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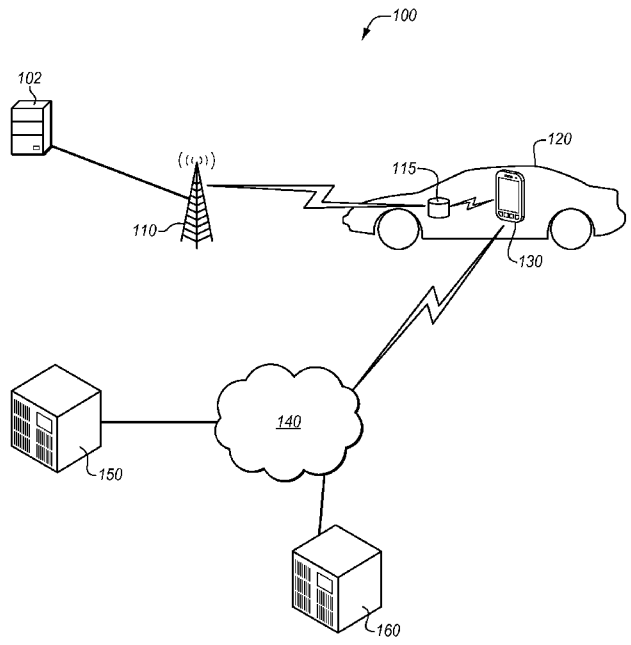
[Continued on next page]

(54) Title: BROADCAST STREAM INTERACTION VIA CODED TAG AND SHORT RANGE COMMUNICATION PROTOCOL TO A MOBILE COMPUTING DEVICE

FIG. 1



(57) Abstract: A method for broadcast stream tagging includes receiving a broadcast signal including content at a FM radio and playing the content in an audio format to the user. The method further includes receiving an indication from the user during the play of the content; capturing a coded tag, wherein the coded tag is received at the radio in the RDS signal, from the broadcast signal with a CAN bus, the CAN bus interconnected with the FM radio; sending the coded tag from the CAN bus to a NFC communication module; and sending the coded tag to a smart phone from the NFC communication module. The method further includes receiving the coded tag at an application, resident on the smart phone, sending the coded tag to a decoder server; receiving presentation instructions from the decoder server; executing the presentation instructions using the application; and displaying content to the user.

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SYSTEMS AND METHODS FOR BROADCAST STREAM INTERACTION VIA CODED TAG AND SHORT RANGE COMMUNICATION PROTOCOL TO A MOBILE COMPUTING DEVICE

TECHNICAL FIELD

The embodiments described herein relate to systems and methods for allowing the user to access enhanced informational, advertising, and entertainment content, via a mobile computing device, related to a first broadcast stream.

BACKGROUND

With the introduction of smart phones and other mobile computing devices, users have rapid access to information, content, and the ability to purchase products. People in various contexts, whether commuting via car, motorcycle, or other vehicle, may not have the ability to fully access their smart phone or mobile computing device; however, they may still desire to interact with the device, tag and access information, or otherwise utilize their smart phone or mobile computing device.

Some innovations have occurred in relation to smart phones and mobile computing devices in vehicles such as Bluetooth® connectivity for voice features and other systems. This allows the smart phones or other mobile computing devices some opportunity to interface with the vehicle. Bluetooth® integration typically only involves the speakers of the vehicle as well as a microphone for receiving sounds from the user. Integration of many of the vehicle's other systems has not occurred to a large extent, and the ability for advertisers to more directly reach consumers through such systems also has not been realized. A methodology for interconnection of systems, such as terrestrial radio and satellite radio to smart phones and other mobile computing devices, has not been realized.

SUMMARY

In one embodiment, a method for broadcast stream tagging includes receiving a broadcast signal including content at a Frequency Modulation (FM) radio and playing the content in an audio format to the user. The method further includes receiving an indication from the user during the play of the content. The method further includes capturing a coded tag, wherein the coded tag is received at the radio in the Radio Data System (RDS) signal, from the broadcast signal with a Controller Area Network (CAN) bus, the CAN bus interconnected with the FM radio. The method further includes sending the coded tag from the CAN bus to a Near Field Communication (NFC) module and sending the coded tag to a smart phone from the NFC module. The method further includes receiving the coded tag at an application, resident on the smart phone, and sending the coded tag to a decoder server. The method further includes receiving presentation instructions from the decoder server and executing the presentation instructions using the application and displaying content to the user. Optionally, the NFC module is in a charging pad mounted in the vehicle. Alternatively, the charging pad is a conductive charging pad.

In one embodiment, a system for broadcast stream tagging includes a broadcast signal receiver, the broadcast signal receiver operable to receive a broadcast signal including content and play the content in an audio format to the user. The system further includes a short range communication module, configured to communicate with a smart phone of a user. The system further includes a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver and configured to receive an indication from the user during the play of the content, capture a coded tag from the broadcast signal, and send the coded tag to the short range communication module, wherein the short range communication

module is configured to send the coded tag to the smart phone. Optionally, the system further includes an application, resident on the smart phone. The application is configured to receive the coded tag, send the coded tag to a decoder server, receive presentation instructions from the decoder server, execute the presentation instructions, and display content to the user. Optionally, the broadcast signal receiver is a radio. In one configuration, the short range communication module is in a charging pad mounted in the vehicle. Alternatively, the charging pad is a conductive charging pad. Optionally, the short range communication module is a NFC chip. Alternatively, the vehicle-based controller system is a CAN bus. Optionally, the coded tag is received at the radio in the RDS signal. Alternatively, the presentation instructions are an advertisement for a product. In one alternative, the presentation instructions are options to purchase content. Optionally, the content is a song and the song was playing in the broadcast signal at a time the user provided the indication.

In one embodiment, a computer-readable non-transitory storage medium that contains instructions, which instructions, when executed by one or more processors, result in performing operations. The instructions are to receive a coded tag from a short range communication module, send the coded tag to a decoder server, receive presentation instructions from the decoder server, execute the presentation instructions, and display content to the user. Optionally, the short range communication module is in a charging pad mounted in the vehicle. Alternatively, the charging pad is a conductive charging pad. In one alternative, the short range communication module is a NFC chip. In another alternative, the presentation instructions are an advertisement for a product. Optionally, the presentation instructions are options to purchase content. Alternatively, the content is a song and the song was playing in a broadcast signal at a time the user provided an indication to capture the coded tag.

In one embodiment, a method for broadcast stream tagging includes receiving a broadcast signal, including content at a broadcast signal receiver. The method further includes playing the content in an audio format to the user and receiving an indication from the user during the play of the content. The method further includes capturing a coded tag from the broadcast signal with a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver. The method further includes sending the coded tag from the vehicle-based controller system to a short range communication module and sending the coded tag to a smart phone from the short range communication module. Optionally, the method further includes receiving the coded tag at an application, resident on the smart phone; sending the coded tag to a decoder server; receiving presentation instructions from the decoder server; executing the presentation instructions using the application; and displaying content to the user. Alternatively, the broadcast signal receiver is a radio. In one alternative, the short range communication module is a NFC chip. In another alternative, the vehicle-based controller system is a CAN bus. Optionally, the coded tag is received at the radio in the RDS signal. Alternatively, the presentation instructions are an advertisement for a product. Optionally, the presentation instructions are options to purchase content. In one configuration, the content is a song and the song was playing in the broadcast signal at a time the user provided the indication.

In another embodiment, a clearing house system for broadcast stream tagging includes a decoder server configured to receive a message from a smart phone including a coded tag; determine content instructions to be delivered to the smart phone based on the coded tag; and transmit content instructions to the smart phone. Optionally, the content instructions are instructions sent to an application on the smart phone for providing content to the user. Alternatively, the content instructions are content to be displayed to the user. In one alternative, the coded tag server is

configured to provide the coded tag to a broadcast station, and the broadcast station is configured to transmit the coded tag with content to the user. Optionally, the system further includes a broadcast signal receiver, the broadcast signal receiver operable to receive a broadcast signal including content, and play the content in an audio format to the user. The system optionally further includes a short range communication module, configured to communicate with the smart phone of a user. The system optionally further includes a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver and configured to receive an indication from the user during the play of the content, capture the coded tag from the broadcast signal, and send the coded tag to the short range communication module, wherein the short range communication module is configured to send the coded tag to the smart phone. In one alternative, the application, resident on the smart phone, is configured to receive the coded tag; send the coded tag to a decoder server; receive the content instructions from the decoder server; execute the content instructions; and display content to the user.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows one embodiment of a system diagram for broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device;

Fig. 2 shows one embodiment of a vehicle-based view of a broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device;

Fig. 3 shows one embodiment of a method for broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device;

Fig. 4 shows one embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol;

Fig. 5 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol;

Fig. 6 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol; and

Fig. 7 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of systems and methods for broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device include receiving and at least temporarily recording a coded tag that relates to a broadcast stream. The coded tag then is transferred to a smart phone or other mobile computing device where it is translated such that content or information of various forms may be provided to the user on their smart phone or computing device. The term "smart phone" will be used generically herein to include both smart phones as well as other mobile devices such as tablets and laptops or other devices, with the main requirements for the device being that they can communicate via at least one communications protocol to receive the coded tag and then access content through that or another communications protocol. Embodiments of the system may generically be referred to as a "broadcast stream tagging system."

Currently, vehicles typically are configured to include various radio systems. Typically, a car or other vehicle will include an Amplitude Modulation/Frequency Modulation (AM/FM) radio and, in many cases, a satellite radio system. One feature of many modern FM radios is that they are configured to include a data transmission receiver. Data transmission through FM radio typically occurs using a communications protocol referred to as Radio Data Systems (RDS), which goes

by Radio Broadcast Data Systems (RBDS) in the United States. In this disclosure, data transmissions over FM radio will be generically referred to as RBDS; however, other RDS systems and other potential FM data transmission systems may be substituted in various alternatives. For instance, in Germany, ARI (Autofahrer-Rundfunk-Informationssystem) may be utilized, among a variety of other systems.

Typically, RBDS will include various content channels, such as Alternative Frequencies (AF), Clock Time (CT), Enhanced Other Networks (EON), Program Identification (PI), Program Service (PS), Program Type (PTY), Regional (REG), Radio Text (RT), Traffic Announcement (TA or TP), and Traffic Message Channel (TMC).

Satellite Radio also includes the ability to transmit data as well, generally with greater freedom than that of traditional FM radio. Some satellite radio providers, such as SIRUS, use statistical multiplexing technology and may dynamically utilize band width and program their systems accordingly to transmit information in addition to the typical radio programing transmitted. SIRUS also already uses an "S-Band" transmission system for transmitting weather information to users. Other satellite radio providers have this ability in different forms and configurations. SIRUS and others provide programming information along with their programming.

Similar data transmission systems may be available or the radio systems can be configured accordingly, for various other radio systems provided in a vehicle, such as HD FM, and AM. All of these systems, satellite, AM, FM, and HD FM radios, as well as any other broadcast system, will be referred to as "radio" generically herein. Although the systems described herein typically retrieve tags from broadcast radio, other systems may be used. For instance, a multicast or unicast system (such as a direct music stream like Pandora) may be delivered to a vehicle via various transmission medium, including unicast data systems that are utilized for mobile phones.

In many situations, while a user is operating a vehicle, he or she may not be able to properly utilize a smart phone due to safety and legal (hands-free laws) constraints. The user may be unable to effectively operate their smart phone. At the same time, the user may listen to the radio. In many cases, radio station revenue is supported at least in part through the usage of advertisements. The effectiveness of these advertisements is somewhat uncertain, since there is generally no way of knowing whether the user selects a product or service on the basis of these ads, beyond the user indicating as such at the time of purchase.

By using the tag system, numerous advantageous methods of connecting the user with the product or service they desire may be utilized.

In one embodiment, the system includes a radio interconnected with the CAN bus of the vehicle, a communications module for connecting a smart phone with the CAN bus, and a server (or server system) for receiving coded tags from the smart phone, where the coded tags were originally received through the radio, communicated through the CAN bus of the vehicle, and subsequently through the communications module, to the smart phone.

Fig. 1 shows an embodiment of a system for Broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device 100. A party interested in having a coded tag associated with a particular radio transmission first acquires or purchases the right to have their tag associated with particular content. The association between content and particular programing may be stored at server 102 or other computing system that is associated with the transmission of the broadcast stream. Server 102 may be local or remote from the broadcast system 110. Broadcast system 110 then broadcasts radio programming. In the case of FM broadcast, the RBDS system and its various content channels may be utilized. These content channels may include Alternative Frequencies (AF), Clock Time (CT), Enhanced Other

Networks (EON), Program Identification (PI), Program Service (PS), Program Type (PTY), Regional (REG), Radio Text (RT), Traffic Announcement (TA or TP), and Traffic Message Channel (TMC) channels. One of these channels may be utilized for transmission of the coded tag. Alternatively, a separate channel may be established. Existing channels that are likely to transmit the code include the PI and RT channels, but any channel may be utilized. A special header may be used that causes the radio and CAN bus system not to display the coded tag, but instead temporarily store it, in order to transmit to the smart phone.

The radio programing from the broadcast system 110 is received by the car's radio and CAN bus system 115. This system will include a communications module for communicating with the smart phone 130. A wide variety of communications systems may be used including, but not limited to, Bluetooth®, Bluetooth Low Energy®, and Near Field Communication protocols, as well as ANT+®, Cellular, IEEE 802.15.4, IEEE 802.22, ISA 100a, Infrared, ISM band, RFID, 6LoWPAM, UWB, Wi-Fi, Wireless HART, WirelessHD, Wireless USB, ZigBee®, and Zee-Wave®, as well as many other communications protocols. Due to the particular configuration of the system, it is thought that Bluetooth®, Bluetooth LE®, and NFC present the most natural technical fit (since many devices already incorporate these technologies), although other short range communication systems are possible.

The smart phone 130 includes the ability to communicate over various data networks, either when the smart phone 130 is in the vehicle or later, after the smart phone 130 is out of the vehicle 120. Through a data network, the smart phone may contact the Internet 140 or other network. The Internet provides for connection to a decoder server 150 and websites belonging to content providers, online stores, or other providers.

During a broadcast, various programing is provided. When the user is interested in more information or purchasing content related to a particular piece of programing in a broadcast, the user provides an indication to the system 100. There are a number of alternative ways in which the user may provide the indication. In one embodiment, an indication includes actuating a button on the control panel or steering wheel of a vehicle. If the vehicle has voice-enabled systems (in some alternatives via Bluetooth®), the indication may be the pressing of a button on the control panel or steering wheel of a vehicle and a verbal command. Alternatively, the indication may be the actuation of a button on the smart phone 130. Alternatively, the indication may be the actuation of a button on the smart phone 130 followed by a voice command.

The provision of an indication may result in various operations depending on the embodiment, the configuration of the system, and the type of coded tag. In some embodiments, whether indications are provided or not, the system sends a listing of programming listened to, according to the data provided with the program (via RBDS in the case of FM radio) and a listing of the coded tags for those programs. This may occur on the basis of a record being sent each time a user listens to a program and a new coded tag occurs. When the term "programs" is used, it may refer to programs or advertisements. This listing is sent via short range communications protocol via a NFC chip (although in other alternatives, different chips and protocols may be used) incorporated into the radio and CAN bus system 115. The user then at a later time may access this list of programing and coded tags. If the user has provided an indication, as described above, then the list of programing and coded tags may be modified to provide content and coded tags that occurred during an indication of increased prominence in the list. This may occur via putting those programing and coded tags first in the list, highlighting them in some way, putting them in a separate list that is presented with prominence, or various ways.

In some configurations, the list is stored on the smart phone 130. In other configurations, the coded tags and listing of associated programing may be sent to decoder server 150 (or another server) and stored in a profile related to the user that later may be accessed by the user via smart phone 130 or other Internet-enabled device. In many configurations, the user does not see the coded tags themselves. Instead, the coded tags are converted to advertisements, content, purchase options, or links to webpages. The coded tags are interpreted by the decoder server to generate these advertisements, etc. Alternatively, the coded tags may be hyperlinks. These hyperlinks may be oriented to first direct the user to the decoder server 150 and then to the website of a content provider or seller of goods, etc., hosted by server 160. The point of directing the user to the decoder server 150 first is to record that the link was accessed therefore to derive revenue from the service. Techniques for tracking, including cookies, separate landing pages, and other techniques will occur to those of ordinary skill in light of this disclosure.

In an alternative to storing a list of all programing and associated coded tags, the system may merely store a record of programming and the associated coded tag each time the user provides an indication. In another alternative to storing a list of all programing and associated coded tags, the system may merely store a record of the coded tag each time the user provides an indication. As above, these records may be made on the device or transmitted from the device to remote cloud-based storage, such as decoder server 150, or both.

In another alternative, when an indication is received, the coded tag may be transmitted to the smart phone 130. When the smart phone 130 receives the coded tag, this coded tag may be interpreted, either at the smart phone 130, or by sending the coded tag to the decoder server 150. The coded tag then may trigger additional operations by the smart phone 130. These additional

operations may occur when the indication is received or at a later time when the smart phone 130 is accessed by the user.

If the smart phone 130 is interconnected with the vehicle via Bluetooth®, receiving an indication from a user may cause a coded tag to trigger a series of interactions between the smart phone 130 and the user. For example, if a user provides an indication during a song, the coded tag related to the song may be sent to the smart phone 130. The smart phone 130 then may perform a series of interrogatories of the user using the Bluetooth® system in response to the coded tag. For instance, the smart phone may ask if the user wants to purchase the song. The source from who the user purchases the song may be based on the individual who purchased the coded tag. For instance, if the user provides an indication during a restaurant commercial, the smart phone may be programed via the coded tag to ask if the user wants directions to the restaurant, or if the user wants to make a reservation at that restaurant. Various scenarios are possible and may be provided by the manager of the system or the purchaser of the code.

Although typically the system will interact with a smart phone 130 that has connectivity to a data network at the time of connection, in configurations or alternatives, this is not necessary. The smart phone 130 may connect to data networks at a later time and utilize the coded tags at that time.

Fig. 2 shows one embodiment of a Broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device deployed in a vehicle. In this configuration, a charging pad 210 has been installed in a vehicle. Charging pad 210 may be an inductive or conductive charging pad. Charging pad 210 specially is configured to include a NFC communication chip and controller module. The controller module is interconnected with the CAN bus of the vehicle. The vehicle also includes a radio 230, Bluetooth® buttons 220, and

a button 225 for interacting with the controller module of charging pad 210. In operation, a smart phone 240 with a NFC chip may be placed by the user on charging pad 210. In many cases, the phone 240 will include a module or case for enabling the charging of the phone. The smart phone 240 may automatically mate with the charging pad via NFC communication and may automatically mate with the Bluetooth® system of the vehicle as well.

During the presentation of a broadcast over radio 230, the user may recognize a song that he desires to purchase. By actuating button 225, the use may capture a particular coded tag that is associated with the song playing. In operation, the CAN bus of the vehicle may constantly send RBDS information captured from the radio to the controller module of the charging pad 210. The controller module may store these coded tags for a short period of time, or until it receives the next code. It also may buffer several codes and discard the coded tag on a first-in, first-out type of arrangement. When the user actuates the button, the most recently received coded tag is sent via NFC communication to the smart phone 240.

The smart phone 240 may include a flexible operating system such as the iPhone's iOS® or the Android® operating system, or any other operating system that allows the installation of customized code or applications. Smart phone 240 may include an application or app designed to work with the charging pad 210 and button 225. In such a configuration, the controller module 210 of the charging pad may packetize the coded tag and transmit it to smart phone 240. The application running on the smart phone 240 then may have the packet routed to the application where the application can process the packet. The application may then communicate with a remote decoder server via a data network provided by the smart phone 240.

The application running on the smart phone 240 may include numerous features. In some configurations, the application simply may receive the coded tag, record the coded tag, send the

coded tag to a decoder server, and then receive back from the coded server content to display through the app enabling the sale of content, items, or other transactions.

Optionally, when the application running on the smart phone 240 receives instructions via the decoder server, the smart phone 240 may activate the Bluetooth® system of the vehicle. In such a configuration, the controller module 210 also may be interconnected via the CAN bus with the Bluetooth® system of the vehicle. Alternatively, the smart phone 240 may use the Bluetooth® system of the vehicle. In either configuration, the user may be prompted to issue voice commands via the Bluetooth® system to interact with the application concerning the content retrieved according to the coded tag. For instance, if the coded tag is related to a song, the application may prompt the user concerning purchasing the song and wait to receive a verbal response through the Bluetooth® system.

Fig. 3 shows one embodiment of a method of broadcast stream interaction via coded tag and short range communication protocol to a mobile computing device. In step 310, a FM radio station broadcast song ID code tag is sent to the vehicle radio CAN bus via RDS (code example 1234). This is a unique code granted by the operator of the system to identify a song, advertisement, morning show, announcements, or any other communication wished to be transmitted by the broadcasting station. In step 320, if a customer chooses to interact with said media and presses a button that provides an indication that the coded tag should be transmitted, via the CAN RDS/NFC module the RDS code then is pulled off of the CAN bus. In step 330, the RDS code now travels out of the CAN bus and into the NFC transmitter. In step 340, the RDS code is transmitted from the CAN RDS/NFC embedded inside of a wireless charging pad and into the customer's phone via NFC. In step 340, the RDS code transmitted via NFC triggers the phone application installed on the phone to open, and the application sends this RDS code

(example 1234) to the decoder server. In step 350, the phone is connected to the server, the server evaluates the code, and gives the phone proper direction on what to do next. For example, a Code 1234 may be associated with:

- Artist: The Beatles
- Album: Sgt. Pepper's Lonely Hearts Club Band
- Song: With a Little Help From My Friends

The application on the smart phone may provide the user prompts for purchasing the song. For example, it may prompt the user to choose a method to purchase/listen/ download the song, such as iTunes® – Purchase/add to playlist, Xbox Music® – Purchase/add to playlist, or Pandora® – Add to playlist.

The broadcast stream tagging system described herein may be used in various contexts. Once a user tags something from radio via the broadcast stream tagging system and the customer completes the desired task on their smart phone using the application, then the broadcast stream tagging system may control the user experience. This gives the operator of the broadcast stream tagging system a site to sell advertisement spots directly on their application. Revenue may be derived from the sale of the advertisement but also a potential revenue stream from Pay-per-click, along with cost per impression and cost per order.

Example of process:

- Customer tags an ad for a hardware store from the radio, example: Ace Hardware;
- Customer pulls up the application on his smart phone to access information;
- Customer now sees Ace Hardware information;
- Customer is notified that there are other hardware stores in the area, i.e., Home Depot, via their advertisement spot purchased from the broadcast stream tagging system operator.

According to the Radio Advertising Bureau (RAB), the revenue from radio advertising exceeds over $19.8 billion. Businesses currently are purchasing radio commercials, and the advertising segment continues to grow. These businesses currently purchase advertisements in the hopes that listeners will remember the ad, business, phone number, or website. With a click of a broadcast stream tagging system button, customers may transfer the information from that advertisement on the radio and send it to their smart phone. Once in the phone, the broadcast stream tagging system smart phone app will direct the customer to where the business wants them to be, i.e., Website, Facebook, navigation, or advertisement.

The broadcast stream tagging system operator will sell RDS codes from/to their application/server to the radio broadcasters who will in turn sell the code to their business advertisers. These codes will be linked back to the broadcast stream tagging system decoder server with desired information from the business advertisers.

The broadcast stream tagging system directs customers to these media content sources for customers to purchase media. The operator of the broadcast stream tagging system may negotiate a revenue share for each purchased form of media that was directed NFC/RDS code via their server to the media content source store.

Fig. 4 shows one embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol. If RDS information from radio 410 resides on the Vehicle CAN 420, it can be accessed directly from the OBDII diagnostic connector 430. Module 440 can be easily plugged into OBDII connector, which then interfaces directly through Wi-Fi, Bluetooth®, NFC, RFID, or any wireless data communication to mobile device 450.

Fig. 5 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol. If RDS information from radio 510 resides on a dedicated or specific CAN bus, a GATEWAY or translator module 530 can be added to allow communication between the buses. Messages may travel over vehicle CAN 540 to OBDII 550. The external GATEWAY will monitor information/traffic on both buses and will pass pertinent information between the buses. This will provide access to the specific CAN bus through the common/more accessible OBDII Vehicle CAN bus 550. The module 560 may be interconnected with OBDII 550 and then may transmit messages to smart phone 570.

Fig. 6 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol. In this embodiment, GATEWAY 615 also can be an internal module to RADIO 610 or Audio/ Visual devices providing RDS/information access to the outside world via direct CAN wires 620 or possibly wireless communication (if working directly with device manufacturers to place internally). If direct CAN wires 620 are used, then module 640 may be interconnected with OBDII 630 and then may transmit messages to smart phone 650.

Fig. 7 shows another embodiment of a system diagram for a vehicle providing for broadcast stream interaction via coded tag and short range communication protocol. GATEWAY and NFC module 720 also could exist internally, integrated into RADIO/ VISUAL devices 710 for direct smart phone 730 access through wireless (Wi-Fi, Bluetooth®, or NFC) if working directly with device manufacturers.

Various embodiments of systems and methods described herein may be implemented fully or partially in software and/or firmware. This software and/or firmware may take the form of

instructions contained in or on a non-transitory computer-readable storage medium. Those instructions then may be read and executed by one or more processors to enable performance of the operations described herein. The instructions may be in any suitable form such as, but not limited to, source code, compiled code, interpreted code, executable code, static code, dynamic code, and the like. Such a computer-readable medium may include any tangible non-transitory medium for storing information in a form readable by one or more computers such as, but not limited to, read only memory (ROM); random access memory (RAM); magnetic disk storage media; optical storage media; a flash memory, etc.

Embodiments of systems and methods described herein may be implemented in a variety of systems including, but not limited to, smartphones, tablets, laptops, and combinations of computing devices and cloud computing resources. For instance, portions of the operations may occur in one device, and other operations may occur at a remote location, such as a remote server or servers. For instance, the collection of the data may occur at a smartphone, and the data analysis may occur at a server or in a cloud computing resource. Any single computing device or combination of computing devices may execute the methods described.

Although the foregoing description is directed to certain embodiments, it is noted that other variations and modifications will be apparent to those skilled in the art and may be made without departing from the spirit or scope of the disclosure. Moreover, features described in connection with one embodiment may be used in conjunction with other embodiments, even if not explicitly stated above.

WHAT IS CLAIMED IS:

1. A method for broadcast stream tagging, the method comprising:

receiving a broadcast signal including content at a FM radio;

playing the content in an audio format to the user;

receiving an indication from the user during the play of the content;

capturing a coded tag, wherein the coded tag is received at the radio in the RDS signal, from the broadcast signal with a CAN bus, the CAN bus interconnected with the FM radio;

sending the coded tag from the CAN bus to a NFC communication module;

sending the coded tag to a smart phone from the NFC communication module;

receiving the coded tag at an application, resident on the smart phone;

sending the coded tag to a decoder server;

receiving presentation instructions from the decoder server;

executing the presentation instructions using the application; and

displaying content to the user.

2. The method of claim 1, wherein the NFC communication module is in a charging pad mounted in the vehicle.

3. The system of claim 2, wherein the charging pad is a conductive charging pad.

4. A system for broadcast stream tagging, the system comprising:

a broadcast signal receiver, the broadcast signal receiver operable to receive a broadcast signal including content and play, the content in an audio format to the user;

a short range communication module, configured to communicate with a smart phone of a user;

a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver and configured to receive an indication from the user during the play of the content, capture a coded tag from the broadcast signal, and send the coded tag to

the short range communication module, wherein the short range communication module is configured to send the coded tag to the smart phone.

5. The system of claim 4, further comprising:

an application, resident on the smart phone, the application configured to:

receive the coded tag;

send the coded tag to a decoder server;

receive presentation instructions from the decoder server;

execute the presentation instructions; and

display content to the user.

6. The system of claim 5, wherein the broadcast signal receiver is a radio.

7. The system of claim 5, wherein the short range communication module is in a charging pad mounted in the vehicle.

8. The system of claim 7, wherein the charging pad is a conductive charging pad.

9. The system of claim 5, wherein the short range communication module is a NFC chip.

10. The system of claim 5, wherein the vehicle-based controller system is a CAN bus.

11. The system of claim 6, wherein the coded tag is received at the radio in the RDS signal.

12. The system of claim 5, wherein the presentation instructions are an advertisement for a product.

13. The system of claim 5, wherein the presentation instructions are options to purchase content.

14. The system of claim 13, wherein the content is a song, and the song was playing in the broadcast signal at a time the user provided the indication.

15. A computer-readable non-transitory storage medium that contains instructions, which, when executed by one or more processors, result in performing operations comprising:

receive a coded tag from a short range communication module;

send the coded tag to a decoder server;

receive presentation instructions from the decoder server;

execute the presentation instructions; and

display content to the user.

16. The computer-readable non-transitory storage medium of claim 10, wherein the short range communication module is in a charging pad mounted in the vehicle.

17. The computer-readable non-transitory storage medium of claim 16, wherein the charging pad is a conductive charging pad.

18. The computer-readable non-transitory storage medium of claim 15, wherein the short range communication module is a NFC chip.

19. The computer-readable non-transitory storage medium of claim 15, wherein the presentation instructions are an advertisement for a product.

20. The computer-readable non-transitory storage medium of claim 15, wherein the presentation instructions are options to purchase content.

21. The computer-readable non-transitory storage medium of claim 15, wherein the content is a song and the song was playing in a broadcast signal at a time the user provided an indication to capture the coded tag.

22. A method for broadcast stream tagging, the method comprising:

receiving a broadcast signal including content at a broadcast signal receiver;

playing the content in an audio format to the user;

receiving an indication from the user during the play of the content;

capturing a coded tag from the broadcast signal with a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver;

sending the coded tag from the vehicle-based controller system to a short range communication module; and

sending the coded tag to a smart phone from the short range communication module.

23. The method of claim 22, further comprising:

receiving the coded tag at an application, resident on the smart phone;

sending the coded tag to a decoder server;

receiving presentation instructions from the decoder server;

executing the presentation instructions using the application; and

displaying content to the user.

24. The method of claim 23, wherein the broadcast signal receiver is a radio.

25. The method of claim 23, wherein the short range communication module is a NFC chip.

26. The method of claim 23, wherein the vehicle-based controller system is a CAN bus.

27. The method of claim 23, wherein the coded tag is received at the radio in the RDS signal.

28. The method of claim 23, wherein the presentation instructions are an advertisement for a product.

29. The method of claim 23, wherein the presentation instructions are options to purchase content.

30. The method of claim 29, wherein the content is a song and the song was playing in the broadcast signal at a time the user provided the indication.

31. A clearinghouse system for broadcast stream tagging, the system comprising:

a decoder server configured to:

receive a message from a smart phone including a coded tag;

determine content instructions to be delivered to the smart phone based on the coded tag; and

transmit content instructions to the smart phone.

32. The clearinghouse system of claim 31, wherein the content instructions are instructions sent to an application on the smart phone for providing content to the user.

33. The clearinghouse system of claim 31, wherein the content instructions are content to be displayed to the user.

34. The clearinghouse system of claim 31, wherein the coded tag server is configured to:

provide the coded tag to a broadcast station; and

the broadcast station is configured to transmit the coded tag with content to the user.

35. The clearinghouse system of claim 34, further comprising:

a broadcast signal receiver, the broadcast signal receiver operable to receive a broadcast signal including content, and play the content in an audio format to the user;

a short range communication module, configured to communicate with the smart phone of a user; and

a vehicle-based controller system, the vehicle-based controller system interconnected with the broadcast signal receiver and configured to receive an indication from the user during the play of the content, capture the coded tag from the broadcast signal, and send the coded tag to the short range communication module, wherein the short range communication module is configured to send the coded tag to the smart phone.

36. The system of claim 4, wherein:

the application, resident on the smart phone is configured to:

receive the coded tag;

send the coded tag to a decoder server;

receive the content instructions from the decoder server; and

execute the content instructions and display content to the user.

FIG. 1

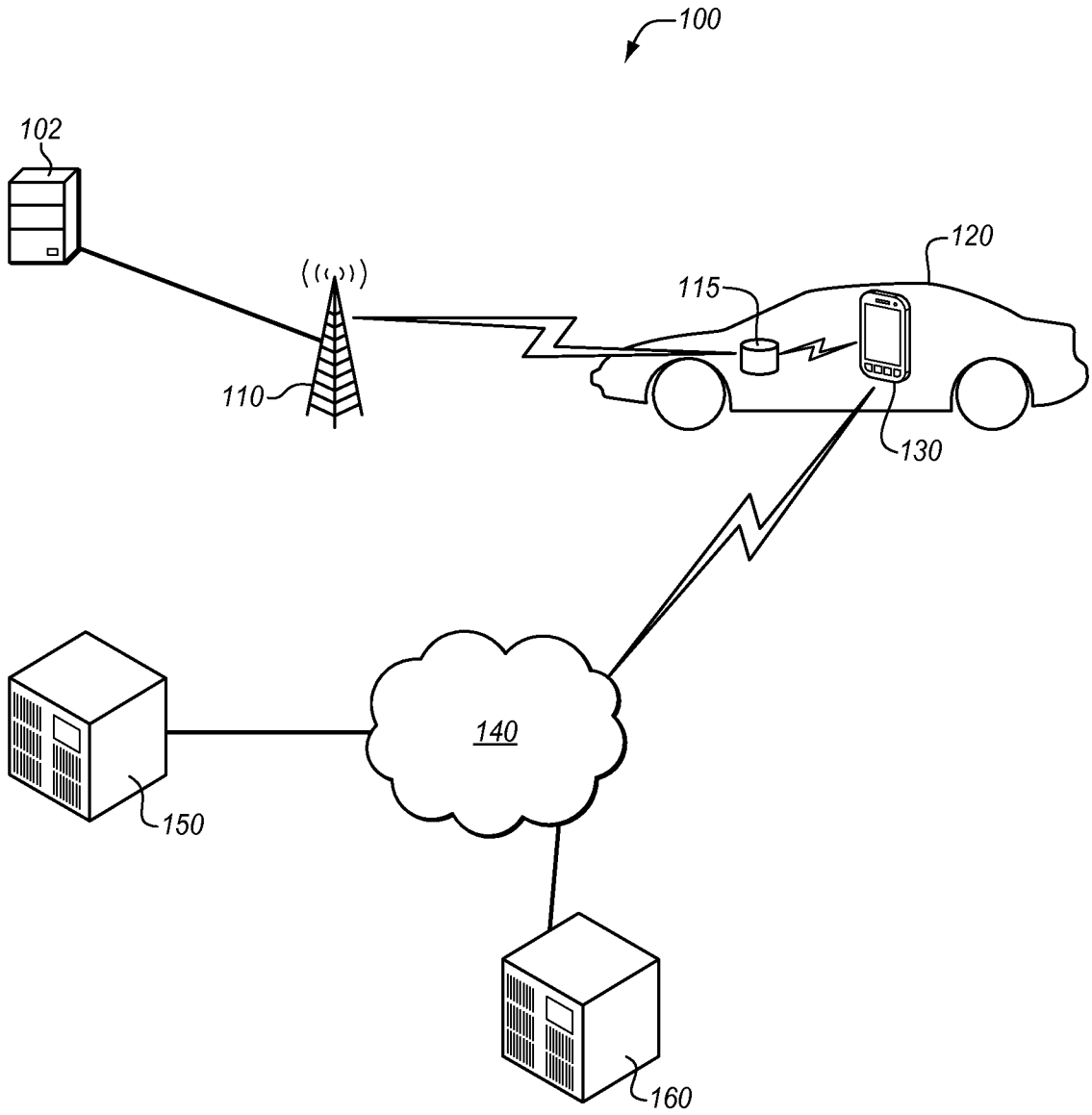


FIG. 2

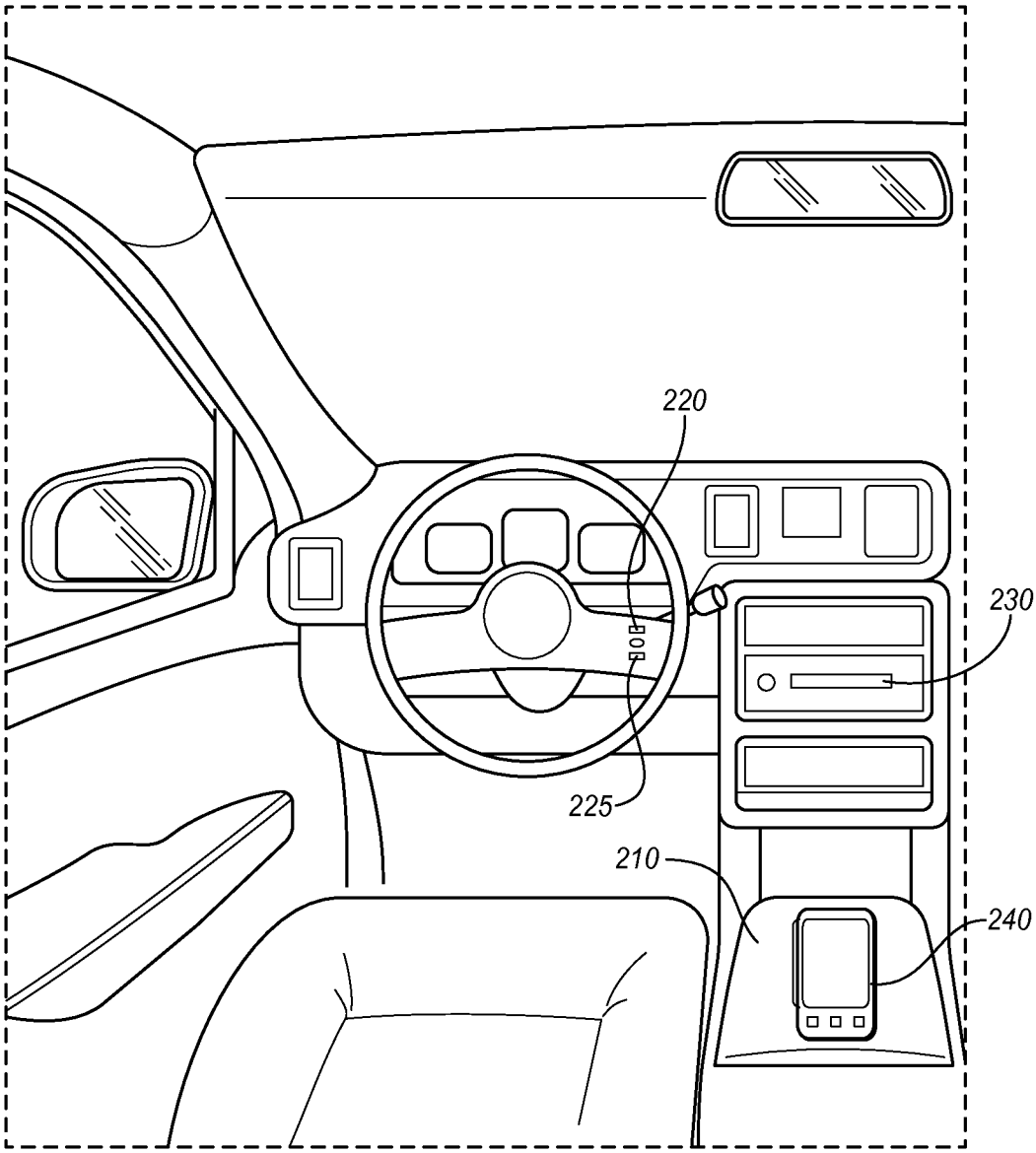


FIG. 3

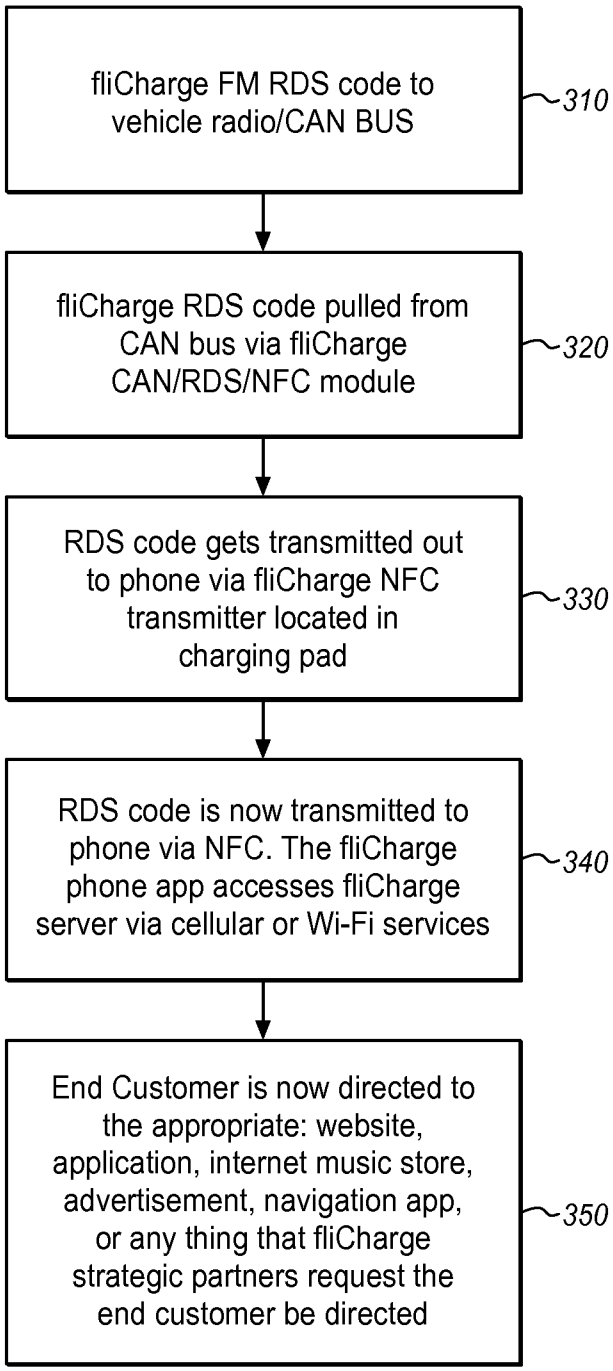

fliCharge FM RDS code to vehicle radio/CAN BUS
310
fliCharge RDS code pulled from CAN bus via fliCharge CAN/RDS/NFC module
320
RDS code gets transmitted out to phone via fliCharge NFC transmitter located in charging pad
330
RDS code is now transmitted to phone via NFC. The fliCharge phone app accesses fliCharge server via cellular or Wi-Fi services
340
End Customer is now directed to the appropriate: website, application, internet music store, advertisement, navigation app, or any thing that fliCharge strategic partners request the end customer be directed
350

FIG. 4

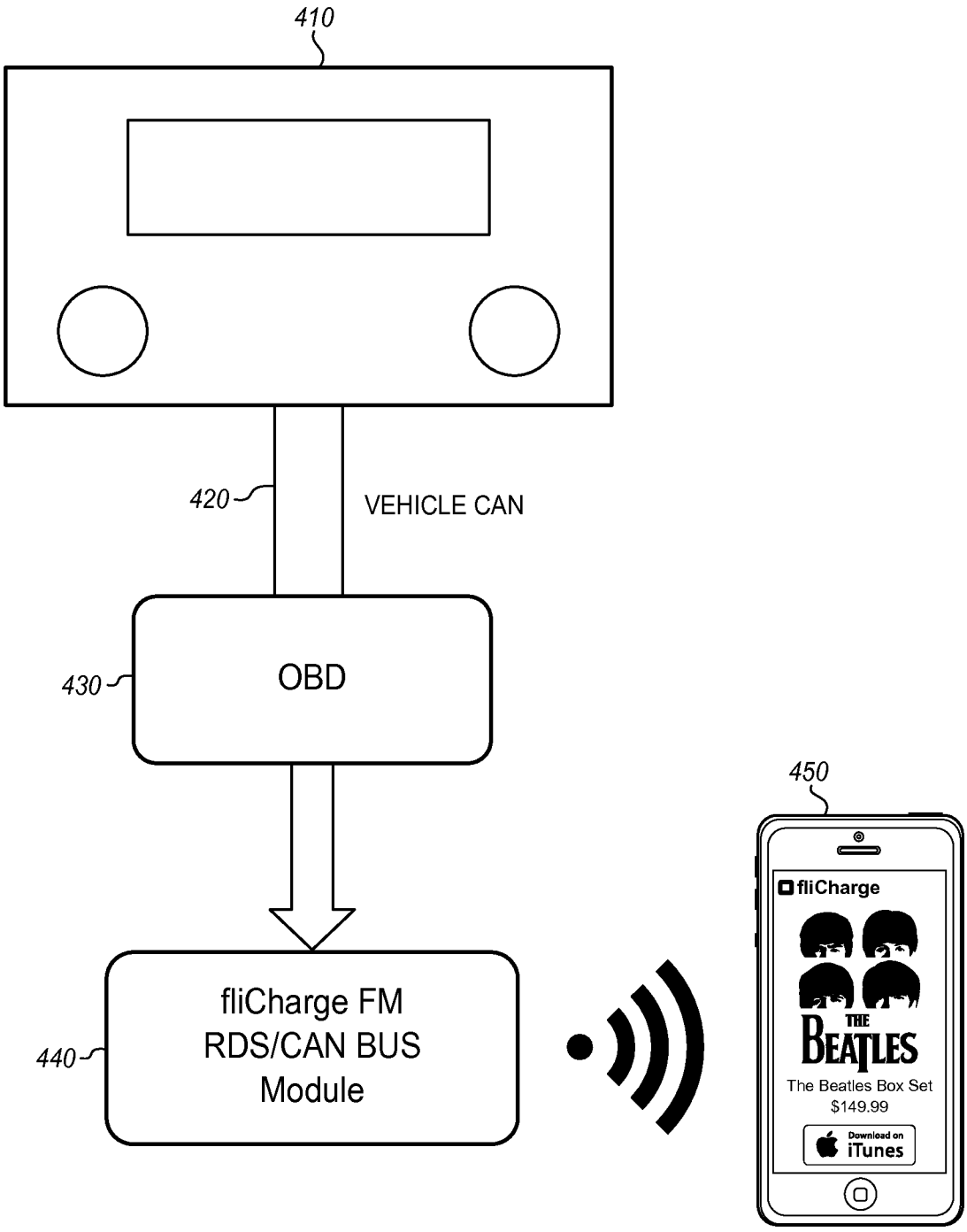

410
420
VEHICLE CAN
430
OBD
440
fliCharge FM
RDS/CAN BUS
Module
450
fliCharge
THE BEATLES
The Beatles Box Set
$149.99
Download on iTunes

FIG. 5

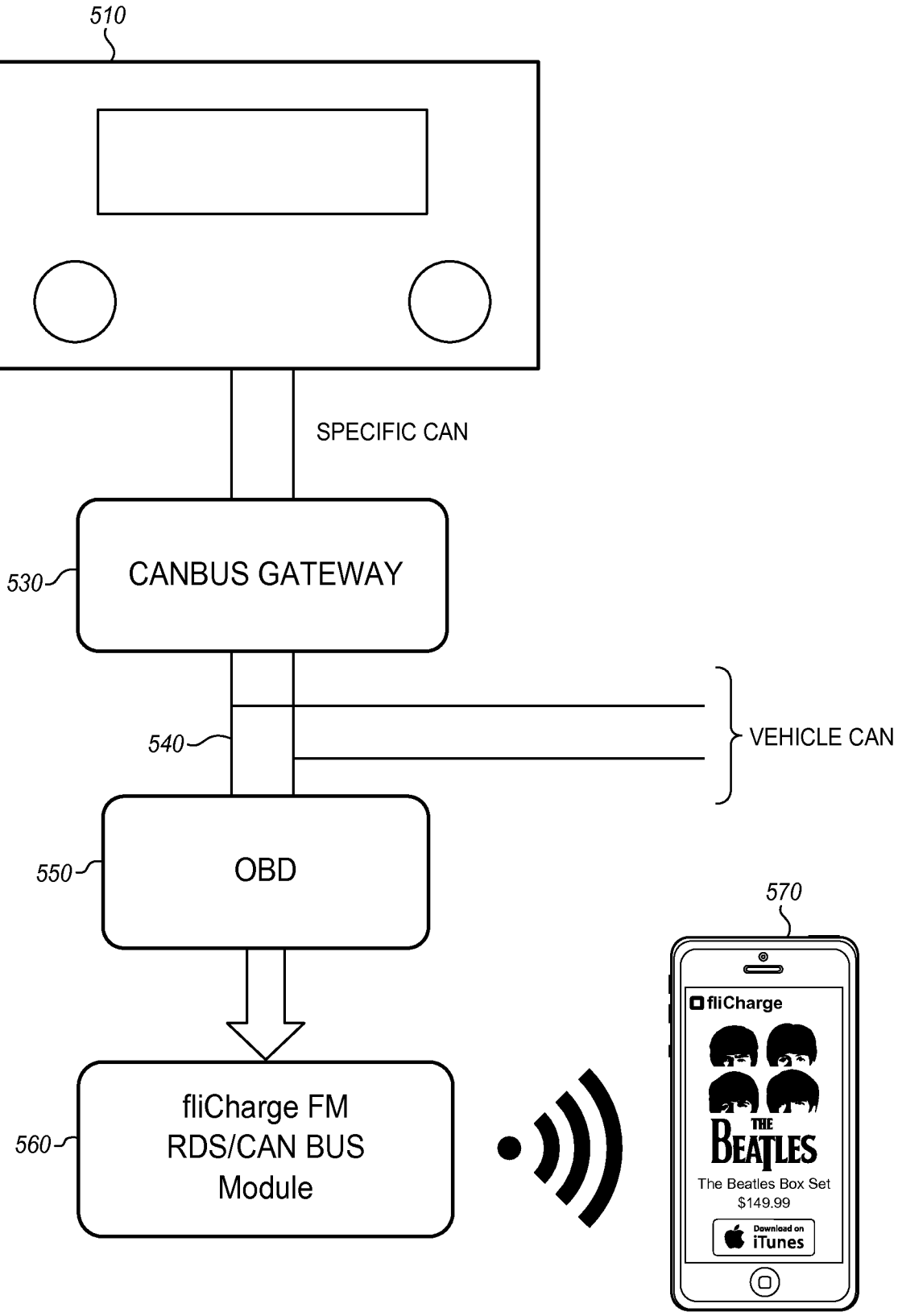

510
SPECIFIC CAN
530
CANBUS GATEWAY
540
VEHICLE CAN
550
OBD
570
560
fliCharge FM
RDS/CAN BUS
Module
fliCharge
THE BEATLES
The Beatles Box Set
$149.99
Download on iTunes

FIG. 6

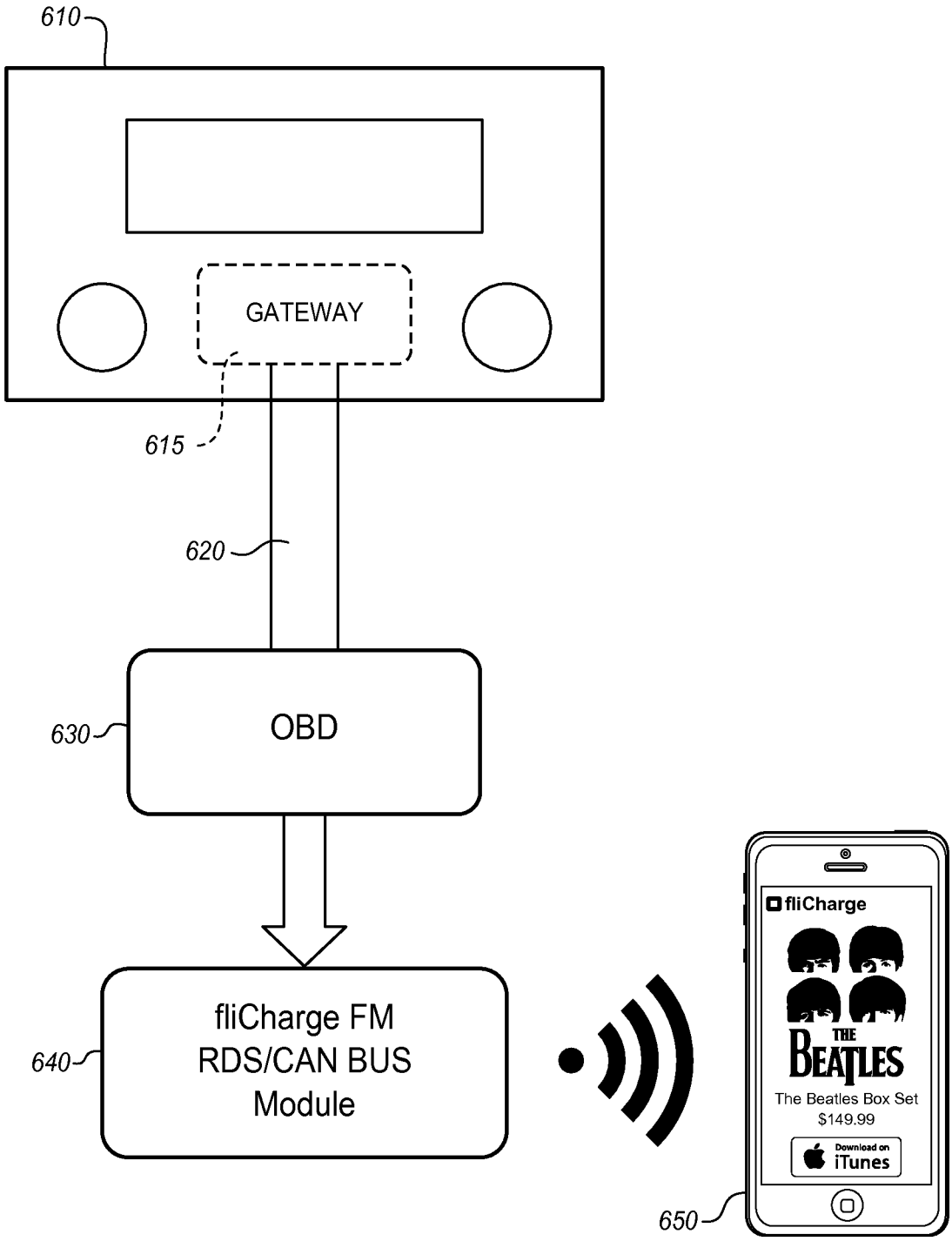
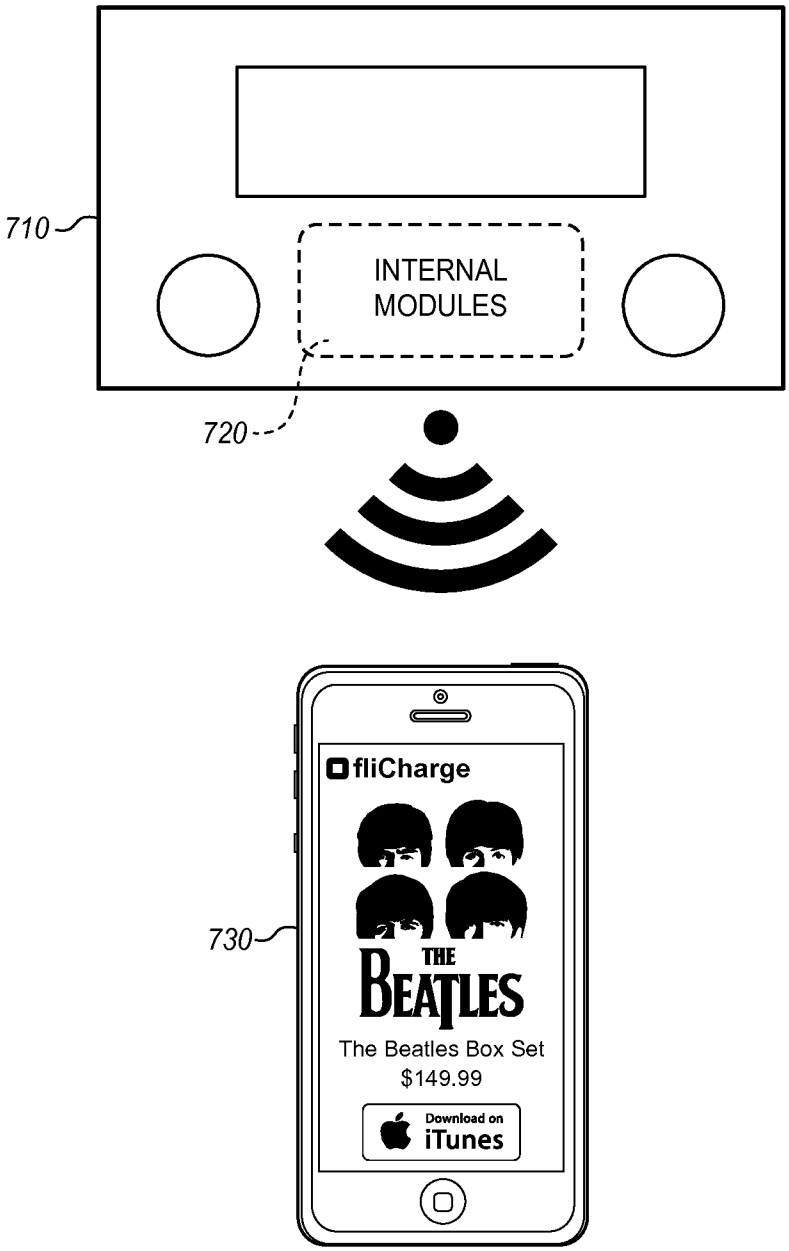

610
GATEWAY
615
620
630
OBD
640
fliCharge FM
RDS/CAN BUS
Module
650
fliCharge
THE BEATLES
The Beatles Box Set
$149.99
Download on iTunes

FIG. 7


710
INTERNAL MODULES
720
730
fliCharge
THE BEATLES
The Beatles Box Set
$149.99
Download on iTunes

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US15/39992

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06Q 30/02 (2015.01)
CPC - G06Q 30/02
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(8) Classification(s): G06Q 30/02, 30/00; G06F 17/30 (2015.01)
CPC Classification(s): G06Q 30/02, 30/0241, 30/0267; H04H 60/73, 20/28; H04W 4/008, 4/185

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, Other Countries (INPADOC), RU, AT, CH, TH, BR, PH); IEEE/IEEEXplore; Google/Google Scholar; IP.com; Keywords: broadcast, distribute, frequency modulation, FM, video, audio, image, content, media, selection, indication, tag, advertising, coded, encrypted, bus, interface, controller area network, CAN, Near Field Communications, NFC, bluetooth, smartphone, cell phone

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0131567 A1 (DOROGUSKER, J et al.) May 27, 2010; paragraphs [0038], [0040], [0042], [0043], [0047], [0070]- [0072], [0092], [0095], [0152]	15, 19-21, 31-33
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Y		1-14, 16-18, 22-30, 34-36
Y	US 2014/0114504 A1 (OMRON AUTOMOTIVE ELECTRONICS CO., LTD.) April 24, 2014; paragraphs [0065], [0196], [0214]	1-3, 7, 8, 10, 16, 17, 26
Y	US 2006/0209174 A1 (ISAAC, E et al.) September 21, 2006; abstract; paragraphs [0016], [0039]	4-14, 22-30, 35, 36
Y	US 2014/0154982 A1 (DUA, R) June 5, 2014; paragraph [0176]; claim 1	9, 18, 25
Y	US 2001/0037378 A1 (HIRAYAMA, T) November 1, 2001; paragraph [0081]	34, 35
A	US 2014/0188619 A1 (RAVINDRAN, B et al.) July 3, 2014; entire document	1-36

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"O" document referring to an oral disclosure, use, exhibition or other means
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 September 2015 (11.09.2015)	05 OCT 2015
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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