspect, the cable/satellite service provider can provide the television program content provider with an incentive to insert the codes by offering more favorable contract terms for distributing the television program content. Here, the audio content identifier codes can be standardized
5 between music producers/copyright holders and one or more cable/satellite service providers. A cable/satellite service provider and/or music producers/copyright holders can provide the audio content identifier codes and/or a coding standard to permit the generation of the codes to the television program provider.

Optionally, at step 404, the tagging module 204 can tag the content received at the
10 head-end. For example, if audio content identifiers are not inserted prior to receiving the television content at the head end 104, then the tagging module 204 can tag the television program content to insert such codes to permit identification of music in the television program as the television program is played, as discussed above with respect to step 402. For example, the head-end 104 can play the television program content and the controller 208
15 can employ voice recognition software or other types of recognition software to extract lyrics and/or notes from music played in the television program. In turn, the storage medium 206 can include a large database of music lyrics and/or music notes of various songs to permit the controller to cross-reference extracted lyrics and/or notes with the database and thereby identify the songs included in the television program. Thus, under the control of the
20 controller 208, the tagging module 204 can insert audio content identifier codes corresponding to the identified songs into the television program content in the same manner in which a television content provider can insert the audio identifier codes, as described above with respect to step 402.

With regard to audio program content, the controller 208 in the head-end 104 can
25 identify the audio content using existing identifiers. For example, in a music video on-demand scenario, the controller 208 in the head-end 104 can employ the same identifiers, for example, identifying the artist, title and/or album of a song, it utilizes to display music video on-demand options to a user. In addition, for an audio program played on a dedicated music channel, the controller 208 can similarly employ the same identifiers that it utilizes to display
30 artist, title and/or album of the audio content in the still frames displayed while a corresponding song is played. Here, the tagging module 204 can insert audio content identifier codes in audio program content that identify the audio content in the program to permit a set top box to discover the song for purchasing, download or Radio Station seeding purposes, as discussed in more detail below.

At step 406, the head end 104 can transmit the content to the set top box 300 through the wide area network 106. As discussed above, the transmitted content can include broadcast and/or on-demand content, which in turn can include television and/or audio programs.

5 At step 408, the set top box 300 can receive the content transmitted from the head end 104 via the receiver 302 and can store the content in the storage medium 306. As mentioned above, for live content, the storage medium 306 can act as a buffer.

At step 410, the processor 308 of the set top box 300 can direct the display of the received content to the user. For example, the processor 308 can control the encoder 310 to
10 format the content for transmission through the interface 312 for display on a user's television set.

At step 412, the processor 308 can receive an indication that a user has marked or selected content currently being presented. For example, the set top box 300 can transmit a broadcast or on-demand television or audio program to a user's television via the television
15 interface 312, as stated above. Here, a user can mark or select a song that is being played on his television set by selecting a dedicated button on a remote control, which in turn can be detected by the processor 308 via the user-interface 314. It should be noted that in an alternative embodiment, the indication can be received by the controller 208. For example, the processor 308 can relay the indication to the head end 104 through the wide area network
20 106.

At step 414, the processor 308 or the controller 208 can identify the audio content marked by the user. For example, the processor 308 or the controller 208 can process the data stream transmitted to the television set or the set top box 300, respectively, to determine the audio content identifier code associated with the content displayed at the user's television
25 set. Using the determined audio content identifier, the processor 308 or the controller 208 can identify the song selected or marked by the user by cross-referencing the determined audio content identifier with the code/tag table 318. Here, the code/tag table 318 can relate a set of audio content identifier codes with the artist, title and/or album of various songs. In addition, the code/tag table can be included in the head end 104.

30 Optionally, at step 416, the processor 308 can store the audio content selection in the storage medium 306. For example, as discussed in more detail below, the audio content selection can be employed by the radio station application 320 to generate a playlist. A list of such selections can be stored in the storage medium 306 over time to permit the radio station application 320 to use one or more of the selections, singly or in combination, to

provide playlists that are tailored to the user's tastes. It should also be noted that the selections can be stored in separate lists for different respective users, where a user can log-on to the set top box 300 and make his or her own audio content selections.

5 Optionally, at step 418, the processor 308 can direct the television to display the artist, title and/or album of the audio content marked or selected by the user at step 412. For example, the processor 308 can display the artist, title and/or album of the audio content automatically or in response to a user-request. For example, the user-request can be received via the user-interface 314, where the user can select a dedicated button on a remote control. Alternatively or additionally, the display of the artist, title and/or album of the audio content
10 can be performed in response to user-selection of an option to display the audio information that is presented on the television display.

Optionally, at step 420, the processor 308 can determine whether it should initiate a sale and/or a delivery of the audio content marked or selected by the user at step 412. Here, the processor 308 can initiate the sale and/or delivery of the audio content can in response to
15 user-selection of an option prompting the user to purchase and/or receive the audio content that the processor 308 displays on the user's television. Alternatively, the processor 308 can initiate a sale and/or a delivery of the audio content in response to a user-selection of a dedicated button on a remote control.

If the processor 308 determines that it should not initiate a sale and/or a delivery of
20 the audio content marked or selected by the user at step 412, then the method can proceed to step 410 and can be repeated or can proceed to step 424, which is discussed in more detail below. If the processor 308 determines that it should initiate a sale and/or a delivery of the audio content marked or selected by the user at step 412, then, at step 422, the processor 308 can initiate the sale and/or delivery of the audio content. For example, the processor 308 can
25 implement the purchase by transmitting an indication of the purchase to the controller 208 of the head end 104, which, in turn, can bill the user using a credit card that is included in a pre-configured user-profile. Alternatively, the user can be charged for the audio content in a bill for the cable/satellite services provided by the service provider operating the head end 104. It should be noted that a delivery of the audio content can be implemented in a variety of
30 ways. For example, the processor 308 can download the audio content through the wide area network 106 from the head end 104 and can store the audio content in the storage medium 306. Further, the downloaded song can be accessed by the user through one or more of the device interfaces 316 for storage on a personal computer, a media player and/or a smart phone. Alternatively or additionally, the audio content can be delivered by transmitting the

audio content in accordance with user-preferences. For example, the processor 308 can transmit, via the wide area network 106, an indication to the controller 208 that the audio content should be delivered to the user. Here, the controller 208 can direct the audio content to be transmitted to an e-mail server to permit the user to access the audio content via his or her e-mail account, which can be specified in user-preferences stored at the storage medium 306 and/or the storage medium 206. Alternatively or additionally, the controller 208 can contact a cellular telephone service provider to permit the delivery of the audio content to a user's smart phone. Moreover, the controller 208 can, for example, relay the delivery request to a digital music provider, which, in certain exemplary embodiments, can directly charge the user for the audio content and can render the audio content accessible via an account held by the user with the digital music provider.

Optionally, at step 424, the processor 308 can determine whether to start a radio station application. As discussed herein below, the radio station application 320 can be locally stored and implemented in the set top box, can be implemented at the head end 104 and/or can be implemented at a remote site, such as the internet radio station site 110. In accordance with step 424, the processor 308 can start the radio station application 320 automatically if user-preferences indicate that the radio station application should be initialized once audio content is selected or marked by the user at step 412. Alternatively, the radio station application 320 can be initialized in response to user-selection of an option to initialize the radio station application. For example, the option can be presented to a user automatically after the user selects audio content, as discussed above with respect to step 412. Alternatively, the user can prompt the display of a menu option by selecting a dedicated button for a menu on a remote control. Through the menu, the user can select an option to initiate a radio station using one or more audio content selections stored, for example, at step 416. In addition, according to other aspects, the processor 308 can present a list of songs selected and stored by the user, as discussed above with respect to steps 414 and 416, and can permit the user to select which songs to use as seeds to generate a radio station.

At step 426, if the processor 308 determines that a radio station application should be not be initialized, then the method can proceed to step 410 and can be repeated. If the processor 308 determines that a radio station application should be initialized, then, at step 426, the processor 308 can initialize the radio station application 320, which in turn can implement a radio station using one or more songs as a seed to generate and play a playlist. For example, as discussed above, the radio station application 320 can employ one or more seed songs to generate one or more playlists of songs that are similar to the seed songs using

known, complex algorithms. As a simple example, songs in the same category as a seed song can be included in a playlist. A category can correspond to a genre, such as jazz, classical, rock, etc., to a common artist and/or to a time period, such as 80's, 90's, etc. The degree of specificity of a category can be selected in accordance with design choice. In addition, categories can be weighted in accordance with the number of songs selected by a user at step 412. For example, the playlist can include a proportion of songs in a given category equivalent to the proportion of songs selected and stored by the user at steps 412 and 416 that are in the given category. Further, according to other aspects, recently selected songs can be weighted over songs selected at an earlier date or time so that the playlist includes a greater proportion of songs that are similar to the recently selected songs.

Moreover, it should also be understood that the radio station can be implemented in a variety of ways. For example, the songs in a generated playlist can be played over a dedicated channel. Thus, when a radio station is implemented, the processor 308 can cause the set top box 300 to automatically tune to the dedicated channel to play the songs in the playlist. Here, the radio station application 320 can be configured to contact the controller 208 at the head end 104 through the wide area network 106. In turn, the controller 208 can direct the head end 104 to stream songs in the playlist from the storage medium 206 for delivery to the set top box 300 and presentation to a user via one of the interfaces. For example, the songs can be played on a user's television through the television interface 312 or can be played on other devices, such as a personal computer, smart phone or media player, by utilizing the device interfaces 316. Alternatively, the songs can be streamed directly to the user devices. For example, the head end 104 can stream songs in a playlist generated by the radio station application 320 to a user's personal computer over the Internet or to a user's smart phone through the user's cellular telephone service provider. In accordance with other aspects, the controller 208 can communicate with the internet radio station site 110, which, in turn, can deliver or stream the songs included in the playlist to the set-top box 300 over the wide area network 106, or to user devices over the internet or through the user's cellular network service provider.

At step 428, the processor 308 can receive and store an indication of an approval or disapproval of a currently played song. For example, when a song is played within content provided to the user at step 410 or is played at step 426, a user can select a "thumbs up" option via a remote control to indicate that the user approves of a currently played song or can select a "thumbs down" option to indicate that the user disapproves of a currently played song. Here, dedicated buttons on a remote control can be employed by the user to select the

“thumbs up” and “thumbs down” options. Alternatively or additionally, the “thumbs up” and “thumbs down” options can be displayed automatically within a certain time interval, such as ten or fifteen seconds, from when the song is first played. Alternatively or additionally, the user can select the “thumbs up” or “thumbs down” options via a menu that is prompted by user-selection of a menu option on a remote control.

At step 430, the processor 308 and/or the radio station application 320 can employ the approval or disapproval indications to modify a radio station implemented at step 426. For example, the radio station application 320 can be configured to exclude any songs from a playlist that are deemed to be similar to a song marked as “disapproved” by a user.

Alternatively, the radio station application 320 can be configured to exclude any songs belonging to the same category as a song marked “disapproved” after a threshold number of songs in that category has been selected by the user. Moreover, the processor 308 and the radio station application 320 can add songs to the play list that are deemed to be similar to the song marked as “approved” or can increase the proportion of songs that are in the same or similar categories as the song marked as “approved.” For example, an approval of a song in a given category can add or increase a weight for the given category. As discussed above, similarity of songs can be based on whether the songs are included in the same category or categories.

Approval and disapproval indications can be stored with song selections stored at step 416. In addition, the stored indications and selections can be presented to a user as a list that can be modified by a user. For example, a menu can be presented to a user that includes an option that permits the user to view all songs marked as approved or disapproved. The list can identify songs by artist, album and/or title and can permit a user to hear an excerpt of a song in response to user-selection of a song in the list. Here, the excerpt of the song can be downloaded from the head end 104 after the approval/disapproval indication of the song is received by the set top box 300 or after the song is selected at step 412. Through the list, the user can mark listed songs using a “check box,” to indicate whether the processor 308 and the radio station application 320 should use the marked or checked songs to modify a playlist or radio station as discussed above. In addition, the processor 308 can remove songs in the list in response to a user-selected option to remove the songs from the list.

After modification of the radio station at step 430, the method can proceed to step 426, where a playlist generated and/or modified in accordance with a modified radio station is provided.

At step 432, the processor 308 can display an option to store a playlist generated at step 426 and/or a radio station generated at step 426 or modified at step 430. For example, the processor 308 can display the option when a first song in a playlist is played or after a user stops the playing of songs in the playlist. For example, the user can stop play of a
5 playlist by selecting a dedicated stop button on a remote control or by directing the set top box to tune to another channel. Alternatively, the user can prompt the display of a menu at any time during the playlist play and can select an option to store the playlist and/or the radio station via the menu.

At step 434, the processor 308 can store the radio station/playlist generated by the
10 radio station application 320 in the storage medium 306 in response to user-selection of the option displayed at step 432. It should be understood that a "radio station" is defined by the set of songs marked or selected by a user for purposes of generating playlists. Here, the songs marked or selected by the user can be those selected at step 412 and/or those songs for which an indication of approval of disapproval is received at step 428.

Thus, a set of songs of a radio station can be used as seeds in the complex radio
15 station application algorithms to generate a variety of playlists with songs that are similar to songs in the set of songs or that are weighted in accordance with selected songs in the set, such as those songs for which approval/disapproval indications were received. Accordingly, a user can at any time prompt the display of a menu and select an option to view a listing
20 stored radio stations and/or playlists. From the listing, the user can select any stored radio station and/or playlist to initiate the playing of the stored playlist and/or a new playlist that is generated in accordance with the set of songs defining the stored radio station. Thus, any one or more of steps 424-434 can be performed at any time in response to user-selection of an option to initiate the play of a playlist and/or a radio station. Furthermore, the user can at
25 anytime modify stored radio stations by adding or deleting songs defining a stored radio station. For example, the user can select a stored radio station in the listing of stored radio stations to prompt the processor 308 to display songs defining the selected radio station. Here, the user can choose any song that is displayed to prompt the display of an option to delete the song for user-selection. In addition, the user can prompt the display of a menu and
30 select an option to view a listing of all songs selected or marked, for example, at step 412 and/or step 428. Upon selection of a song in the listing of marked songs, the processor 308 can direct the display of an option listing stored radio stations and/or playlists to which the user can add the selected song by selecting the displayed option.

Having described preferred embodiments for systems and methods (which are intended to be illustrative and not limiting) for identifying audio content in media streams and performing related services, it is noted that modifications and variations can be made by persons skilled in the art in light of the above teachings. It is therefore to be understood that
5 changes can be made in the particular embodiments of the invention disclosed which are within the scope of the invention as outlined by the appended claims. While the forgoing is directed to various embodiments of the present invention, other and further embodiments of the invention can be devised without departing from the basic scope thereof.

Claims:

1. A method comprising:
receiving, as a part of a displayed television program, an indication that a user has
5 selected audio content played during display of the part of the television program;
identifying the audio content; and
displaying information identifying the audio content in response to the user-selection
of the audio content.
- 10 2. The method of claim 1, wherein the received television program includes audio
identifier codes associated with portions of the television program that include corresponding
audio content identified by the codes.
- 15 3. The method of claim 2, wherein the identifying further comprises determining a
particular audio identifier code associated with the given portion of television program in
response to the user-selection of the audio content.
- 20 4. The method of claim 3, wherein the identifying further comprises cross-
referencing the particular audio identifier code with a song, wherein the displayed
information identifies the song.
- 25 5. The method of claim 1, further comprising:
playing a playlist that is compiled by employing the selected audio content as a seed
to determine and insert entries in the playlist that are deemed to be similar to the selected
audio content.
- 30 6. The method of claim 5, further comprising:
storing a plurality of audio content selections, wherein the playlist is compiled by
employing a combination of the audio content selections as seeds to determine and insert
entries in the playlist that are deemed to be similar to the audio content selections.
7. The method of claim 5, further comprising:
receiving from the user an indication of approval or disapproval of a song as or after
the song is played.

8. The method of claim 7, further comprising:
modifying the playlist by employing the indication of approval or disapproval.

5 9. A method comprising:
receiving, as a part of displayed broadcast content, an indication that the user has
selected audio content played the broadcast content;
identifying the audio content; and
seeding a playlist that is compiled by employing the audio content, selected as a part
10 of the displayed broadcast content is displayed, with entries added to the playlist that are
deemed to be similar to the selected audio content.

10. The method of claim 9, further comprising:
receiving from the user an indication of approval or disapproval of a song as or after
15 the song is played.

11. The method of claim 10, wherein the song is an entry in the playlist.

12. The method of claim 10, wherein the song is the audio content.

20 13. The method of claim 10, further comprising:
modifying the playlist by employing the indication of approval or disapproval.

14. The method of claim 9, further comprising:
25 storing a plurality of audio content selections, wherein the playlist is compiled by
employing a combination of the audio content selections as seeds to determine and insert
entries in the playlist that are deemed to be similar to the audio content selections.

15. The method of claim 9, further comprising:
30 displaying an option to store the playlist; and
storing the playlist in response to user-selection of the option.

16. A system comprising:

a storage medium configured to store broadcast content for display to a user, wherein the broadcast content includes audio content identifier codes that identify audio content included in respective portions of the broadcast content;

5 a code table relating the audio content identifier codes to a set of songs; and

a processor configured to identify a particular song corresponding to audio content played in a given portion of the broadcast content using the code table in response to user-selection of the corresponding audio content as the given portion of broadcast content is presented to the user.

10

17. The system of claim 16, wherein the processor is further configured to display information identifying the particular song in response to user-selection of the audio content included in the given portion of the broadcast content.

15

18. The system of claim 16, further comprising:

an application module configured to compile a playlist by employing the audio content, selected as the portion of the broadcast content is displayed, as a seed to determine and insert entries in the playlist that are deemed to be similar to the selected audio content, wherein the processor is further configured to play the playlist.

20

19. The system of claim 16, wherein the processor is further configured to initiate the sale or delivery of the song to the user.

25

20. The system of claim 19, wherein the processor is further configured to prompt the user to purchase or download the song by displaying an option to purchase or download the song.

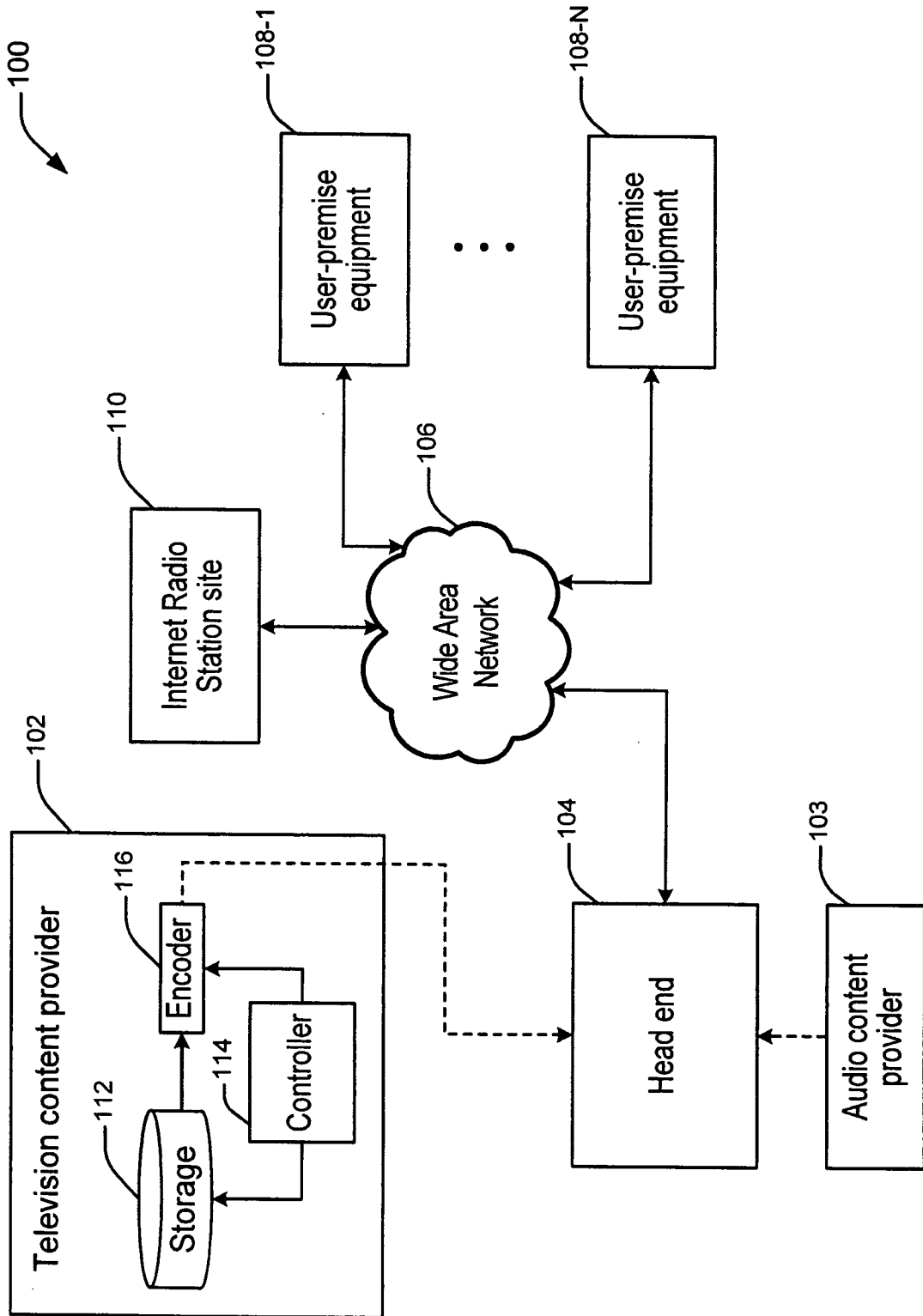


FIG. 1

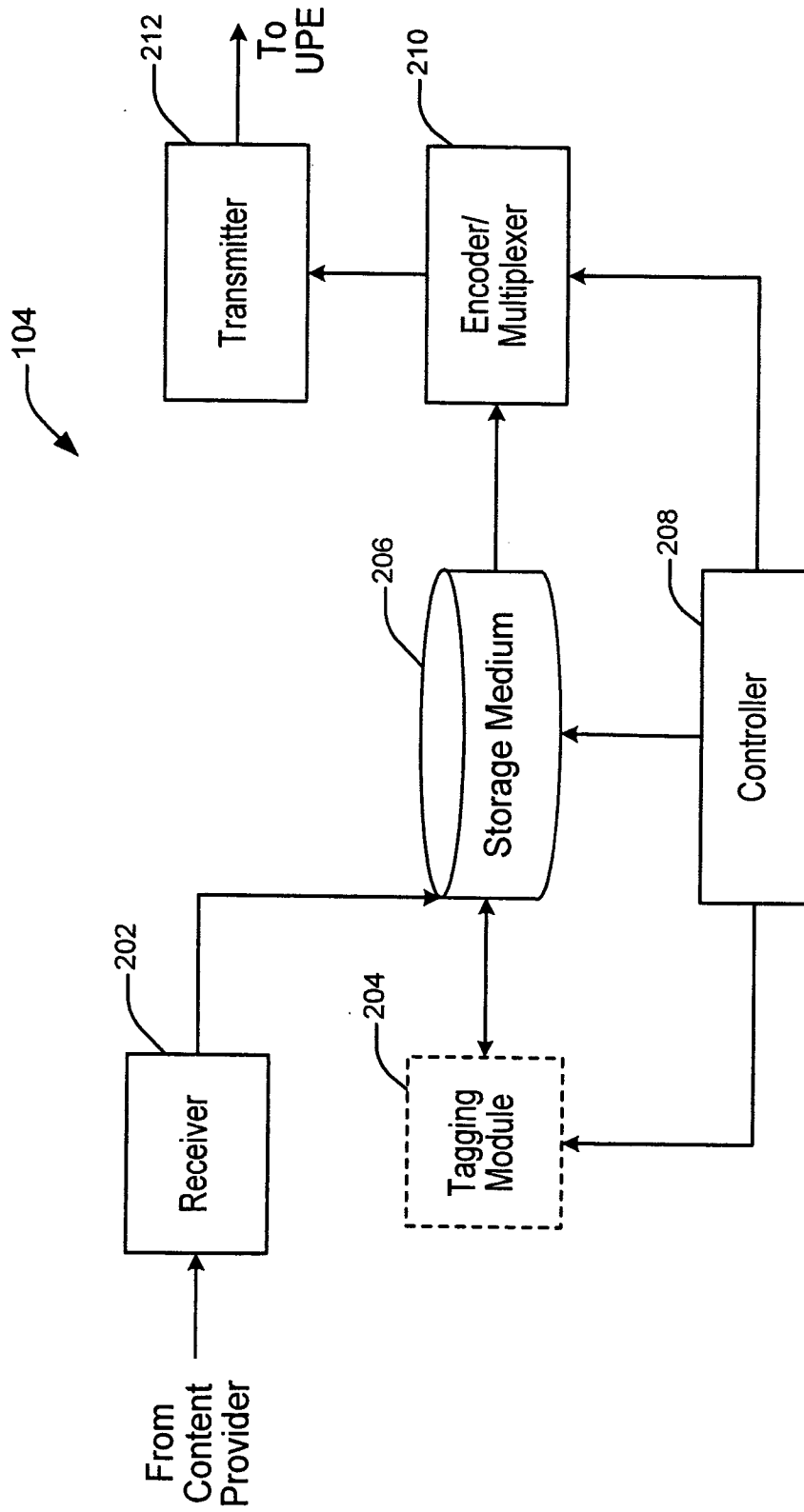


FIG. 2

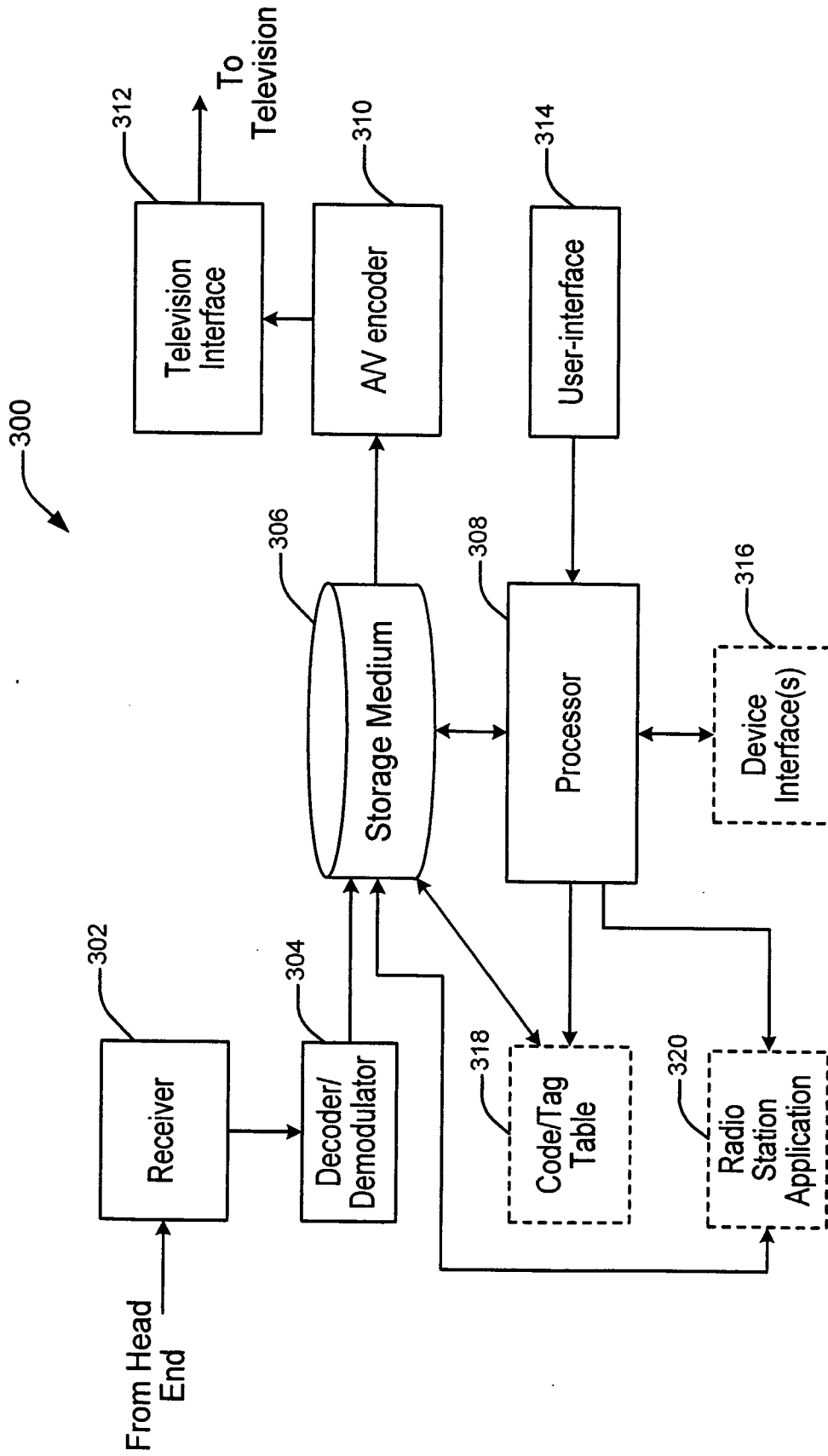


FIG. 3

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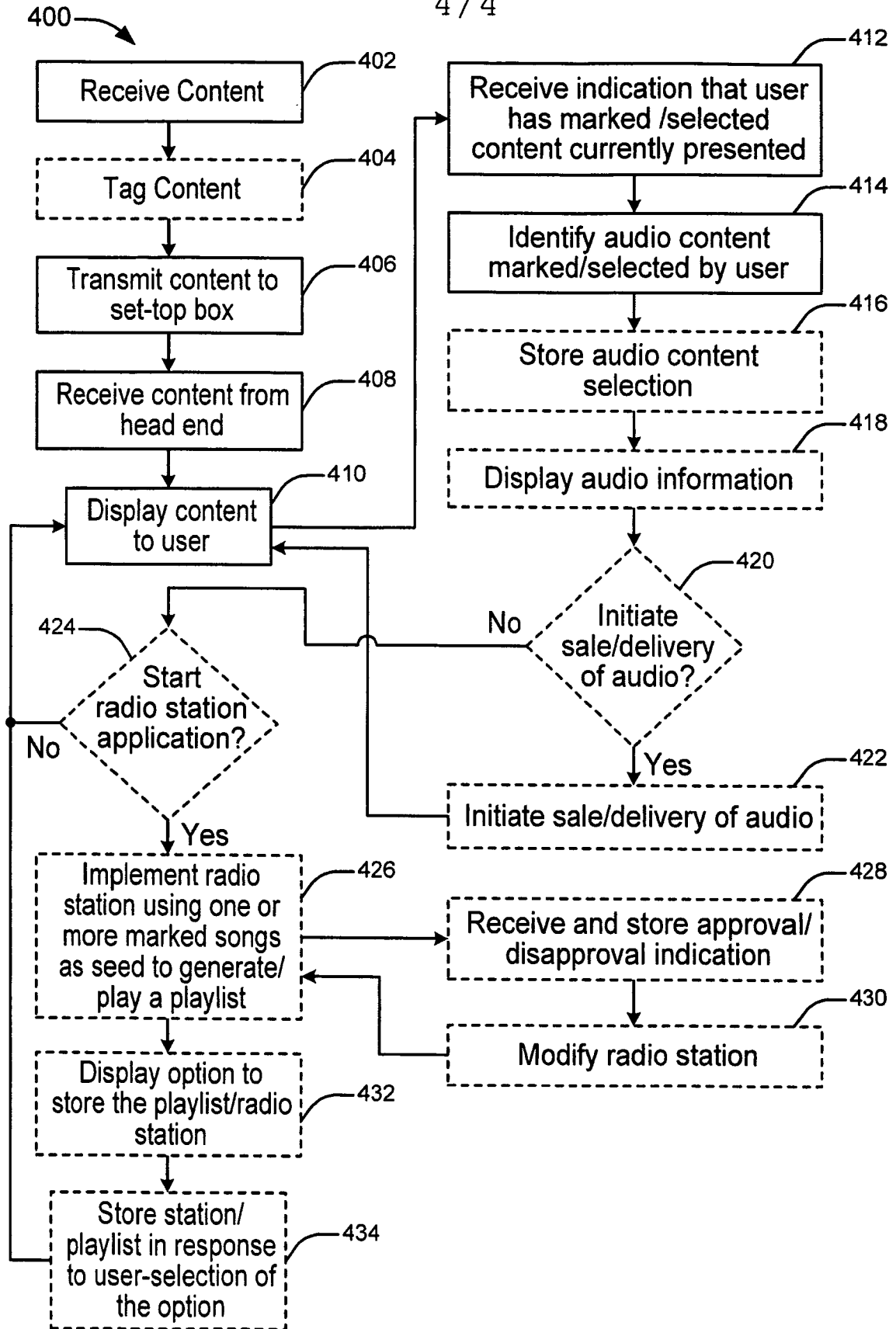


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/002842

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04H60/58 H04H60/37 H04H60/64 H04N7/173
 ADD. H04N21/4722 H04N21/262 H04N21/466 H04N21/482 H04N21/81

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)
 H04H H04N

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/075430 A1 (PARK YONG SOO [KR]) 6 April 2006 (2006-04-06)	1-8, 16-20
Y	paragraphs [0007], [0015] paragraph [0019] - paragraph [0021] paragraph [0035] - paragraph [0074] -----	9-15
X	US 2007/261079 A1 (PACK BOK H [KR] ET AL) 8 November 2007 (2007-11-08)	1-4,16, 17
X	US 2007/061215 A1 (WAITES NIGEL [US]) 15 March 2007 (2007-03-15)	9-15
A	paragraph [0018] - paragraph [0029] -----	6,18
Y	EP 1 791 130 A2 (DELPHI TECH INC [US]) 30 May 2007 (2007-05-30)	9-15
A	paragraph [0018] paragraph [0034] - paragraph [0041] -----	6,18
	-/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "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)
- "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

- "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
- "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
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search 5 July 2011	Date of mailing of the international search report 14/07/2011
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Vaquero, Raquel
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/002842

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8, 16-20

Receiving an indication that the user has selected audio content, identifying said audio content, and displaying information identifying the audio content in response to the user-selection of the audio content.

2. claims: 9-15

Receiving an indication that the user has selected audio content, identifying said audio content, and seeding a playlist that is compiled by employing the audio content, selected as a part of the displayed broadcast content is displayed, with entries added to the playlist that are deemed to be similar to the selected audio content.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/002842

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010/043020 A1 (BASSO ANDREA [US] ET AL) 18 February 2010 (2010-02-18) paragraph [0023] - paragraph [0027] -----	7,19,20
X	EP 1 096 392 A2 (SONY CORP [JP]) 2 May 2001 (2001-05-02) paragraph [0041] - paragraph [0052] paragraph [0161] -----	1-4,16, 17,19,20
X	US 2010/125879 A1 (PETERKA PETR [US] ET AL) 20 May 2010 (2010-05-20) paragraph [0025] - paragraph [0026] paragraph [0031] - paragraph [0032] -----	1-4,16, 19,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/002842

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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			US 7200586 B1 03-04-2007

US 2010125879	A1	20-05-2010	NONE
