TITLE OF THE INVENTION

System and Method for Communication using Mobile Communication Devices

Not perfect, but very good overall (A)

BACKGROUND OF THE INVENTION

[0001] The invention generally relates to a communication system and method. More particularly, the present invention relates to a communication system and method having a mobile communication device in communication with a server.

[0002] Previously, citizens band radio (CB radio) was a popular method for communicating roadway conditions and incidents among drivers. CB radio, however, is a short-range communication system, and communications are only possible over a short distance of about four miles. The development of new communication devices, such as computers and cell phones, now allow people to communicate over a nearly limitless distance, provided internet service and/or cell phone service is/are available. Many systems and methods seek to improve the communication of roadway conditions and incident reporting to drivers using new communication device technologies.

[0003] One solution to improve driver awareness of roadway conditions is disclosed in Baldwin, U.S. Pub. No. 2013/0063282 A1. The Baldwin system provides that driver-reliant systems may be undependable and, therefore, discloses a system and method that does not depend upon information provided by drivers. The system discloses the use of fixed sensor devices mounted along a roadway. The sensor devices utilize magnetic sensor elements that detect analog waveforms generated by passing vehicles. The sensor device collects the analog waveform data, digitizes the data, and sends digitized data by radio transmissions to system control stations, which are part of a larger traffic control system. Thus, the Baldwin system can identify traffic congestion and incidents using analog waveforms. Upon detection, the system control station transmits traffic warnings to warning devices, which flash a predefined color pattern depending upon the type, urgency, and severity of the incident.

[0004] Another non-driver-reliant solution is disclosed in Washlow, U.S. Pub. No. 2013/0214939. The Washlow system in one embodiment uses electromagnetic signals produced by police radars to alert motor vehicle operators as to the presence of speed detection threats for specific geographic locations. The alerts take the form of flashing colors and/or audio tones, such as rapid beeps, on a mobile communication device. In another embodiment, the Washlow system also discloses driver-reliant systems of traffic reporting. The system facilitates the sharing of audio broadcasts from a driver's mobile communication device, wherein the audio broadcast is associated with a communication area. The audio broadcasts are distributed when another driver using a mobile communication device enters the communication area.

[0005] Another system of transmitting audio to communication devices is disclosed in Bouat, U.S. Pat. No. 8,391,908. The Bouat system discloses an electronic communication system for enabling users to communicate in substantially real-time and in a full-duplex manner. The Bouat system provides a method of inviting some of the users involved in a first communication on a first communication system to establish a second communication on a second communication system. More particularly, the method includes inviting predetermined users from a push-to-talk conversation to a telephone conversation. The telephone conversation allows users to communication in substantially real-time, as opposed to the half-duplex nature of CB radio or push-to-talk communications, such as text-messaging.

[0006] Another audio content distribution system and methods is disclosed in Sullivan, U.S. Pat. No. 8,429, 287. The Sullivan system and method discloses gathering, distributing, and receiving digital audio packets of limited duration stored on a network audio server. The stored digital audio packets are received upon request by a user at a client terminal in the Internet environment. Thus, the user selectively recalls the digital audio packets stored on the network audio server. Sullivan discloses that the digital audio packets may include information provided from police radio scanners, which may provide traffic incident information to drivers.

[0007] An advertising content distribution system and method is disclosed in Ramer, U.S. Pub. No 2014/0012665. The Ramer system distributes advertising content to a user's mobile communication device using information about the mobile communication device's geographic location with respect to businesses along a roadway and using information as to the user's commercial transaction event history.

[0008] Despite the function they provide, the prior art systems and methods have various disadvantages. For example, the Ramer system is limited to distributing advertising content to mobile communication devices only when they pass a fixed location of a business. Similarly, the Baldwin system is restricted to collecting traffic condition data from fixed sensor devices. Further, the warning devices of Baldwin only provide an indication that a traffic condition may be present by flashing a pre-determined light pattern. Therefore, the Baldwin system does not provide audio or text information explaining the traffic condition that may affect some drivers.

[0009] The Sullivan system, while providing audio content that describes traffic and other travel related information to drivers, associates the audio content with a geographic region and requires the driver to enter the geographic region to receive the audio content.

[0010] Both the Bouat system and the Sullivan system require a user to request the distribution of audio content rather than automatically providing the content to user based upon the user's location. The Bouat system, while providing audio content to users, requires the user to invite another user to the conversation. Therefore, if the user does not have an identifier, such as a phone number for the other user's mobile communication device, communication between the users cannot occur. Similarly, the Sullivan system requires the user to selectively recall recorded audio content, which is limited in duration.

good

BRIEF SUMMARY OF THE INVENTION

[0011] One or more of the embodiments of the present invention provides a system and a method for communication using mobile communication devices, including a first communication device, wherein the first communication device includes a first global positioning system (GPS) and a second communication device, wherein the second communication device includes a second GPS, and a server, wherein the server includes a data storage unit, a data possessor unit, and a transceiver. The data storage unit stores at least one communication mode file and at least one group file. The communication mode file further includes a variable. The data processor unit receives location data from the first communication device and location data from the second communication device. Then, the data processor unit calculates a measure of distance between the location data from the first communication device and location data from the second communication device. The measure of distance is then compared to the value of the variable, wherein the variable sets a condition for when the data processor unit associates a first device identifier of the first communication device and a second device identifier of the second communication device with the group file. If the measure of distance is less than or equal to the value of the variable the data processor unit associates the first device identifier of the first communication device and the second device identifier of the second communication device with the group file stored at the data storage unit. Communication occurs when at least one of the first communication device and the second communication device transmits data representing an analog voice signal using VoIP to a transceiver at the server. The data representing the analog voice signal is compressed at the data processor unit and then transmitted in compressed form to the first communication device and the second communication device associated with the group file.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 illustrates a communication system according to an embodiment of the invention.

[0013] Figure 2 illustrates a user interface of a mobile communication device according to an embodiment of the present invention.

[0014] Figures 3A–3C illustrates a flowchart of an embodiment of a process for facilitating data communication to and from communication devices executed by the system.

[0015] Figure 4 illustrates a map illustration depicting one embodiment of the present invention.

[0016] Figure 5 illustrates a user interface displayed at a mobile communication device according to an embodiment of the present invention.

[0017] Figures 6A–6B illustrate a flowchart of another embodiment of a process for facilitating data communication to and from communication devices executed by the system.

[0018] Figure 7 illustrates a map illustration depicting another embodiment of the invention.

[0019] Figure 8 illustrates a user interface displayed at a mobile communication device according to another embodiment of the invention.

[0020] Figures 9A-9B illustrate a flowchart of another embodiment of a process for facilitating data communication to and from communication devices executed by the system.

[0021] Figure 10 illustrates a map illustration depicting another embodiment of the invention.

[0022] Figures 11A–D illustrates a flowchart of another embodiment of a process for facilitating data communication to and from communication devices executed by the system.

[0023] Figure 12 illustrates a user interface displayed at a mobile communication device according to another embodiment of the invention.

[0024] Figure 13 is a map illustration that is representative of steps of flowchart 1100 of another embodiment of the invention.

[0025] Figure 14 illustrates a user interface displayed at a mobile communication device according to an additional embodiment of the invention.

[0026] Figure 15 illustrates a user interface displayed at a mobile communication device according to an alternative embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0027] Figure 1 illustrates a communication system 100 according to an embodiment of the invention. The communication system 100 includes a controlling communication device 110, a second communication device 120, a global positioning system (GPS) satellite 130, a communication network 140, and a server 160. In the present embodiment, the controlling communication device 110 is a smartphone. The controlling communication device 110 includes a first user interface 112 and a first global positioning system (GPS) 114. In the present embodiment, the second communication device 120 is a smartphone. The second communication device 120 includes a second user interface 122 and a second GPS 124. The communication network 140 includes a network transceiver 142, a first wireless connection 144, a second wireless connection 146, and an internet connection 148. In the present embodiment, the network transceiver 142 is a cell tower. The server 160 includes a data storage unit 170, a data processor unit 180, and a transceiver 190. The data storage unit 170 includes a communication mode file 171. The communication mode file 171 includes a group file 172, pre-determined operational parameters 173, and a variable 174. The group file 172 includes a controlling communication device identifier 175 and location data of the controlling communication device identifier 176, as well as, a second communication device identifier 177 and location data of the second communication device identifier 178, and administrator variables 179.

[0028] In the communication system 100, the controlling communication device 110 and the second communication device 120 are in wireless connection with a GPS satellite 130. The first GPS 114 is electrically connected to the controlling communication device 110, and the second GPS 124 is electrically connected to the second communication device 120. The controlling communication device 110 transmits data to and receives data from the network transceiver 142 through the first wireless connection 144. The network transceiver 142 transmits data to and receives data from the server 160 through the internet connection 148. More particularly, the network transceiver 142 transmits data to and receives data from the transceiver 190 of the server 160. The second communication device 120 transmits data to and receives data from the network transceiver 142 through the second wireless connection 146. The network transceiver 142 transmits data to and receives data from the server 160 through the internet connection 148. More particularly, the network transceiver 142 transmits data to and receives data from the transceiver 190 of the server 160. The server 160 is electrically connected to the data storage unit 170, the data processor unit 180, and the transceiver 190.

[0029] In operation, the communication system 100 involves four main components: the controlling communication device 110, the second communication device 120, the communication network 140, and the server 160. Upon selection of a communication mode file from the first user interface 112 (see discussion of Figure 2), input data indicative of the selection is sent from the controlling communication device 110 to a network transceiver 142 through a first wireless connection 144. The input data indicative of the selection is then relayed from the network transceiver 142 to the transceiver 190 of the server 160 through an internet connection 148. Upon the input data indicative of the selection being received at the transceiver 190, the input data is compared to a communication mode file 171 at the data storage unit 170. The server 160 retrieves the communication mode file 171 and establishes a connection between the controlling communication device 110 and the server 160.

[0030] Upon selection of a communication mode representation from the second user interface 122 (see discussion of Figure 2), input data indicative of the selection is sent from the second communication device 120 to a network transceiver 142 through a second wireless connection 146. The input data indicative of the selection is then relayed from the network transceiver 142 to the transceiver 190 of the server 160 through an internet connection 148. Upon the input data indicative of the selection being received at the transceiver 190 if the server 160, the input data is compared to a communication mode file 171 at the data storage unit 170. The server 160 retrieves the communication mode file 171 and establishes a connection between the second communication device 110 and the server 160.

[0031] Further describing the operation of the system 100 and, in particular, operation of the server 160, the pre-determined operational parameters 173 govern the process by which the data processor unit 180 compares and associates data stored at the data storage unit 170. The variable 174 set the conditions as to when communication device identifiers 175, 177 is associated with a group file at the data storage unit 170. The variable 174 include, but are not limited to, a geographic parameter, such as an adjustable or pre-determined radius, or a range of values of a distance. Administrator variables 179 include a direction of travel, or a known roadway, a number of communication device identifiers that may be associated with the group file, communication device identifiers that may be associated with a group file, and communication device identifiers that may not be associated with a group file.

Put some identifier in the Box - Example

LD 176

[0032] In operation, location data of the controlling communication device 176 is received at the server 160. Using the location data of the controlling communication device 176, the pre-determined operational parameters 173 and the variables 174, the controlling communication device identifier 175 is associated with a group file 172 included in the communication mode file 171. The location data of the controlling communication device 176 is stored in association with the controlling communication device identifier 175 in the group file 172 (see discussion of Figures 3, 6, 9, and 11).

[0033] Location data of the second communication device 178 is also received at the server 160. Using the location data of the second communication device 178, the pre-determined operational parameters 173 and variables 174, the second communication device identifier 177 is further associated with the group file 172 included in the communication mode file 171. The location data of the second communication device 178 is stored in association with the second communication device identifier 177 in the group file 172 (see discussion of Figures 3, 6, 9, and 11).

[0034] The designation of a communication device as the controlling communication device is an indication of the ability of the communication device to adjust the variable 174 as used for a particular group file. Data representing adjustments to the variable 174 of the pre-determined operational parameters 173 or to administrator variables 179 are also received from the controlling communication device 176 and stored with the group file 172 at the data storage unit 170. In one embodiment, the controlling communication device identifier is associated with an administrator identifier in the group file. The administrator identifier sets the condition as to when a communication device may transmit data representing adjustments to variables 174. The administrator identifier further designates the communication device identifier that is used as the point of measure from which a variable 174 is measured to determine whether an additional communication device identifier is associated with a group (see a discussion of Figures 3, 6, 9, and 11). The administrator identifier may be disassociated from the controlling communication device and then associated with the second communication device identifier. Upon associating the administrator identifier with the second communication device identifier, the second communication device may transmit data representing adjustments to the variables 174.

[0035] In another embodiment, the controlling communication device 110 further includes a first microphone 116 and a first speech recognition system 118. The first microphone 116 is electrically connected to the controlling communication device 110. The speech recognition system software may be uploaded as a processor for operation on the operating system of the controlling communication device 110.

[0036] In operation, upon selection of a speech recognition mode from a user interface (see Figure 2), an activation voice command is received at the first speech recognition system 118. The activation voice command is received at the first speech recognition system 118 as an analog voice signal and is converted into data representing an activation voice command. The data representing the activation voice command is transmitted to the first speech recognition system 118. Upon receiving the data representing the activation voice command, the speech recognition system 118 compares the data representing the activation voice command to stored audio models to determine what voice command was spoken. If data representing the voice command corresponds to a stored audio model, the first speech recognition system 118 is activated to receive additional voice commands indicative of a communication mode file selection.

[0037] The voice command indicative of the communication mode file selection from the first user interface 112 is received at the first speech recognition system 118 as an analog voice signal and is converted into data representing a voice command. Upon receiving the data representing the voice command, the first speech recognition system 118 compares the data representing the voice command to stored audio models to determine what voice command was spoken. The voice command corresponds to a communication mode file stored at the data storage unit. Therefore, if data representing the voice command corresponds to a stored audio model, the server then queries the data storage unit for the communication mode file stored at the data storage unit. Alternatively, the communication mode file may be stored at a memory unit (not shown) at the controlling communication device 110.

[0038] In another embodiment, the second communication device 120 further includes a second microphone 126 and a second speech recognition system 128. The second microphone 126 is electrically connected to the second communication device 120. The speech recognition system software may be uploaded as a processor for operation on the operating system of the second communication device 120.

[0039] In operation, upon selection of a speech recognition mode from a user interface (see Figure 2), an activation voice command is received at the second speech recognition system 128. The activation voice command is received at the second speech recognition system 128 as an analog voice signal and is converted into data representing an activation voice command. Upon receiving the data representing the activation voice command, the speech recognition system 128 queries for and compares the data representing the activation voice command to stored audio models to determine what voice command was spoken. If data representing the voice command corresponds to a stored audio model, the second speech recognition system 128 is activated to receive additional voice commands indicative of a communication mode file selection.

[0040] The voice command indicative of the communication mode file selection from the second user interface 122 is received at the second speech recognition system 128 as an analog voice signal and is converted into data representing a voice command. Upon receiving the data representing the voice command, the second speech recognition system 128 queries for and compares the data representing the voice command to stored audio models to determine what voice command was spoken. The voice command corresponds to a communication mode file stored at the data storage unit. Therefore, if data representing the voice command corresponds to a stored audio model, the server then queries the data storage unit for the communication mode file stored at the data storage unit. Alternatively, the communication mode file may be stored at a memory unit (not shown) at the second communication device 120.

[0041] For example, in one embodiment, the stored activation audio model is data representing the word "RoadShout." Therefore, when the speech recognition system receives an analog voice signal of "RoadShout" the system is activated. Next, the speech recognition system may receive an analog voice signal of "Geo." Therefore, the speech recognition system would query for the communication mode file associated with the stored audio model corresponding to the voice signal of "Geo."

[0042] In another embodiment, the system 100 further includes additional communication devices.

[0043] In another embodiment, the data storage unit 170 further includes additional communication mode files.

[0044] In another embodiment, a communication device identifier may be associated with a group file in more than one communication mode file.

[0045] In another embodiment, the communication mode file 171 further includes additional group files.

[0046] In another embodiment, the group file 172 further includes additional communication device identifiers and location data of the additional communication device identifiers.

[0047] In an alternative embodiment, a communication device may be, but is not limited to, one or more of a cellular phone, a mobile phone, a personal computer, a laptop, a tablet, a personal digital assistant (PDA), a vehicle-based control panel, a vehicle having an integrated computer system, a smartwatch, Google Glass, other wearable computer devices, personal computer device, and other mobile data network connected devices.

[0048] In an alternative embodiment, a network transceiver may be, but is not limited to, one or more of a cell tower, a router, a Bluetooth transceiver, a WIFI transceiver, a ZigBEE radio, UHF antenna, NFC transceiver, a fiber optic transceiver, a bridge, or other transceiver capable of receiving and transmitting FM or AM radio waves, microwaves, infrared radiation, or other types of electromagnetic radiation.

[0049] In an alternative embodiment, a wireless connection may be, but is not limited to, a wired connection, a fiber optic connection, other optical connections, a WIFI connection, a microwave connection, a Bluetooth connection, a UHF connection, an electrical connection, or other wireless connection according to any of the IEEE 802.11 standards.

[0050] In an alternative embodiment, the internet connection may be, but is not limited to, a wireless internet connection, a wired internet connection, such as local area network (LAN), cable-broadband internet connection, a DSL connection, a integrated services digital network (ISDN), a broadband ISDN, a dial-up internet access connection, or a satellite connection.

[0051] In an alternative embodiment, a server may be, but is not limited to, another storage terminal, memory unit, or other potential computer device.

[0052] Figure 2 illustrates a user interface 200 of a communication device according to an embodiment of the present invention. The user interface 200 includes a Geo button 210, a Private button 220, a Mutual button 230, a ShoutOut! button 240, and a speech recognition system button 250.

[0053] The user interface 200 is a touch-sensitive display for selecting a communication mode representation. Each button 210–240 represents a communication mode file stored at a server. As described with respect to system 100 in Figure 1, each communication mode file includes pre-determined operational parameters and variables used by the data processing unit to associate a communication device identifier with a group file within the communication mode file.

[0054] The pre-determined operational parameters for the communication mode file associated with Geo button 210 facilitates the association of a communication device identifier with a group file when the distance between location data of a first communication device and location data of a second communication device is less than or equal to the value of a variable. In one embodiment, the variable is an adjustable radius, which is a measurable distance between location data of communication devices. In operation, upon selection of the Geo button 210, a communication device transmits input data indicative of the selection from the user interface 200 to a server through a communication network, and the process proceeds to step 305 of flowchart 300 (see Figure 3A).

[0055] The pre-determined operational parameters for the communication mode file associated with the Private button 220 facilitates the association of a communication device identifier with a group file when the distance between location data of a first communication device and location data of a second communication device is less than or equal to the value of a variable. In one embodiment, the variable is an adjustable radius. In a preferred embodiment, the adjustable radius has a value of 2 meters. In operation, upon selection of the Private button 220, a communication device transmits input data indicative of the selection from the user interface 200 to a server through a communication network, and the process proceeds to step 602 or alternatively to step 614 of flowchart 600 (see Figure 6A).

[0056] In an alternative embodiment, the pre-determined operational parameters for the communication mode file associated with the Private button 220 also facilitates the association of a communication device identifier with a group file if the communication device identifier is further associated with an email account, a social media user account, a cell phone number, or other unique identifier. In operation, upon selecting a hyperlink or other reference to data on a communication device user interface that is received in a text, email, or other electronic message, the communication device identifier is associated with the group file at the server.

[0057] The pre-determined operational parameters for the communication mode Mutual facilitates the association of data representing a communication device with a group file if data representing a location of the communication device and calculated data representing a direction of travel of the communication device corresponds to the group file's calculation parameters, which includes a location corresponding to a known roadway and a direction of travel along the known roadway. In operation, upon selection of the Mutual button 230, a communication device transmits input data indicative of the selection from the user interface 200 to a server through a communication network, and the process proceeds to step 905 of flowchart 900 (see Figure 9A).

[0058] The communication mode ShoutOut facilitates the association of data representing a communication device with a group file if 1) a first communication device identifier and a second communication device identifier are each associated with data representing a location of a known roadway and data representing a direction of travel on the known roadway and 2) the second communication device identifier is further associated with a set of data representing a vehicle data corresponding to input data indicative of vehicle received at a server from the first communication device. In operation, upon selection of the ShoutOut button 240, a first communication device transmits input data indicative of a selection from the user interface 200 to a server through a communication network, and the process proceeds to step 1102 of flowchart 1100 (see Figures 11A).

[0059] The speech recognition system button 250 is a representation of a selection from the user interface 200. The selection is a command to activate the speech recognition system as discussed above in Figure 1.

[0060] In another embodiment, each button 210-260 at the user interface 200 may be represented in numbers, letters, images, symbols, equations, colors, shapes, or other figures and characters.

[0061] Figures 3A–3C are a flowchart 300 illustrating an embodiment of a process for facilitating data communication to and from communication devices executed by the system 100. At a first step 305, a server receives input data indicative of a communication mode selection from a user interface of a first communication device. In the present embodiment, the communication mode selection from the user interface is the Geo button 210 (see Figure 2). At step 310, the data processor unit at the server queries a data storage unit for a communication mode file corresponding to the input data. The communication mode file also includes pre-determined operational parameters and a variable that sets the condition as to when to associate a first communication device identifier with a group file. In a preferred embodiment, the variable has a numerical value and is an adjustable radius. The numerical value of the variable may be between 2 m and 8.0×10^3 m.

[0062] At step 315, the first communication device transmits location data of the first communication device to the server. Then at step 320, the server receives the location data of the first communication device. In step 325, the server associates and stores the location data of the first communication device with the first communication device identifier at the data storage unit. The steps of 315-325 are repeated at a pre-determined interval of time to track the location of the first communication device. In an alternative embodiment, the steps of 315-325 are not repeated.

[0063] In step 330, the data processor unit queries for and compares the location data of the first communication device with location data of a second communication device identifier that is associated with a pre-existing group file. When the distance between the location data of the first communication device and the location data of the second communication device is less than or equal to the distance as provided by the adjustable radius, the process proceeds to step 335. At step 335, the server transmits data representing the pre-existing group file including the second communication device identifier to the first communication device. In another embodiment, more than one communication device identifier may exist having location data less than or equal to the distance value provided by the adjustable radius and may be associated with another pre-existing group file (see discussion of Figure 4).

[0064] In step 340, the first communication device displays a representation of the data representing the pre-existing group file, or in an alternative embodiment pre-existing group files, at the user interface (see discussion of Figure 5). At step 345, the first communication device transmits data indicative of a selection of one pre-existing group file. Then, at step 350, the server receives the data indicative of the selection and associates the first communication device identifier with the pre-existing group file selected at step 345.

[0065] If at step 330, the distance between the location data of the first communication device and the location data of the second communication device is greater than the distance as provided by the adjustable radius, the process proceeds to step 355. In step 355, the server creates a new group file and further associates the first communication device identifier with the new group file. The new group file is subsequently stored at the data storage unit within the communication mode file.

[0066] The process will proceed from step 355 to step 360 when an additional communication device identifier 1) has previously proceeded through steps 305-330 and 2) has location data that is less than or equal to the distance value of the adjustable radius as measured from the location data of the first communication device, and 3) is associated with the new group file. In that circumstance, the new group file is treated as a pre-existing group at steps 330–345.

[0067] Next, at step 360, the first communication device transmits data representing analog voice signals using VoIP to the server, and the server receives the data representing analog voice signals at step 365. Then, at step 370, the server compresses and combines the data representing analog voice signals into a combined data packet representing the analog voice signals. The combined data packet representing the analog voice signals is then transmitted to all the communication devices associated with device identifiers associated with the pre-existing group file at step 375. In another embodiment, the second communication device transmits data representing analog voice signals. In another embodiment, any communication device associated with a device identifier which is further associated with the pre-existing group file transmits data representing analog voice signals. Steps 360 to 375 are repeated when any communication device associated with the pre-existing group file transmits new data representing analog voice signals.

[0068] In an additional embodiment, at step 340, the first communication device displays a representation of the data representing an option to form a new group file at the user interface. Upon selection of the option to form the new group file, the first communication device transmits input data indicative of a command for the process of flowchart 300 to proceed from step 330 to 355. The server receives the input data, creates the new group file, and associates the first communication device identifier with the new group file. The new group file is subsequently stored at the data storage unit.

[0069] In another embodiment, additional communication device identifiers are associated with a pre-existing group file or a new group file.

[0070] In another embodiment, the method illustrated in flowchart 300 includes an additional step at which a communication device identifier is disassociated from a group file. For example, the first communication device identifier is disassociated if the location data of the first communication device changes such that the distance between the location data of the first communication device and the location data of the second communication device is greater than the adjustable radius. Alternatively, the first communication device may not be disassociated from the group file if the location data of the communication device changes such that distance between the location data of the first communication device and the location data of the second communication device is greater than the adjustable radius. The communication device identifier may be further disassociated if a variable, such as the adjustable radius, a number of communication device identifiers that may be associated with the group file, communication device identifiers that may or may not be associated with the group file, is adjusted.

[0071] In an additional embodiment, the step 305 may be performed at any time during the steps of a process as illustrated in flowchart 600, 900, and 1100.

[0072] Figure 4 is a map illustration 400 of steps 330–355 illustrated in flowchart 300 according to one embodiment of the present invention. The map illustration 400 includes a first initiating communication device 410, a first adjustable radius 412, a first circular geographic area 415, a second initiating communication device 420, a second adjustable radius 422, a second circular geographic area 425, a third communication device 430, and a fourth communication device 440.

[0073] In operation, the location of the first initiating communication device 410 is used as a point from which a first adjustable radius 412 extends, or, in other words, is one point of measurement to determine the distance between location data of the first initiating communication device 410 and location data of another communication device. A first circular geographic area 415 represents the area of a circle calculated using the first adjustable radius 412 and includes each location data point that is measured as less than or equal to the first adjustable radius 412.

[0074] The location of the second initiating communication device 420 is used as a point from which a second adjustable radius 422 extends, or, in other words, is one point of measurement to determine the distance between location data of the second initiating device 420 and location data of another communication device. A second circular geographic area 425 represents the area of a circle calculated using the second adjustable radius 422 and includes each location data point that is measured as less than or equal to the second adjustable radius 422.

[0075] For exemplary purposes, the third communication device 430 has completed steps 305–325. Given that the third communication device 430 has a location within the first circular geographic area 415, the distance between location data of the first initiating communication device 410 and location data of the third communication device 430 is less than the first adjustable radius 412. Therefore, in step 330, the data processor unit would identify in the query a group file including a device identifier of the first, initiating communication device 410 and location data associated with the first initiating communication device 410. Given that the third communication device 430 also has a location within the second circular geographic area 415, the distance between location data of the second initiating communication device 420 and location data of the third communication device 430 is less than the second adjustable radius 422. Therefore, in step 330, the data processor unit would identify in the query a group file including a device identifier of the second initiating communication device 420 and location data associated with the second initiating communication device 420. Then, the user interface would display an option to join either the group file including the device identifier of the first initiating communication device 410 or the group file including the device identifier of the second initiating communication device 420 (see discussion of Figure 5) .

[0076] For further exemplary purposes, the fourth communication device 440 has completed steps 305–325. Given that the fourth communication device 440 has a location not within the first circular geographic area 415 or the second circular area 425, the process of flowchart 300 would proceed to step 355. At step 355, the server creates a new group file and associated a device identifier of the fourth communication device 440 with the new group file. The new group file is further stored in a communication mode file at the data storage unit.

[0077] In another embodiment, the map illustration 400 is presented at a user interface of a communication device. The map illustration 400 may include, but is not limited to including, representations of circular geographic areas calculated using the adjustable radius extending from the location data of a communication device associated with a pre-existing group file, a symbol representing a location of a communication device, the symbol representing the communication device further indicating the communication mode file or files including a group file that the communication device identifier is associated with. Alternatively, the symbol may be represented in numbers, letter, images, equations, colors, shapes, or other figures and characters.

[0078] In an additional embodiment, the map illustration 400 is interactive.

[0079] In an additional embodiment, the map illustration 400 is combined with data as illustrated by map illustration 700, 1000, and 1300, alone or in combination with one another.

[0080] Figure 5 illustrates a user interface 500 displayed on a communication device at step 340 illustrated in flowchart 300 according to an embodiment of the present invention. The user interface 500 includes a Group 1 button 510, a Group 2 button 520, and a Create Your Own Group button 530. The Group 1 button 510 is a visual representation of data representing a first, corresponding group file as identified in step 330 and as transmitted in step 335 of flowchart 300. The Group 2 button 520 is a visual representation of data representing a second, corresponding group file as identified in step 330 and as transmitted in step 335 of flowchart 300. The Create Your Own Group button 530 is a visual representation of data representing an option to create a new group file within a communication mode file at a data storage unit.

[0081] In operation, upon selection of either the Group 1 button 510 or the Group 2 button 520, the communication device transmits input data indicative of a selection from the user interface to the server. The server would then associate the communication device identifier of the communication device with the group file corresponding to the selection. For exemplary purposes, the Group 1 button 510 represents a group file including the communication device identifier of the first, initiating communication device 410, and the Group 2 button 520 represents a group file including the communication device identifier of the first, initiating communication device 410. Therefore, upon selection of Group 1 or Group 2 from the user interface of the third communication device 430, the third communication device 430 would transmit data indicative of a selection from the user interface 500 to the server. At the data storage unit of the server, a communication device identifier of the third communication device 430 is associated with the selected group file.

[0082] In operation, upon selection of the Create Your Own Group button 530, the communication device transmits input data indicative of the selection to the server. At the data storage unit of the server, a new group file is created and stored within a communication mode file. Then, a device identifier of the communication device is associated with the new group file.

[0083] In another embodiment, each button 510–530 represented at the user interface 500 may be represented in numbers, letters, images, symbols, equations, colors, shapes, or other figures and characters.

[0084] Figure 6 is a flowchart 600 illustrating another embodiment of a process for facilitating data communication to and from communication devices executed by the system 100.

[0085] Figures 6A–6B are a flowchart 600 illustrating another embodiment of a process for facilitating data communication to and from communication devices executed by the system 100. At a first step 602, the server receives input data indicative of a selection from a user interface 200 of a first communication device. In the present embodiment, the selection from the user interface 200 is the Private button 220 (see Figure 2). A data processor unit of the server queries a data storage unit for a communication mode file corresponding to the input data at step 604. The corresponding communication mode file also includes pre-determined operational parameters and a variable that sets the condition as to when to associate a first communication device identifier with a group file. Proceeding to step 606, the server retrieves the pre-determined operational parameters and variable in order to subsequently associate at least a first communication device identifier at step 628 and to associate data received from and transmitted to at least the first communication device in steps 636-642.

[0086] At step 608, the first communication device transmits location data of the first communication device to the server. Then at step 610, the server receives the location data of the first communication device. In step 612, the server associates and stores the location data of the first communication device with the first communication device identifier at the data storage unit.

[0087] Steps 614–624 occur concurrently with or subsequent to steps 602–612. At step 614, the server receives input data indicative of a selection from a user interface 200 of a second communication device (see Figure 2). In the present embodiment, the selection from the user interface 200 is the Private button 220. The data processor unit of the server queries the data storage unit for a communication mode file corresponding to the input data at step 616. The corresponding communication mode file also includes pre-determined operational parameters and a variable that sets the condition as to when to associate a first communication device identifier with a group file. Proceeding to step 618, the server retrieves the pre-determined operational parameters and variable in order to subsequently associate at least a second communication device identifier a group file at step 632 and to associate data received from and transmitted to at least the second communication device in steps 636-642.

[0088] At step 620, the second communication device transmits location data of the second communication device to the server. Then at step 622, the server receives the location data of the second communication device. In step 624, the server associates and stores the location data of the second communication device with the second communication device identifier at the data storage unit.

[0089] At step 626, the server receives input data indicative of a selection from a initiation user interface 800 of a first communication device (see Figure 8). The input data is further indicative of a command to proceed to step 628. At step 628, the server creates and stores a new group file and associates the first communication device identifier with the new group file. Then, at step 630, the server queries the data storage unit for location data of the second communication device and compares the location data of the first communication device and the location data of the second communication device using the pre-determined operational parameters and variable, which has a numerical value and is a pre-determined radius. In a preferred embodiment the pre-determined radius has a numerical value of 2 m. In an alternative embodiment, the pre-determined radius is adjustable.

[0090] When the distance between the location data of the first communication device and the location data of the second communication device is less than or equal to the distance as provided by the pre-determined radius, the process proceeds to step 634 (see discussion of Figure 7). At step 634, the server associates the second communication device identifier with the new group file. Alternatively, when the distance between the location data of the first communication device and the location data of the second communication device is greater than the distance as provided by the pre-determined radius, the process proceeds to step 632. At step 632, the server does not associate the second communication device with the new group file (see discussion of Figure 7). Further at step 632, the server transmits data representing a user interface message display stating no matches were found.

[0091] Next, at step 636, the first communication device belonging to either the new group file transmits data representing analog voice signals using VoIP to the server. Then, at step 638, the server receives the data representing voice signals. Then, at step 640, the server compresses and combines the data representing analog voice signals into a combined data packet representing the analog voice signals. The combined data packet representing the analog voice signals is then transmitted to all the communication devices associated with the group file at step 642. In another embodiment, the second communication device transmits data representing analog voice signals using VoIP to the server. In another embodiment, any communication devices associated with a device identifier which is further associated with the pre-existing or new group file transmits data representing analog voice signals. Steps 636 to 642 are repeated when the first communication device, the second communication device, or any communication device transmits new data representing analog voice signals to the server.

[0092] In another embodiment, a first communication device identifier and a second communication device identifier are associated with a group file using a secondary identifier associated with the second communication device identifier. The secondary identifier may be, but is not limited to, an email address, a LinkedIn account, a Facebook account, a Myspace account, another social media account, a phone number, an IP address, or other identifier. After step 606, the first communication device sends data representing an electronic message to a second communication device. The electronic message includes a hyperlink, which is a reference to data, displayed on a user interface of the second communication device. Upon selection of the hyperlink, the second communication device transmits input data indicative of the selection from the user interface to a server, and the server associates a device identifier of the second communication device with the new group file. The device identifier of the second communication device is further associated Then, the process will proceed to step 636 of flowchart 600.

[0093] In another embodiment, the hyperlink may be represented by numbers, letters, images, symbols, equations, colors, shapes, or other figures and characters.

[0094] In another embodiment, an unrestricted number of communication device identifiers are associated with a pre-existing group file or a new group file.

[0095] In an additional embodiment, the step 602 may be performed at any time during the steps of a process as illustrated in flowchart 300, 900, and 1100. In an additional embodiment, the step 614 may also be performed at any time during the steps of a process as illustrated in flowchart 300, 900, and 1100.

[0096] Figure 7 is a map illustration 700 of steps 630–634 illustrated in flowchart 600 according to another embodiment of the invention. The map illustration 700 includes a first initiating communication device 710, a first adjustable radius 712, a first circular geographic area 715, a second communication device 720, and a third communication device 730.

[0097] In operation, the location of the first initiating communication device 710 is used as a point from which a first adjustable radius 712 extends, or, in other words, is one point of measurement to determine the distance between location data of the first initiating communication device and location data of another communication device. A first circular geographic area 715 is represent the area of a circle calculated using the first adjustable radius 712 and includes each location data point that is measured as less than or equal to the first adjustable radius 712. The first adjustable radius may have a length having a measurement between the accuracy of the GPS system and 5 meters, between 1 meter and 3 meters, and preferably 2 meters.

[0098] For exemplary purposes, at step 630, given that the second communication device 720 has a location within the first circular geographic area 715, the distance between location data of the first initiating communication device 710 and location data of the second communication device 720 is less than the first adjustable radius 712. Therefore, in the process illustrated in flowchart 600, a communication device identifier associated with the second communication device 720 is further associated with the new group file at step 630 and 634. For further exemplary purposes, given that the third communication device 730 has a location that is not within the first circular geographic area 715, the distance between location data of the first initiating communication device 710 and location data of the third communication device 730 is greater than the first adjustable radius 712. Therefore, in the process illustrated in flowchart 600, a communication device identifier associated with the third communication device 730 would not be associated with the new group file at step 630.

[0099] In another embodiment, the map illustration 700 is presented at a user interface of a communication device. The map illustration 700 may include, but is not limited to including, representations of the geographic areas associated with the new group files, a symbol representing a communication device, the symbol representing the communication device further indicating the communication mode or modes that a device identifier of the communication device is associated with. Alternatively, the symbol is represented in numbers, letter, images, equations, colors, shapes, or other figures and characters.

[00100] In an additional embodiment, the map illustration 700 is interactive.

[00101] In an additional embodiment, the map illustration 700 is combined with data as illustrated by map illustration 400, 1000, and 1300, alone or in combination with one another.

[00102] Figure 8 illustrates a user interface presented to a user at step 626 illustrated in flowchart 600 in another embodiment of the invention. The user interface 800 includes a Near Proximity Auto Inclusion button 810, a pre-existing group file button 820, and an invite button 830.

[00103] The Near Proximity Auto Inclusion button 810 is a visual representation of data representing a command for the process illustrated in flowchart 600 to proceed to step 628 and then to step 30. In operation, upon selection of the Near Proximity Auto Inclusion button 810, the first communication device transmits input data indicative of the command for the process to proceed to step 628, at which the server creates and stores a new group file and associates the first communication device identifier with the new group file. Then, at step 630 the server queries the data storage unit for location data of the second communication device and compares the location data of the first communication device and the location data of the second communication device using the pre-determined operational parameters and variable, which is an adjustable radius. Communication device identifiers associated with location data within the adjustable radius are then associated with the new group file.

[00104] The pre-existing group file button 820 is a visual representation of data representing a stored group file in an alternative embodiment. In this embodiment shown in Figure 8, the visual representation of data representing the stored group file is the name of the group, which is "Vegas!" in this example. The stored group file is a new group file that was previously created in steps 602 through 634 and subsequently stored at the server. In operation, upon selection of the existing group button 520, the first communication device transmits input data indicative of a command for the process illustrated in flowchart 600 to proceed from step 626 to step 636, thereby skipping the steps of 628 through 634.

[00105] The invite button 830 is a visual representation of data representing another embodiment of the method illustrated in flowchart 600. In operation, upon selection of the invite button 830, the first communication device transmits data representing an electronic message to a second communication device. Data representing the electronic message is displayed at a user interface of the second communication device. The electronic message includes a hyperlink. Upon selection of the hyperlink at the user interface of the second communication device, the second communication device transmits input data indicative of the selection to a server. Then, the server associates the device identifier of the second communication device with the new group file formed at step 628 of the flowchart 600.

[00106] In another embodiment, each button 810–830 represented at the user interface 900 is represented in numbers, letters, images, symbols, equations, colors, shapes, or other figures and characters.

[00107] Figures 9A-9C are a flowchart 900 illustrating another embodiment of a process for facilitating data communication to and from communication devices executed by the system 100. At a first step 902, the server receives input data indicative of a selection from a user interface of a first communication device. In the present embodiment, the selection from the user interface is the Mutual button 230 (see Figure

2). A data processor unit of the server queries a data storage unit for a communication mode file corresponding to the input data at step 904. The corresponding communication mode file also includes pre-determined operational parameters and variable. In present embodiment, the variable includes an adjustable length, where the adjustable length is a distance ahead of and behind the location data of a communication device. Proceeding to step 906, the server retrieves the pre-determined operational parameters and the variable in order to subsequently associate a first communication device identifier with a group file in steps 924 or 938.

[00108] At step 908, the first communication device transmits location data of the first communication device to the server. Then at step 910, the server receives the location data, and in step 912, associates and stores the location data with the first communication device identifier at the data storage unit. The steps of 908–912 are repeated at a pre-determined interval of time to track the location of the first communication device.

[00109] Next, in a series of steps, the location data of the first communication device is associated with a known roadway. A geographic information system (GIS) stores geographically referenced information including the location data points of a known roadway and geographic representations, such as maps of known roadways. In step 914, the data processor unit queries the GIS and compares the location data of the first communication device with the location data of a known roadway stored at the GIS. When the location data of the first communication device corresponds to a location data point of a known roadway within the margin of error of the GPS, data representing the identified known roadway is transmitted to the data storage unit at step 916. Data representing the identified known roadway is received at the server and stored in association with the first communication device identifier at the data storage unit in step 918.

[00110] Then, at step 920, the data processor unit queries the data storage unit for and compares the location data of the first communication device and location data of a second communication device, which is associated with a pre-existing group file. When the distance between the location data of the first communication device and the location data of the second communication device is less than or equal to the distance of the adjustable length, the process proceeds to step 922. At step 922, the data processor unit filters the results of step 920 using the data representing the identified known roadway associated with the first communication device identifier.

[00111] When the data representing the identified known roadway associated with the first communication device identifier corresponds to data representing the identified known roadway associated with the second communication device identifier, which is associated with the pre-existing group file, the process proceeds to step 924 (see discussion of Figure 10). At step 924, the server associates the first communication device identifier with the pre-existing group file identified at step 922.

[00112] When the distance between the location data of the first communication device and the location data of the second communication device is greater than the distance of the adjustable length, the process proceeds to step 926. At step 926, the server creates and stores a new group file and associates the first communication device identifier with the new group file, along with the location data of the first communication device and data representing the identified known roadway associated with the first communication device identifier. The process will proceed from step 926 to step 940 when an additional communication device identifier is associated with the new group file, wherein the additional communication device identifier 1) has previously proceeded through steps 902–922, 2) has location data that is less than or equal to is less than or equal to the distance of the adjustable length measured from the location data of the first communication device, and 3) is associated with data representing the identified known roadway that is also associated with the first communication device identifier. In this circumstance, the new group file is treated as a pre-existing group file in step 920 and 922.

[00113] Ultimately, at step 940, the first communication device having a communication device identifier belonging to either to the pre-existing or new group file transmits data representing analog voice signals using VoIP to the server. Then, at step 942, the server receives the data representing voice signals. Then, at step 944, the server compresses and combines the data representing analog voice signals into a combined data packet representing the analog voice signals. The combined data packet representing the analog voice signals is then transmitted to all the communication devices associated with the pre-existing group file at step 946. In another embodiment, the second communication device transmits data representing analog voice signals. In another embodiment, any communication device associated with a device identifier which is further associated with the pre-existing group file transmits data representing analog voice signals. Steps 940 to 946 are repeated when at least one communication device transmits new data representing analog voice signals.

[00114] In an alternative embodiment, the data processor unit further filters the results of step 922. At step 928, the data processor unit retrieves the two most recently stored location data points that were stored in association with the first communication device identifier. Then, in step 930, the data processor compares the two most recently stored location data points with the location data of the known roadway (identified in step 922) stored at the GIS and determines a direction of travel along the known roadway. Upon determining the direction of travel along the known roadway, data representing the direction of travel along the known roadway is transmitted to the data storage unit at step 932. Data representing the direction of travel along the known roadway is received and stored in association with the first communication device identifier at the data storage unit in step 934.

[00115] At step 936, the data processor unit filters the results of step 922 using the data representing the direction of travel along the known roadway associated with the first communication device identifier. When the data representing the identified direction of travel along the known roadway associated with the first communication device identifier corresponds to data representing the identified direction of travel along the known roadway associated with the second communication device identifier that is further associated with the pre-existing group file, the process proceeds to step 938 (see discussion of Figure 10). At step 938, the server associates the first communication device identifier with the pre-existing group file identified at step 936.

[00116] When the data representing the identified direction of travel along the known roadway associated with the first communication device identifier does not correspond to data representing the identified direction of travel along the known roadway associated with the second communication device identifier that is further associated with the pre-existing group file, the process proceeds to step 926. At step 926, the server creates and stores a new group file and associates the first communication device identifier with the new group file, along with the location data, data representing the identified known roadway, and data representing the identified direction of travel along the known roadway associated with the first communication device identifier. The process will proceed from step 926 to step 940 when an additional communication device identifier is associated with the new group file, wherein the additional communication device identifier 1) has previously proceeded through steps 902–922 and steps 928–936, 2) has location data that is less than or equal to the distance of the adjustable length measured from the location data of the first communication device, 3) is associated with data representing the identified known roadway that is associated with the first communication device identifier, and 4) is associated with data representing the identified direction of travel along the known roadway associated with the first communication device identifier. In this circumstance, the new group file is treated as a pre-existing group file in steps 920, 922, and 936.

[00117] In an alternative embodiment the steps of 928 through 934 are performed after step 918 and prior to step 920.

[00118] In another embodiment, additional communication device identifiers are associated with a pre-existing group file or a new group file.

[00119] In another embodiment, the method illustrated in flowchart 900 includes a step at which a second communication device identifier is disassociated from a group file. The second communication device identifier is disassociated if the location data of the communication device changes such that 1) the distance the location of the first and second communication device is greater than value of the adjustable length, 2) the location data does not correspond to the identified known roadway, 3) the location data does not correspond to the identified direction of travel along the known roadway, and/or 4) the value of the adjustable length is adjusted.

[00120] In an additional embodiment, the step 905 may be performed at any time during the steps of a process as illustrated in flowchart 300, 600, and 1100, and therefore interrupts the process as illustrated flowchart 300, 600, and 1100.

[00121] Figure 10 is a map illustration 1000 of steps illustrated in flowchart 900 according to another embodiment of the invention. The map illustration 1000 includes an area of a known roadway 1010, a first communication device 1020, a second communication device 1030, a first direction of travel 1040, and a second direction of travel 1050.

[00122] In operation of one embodiment illustrated in flowchart 900, the location of the first communication device 1020 is used as? a point from? which an adjustable length extends in a forward and backward direction, or, in other words, is one point of measurement to determine the distance between location data of the first communication device 1020 and the second communication device 1030. The area of the known roadway 1010 represents the area of a known roadway that includes each data point that is measured as less than or equal to the adjustable length in step 922 of flowchart 900. In this example, the first communication device has proceeded through steps 902-920 and was associated with a new group file in step 926.

[00123] For exemplary purposes, the second communication device 1030 has proceeded through steps 902–918 of the flowchart 900. Given that the second communication device 1030 has a location within the area of the known roadway 1010, the distance between location data of the first communication device 1020 and location data of the second communication device 1030 is less than the adjustable length at step 920. Further, the communication device identifier of the second communication device 1030 is associated with the identified known roadway also associated with the communication device identifier of the first communication device 1020 as identified in step 914. Therefore, the data processor unit would proceed to step 924, in which the device identifier of the second communication device 1030 is associated with a new group file including the device identifier of the first communication device 1020 that was previously created and is therefore treated as a pre-existing group file.

[00124] For further exemplary purposes, in Figure 10 the first communication device 1020 has a first direction of travel 1040 established in steps 928–934 that is considered southbound. In Figure 10, the second communication device 1030 that the second communication device 1030 has a second direction of travel 1050 established in steps 928–934 that in Figure 10 is considered northbound. Therefore, in step 936 of flowchart 900, the device identifier of the second communication device 1030 would not be associated with the group file including the device identifier of the first communication device 1020 but is associated with a new group file, which is created and stored in step 926.

[00125] In another embodiment, the map illustration 1000 is presented at a user interface of a communication device. The map illustration 1000 may include, but is not limited to including, representations of the geographic areas associated with pre-existing group files, a symbol representing a communication device, the symbol representing the communication device further indicating the communication mode or modes that a device identifier of the communication device is associated with. Alternatively, the symbol may be represented in numbers, letter, images, equations, colors, shapes, or other figures and characters.

[00126] In an additional embodiment, the map illustration 1000 is interactive.

[00127] In an additional embodiment, the map illustration 1000 is combined with data as illustrated by map illustration 400, 700, and 1300, alone or in combination with one another.

[00128] Figures 11A–C are a flowchart 1100 illustrating another embodiment of a process for facilitating data communication to and from communication devices executed by the system 100. At a first step 1102, the server receives input data indicative of a selection from a user interface 200 of a first communication device. In the present embodiment, the selection from the user interface 200 is the ShoutOut! Button 240 (see Figure 2). A data processor unit of the server queries a data storage unit for a communication mode file corresponding to the input data at step 1102. The corresponding communication mode file also includes pre-determined operational parameters and variable. In the present embodiment, the variable has a numerical value and includes a pre-determined length range, where the pre-determined length range is a distance range ahead of and/or behind the location data of a communication device. Proceeding to step 1106, the server retrieves the pre-determined operational parameters and the variable, which sets a condition as to when communication device identifiers is associated with a group file at the data storage unit.

[00129] At step 1108, the first communication device transmits location data of the first communication device to the server. Then at step 1110, the server receives the location data of the first communication device, and in step 1112, associates and stores the location data of the first communication device with the first communication device identifier at the data storage unit. The steps of 1108-1112 are repeated at a pre-determined interval of time to track the location of the first communication device.

[00130] At step 1114, the first communication device receives from the server data representing an interactive form for display on the user interface (see Figure 12). After the interactive form collects inputs at the user interface, the server receives input data representing data selected at the user interface at step 1116. The data selected at the user interface includes vehicle data. Therefore, at step 1116, the server receives data representing a first vehicle color, data representing a first vehicle make, and data representing a first vehicle model. Further at step 1116, the vehicle data is associated and stored with the first communication device identifier at the data storage unit.

[00131] Steps 1118–1132 occur concurrently with or subsequent to steps 1102–1116. At step 1118, the server receives input data indicative of a selection from a user interface 200 of a second communication device (see Figure 2). The data processor unit of the server queries the data storage unit for the communication mode file corresponding to the input data at step 1120. The corresponding communication mode file also includes pre-determined operational parameters and a variable. In the present embodiment, the variable includes a pre-determined length range, where the pre-determined length range is a distance having a positive or negative value between a lower value and a higher value as measured from the location data of a first communication device. The pre-determined length range further corresponds to a positional identifier (see discussion of Figure 13). Proceeding to step 1122, the server retrieves the pre-determined operational parameters and variable which sets a condition as to when communication device identifiers is associated with a group file at the data storage unit.

[00132] At step 1124, the second communication device transmits data representing a location of the second communication device to the server. Then at step 1126, the server receives the location data of the second communication device. In step 1128, the server associates and stores the location data of the second communication device with the second communication device identifier at the data storage unit. The steps of 1124-1128 are repeated at a pre-determined interval of time to track the location of the second communication device.

[00133] At step 1130, the second communication device receives from the server data representing an interactive form for display on the user interface (see discussion of Figure 12), and, after the interactive form receives inputs at the user interface, transmits the input data. The input data includes vehicle data. Therefore, at step 1132, the server receives data representing a second vehicle color, data representing a second vehicle make, and data representing a second vehicle model. Further at step 1132, the vehicle data is associated and stored with the second communication device identifier at the data storage unit.

[00134] At step 1134, the server receives input data from a first communication device (see Figure 2). In the present embodiment, the input data includes 1) a command to proceed to step 1136, 2) a vehicle data, and 3) a positional identifier. At step 1136, the server creates and stores a new group file and associates the first communication device identifier and location data of the first communication device with the new group file. The vehicle data includes a vehicle color, a vehicle make, or a vehicle model, alone or in combination (see discussion of Figure 12). The positional identifier represents a location of a second communication device associated with vehicle data at the server provided with reference to the location of the first communication device transmitting the input data to the server (see discussion of Figure 13).

[00135] Next, in a series of steps, the location data of the first communication device is compared to the location data of the second communication device to determine whether the second communication device is associated with the new group file. At step 1138, the data processor unit retrieves the location data of the first communication device from the new group file. At step 1140, the data processor unit also retrieves the pre-determined length range corresponding to the positional identifier provided in step 1134 (see discussion of Figure 13). At step 1142, the data processor unit queries the data storage unit for the location data of the second communication device and compares the location data of the first communication device and the location data of the second communication device. When the distance between the location data of the first communication device and the location data of the second communication device is less than or equal to the higher value of the pre-determined length range and greater than or equal to the lower value of the pre-determined length range associated with the positional identifier, the process proceeds to step 1144. When the distance between the location data of the first communication device and the location data of the second communication device is greater than the higher value of the pre-determined length range or less than the lower value of the pre-determined length range associated with the positional identifier, the process proceeds to step 1146, at which the location data of the second communication device is discarded.

[00136] Using the location data of the first communication device and the location data of the second communication device having a distance of less than or equal to the adjustable length distance, the data processor unit further filters the results in a series of steps. In step 1144, the data processor unit queries a GIS, which stores geographically referenced information including location data points of known roadways, and compares the location data of the first communication device with location data points of the known roadways. When the location data of the first communication device corresponds to a location data point of a known roadway (within the margin of error of the GPS), the identified known roadway data is retrieved from the GIS and associated and stored with the first communication device identifier in the new group file at step 1148. At step 1150, the data processor unit queries the results of step 1142 and compares the location data of the second communication device to the location data points of the identified known roadway. When the location data of the second communication device corresponds to location data points of the identified known roadway, the process proceeds to step 1152. When the location data of the second communication device does not correspond to location data points of the identified known roadway, the location data of the second communication device is discarded at step 1154.

[00137] Using the location data of the first communication device and the location data of the second communication device having 1) a distance of less than or equal to the adjustable length distance and 2) having location data corresponding to the identified known roadway, the data processor unit further filters the results in a series of steps. At step 1152, the data processor unit retrieves the two most recently stored location data points associated with the first communication device identifier. Then, in step 1156, the data processor unit compares the two most recently stored location data points with the location data of the identified known roadway stored at the GIS and determines a direction of travel along the known roadway. Next, at step 1158, the direction of travel of the location data points of the first communication device identifier is retrieved from the GIS and further associated and stored with the first communication device identifier in the new group file. In step 1160, the data processor unit queries the results of step 1150 and compares the two most recently stored location data points of the second communication device with the location data of the identified known roadway (identified at step 1148). When the two most recently stored location data points of the second communication device corresponds to the direction of travel along the identified known roadway associated with the first communication device identifier, the process proceeds to step 1162. When the two most recently stored location data points of the second communication device do not correspond to the direction of travel along the identified known roadway associated with the first communication device identifier, the location data of the second communication device is discarded at step 1164.

[00138] Next, in a series of steps, the results of step 1160, are further filtered using the input data from the first communication device (received at step 1134) including vehicle data. In step 1162, the data processor unit queries the vehicle data associated with the second communication device identifier at the data storage unit and compares the input data including vehicle data with the vehicle data associated with the second communication device identifier. When the vehicle data associated with the second communication device identifier corresponds to the input data including vehicle data, the process proceeds to step 1166. When the vehicle data associated with the second communication device identifier does not correspond to the input data including vehicle data, the location data of the second communication device is discarded at step 1168.

[00139] At step 1166, the device identifier associated with the location data of the second communication device and the vehicle data is associated with the new group file including the first communication device identifier.

[00140] At step 1170, the first communication device associated with the new group file transmits data representing analog voice signals using VoIP to the server. Then, at step 1172, the server receives the data representing voice signals. Then, at step 1174, the server compresses and combines the data representing analog voice signals into a combined data packet representing the analog voice signals. The combined data packet representing the analog voice signals is then transmitted to all the communication devices associated with the pre-existing group file at step 1176. In another embodiment, the second communication device transmits data representing analog voice signals. In another embodiment, any communication device associated with a device identifier which is further associated with the new group file transmits data representing analog voice signals. Steps 1170–1176 are repeated when a communication device transmits new data representing analog voice signals.

[00141] At a step 1178, occurring after each of steps 1170–1176 has occurred at least once, the server disassociates the first communication device identifier and the second communication device identifier from the new group file. Step 1178 occurs as a result of the server receiving input data indicative of a command to stop the process occurring in steps 1170–1176 from the first communication device. Alternatively, the input data indicative of the command to stop the process occurring in steps 1170-1176 is received from the second communication device.

[00142] In another embodiment, at steps 1150 and 1160, additional communication device identifiers associated with location data and vehicle data correspond to the location data of the first communication device and vehicle data corresponding to the vehicle data location data of additional communication devices (see discussion of Figure 16).

[00143] In an additional embodiment, the step 1102 may be performed at any time during the steps of a process as illustrated in flowchart 300, 600, and 900, thereby interrupting a process as illustrated flowchart 300, 600, and 900.

[00144] Figure 12 illustrates a user interface 1200 presented at steps 1114 and 1130 of flowchart 1100 of another embodiment of the invention. The user interface 1200 includes a color selection field 1210, a make selection field 1220, a model selection field 1230, and a saved vehicle data button 1240.

[00145] The user interface 1200 is a touch-sensitive display for inputting text into a selection field 1210–1230 or for selecting a saved vehicle data profile. In operation, a user selects a vehicle color, vehicle make, and vehicle mode presented in a drop-down menu including options for each element of the vehicle data in the entry fields 1210, 1220, and 1230, respectively. A communication device then transmits input data representing the data as entered at the user interface 1200. Therefore, the communication device transmits data representing a vehicle color, data representing a vehicle make, and data representing a vehicle model, or collectively vehicle data. The process as illustrated in flowchart 1100 then proceeds to step 1134. Alternatively, a user may select the saved vehicle data button 1240. In operation, upon selection of the saved vehicle data button 1240, the communication device sends input data indicative of a selection of button 1240 to the server. The process as illustrated in flowchart 1100 then proceeds to step 1134.

[00146] In another embodiment, the user interface 1200 may also be display at a user interface of a communication device between steps 330 and 335 of flowchart 300, after step 612 and after step 624 of flowchart 600, and between steps 930 and 935 of flowchart 900.

[00147] Figure 13 is a map illustration 1300 that is representative of steps of flowchart 1100 of another embodiment of the invention. Map illustration 1300 includes a portion of a known roadway 1310, a direction of travel 1320, a first communication device 1330 associated with first vehicle data, a second communication device 1340 associated with second vehicle data, and a third communication device 1350 associated with third vehicle data.

[00148] In operation, the location of the first communication device 1330 is used as one of two location points used to measure the distance between location data of communication devices. The distance between location data of communication devices is measured in step 1142 of flowchart 1100 to determine whether the distance between the communication devices is less than the lower value of a pre-determined length range or higher than higher value of the pre-determined length range. The pre-determined length range is associated with a positional identifier. As discussed above, a positional identifier is received at the server at step 1134 of the flowchart 11, and in step 1140, the pre-determined length range is retrieved and used in the filtering steps 1142-1146.

[00149] In this present embodiment, the positional identifier is one of a near ahead, far ahead, near behind, far behind, even with, and recently passed. The pre-determined length range associated with the positional identifier near ahead is a positive value between 2 m and 400 m measured from a first communication device. The pre-determined length range associated with the positional identifier far ahead is a positive value between 400 m and 1600m. The pre-determined length range associated with the positional identifier near behind is a negative value between 2 m and 400 m. The pre-determined length range associated with the positional identifier far behind is a negative value between 400 m and 1600m. The pre-determined length range associated with the positional identifier even with is between a positive value of 2 m and negative value of 2 m.

[00150] The positional identifier recently passed is related to the history of the location data of a communication device relative to the location data of the first communication device. For exemplary purposes, if the positional identifier associated with the first communication device, where the positional identifier has been previously identified between the communication device and the first communication device, has changed from near behind to near ahead in a range of time between 2 seconds and 30 seconds, then the positional identifier is recently passed.

[00151] To simplify for exemplary purposes, each of the communication device identifiers 1330–1350 is shown in map illustration 1300 such that the location data of each communication device corresponds to the same known roadway and the same direction of travel along the known roadway. Therefore, for example, the positional identifier near ahead is associated with the distance as measured between the location data of first communication device 1330 and the location data of the second communication device identifier 1340. For further exemplary purposes, the positional identifier near behind is associated with the distance as measured between the location data of first communication device 1330 and the location data of the third communication device identifier 1340.

[00152] In another embodiment, the map illustration 1300 is presented at a user interface of a communication device. The map illustration 1300 may include, but is not limited to including, representations of a geographic area associated with a portion of a known roadway, a symbol representing a communication device, the symbol representing the communication device further indicating the communication mode or modes that a device identifier of the communication device is associated with. Alternatively, the symbol is represented in numbers, letter, images, equations, colors, shapes, other figures and characters, or a combination thereof.

[00153] In an additional embodiment, the map illustration 1300 is interactive.

[00154] In an additional embodiment, the map illustration 1300 is combined with data as illustrated by map illustration 400, 700, and 1000, alone or in combination with one another.

[00155] Figure 14 illustrates a user interface 1400 of a communication device presented at step 1144 illustrated in flowchart 1100 in an additional embodiment of the invention. The user interface 1400 includes a first vehicle data and positional identifier representation 1410, a second vehicle data and positional identifier representation 1420, and a third vehicle data and positional identifier representation 1430. Each of the first, second, and third vehicle data and positional identifier representation is stored in association with a first, second, and third communication device identifier, respectively, at a data storage unit.

[00156] In operation, the user interface 1400 is presented in alternative embodiment of flowchart 1300. In the alternative embodiment, more than one communication device identifier is associated with location data corresponding to the location data of a first communication device in steps 1142, 1150, and 1160 and a vehicle data corresponding to input data at step 1162. Therefore, the user interface 1400 is presented at the first communication device to enable a selection to be made. Upon selection of one of the vehicle data and positional identifier representations 1410, 1420, 1430, the first communication device transmits selection data to the server. Then, the communication device identifier associated with the selected vehicle data and positional identifier representation is associated with the new group file at step 1166.

[00157] In another embodiment, the user interface 1400 is a touch-sensitive display.

[00158] In an alternative embodiment, each of the first, second, and third vehicle data and positional identifier representations is represented in numbers, letters, images, symbols, equations, colors, shapes, other figures and characters, or a combination thereof.

[00159] Figure 15 illustrates a user interface 1500 of a communication device presented in an alternative embodiment of the flowchart 1100 of the invention. In the alternative embodiment of the flowchart 1100, the user interface 1500 is present after step

1164 and before step 1166. The user interface 1500 includes an accept button 1510 and a reject button 1520.

[00160] In operation, upon selection of the accept button 1510, the server receives input data indicative of a command to associate the second communication device identifier with the first communication device identifier in the new group file at step 1166. The process then proceeds to step 1166. Upon selection of the reject button 1520, the server receives input data indicative of a command to not associate the second communication device identifier with the first communication device identifier in the new group file at step 1166. Therefore, the process does not proceed to step 1166.

[00161] In an alternative embodiment of the flowchart 300, the flowchart 600, and the flowchart 900, a user interface similar in appearance and functionality may be presented at the user interface prior to a step in which a communication device identifier is associated with a pre-existing group file.

[00162] In another embodiment, the user interface 1500 is a touch-sensitive display.

[00163] In an alternative embodiment, each of the buttons 1510, 1520 is represented in numbers, letters, images, symbols, equations, colors, shapes, other figures and characters, or a combination thereof.

[00164] Figure 16 illustrates an additional embodiment of a data storage unit 1610 of a server 1600 that is part of the system 100 (see discussion of Figure 1). The data storage unit 1610 includes a first communication mode file 1620 and a second communication mode file 1630. The first communication mode file 1620 includes first operational parameters 1622, a first variable 1624, and a first group file 1640. The first group file 1640 includes a first communication device identifier 1641, first administrator variables 1660, and a second communication device identifier 1680. The first communication device identifier 1641 is associated with location data of the first communication device 1642, an identifier of an identified known roadway 1643, an identifier of a direction of travel on the identified known roadway 1644, a first vehicle data 1645, and an administrator identifier 1646. The second communication device identifier 1680 is associated with location data of the second communication device 1681, an identifier of an identified known roadway 1682, an identifier of a direction of travel on the identified known roadway 1683, and a second vehicle data 1684. The second communication mode file 1630 includes second operational parameters 1632, a second variable 1634, and second group file 1650. The second group file 1650 includes a third communication device 1651, second administrator variables, and a fourth communication device identifier 1690. The third communication device identifier 1651 is associated with location data of the third communication device identifier 1652, an identifier of an identified known roadway 1653, an identifier of a direction of travel on the identified known roadway 1654, and a second administrator identifier 1655. The fourth communication device identifier 1690 is associated with location data of the fourth communication device 1691, an identifier of an identified known roadway 1692, and an identifier of a direction of travel on the identified known roadway 1693.

[00165] In the present embodiment, the first communication mode file 1620 is the communication mode file as described in the discussion of Figure 11. Therefore, in operation, the first variable 1624 is a positional identifier, which is associated with a pre-determined length range. The positional identifier of the first variable 1624 is used to determine whether to associate the first communication device identifier 1641 and/or the second communication device identifier 1680 with the first group file 1640. The location data of the first communication device 1642 and the location data of the second communication device 1681 is used to determine a measure of distance between the location data. The measure of distance is then compared to the first variable 1624 to determine whether to associate the first communication device identifier 1641 and/or the second communication device identifier 1680 with the first group file 1640 (see discussion of Figure 11). The second vehicle data 1684 is used to determine whether to associate the second communication device identifier 1680 with the first group file 1640 (see discussion of Figure 11). The administrator identifier 1645 sets the condition as to when a first communication device having the first communication device identifier 1645 may transmit data representing adjustments to the first variable 1624 and the administrator variables 1660. The administrator identifier further represents that the location data of the first communication device 1642 is used as the point from which a variable 1624 is measured to determine whether an additional communication device identifier (not shown) may be associated with the first group file 1640.

[00166] For exemplary purposes, given that the first communication device identifier 1641 and the second communication device identifier 1680 are associated with the first group file 1640, the identifier of an identified known roadway 1643 and the identifier of the direction of travel on the identified known roadway 1644 associated with the first communication device identifier 1641 and the identifier of an identified known roadway 1682 and the identifier of a direction of travel on the identified known roadway

1683 associated with the second communication device identifier correspond to the same identified known roadway and the same direction of travel on the identified known roadway (see discussion of Figure 11).

[00167] In an alternative embodiment, the first communication device associated with the first communication device identifier 1641 may change the administrator variables 1660 such that the first communication device identifier 1641 and the second communication device identifier 1680 are associated with the first group file when each is not associate with the same identified known roadway and the same direction of travel on the identified known roadway.

[00168] In another embodiment, the first group file 1640 includes additional communication device identifiers.

[00169] In another embodiment, the first communication mode file 1620 includes additional group files.

[00170] In the present embodiment, the second communication mode file 1630 is the communication mode file as described in the discussion of Figure 9. Therefore, in operation, the second variable 1634 is an adjustable length. The adjustable length of the second variable 1634 is used to determine whether to associate the third communication device identifier 1651 and/or the fourth communication device identifier 1690 with the second group file 1650. The location data of the third communication device 1652and the location data of the fourth communication device 1691 is used to determine a measure of distance between the location data. The measure of distance is then compared to the second variable 1634 to determine whether to associate the third communication device identifier 1651 and/or the fourth communication device identifier 1690 with the second group file 1650 (see discussion of Figure 9). The administrator identifier 1655 sets the condition as to when a third communication device having the third communication device identifier 1651 may transmit data representing adjustments to the second variable 1634 and the administrator variables 1670. The administrator identifier further represents that the location data of the third communication device 1652 is used as the point from which the variable 1634 is measured to determine whether an additional communication device identifier (not shown) may be associated with the second group file 1650.

[00171] For exemplary purposes, given that the third communication device identifier 1651 and the fourth communication device identifier 1690 are associated with the second group file 1650, the identifier of an identified known roadway 1653 and the identifier of the direction of travel on the identified known roadway 1654 associated with the third communication device identifier 1651 and the identifier of an identified known roadway 1692 and the identifier of a direction of travel on the identified known roadway 1693 associated with the fourth communication device identifier correspond to the same identified known roadway and the same direction of travel on the identified known roadway (see discussion of Figure 9).

[00172] In an alternative embodiment, the first communication device associated with the third communication device identifier 1651 may change the administrator variables 1670 such that the third communication device identifier 1651 and the fourth communication device identifier 1690 are associated with the second group file 1650 when each is not associate with the same identified known roadway and the same direction of travel on the identified known roadway.

[00173] In another embodiment, the second group file 1650 includes additional communication device identifiers.

[00174] In another embodiment, the second communication mode file 1630 includes additional group files.

[00175] With the modern day development of new communication devices, such as computers and cell phones, people are able to communicate across greater distances. These new devices can allow drivers on the road to better communicate driving conditions and traffic incidents to other drivers on the road using their communication devices. Previously, CB radio was a popular method for communicating roadway conditions and incidents among drivers. CB radio, however, is a short-range communication system, and communications are only possible over a short distance of about four miles. While systems and methods previously developed have sought to improve the communication of roadway conditions and incident reporting to drivers, these systems have been limited to collecting and transmitting traffic information from fixed device locations. The embodiments disclosed herein allow communication of roadway conditions and incident reporting to drivers from and to mobile devices. Further, as opposed to the previous use of warning tones and flashing lights, the disclosed embodiments allow drivers to communicate details of the roadway conditions and incidents using audio transmitted to a server and transmitted to other drivers within geographic proximity to a driver nearly instantaneously and in a full-duplex manner.

[00176] Further, the audio transmitted is automatically transmitted to drivers as opposed to prior methods which require users to selectively retrieve the audio or to further know a file name or other audio file identifier to retrieve the audio. The disclosed embodiments are advantageous as the communication system connects drivers in communication without requiring the drivers to know the cell phone number or other identifier of a mobile communication device belong to other drivers.

[00177] While particular elements, embodiments, and applications of the invention have been shown and described, it is understood that the invention is not limited thereto because modifications may be made by those skilled in the art, particularly in light of the foregoing teaching. It is therefore contemplated by the appended claims to cover such modifications and incorporate those features which come within the spirit and scope of the invention.

CLAIMS

1. A method for communication, the method comprising:

receiving location data of a first communication device;

receiving location data of a second communication device;

calculating a measure of a distance between said location data of said first communication device and said location data of said second communication device;

comparing said measure of said distance between location data of said first communication device and said location data of said second communication device to a value of an adjustable radius; and

associating a first device identifier of said first communication device and a second device identifier of said second communication device with a group file at a data storage unit, when said measure of said distance between location data of said first communication device and said location data of said second communication device is less than or equal to said value of said pre-determined radius.

2. The method of claim 1, wherein said value of said pre-determined radius is 2 m.

3. The method of claim 1, further comprising transmitting a data representing an analog voice signal using VoIP from said first communication device to said server.

4. The method of claim 3, further comprising compressing said data representing said analog voice signal at said server.

5. The method of claim 4, further comprising transmitting said data representing said analog voice signal to at least one of said first communication device and said second communication device communication device associated with said group file.

6. A method for communication, the method comprising:

receiving a first location data of a first communication device;

creating a group file at a data storage unit;

storing a first communication device identifier of said first communication device at said group file at said data storage unit;

storing said first location data of said first communication device at said group file at said data storage unit;

receiving a second location data of a second communication device;

calculating a measure of a distance between said first location data of said first communication device and said location data of said second communication device;

comparing said measure of said distance between location data of said first communication device and said location data of said second communication device to a value of an adjustable radius; and

associating a second device identifier of said second communication device with said group file at said data storage unit, when said measure of said distance between said first location data of said first communication device and said second location data of said second communication device is less than or equal to said value of said adjustable radius.

7. The method of claim 6, wherein said value of said adjustable radius is between 2 m and 1600 m.

8. The method of claim 6, further comprising storing said second device identifier of said second communication device at said group file at said data storage unit.

9. The method of claim 6, further comprising storing said second location data of said second communication device at said group file at said server.

10. The method of claim 6, further comprising transmitting a data representing an analog voice signal using VoIP from said first communication device to said server.

11. The method of claim 10, further comprising compressing said data representing said analog voice signal at said server.

12. The method of claim 11, further comprising transmitting said data representing said analog voice signal to at least one o, f said first communication device and said second communication device communication device associated with said group file.

13. A system for communication, said system comprising:

a first communication device including a first GPS;

a second communication device including a second GPS;

a server including:

a data storage unit storing:

a communication mode file, wherein said communication mode file includes a variable;

a group file; and

a data processor unit,

wherein said data processor unit:

receives at least one location data from said first communication device;

receives at least one location data from said second communication device;

calculates a measure of distance between said at least one location data from said first communication device and said at least one location data from said second communication device;

compares said measure of distance to said variable, wherein said variable sets a condition for when said data processor unit associates a first device identifier of said first communication device and a second device identifier of said second communication device with said group file;

associates said first device identifier of said first communication device and a second device identifier of said second communication device with said group file, when said measure of distance is less than or equal a value of said variable.

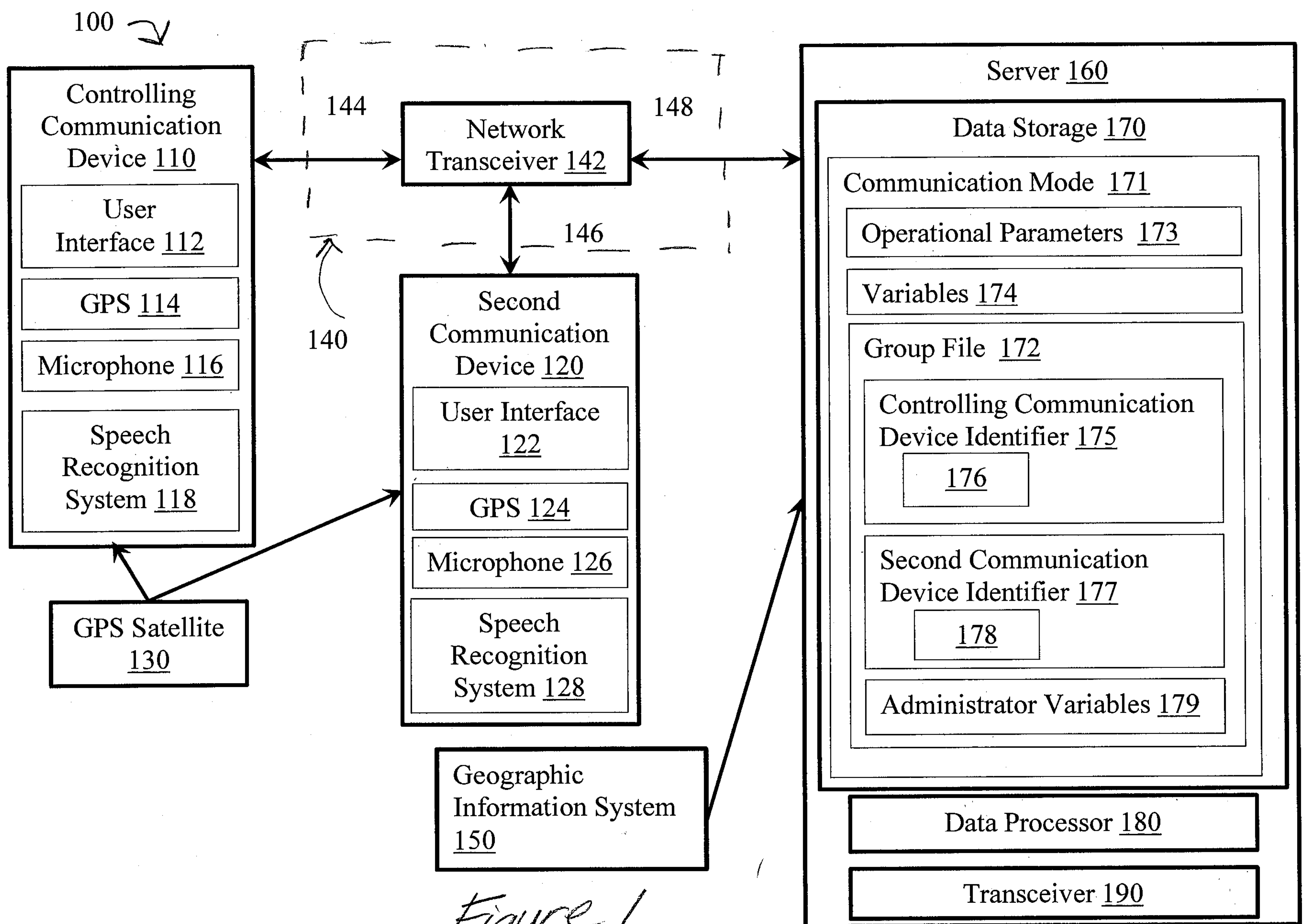
14. The system of claim 13, wherein said variable is a pre-determined length.

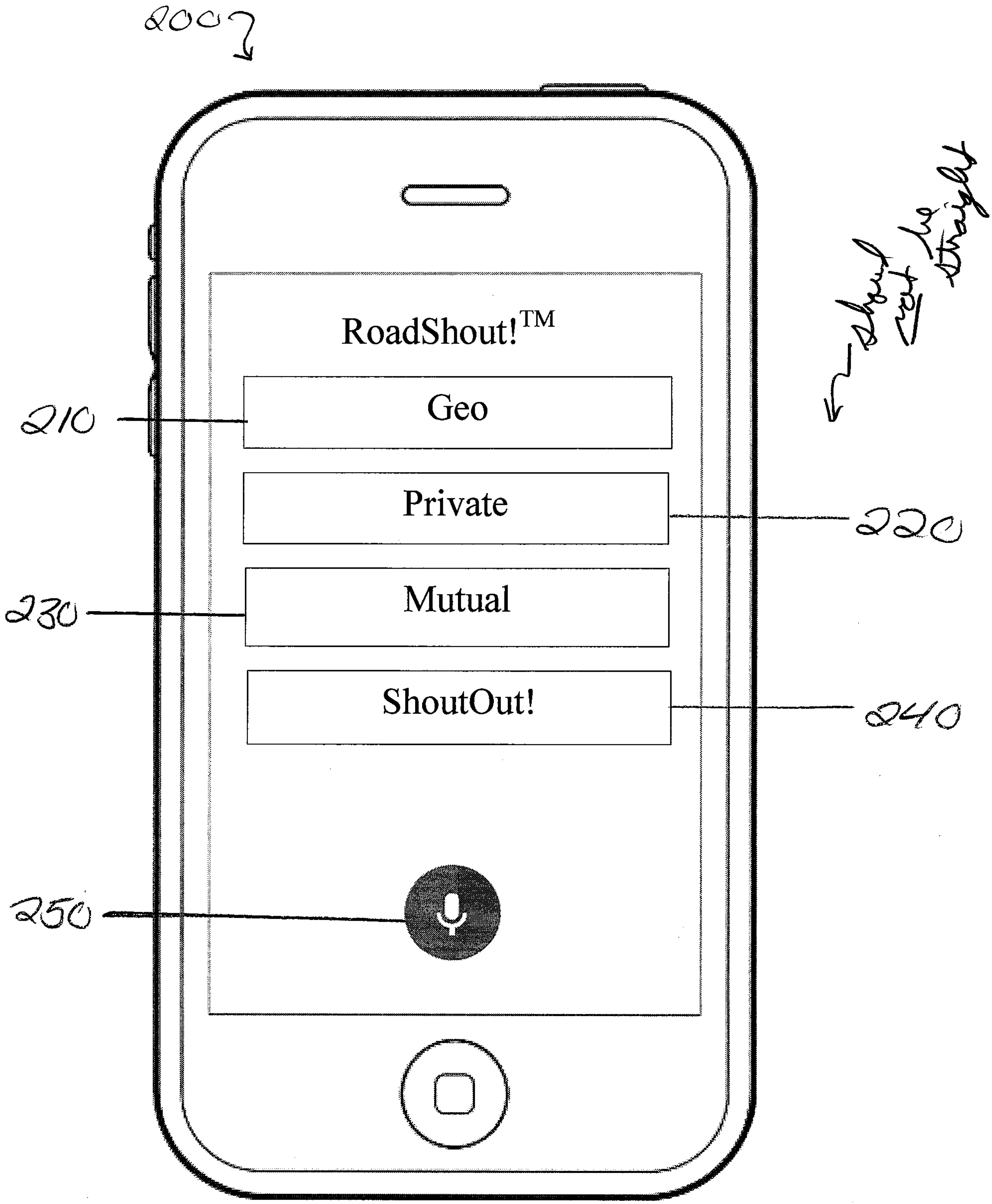
15. The system of claim 13, the server further including a data transceiver.

16. The system of claim 15, wherein the data transceiver receives and transmits data representing analog voice signals from said first communication device and said second communication device.

ABSTRACT

A method and system of communication using mobile communication devices is provided for transmitting and receiving data at a server, as well as, for comparing, filtering, and associating data at a data processor unit of the server. A data storage unit of the server stores at least one communication mode file, which includes pre-determined operational parameters and a variable. The variable has an adjustable numerical value and sets the condition for when a communication device identifier is associated with a group file stored at the data storage unit. The numerical value corresponds to a distance that is calculated between mobile communication devices. Therefore, the method and system facilitates communication between mobile communication devices using a geographic location of the mobile communication devices and a geographic relationship between the mobile communication devices.


100
Controlling Communication Device 110
User Interface 112
GPS 114
Microphone 116
Speech Recognition System 118
GPS Satellite 130
144
Network Transceiver 142
148
146
140
Second Communication Device 120
User Interface 122
GPS 124
Microphone 126
Speech Recognition System 128
Geographic Information System 150
Server 160
Data Storage 170
Communication Mode 171
Operational Parameters 173
Variables 174
Group File 172
Controlling Communication Device Identifier 175
176
Second Communication Device Identifier 177
178
Administrator Variables 179
Data Processor 180
Transceiver 190
Figure 1


200
RoadShout!™
Geo
Private
Mutual
ShoutOut!
210
220
230
240
250

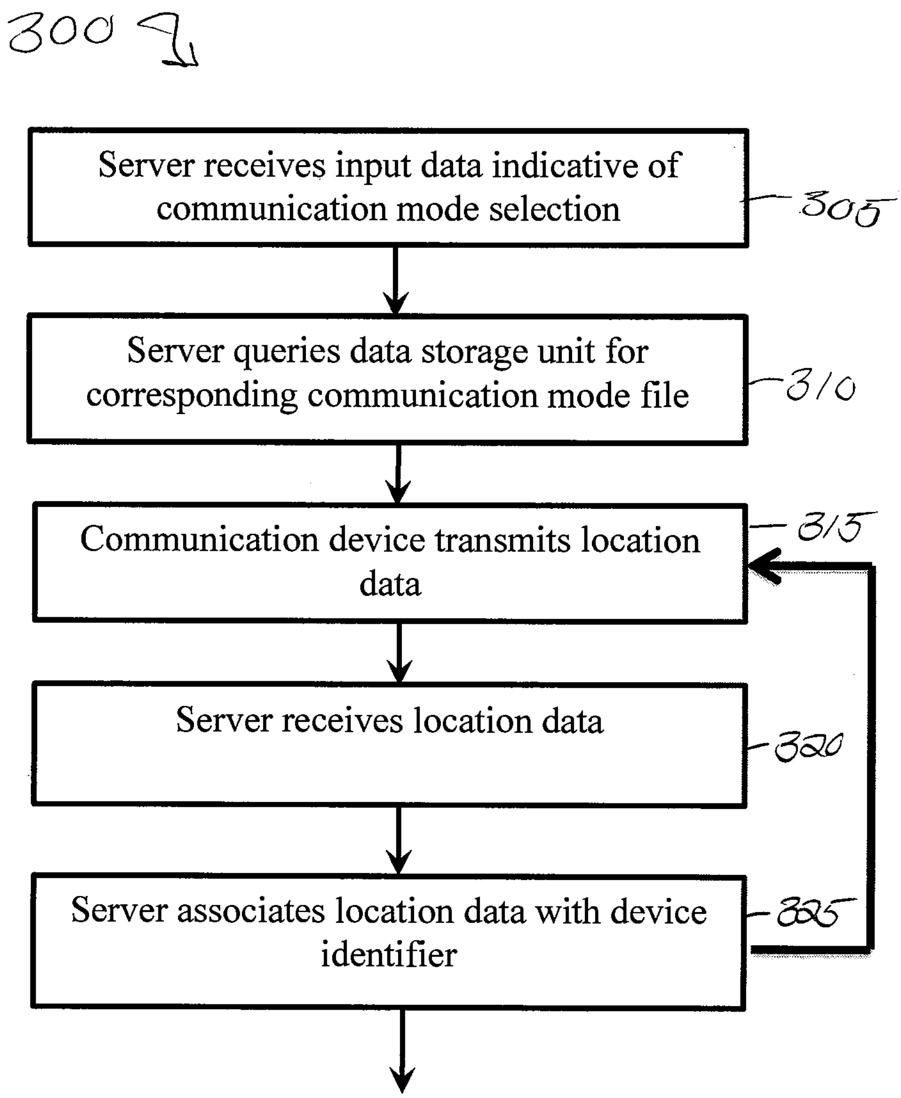

300
Server receives input data indicative of communication mode selection
305
Server queries data storage unit for corresponding communication mode file
310
Communication device transmits location data
315
Server receives location data
320
Server associates location data with device identifier
325

Figure 3A

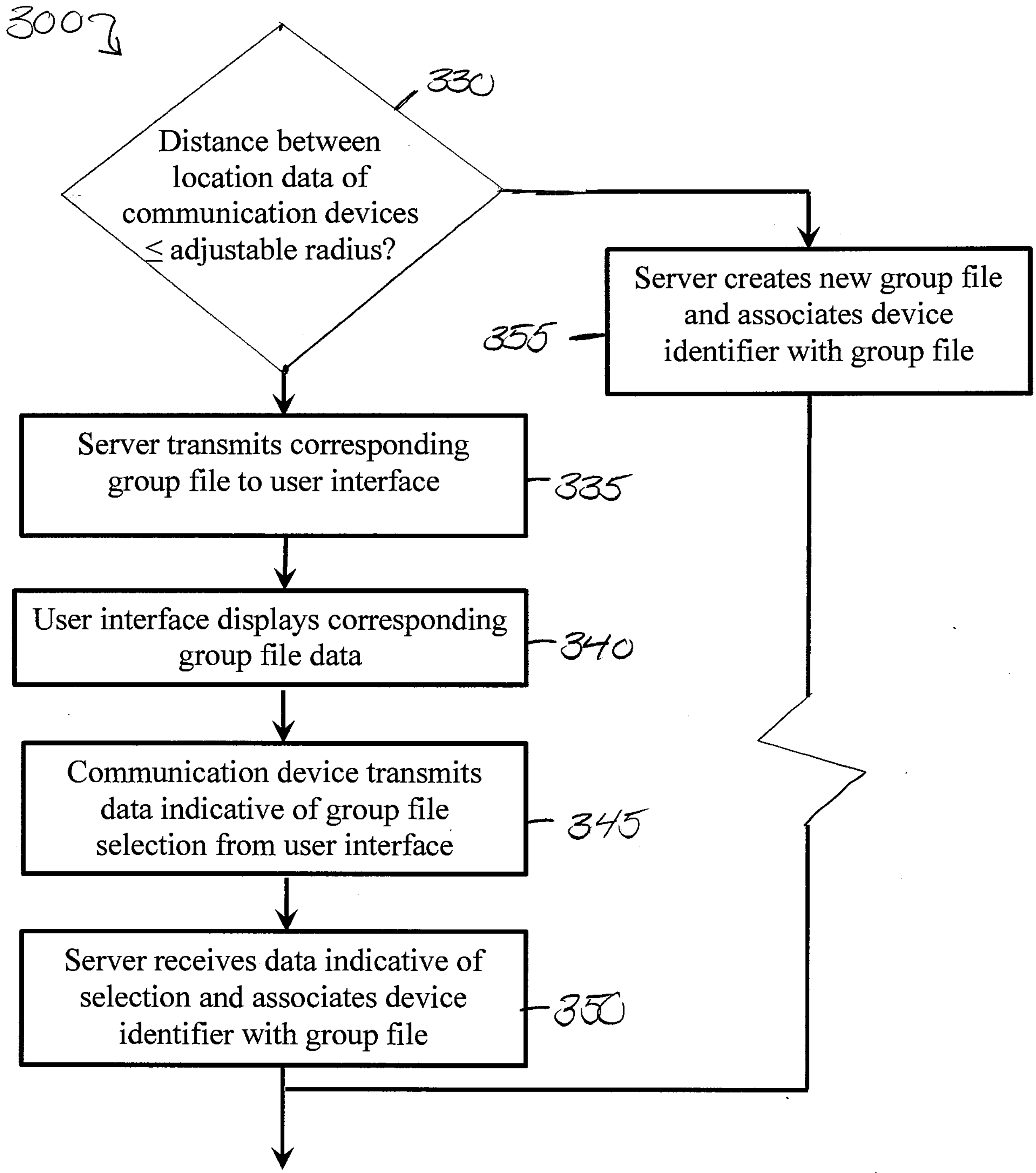

300
330
Distance between location data of communication devices ≤ adjustable radius?
Server creates new group file and associates device identifier with group file
355
Server transmits corresponding group file to user interface
335
User interface displays corresponding group file data
340
Communication device transmits data indicative of group file selection from user interface
345
Server receives data indicative of selection and associates device identifier with group file
350

Figure 3B

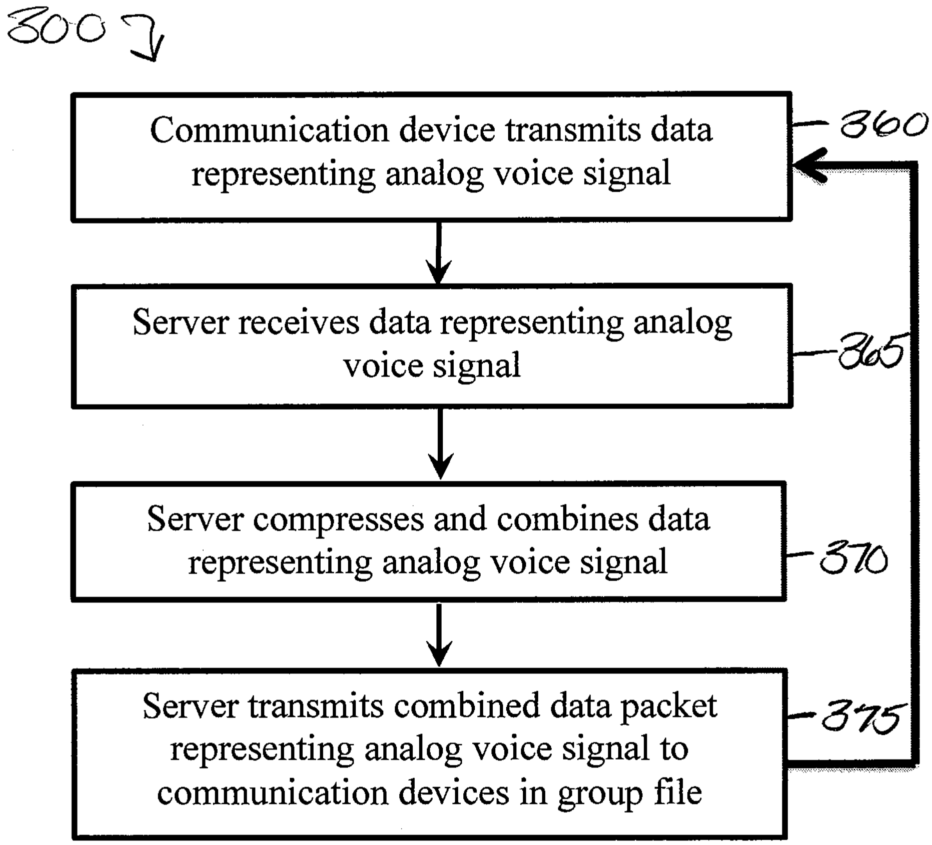

300
Communication device transmits data representing analog voice signal
360
Server receives data representing analog voice signal
365
Server compresses and combines data representing analog voice signal
370
Server transmits combined data packet representing analog voice signal to communication devices in group file
375

Figure 3C

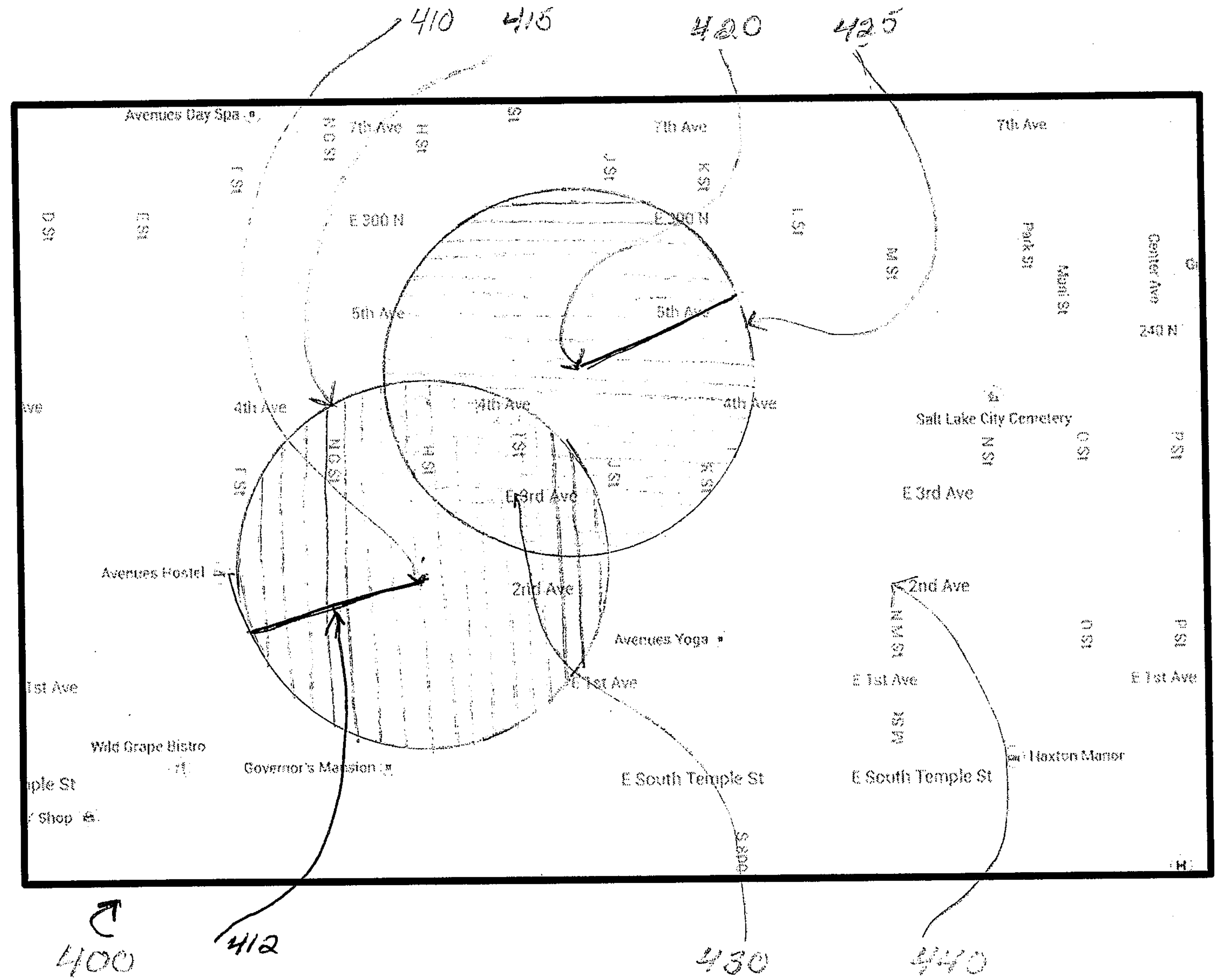

410
415
420
425
Avenues Day Spa
7th Ave
E 300 N
5th Ave
4th Ave
E 3rd Ave
2nd Ave
E 1st Ave
E South Temple St
Avenues Hostel
Avenues Yoga
Wild Grape Bistro
Governor's Mansion
Haxton Manor
Salt Lake City Cemetery
Park St
Center Ave
240 N
412
400
430
440

Figure 4

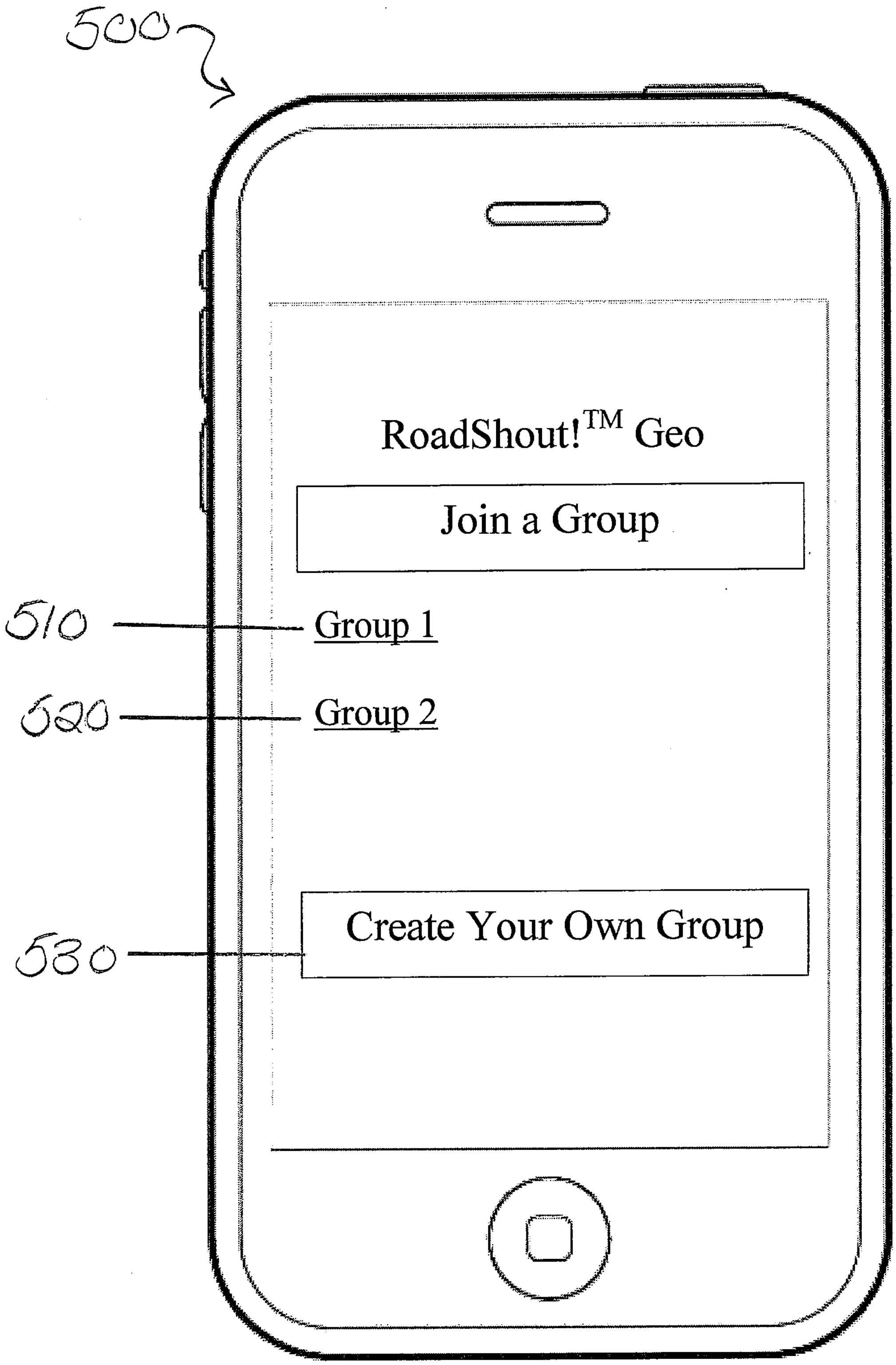

500
RoadShout!™ Geo
Join a Group
510
Group 1
520
Group 2
Create Your Own Group
530

Figure 5

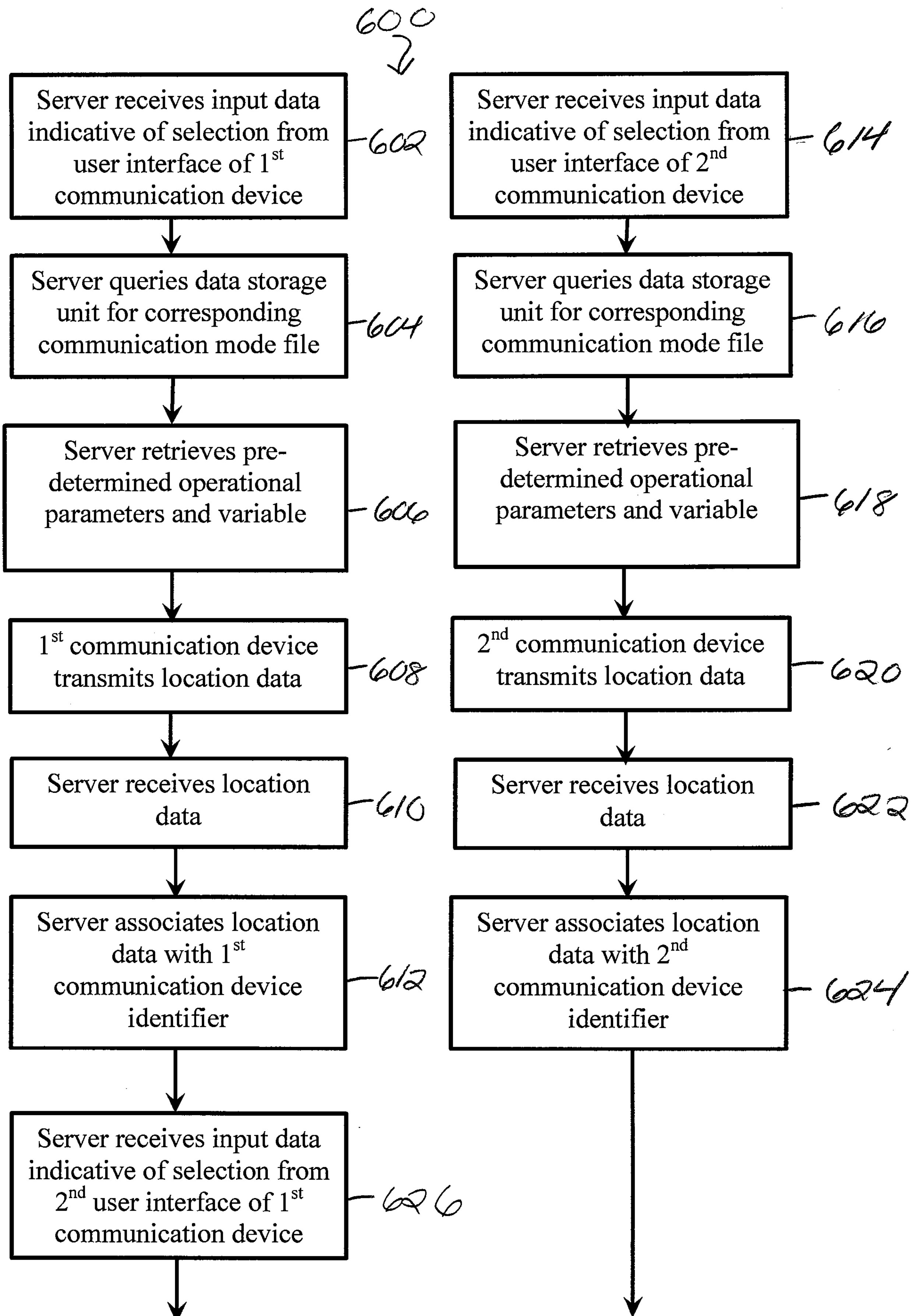
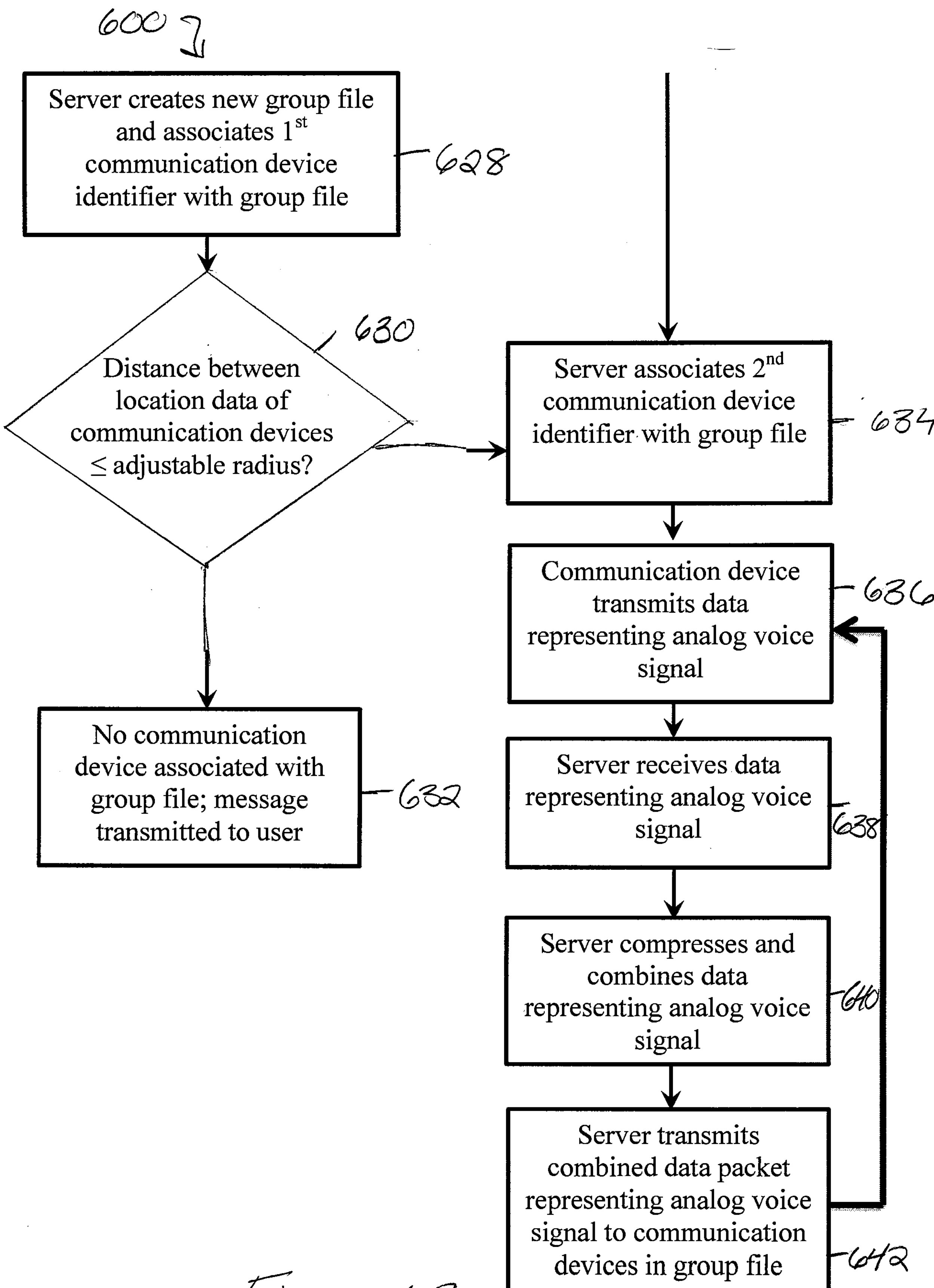

600
Server receives input data indicative of selection from user interface of 1st communication device
602
Server queries data storage unit for corresponding communication mode file
604
Server retrieves pre-determined operational parameters and variable
606
1st communication device transmits location data
608
Server receives location data
610
Server associates location data with 1st communication device identifier
612
Server receives input data indicative of selection from 2nd user interface of 1st communication device
626
Server receives input data indicative of selection from user interface of 2nd communication device
614
Server queries data storage unit for corresponding communication mode file
616
Server retrieves pre-determined operational parameters and variable
618
2nd communication device transmits location data
620
Server receives location data
622
Server associates location data with 2nd communication device identifier
624

Figure 6A


600
Server creates new group file and associates 1st communication device identifier with group file
628
Distance between location data of communication devices ≤ adjustable radius?
630
Server associates 2nd communication device identifier with group file
634
No communication device associated with group file; message transmitted to user
632
Communication device transmits data representing analog voice signal
636
Server receives data representing analog voice signal
638
Server compresses and combines data representing analog voice signal
640
Server transmits combined data packet representing analog voice signal to communication devices in group file
642
Figure 6B

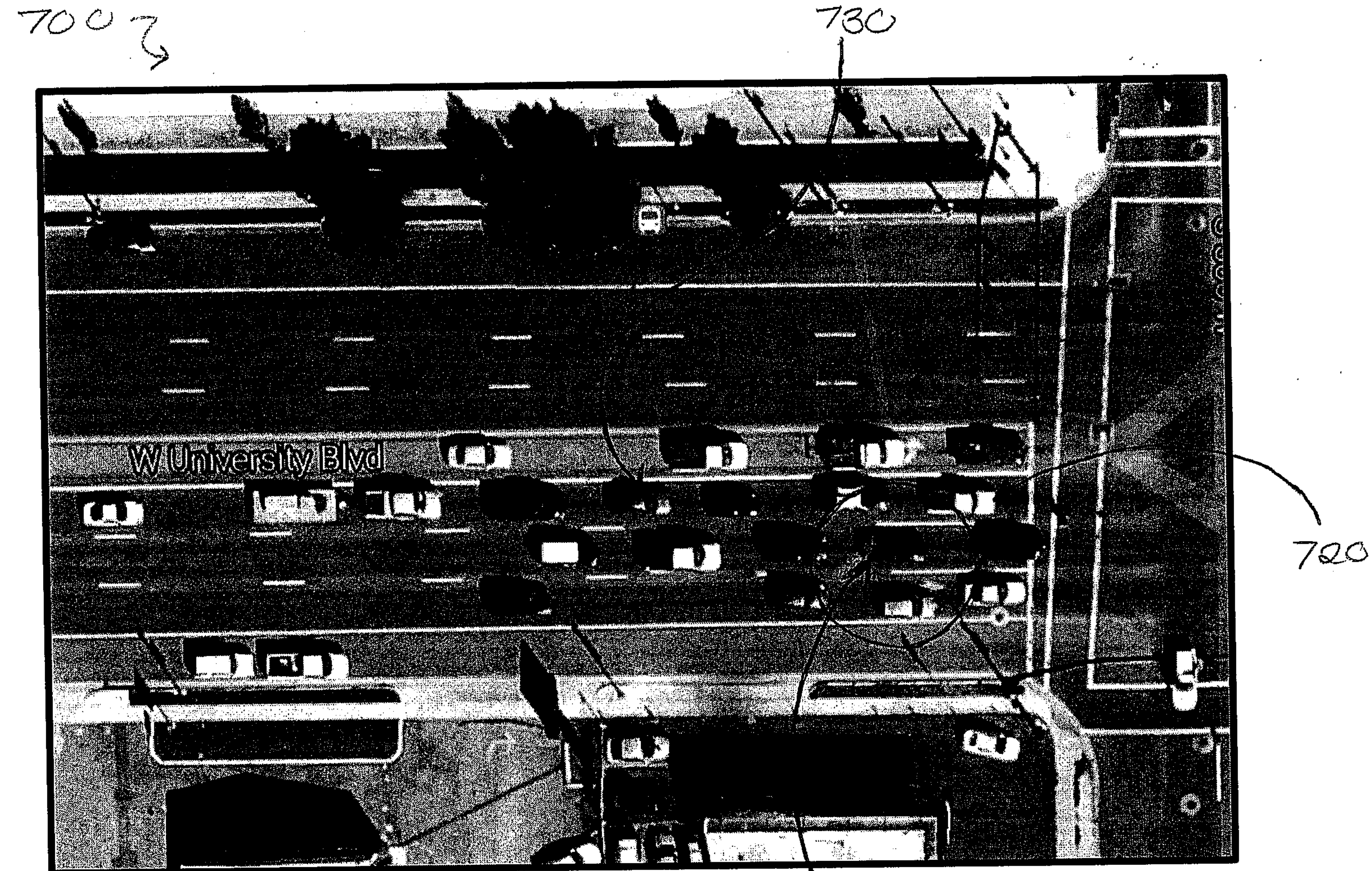


Figure 7

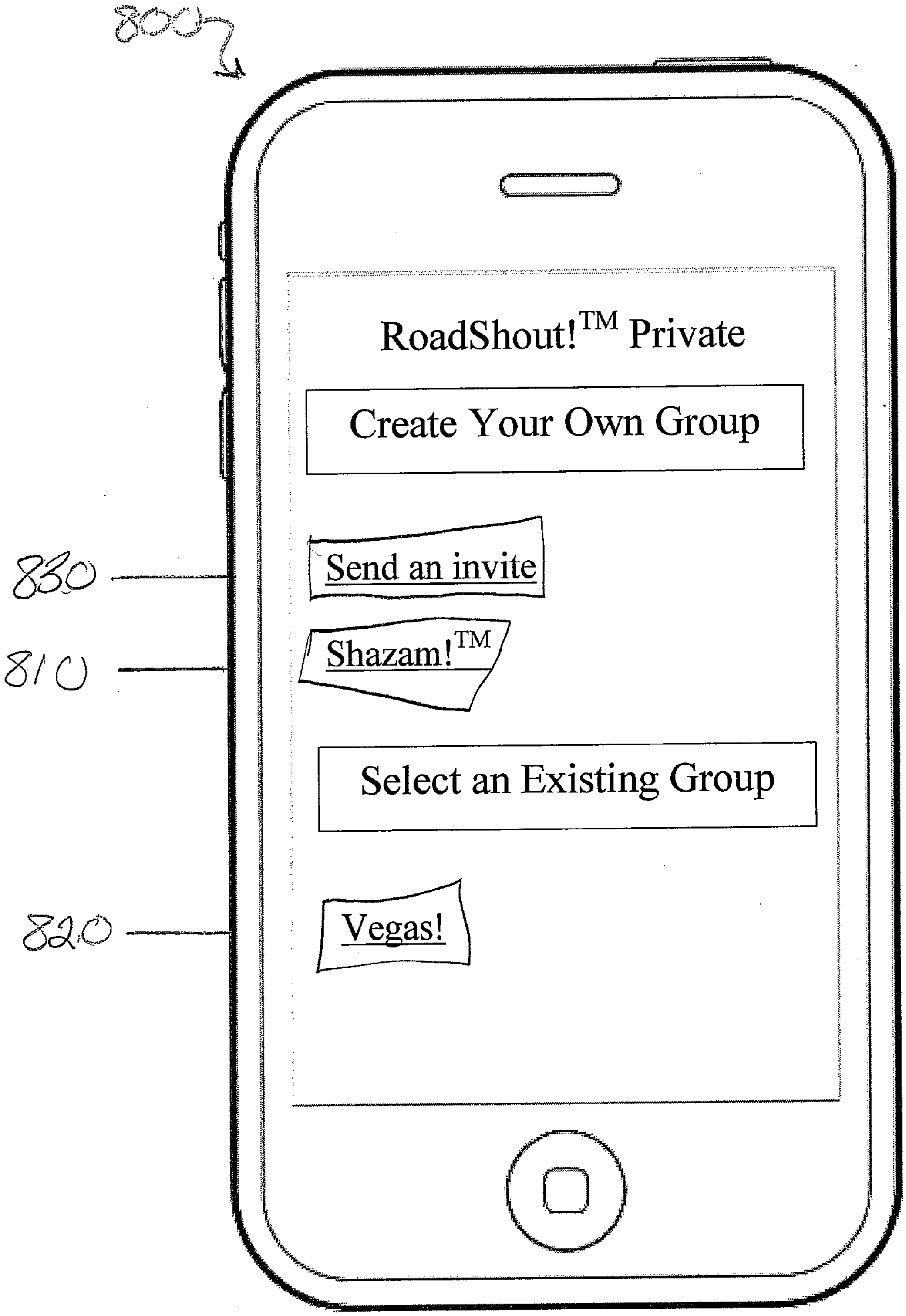

800
RoadShout!™ Private
Create Your Own Group
830
Send an invite
810
Shazam!™
Select an Existing Group
820
Vegas!

Figure 8

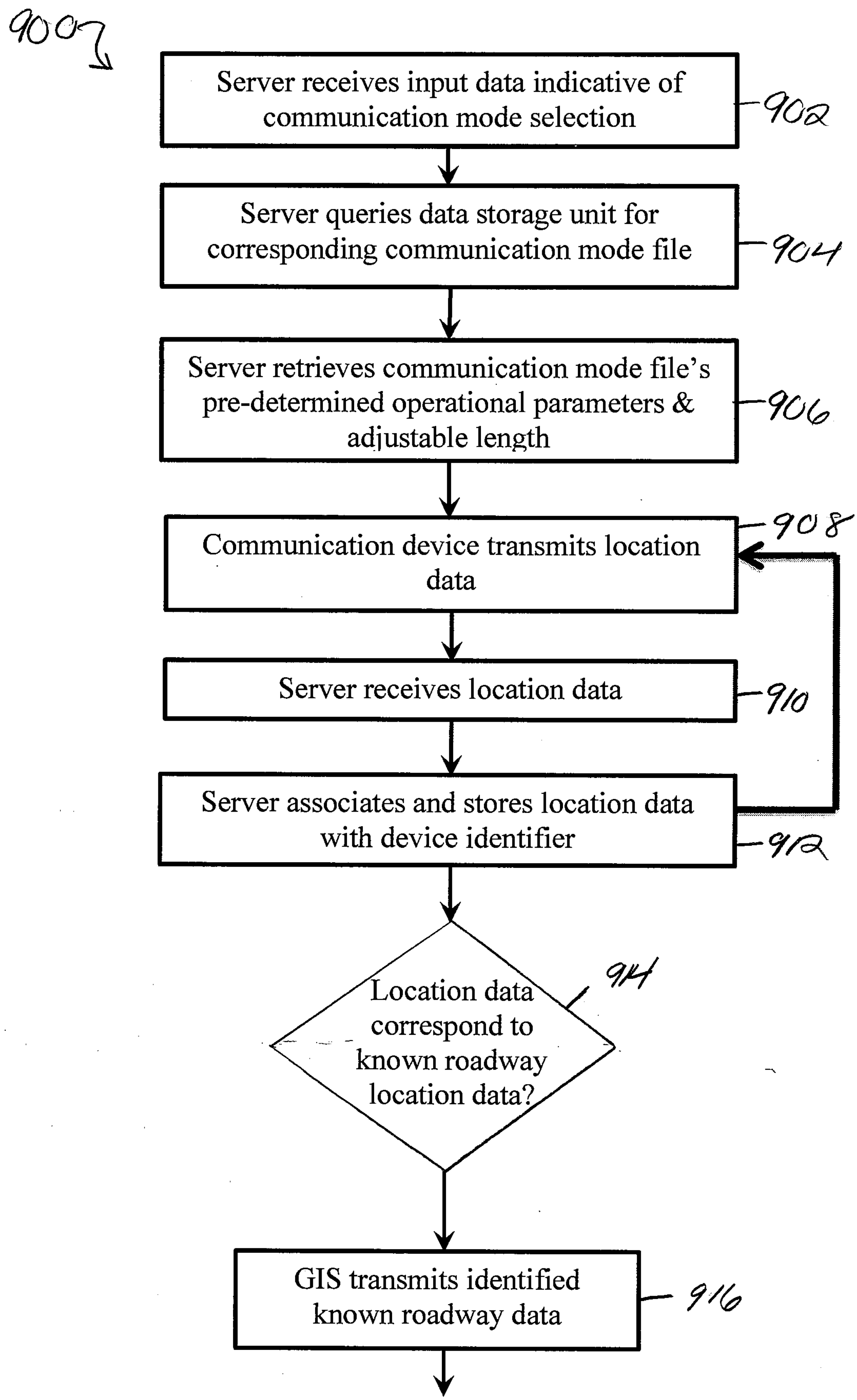

900
Server receives input data indicative of communication mode selection
902
Server queries data storage unit for corresponding communication mode file
904
Server retrieves communication mode file's pre-determined operational parameters & adjustable length
906
Communication device transmits location data
908
Server receives location data
910
Server associates and stores location data with device identifier
912
Location data correspond to known roadway location data?
914
GIS transmits identified known roadway data
916

Figure 9A

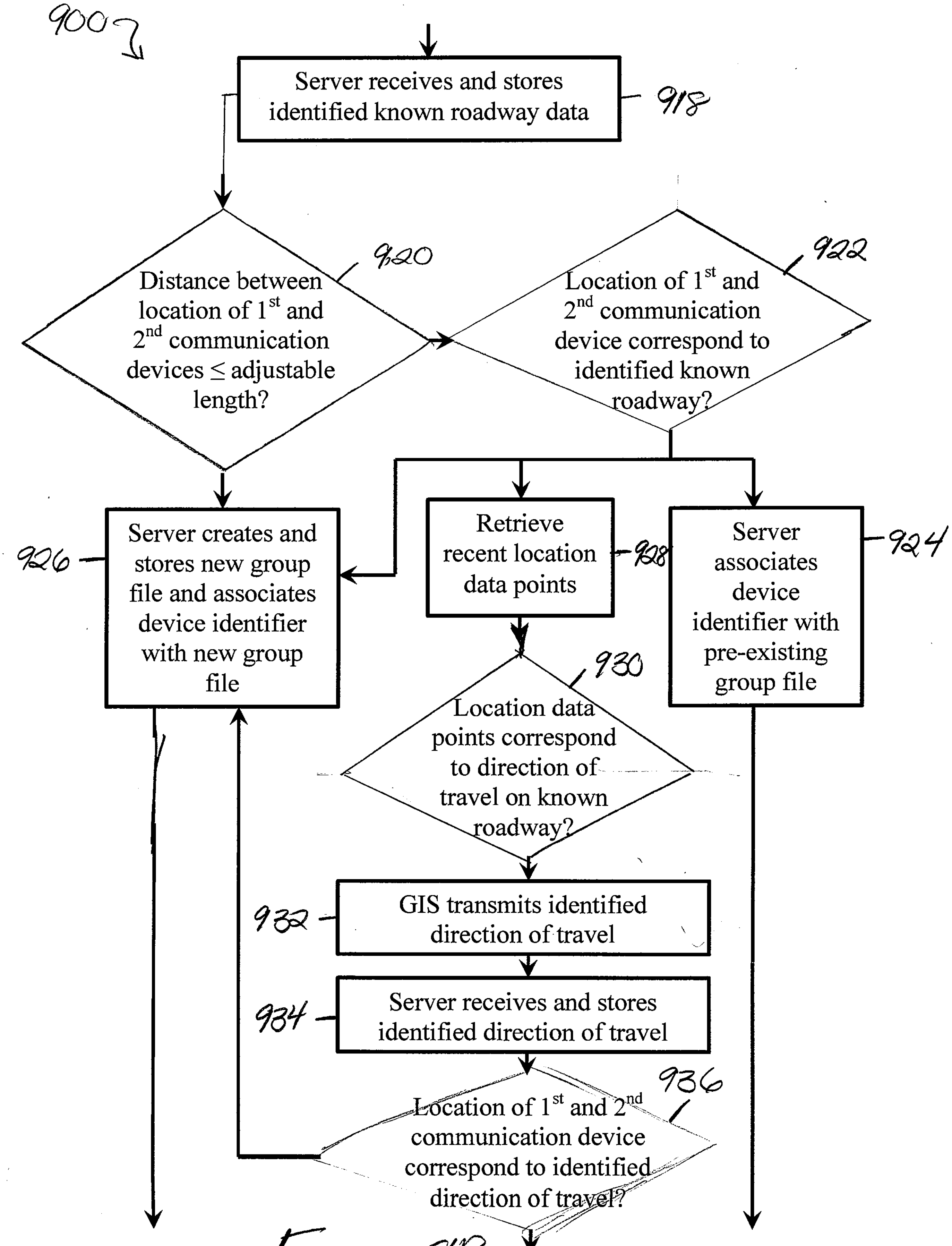

900
Server receives and stores identified known roadway data
918
Distance between location of 1st and 2nd communication devices ≤ adjustable length?
920
Location of 1st and 2nd communication device correspond to identified known roadway?
922
Server creates and stores new group file and associates device identifier with new group file
926
Retrieve recent location data points
928
Server associates device identifier with pre-existing group file
924
Location data points correspond to direction of travel on known roadway?
930
GIS transmits identified direction of travel
932
Server receives and stores identified direction of travel
934
Location of 1st and 2nd communication device correspond to identified direction of travel?
936

Figure 9B

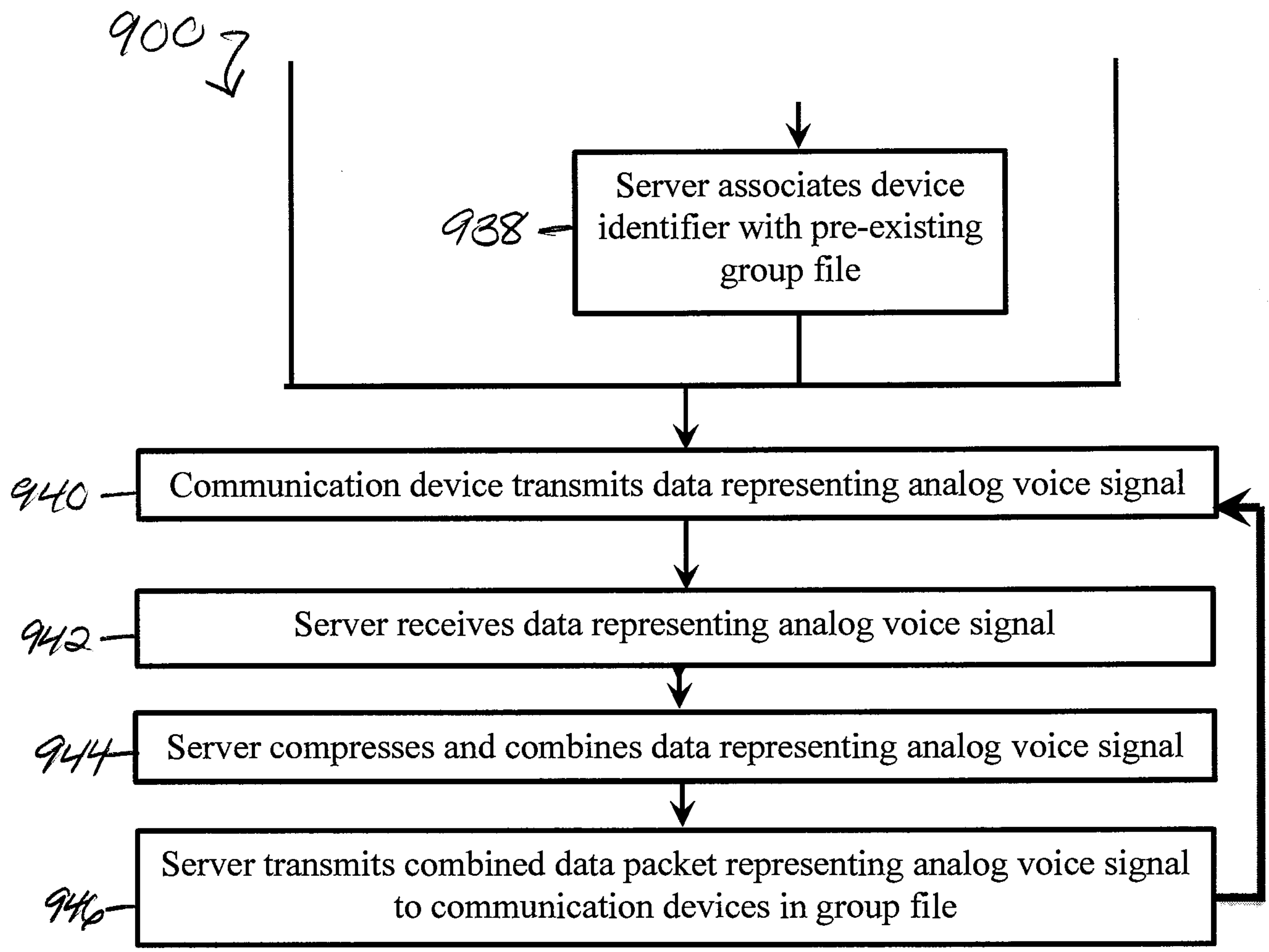

900
938
Server associates device identifier with pre-existing group file
940
Communication device transmits data representing analog voice signal
942
Server receives data representing analog voice signal
944
Server compresses and combines data representing analog voice signal
946
Server transmits combined data packet representing analog voice signal to communication devices in group file

Figure 9C

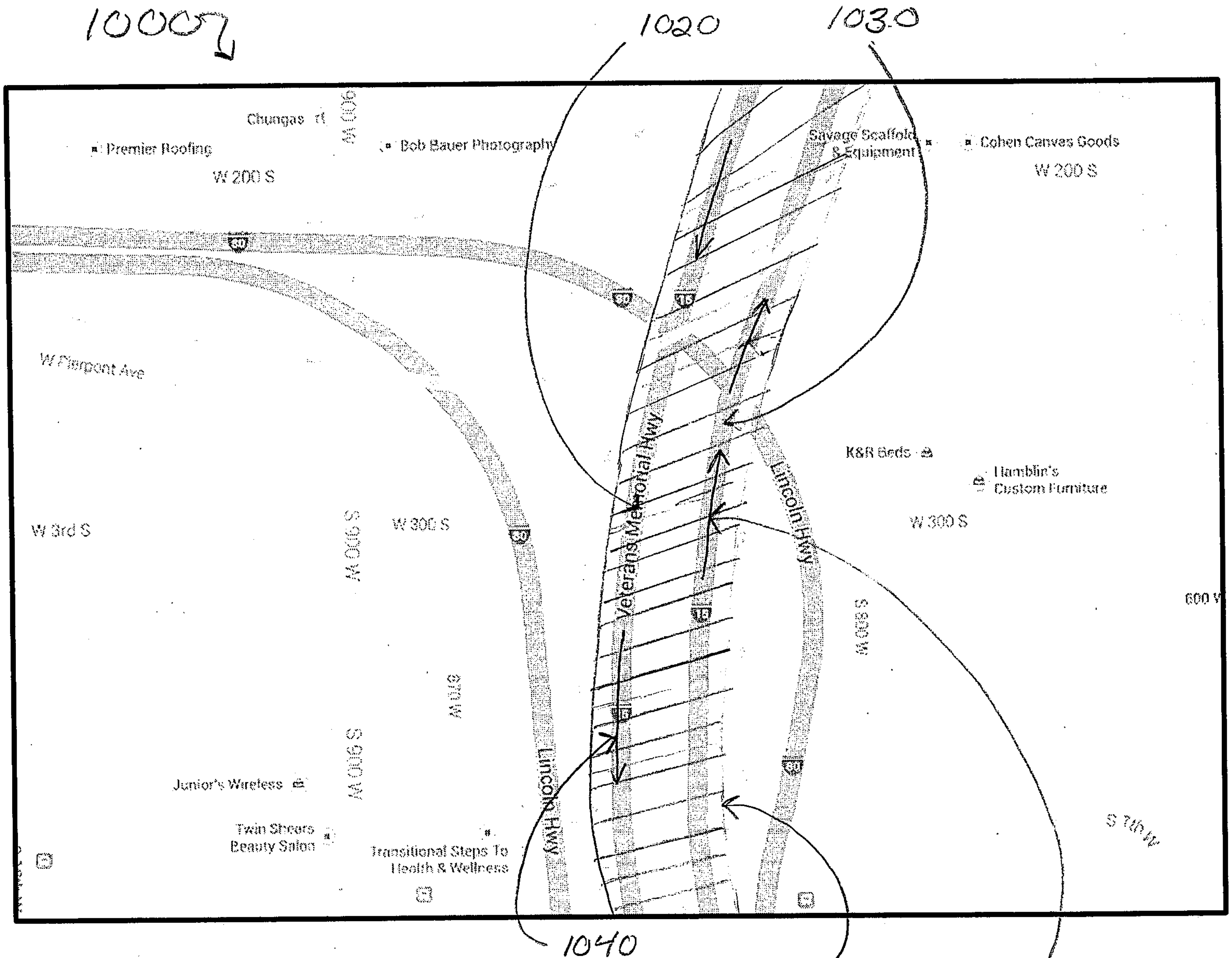

1000
1020
1030
Chungas
Premier Roofing
W 200 S
Bob Bauer Photography
Savage Scaffold & Equipment
Cohen Canvas Goods
W 200 S
W Pierpont Ave
K&R Beds
Hamblin's Custom Furniture
W 3rd S
W 300 S
Veterans Memorial Hwy
Lincoln Hwy
W 300 S
600 W
Junior's Wireless
Twin Shears Beauty Salon
Transitional Steps To Health & Wellness
Lincoln Hwy
S 7th W
1040
1010
1050

Figure 10

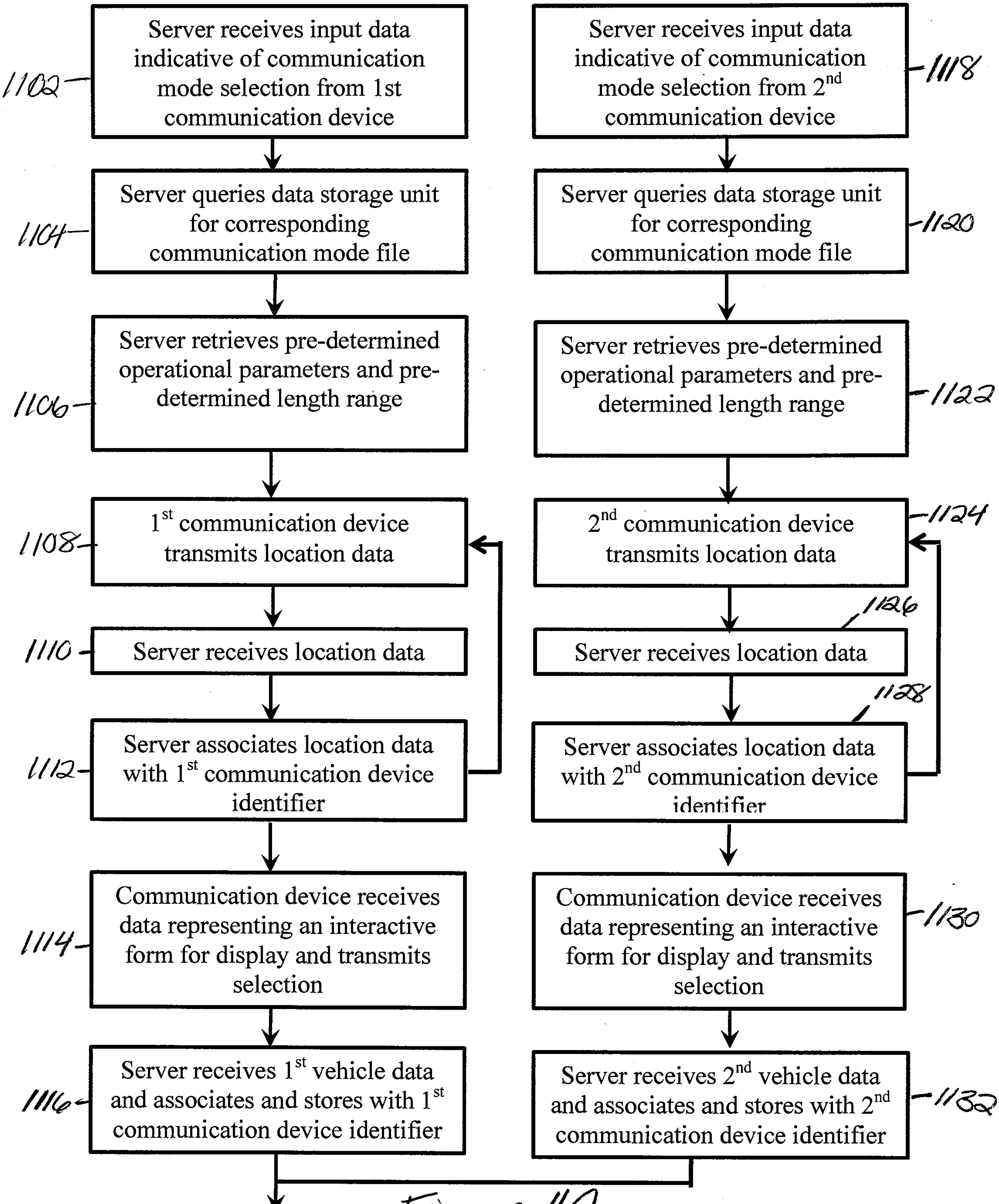

Server receives input data indicative of communication mode selection from 1st communication device
1102
Server queries data storage unit for corresponding communication mode file
1104
Server retrieves pre-determined operational parameters and pre-determined length range
1106
1st communication device transmits location data
1108
Server receives location data
1110
Server associates location data with 1st communication device identifier
1112
Communication device receives data representing an interactive form for display and transmits selection
1114
Server receives 1st vehicle data and associates and stores with 1st communication device identifier
1116
Server receives input data indicative of communication mode selection from 2nd communication device
1118
Server queries data storage unit for corresponding communication mode file
1120
Server retrieves pre-determined operational parameters and pre-determined length range
1122
2nd communication device transmits location data
1124
Server receives location data
1126
Server associates location data with 2nd communication device identifier
1128
Communication device receives data representing an interactive form for display and transmits selection
1130
Server receives 2nd vehicle data and associates and stores with 2nd communication device identifier
1132

Figure 11A

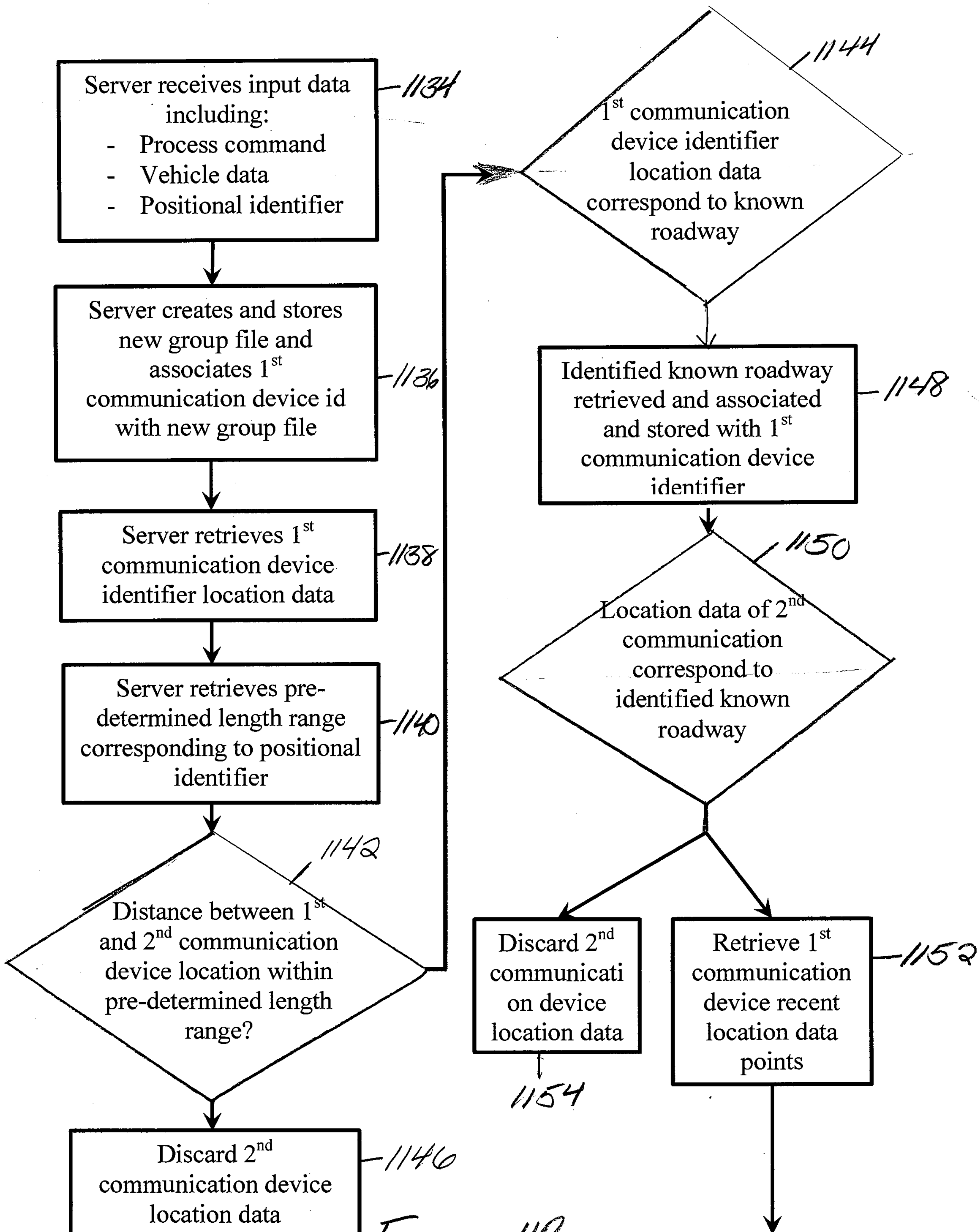

Server receives input data including:
- Process command
- Vehicle data
- Positional identifier
1134
Server creates and stores new group file and associates 1st communication device id with new group file
1136
Server retrieves 1st communication device identifier location data
1138
Server retrieves pre-determined length range corresponding to positional identifier
1140
Distance between 1st and 2nd communication device location within pre-determined length range?
1142
Discard 2nd communication device location data
1146
1st communication device identifier location data correspond to known roadway
1144
Identified known roadway retrieved and associated and stored with 1st communication device identifier
1148
Location data of 2nd communication correspond to identified known roadway
1150
Discard 2nd communication device location data
1154
Retrieve 1st communication device recent location data points
1152

Figure 11B

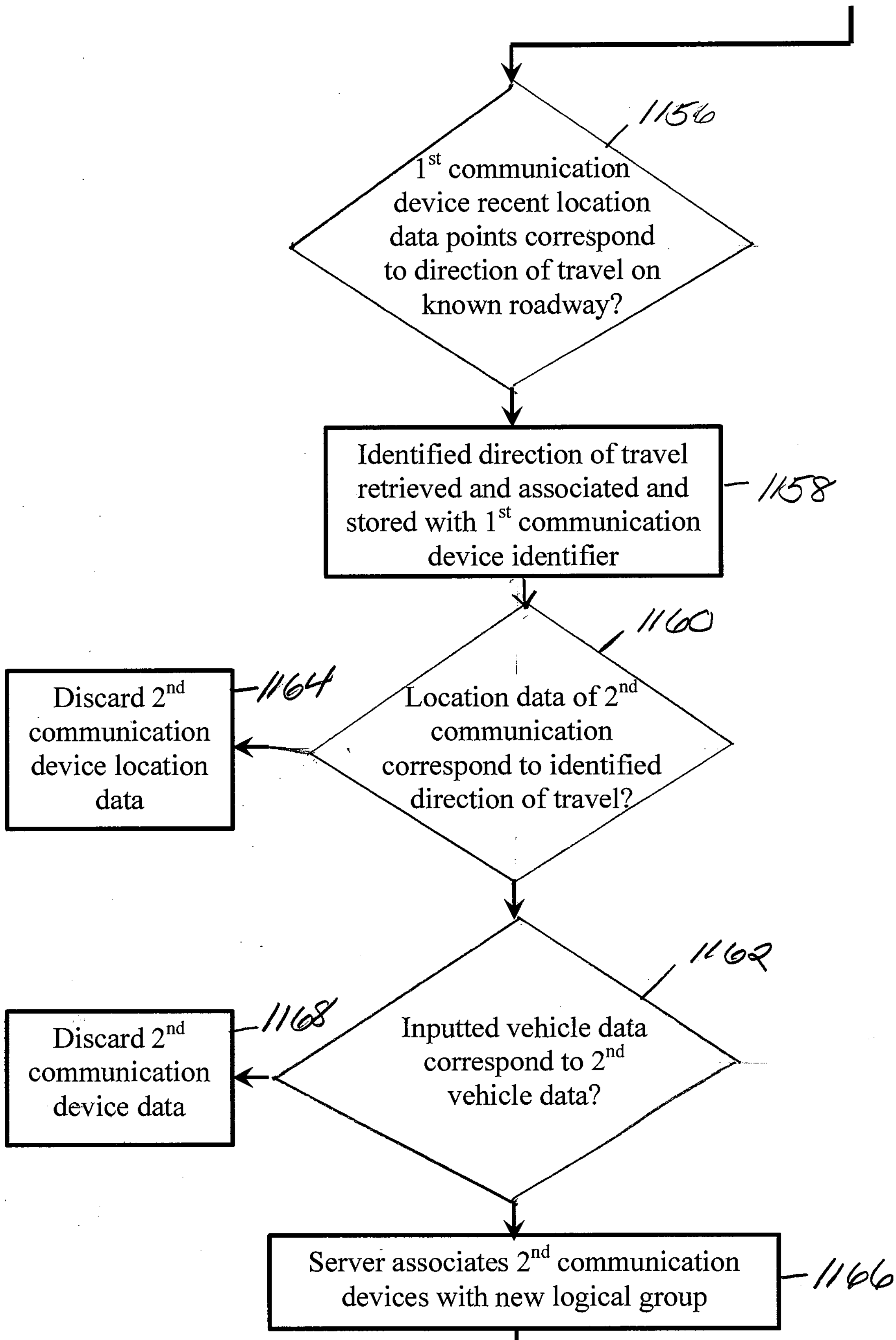

1156
1st communication device recent location data points correspond to direction of travel on known roadway?
Identified direction of travel retrieved and associated and stored with 1st communication device identifier
1158
1160
Discard 2nd communication device location data
1164
Location data of 2nd communication correspond to identified direction of travel?
1162
Discard 2nd communication device data
1168
Inputted vehicle data correspond to 2nd vehicle data?
Server associates 2nd communication devices with new logical group
1166

Figure 11C

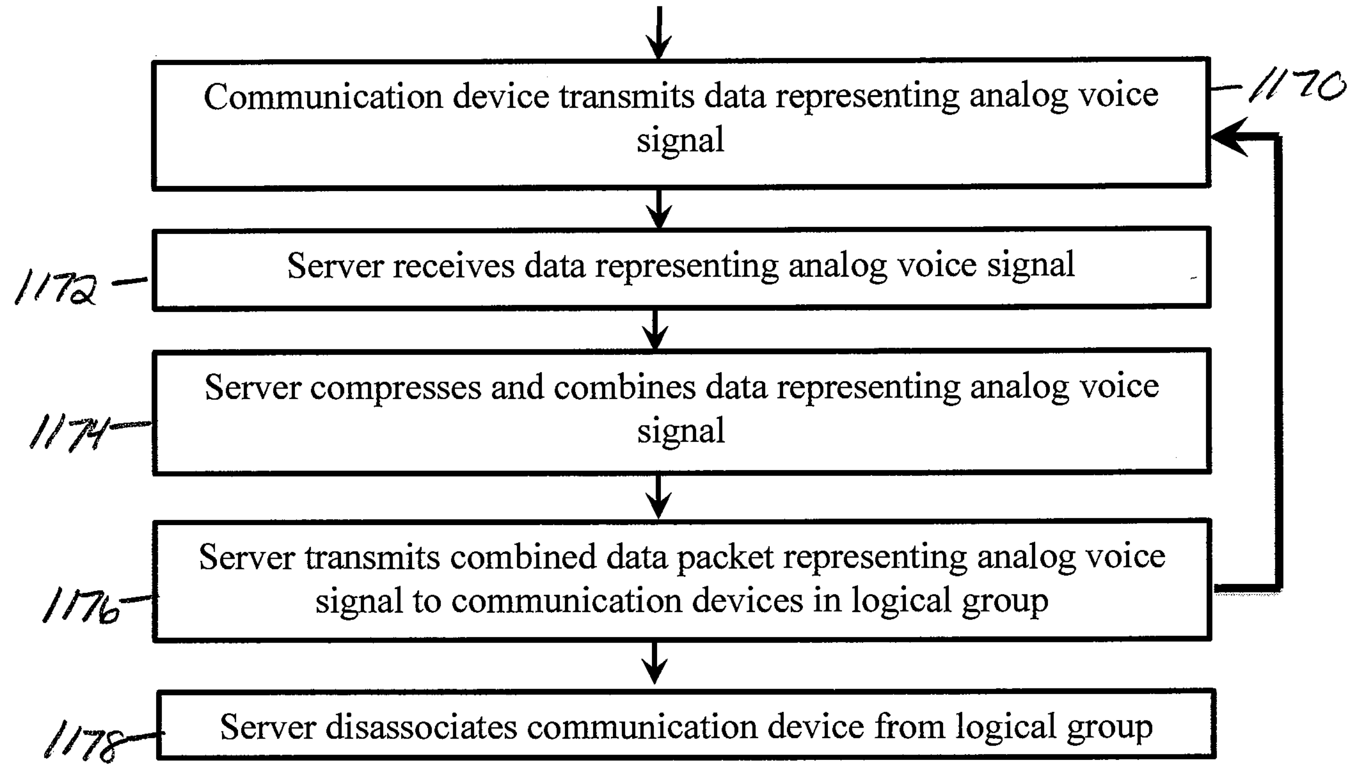

Communication device transmits data representing analog voice signal
1170
1172
Server receives data representing analog voice signal
Server compresses and combines data representing analog voice signal
1174
1176
Server transmits combined data packet representing analog voice signal to communication devices in logical group
1178
Server disassociates communication device from logical group

Figure 11D

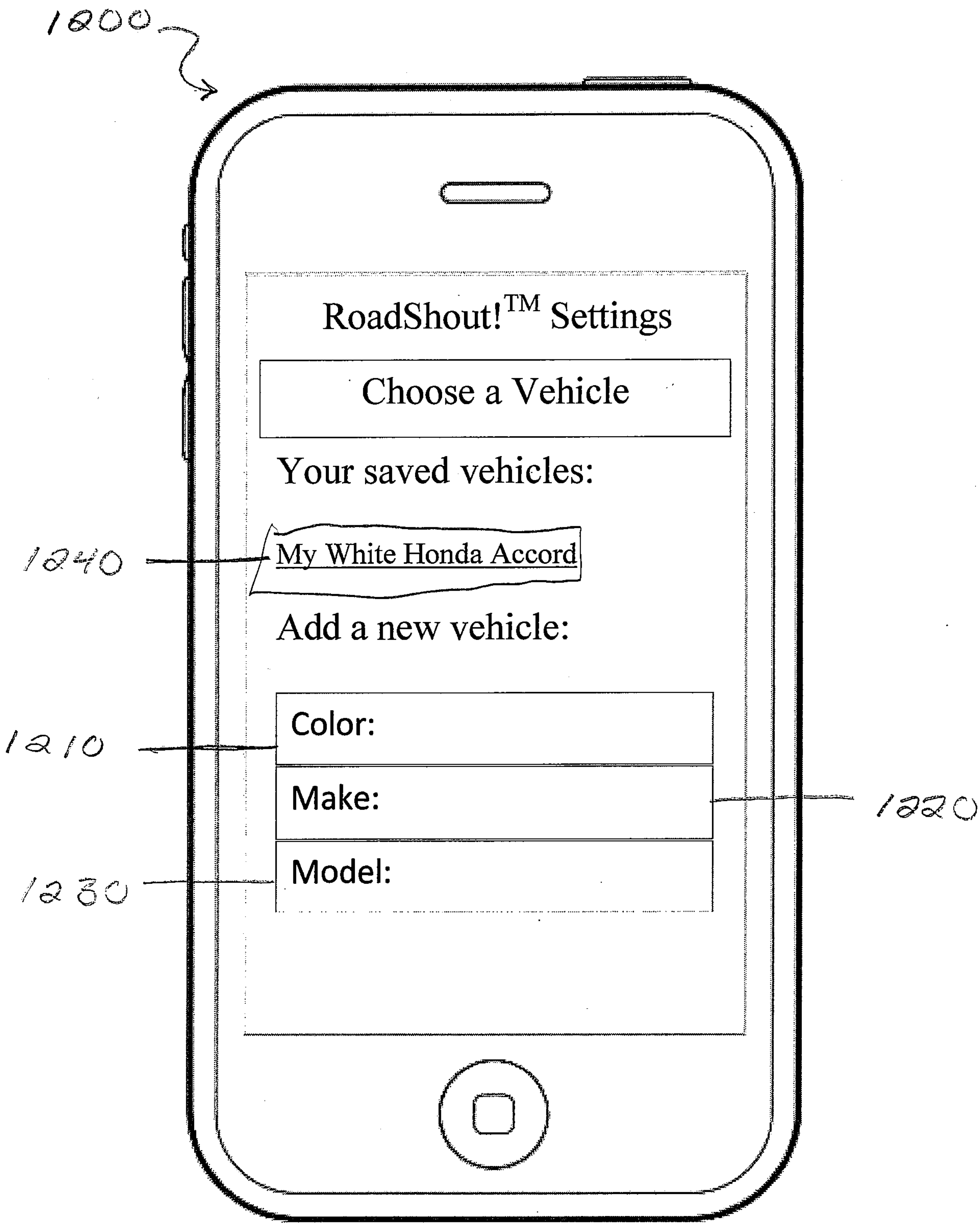

1200
RoadShout!™ Settings
Choose a Vehicle
Your saved vehicles:
1240
My White Honda Accord
Add a new vehicle:
1210
Color:
Make:
1220
1230
Model:

Figure 12

1800

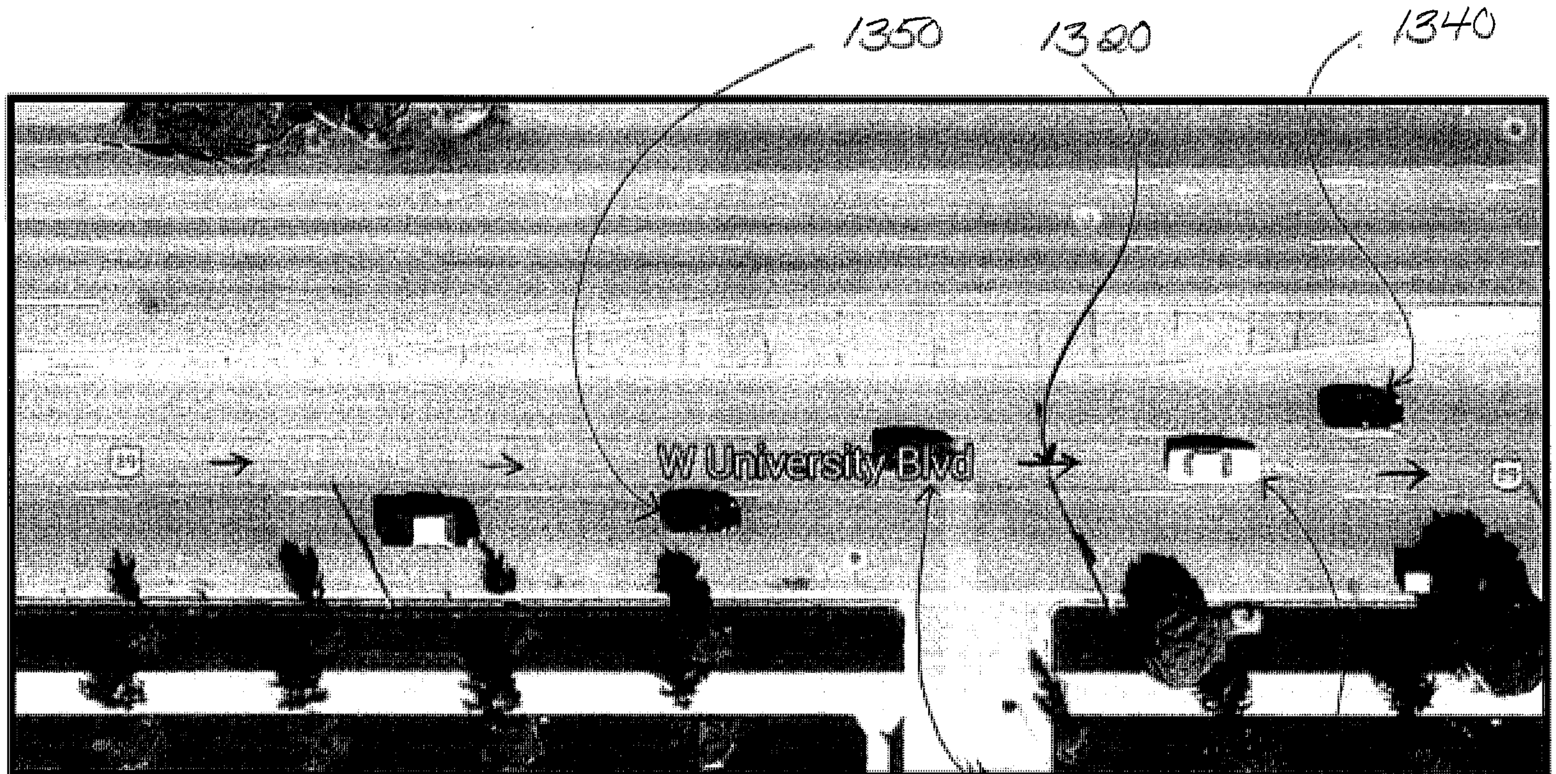


Figure 13

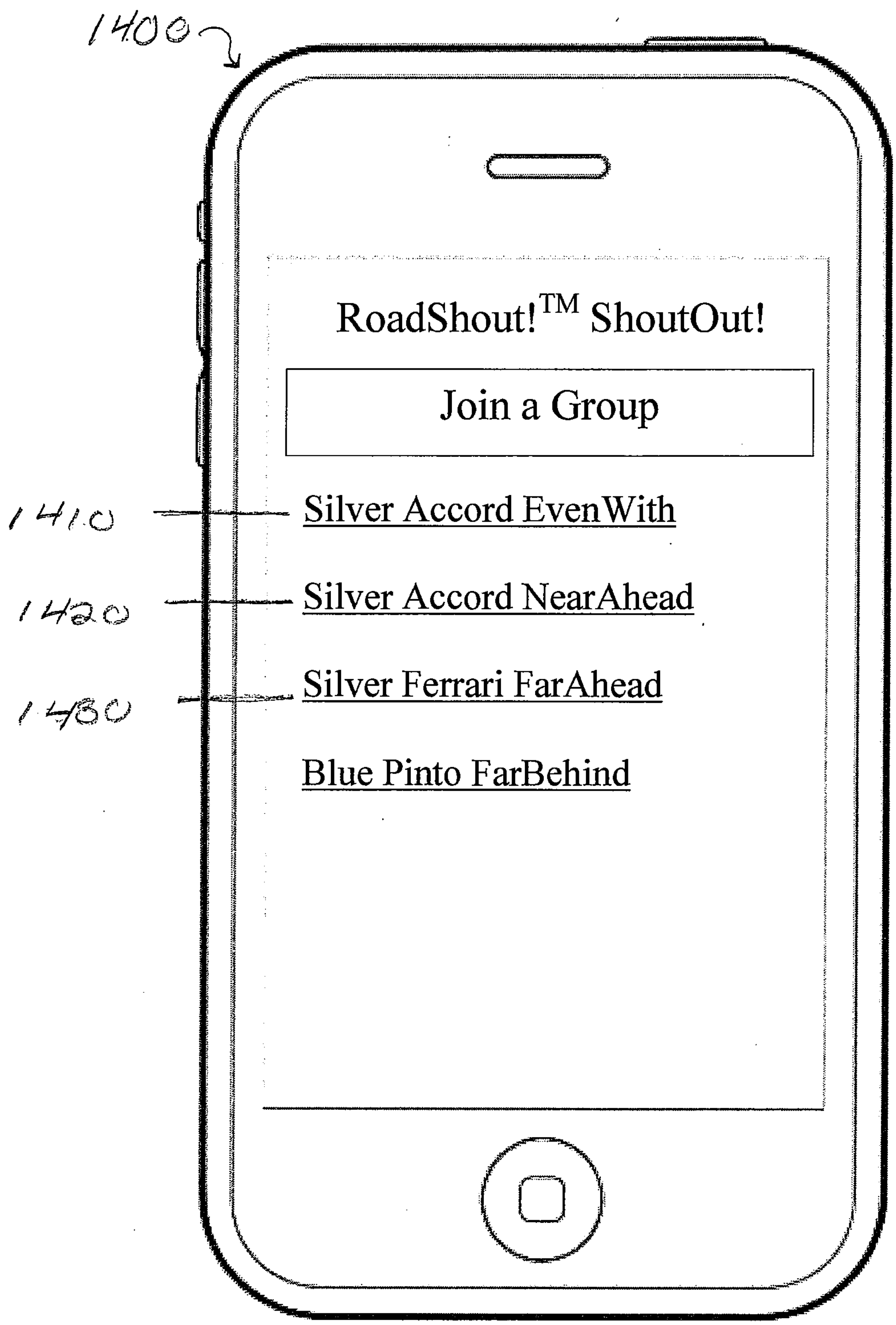

1400
RoadShout!™ ShoutOut!
Join a Group
1410
Silver Accord EvenWith
1420
Silver Accord NearAhead
1430
Silver Ferrari FarAhead
Blue Pinto FarBehind

Figure 14

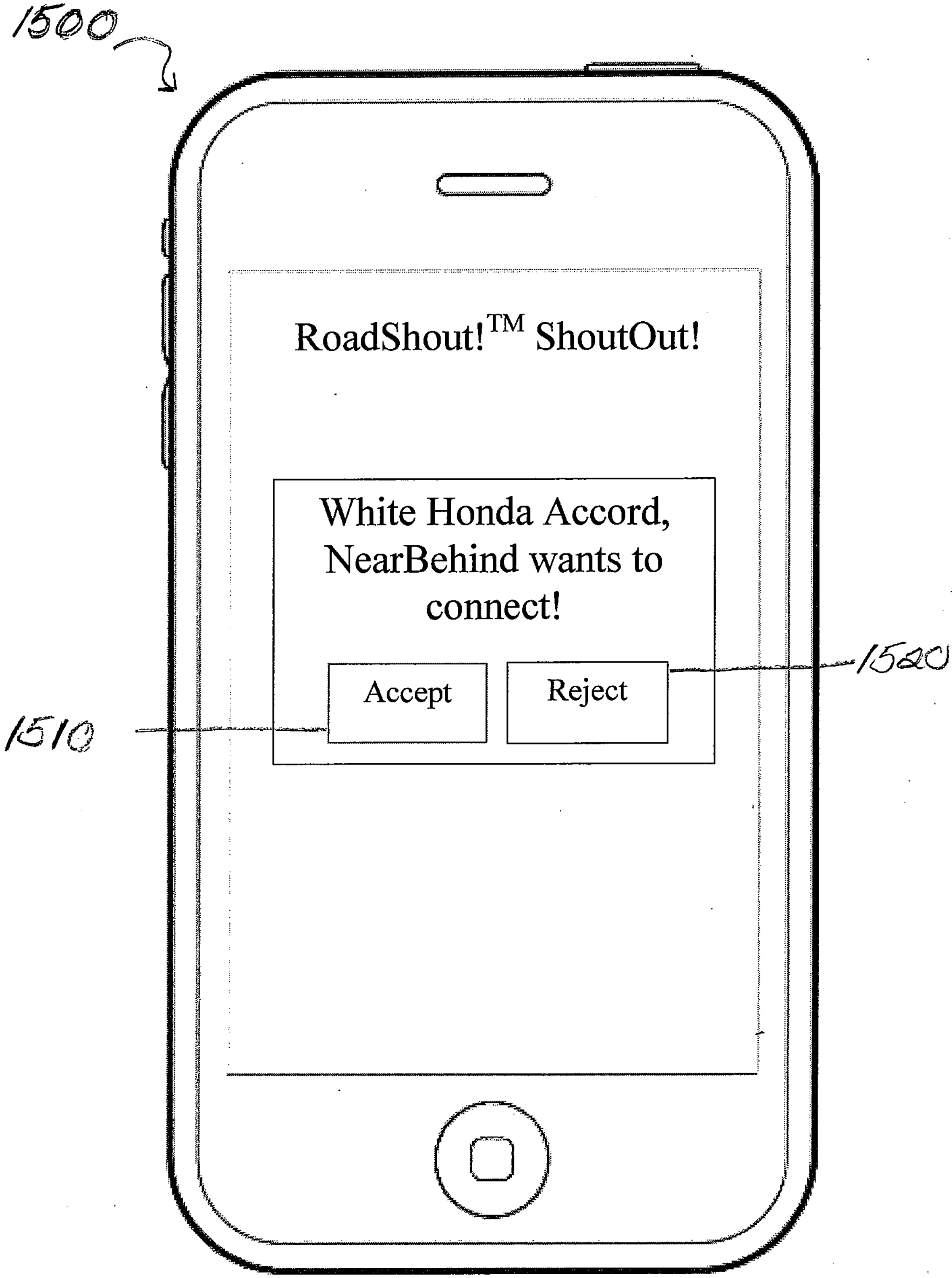

1500
RoadShout!™ ShoutOut!
White Honda Accord, NearBehind wants to connect!
Accept
Reject
1510
1520

Figure 15

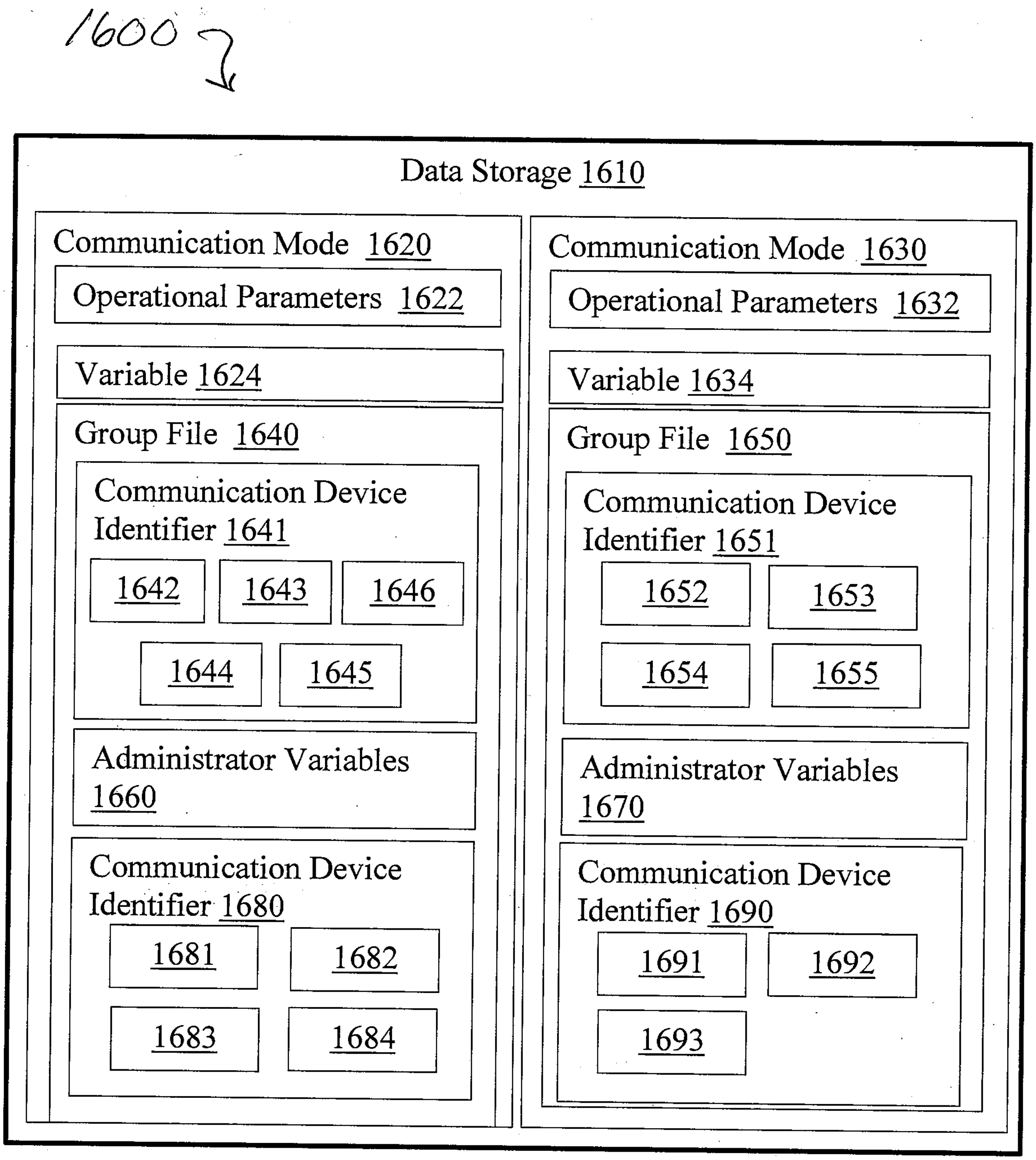

1600
Data Storage 1610
Communication Mode 1620
Operational Parameters 1622
Variable 1624
Group File 1640
Communication Device Identifier 1641
1642
1643
1646
1644
1645
Administrator Variables 1660
Communication Device Identifier 1680
1681
1682
1683
1684
Communication Mode 1630
Operational Parameters 1632
Variable 1634
Group File 1650
Communication Device Identifier 1651
1652
1653
1654
1655
Administrator Variables 1670
Communication Device Identifier 1690
1691
1692
1693

Figure 16