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(54) **A GROUP INTERACTION SYSTEM FOR INTERACTION WITH OTHER VEHICLES OF A GROUP**

GRUPPENINTERAKTIONSSYSTEM ZUR INTERAKTION MIT ANDEREN FAHRZEUGENEINER GRUPPE

SYSTEME D'INTERACTION DE GROUPES PERMETTANT D'INTERAGIR AVEC D'AUTRES VEHICULES D'UN GROUPE

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Description

[0001] The present invention relates generally to group interaction systems enabling interaction with people in other vehicles, and more specifically, to a group interaction system in a networked vehicle environment in which a user may interact with people in other vehicles of an enabled group by using their networked vehicle navigation systems.

[0002] Recently, vehicles have been equipped with navigation systems using global positioning systems (GPS). Conventional navigation systems using GPS pinpoint the current location of a vehicle by triangulation of GPS signals received from three satellites. Such conventional navigation systems typically read digital maps from a CD-ROM, DVD-ROM, or hard disk storing such digital maps, and are capable of indicating the current location of the vehicle on the digital map and guiding the user to a particular destination. However, conventional navigation systems are incapable of tracking the current location of vehicles other than the vehicle in which the navigation system resides.

[0003] Vehicles are also equipped with wireless communication systems such as cellular telephones or satellite telephones. Vehicle users may communicate with people in other vehicles by using such wireless communication systems. However, conventional wireless communication systems are incapable of providing a convenient way of communicating or interacting with a specific group of people or selected members of the group. In order to communicate with selected members of the group, the user of conventional wireless communication systems needs to place a call manually to the selected members of the group, while the user is driving on the road. Such primitive way of communicating or interacting with other members of the group is inconvenient and interruptive.

[0004] Conventional vehicle navigation systems cannot track the current location of other vehicles besides the vehicle in which the navigation system resides either, since they are not capable of communicating with other navigation systems residing in other vehicles. For example, a group of people may drive in separate vehicles to a common destination. In such situation, members of the group would like to track the current location of other members in each of the vehicles in the group so that they can stay together and do not get separated too far apart. Member of the group may also want to be able to communicate with other members in the group while they are driving to the destination in a convenient manner. However, conventional navigation systems fail to provide a way of tracking the location of other vehicles and interacting with them.

[0005] Some conventional two-way radio systems ("walkie-talkie") are equipped with GPS functionality and have the ability to send its position to the other walkie-talkie using radio signals, so that one user of the walkie-talkie may determine the position of another walkie-talkie.

Here, the GPS information of one user of the walkie-talkie is transmitted to the other walkie-talkie by radio frequency communication. However, these two-way radio systems fail to provide maintain a group of members, and location of the members may not be tracked in real-time because the GPS information is only manually transmitted and not updated continuously. Furthermore, anyone with such walkie-talkie may intercept the position information, so these walkie-talkies fail to provide privacy within a group.

[0006] Document US 2001/032236 discloses a portable multi-tracking system. Individuals are grouped into different user groups. Each user group has a group identification number or name, and one of the individuals in a user group is selected as a group server of that user group. Furthermore, it is possible for a user to select a user group of interest. Moreover, the locations of the other individuals of the specific group are overlaid on an electronic map on a display device of the system.

[0007] There is a need for an improved group interaction system in which members of the group may track each other's locations, and communicate or interact with each other in real time and in a convenient and non-interruptive manner. There is also a need for a method of establishing the group of members to be used with the group interaction system in a convenient and efficient and flexible manner.

[0008] This object is solved by a vehicle navigation system as set out in claim 1,

[0009] and by a method as set out in claim 10.

[0010] Further advantageous developments are defined in the dependent claims.

[0011] The group interaction system of the present invention comprises a plurality of vehicle navigation systems that are capable of communicating with one another in a group, tracking and displaying the location of each other and sharing an application for interaction among selected vehicle navigation systems. The user of the vehicle navigation system defines the group of vehicle navigation systems with which to interact using identification information corresponding to the vehicle navigation systems. The user selects one or more of the other vehicle navigation systems from the group and a software application for interaction with the selected vehicle navigation systems. In response, the vehicle navigation system of the present invention runs the selected application with respect to the selected vehicle navigation systems. The application may include a cellular telephone application.

[0012] In one embodiment of the present invention, the vehicle navigation system comprises a global positioning system (GPS) module receiving a GPS signal for determining the location of the vehicle navigation system, a wireless communications module for communicating with other vehicle navigation systems of a group and receiving location information of the other vehicle navigation systems in the group, a display device for displaying the location of the vehicle navigation systems in the group on a map and a list of one or more applications, and an input device such as a touch sensitive screen

coupled to the display device for receiving input commands corresponding to selection of one or more of the other vehicle navigation systems in the group shown one on the map and a selection of an application. A processor coupled to the touch sensitive screen runs the selected application with respect to the other vehicle navigation systems in the selected second vehicles.

[0013] In an embodiment falling outside the scope of the invention, the group interaction system also includes a vehicle network server facilitating the interaction among the vehicle navigation systems of a group. The vehicle network server comprises a wireless communications module for communicating with the vehicle navigation systems of the group. The wireless communications module receives from a vehicle navigation system a selection of one or more vehicle navigation systems with which to interact and a selection of an application for interaction among the selected vehicle navigation systems in the group. The vehicle network server also comprises a processor coupled to the wireless communications module for running the selected application with respect to the selected vehicle navigation systems.

[0014] The vehicle navigation system of the present invention enables its user to establish a group with which to interact while simultaneously tracking the location of the vehicle navigation systems in the group. The vehicle navigation system also provides a simple and convenient way of selecting certain members (or vehicle navigation systems) in the group for interaction. An application for interaction with the selected members may also be conveniently selected. The vehicle navigation system of the present invention is capable of running the selected application with respect to the selected members (or vehicle navigation systems).

[0015] The teachings of the present invention can be readily understood by considering the following detailed description in conjunction with the accompanying drawings.

FIG. 1A is a diagram illustrating a group interaction system according to a first embodiment.

FIG. 1B is a diagram illustrating a group interaction system according to a second embodiment of the present invention.

FIG. 2 is a block diagram illustrating a vehicle network server according to one embodiment.

FIG. 3A is a block diagram illustrating a vehicle navigation system according to a first embodiment.

FIG. 3B is a block diagram illustrating a vehicle navigation system according to a second embodiment of the present invention.

FIG. 4 is a graphical representation of the screen of the display device on a vehicle navigation system according to one embodiment of the present invention.

FIG. 5 is a flowchart illustrating a method of interacting with members within an enabled group using the vehicle navigation system according to one embodiment.

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FIG. 6A is a flowchart illustrating a method of establishing a group of members according to a first embodiment.

FIG. 6B is a flowchart illustrating a method of establishing a group of members according to a second embodiment of the present invention.

FIG. 7A is a flowchart illustrating a method of running the selected application with respect to the vehicle navigation system and the selected members according to one embodiment.

FIG. 7B is a flowchart illustrating a method of running the selected application with respect to the vehicle navigation system and the selected members according to another embodiment.

FIG. 7C is a flowchart illustrating a method of running the selected application with respect to the vehicle navigation system and the selected members according to still another embodiment.

[0016] The embodiments will be described below with reference to the accompanying drawings. Like reference numerals are used for like elements in the accompanying drawings.

[0017] FIG. 1A. is a diagram illustrating a networked group interaction system 100a according to a first embodiment. The networked group interaction system 100a includes a plurality of vehicles 106a, 108a, 110a, a communications service provider 104, a vehicle network server 102, and a service operator 103a. The vehicle network server 102 is also shown connected to the Internet 112. the vehicles 106a, 108a, 110a include vehicle navigation systems 300a, 300b, 300c, respectively, for use in the networked group interaction system 100a of the present invention. Although the group interaction system 100a is shown with three vehicles 106a, 108a, 110a, it should be clear to one skilled in the art that any plurality of vehicles and corresponding vehicle navigation systems may be used.

[0018] The navigation systems 300a, 300b, 300c are capable of performing the functions of conventional navigation systems and are also configured to establish a group of members associated with other navigation systems 300a, 300b, 300c and communicate/interact with other navigation systems 300a, 300b, 300c in the group in accordance with the embodiment. That is, the navigation systems 300a, 300b, 300c are capable of displaying the corresponding vehicle's location by using conventional Global Position Systems (GPS) (not shown) installed therein. In addition, the navigation systems 300a, 300b, 300c in the vehicles 106a, 108a, 110a, respectively, are capable of wireless communication 126, 128, 130, preferably cellular communication, through the communications service provider 104. The communication service provider 104 communicates with the vehicle network server 102a via a wired communication (e.g., a telephone line) 124, although wireless communication may also be used. The communications service provider 104 may be

any conventional cellular telephone service provider.

[0019] Referring to FIG. 1A, the group interaction system 100a enables communication and interaction with members of an enabled group according to the methods described in FIGS. 5, 6A, 6B, 7A, and 7B using the navigation systems 300a, 300b, 300c. The vehicle navigation systems 300a, 300b, 300c in the vehicles 106a, 108a, 110a, respectively, are capable of wireless communication or interaction with one another. In the group interaction system 100a of FIG. 1, wireless communication or interaction among selected members of the enabled group (selected users of the vehicle navigation systems 300a, 300b, 300c) is accomplished via the communication service provider 104a and the vehicle network server 102. The group interaction system 100a is a star topology with the vehicle network server 102 being at the center of the star, such that all communication or interaction among the selected members is accomplished through the vehicle network server 102. For example, the navigation system 300a in vehicle 106a may transmit control signals to the vehicle network server 102a via the communications service provider 104a in order to establish wireless communication or other types of interaction with the navigation system 304b in vehicle 108a. In response, the vehicle network server 102a establishes wireless communication or interaction between the navigation system 300a in vehicle 106a and the navigation system 300b in the vehicle 108a of the enabled group. As stated above, the wireless communication between the navigation systems 300a, 300b, 300c is preferably a cellular telephone communication, although it should be clear to one skilled in the art that other types of wireless communication such as satellite communication, short-range radio communication, or IEEE 802.11(b) standard communication may be used.

[0020] The navigation systems 300a, 300b, 300c may also transmit or receive GPS information of the corresponding vehicles 106a, 108a, 110a, to other navigation systems 300a, 300b, 300c within the group using wireless communication through the vehicle network server 102. For example, navigation system 300a may receive the GPS information of vehicles 108a, 110a, from the navigation systems 300b, 300c, respectively, through the vehicle network server 102 and the communications service provider 104a. The GPS information of the other vehicles 108a, 110a may be displayed, on a display of the navigation system 300a along with the GPS information of its own vehicle 106a.

[0021] The vehicle navigation systems 106a, 108a, 110a, are capable of transmitting and receiving GPS information and control signals selecting groups and applications along with the data (e.g., voice data and control signals for cellular telephone calls) required for running applications among selected members simultaneously to and from the vehicle network server 102. The data required for running applications are transmitted and received via conventional cellular telephone communication (such as GSM) while the GPS information and control

signals for selecting groups and applications are transmitted and received using text messaging (short messaging service) in cellular telephone communication.

[0022] An optional service operator 103a coupled to the vehicle network server 102 may also provide various services to the members in the group, such as providing live operator service, voice mail service, and the like. The service operator 103a may also be capable of establishing wireless communication among the navigation systems 300a, 300b, 300c manually, in case the vehicle network server 102 becomes incapable of automatically establishing such wireless communication. The communication between the server operator 103a and the vehicle network server 102 is preferably carried out by wired communication 122.

[0023] The group interaction system 100a establishes the group of members for wireless communication or other types of interaction using various methods such as those described in FIGS. 6A and 6B. For example, the group may be established in the navigation systems 300a, 300b, 300c by manual input by its users. The group may also be input and stored on a web server (not shown) on the Internet 112 and downloaded from the web site to the vehicle network server 102 via wired data communication 120. The vehicle network server 102 in turn provides the group information to the respective navigation systems 300a, 300b, 300c via the communications service provider 104a. It should be clear to one skilled in the art that various methods of establishing an interactive group for the vehicle navigation systems 300a, 300b, 300c may be used.

[0024] The group information for the group interaction system 100a contains various information regarding the members in the group, such as the identification of each vehicle navigation system 300a, 300b, 300c and the vehicle identification numbers of the corresponding vehicles 106, 108, 110 by their user names or any other type of identification, and a cellular telephone number corresponding to each of the navigation systems 300a, 300b, 300c. The group information may also contain other information, such as the applications available on the respective navigation systems 300a, 300b, 300c for interaction with other members of the group.

[0025] The group interaction system 100 according to the first embodiment may be used to establish a group of members for interaction, track the location of the members in real-time, and to communicate or interact with selected members of the group by wireless communication. For example, the user of the navigation system 300a in vehicle 106 may establish a group including the navigation systems 300a, 300b, 300c in vehicles 106a, 108a, 110a, respectively. Each navigation system 300a, 300b, 300c keeps track of the location of all the vehicles in the group in real time using its own GPS information and the GPS information received from other vehicles 106a, 108a, 110a via the vehicle network server 102. Each member in the group may select some of the members in the group using the navigation systems 300a, 300b,

300c and communicates or interact with the selected members via wireless communication. The manner in which members in the group are selected using the navigation systems and wireless communication or interaction among the selected members is accomplished will be described in detail below with reference to FIGS. 2-5, 6A-6B, and 7A-7B.

[0026] FIG. 1B is a diagram illustrating a networked group interaction system 100b according to the present invention. In contrast to the group interaction system 100a shown in FIG. 1A that uses a vehicle network server 102, the group interaction system 100b in FIG. 1B is modified to be a peer-to-peer system enabling wireless communication without the use of a vehicle network server 102.

[0027] The networked group interaction system 100b includes a plurality of vehicles 106b, 108b, 110b, a communications service provider 104b, and an optional service operator 103b. The vehicles 106b, 108b, 110b include vehicle navigation systems 300d, 300e, 300f, respectively, for use in the networked group interaction system 100b of the present invention. Although the group interaction system 100b is shown with three vehicles 106b, 108b, 110b and three corresponding vehicle navigation systems 300d, 300e, 300f, it should be clear to one skilled in the art that any number of vehicles and corresponding vehicle navigation systems may be used consistent with the present invention.

[0028] The navigation systems 300d, 300e, 300f are different from the navigation systems 300a, 300b, 300c in FIG. 1A, in that they are capable of establishing groups of members and communicating wirelessly with other navigation systems without the use of a vehicle network server. That is, the navigation systems 300d, 300e, 300f are capable peer-to-peer wireless communication 140, 146, 150 among selected members within the group without the use of a vehicle network server. The details of the operations of the vehicle navigation systems 300d, 300e, 300f will be explained below with reference to FIG. 3B. The wireless communication is preferably cellular communication, although any other type of wireless communication may be used. The navigation systems 300d, 300e, 300f are also capable of displaying the corresponding vehicle's location using conventional Global Positioning Systems (GPS) (not shown) installed therein.

[0029] Referring to FIG. 1B, the group interaction system 100b enables communication and interaction with members of a group according to the methods described in FIGS. 5, 6A, 6B, 7A, and 7B by using the navigation systems 300d, 300e, 300f. The vehicles navigation systems 300d, 300e, 300f in the vehicles 106b, 108b, 110b, respectively, are capable of wireless communication or interaction with one another. In the group interaction system 100b of FIG. 1B, wireless communication or interaction among selected members of the enabled group (selected users of the vehicle navigation systems 300d, 300e, 300f) is accomplished, without the use of a vehicle network server. For example, the navigation system 300d

in vehicle 106b may establish wireless communication or other types of interaction with the navigation system 300e in vehicle 108b directly via short-range radio communication 140 or indirectly via the communications service provider 104b, without the use of a vehicle network server. The wireless communication 140, 146, 150 between the navigation systems 300d, 300e, 300f themselves is preferably short range radio communication or IEEE 802.11b communication, but it should be clear to one skilled in the art that other types of wireless communication such as cellular communication or satellite communication may be used in accordance with the present invention.

[0030] The navigation systems 300d, 300e, 300f may also transmit or receive GPS information of the corresponding vehicles 146b, 108b, 110b, respectively, to other navigation systems 300d, 300e, 300f within the group using wireless communication directly 140, 146, 150 or indirectly via the communications service provider 104b, but without the use of a vehicle network server. For example, navigation system 300d may receive the GPS information of vehicles 108b, 110b, from the vehicle navigation systems 300e, 300f, respectively. The GPS information is transmitted directly by using short-range radio communication 140, 146, 150. The GPS information of the other vehicles 108b, 110b may be displayed on a display of the vehicle navigation system 300d along with the GPS information of its own vehicle 106b. Other control signals such as selection of group members and applications are also transmitted directly 140, 146, 150 by using short range radio communication.

[0031] On the other hand, data required for interaction among selected members of the group such as voice data in cellular telephone calls among the vehicle navigation systems 300d, 300e, 300f is transmitted and received among the vehicle navigation systems 300d, 300e, 300f via separate communication channels 142, 144, 148 though the communications service provider 104b. The communication channels 142, 144, 148 are preferably cellular communication channels.

[0032] An optional service operator 103b may also be coupled to the communication service provider 104b via wired communication 152 and provide various services to the members in the group, such as live operator service, voice mail service, and the like.

[0033] The group interaction system 100b establishes the enabled group for wireless communication or other types of interaction using various methods such as those described in FIGS. 6A and 6B. For example, the group may be established in the navigation systems 300d, 300e, 300f by manual input by its users. It should be clear to one skilled in the art that various methods of establishing an interactive group for the navigation systems may be used consistent with the present invention.

[0034] The group information for the group interaction system 100b contains various information regarding a plurality of members in the group, such as the identification of each vehicle navigation system 300d, 300e, 300f

by their user names or any other type of identification, the vehicle identification numbers of the corresponding vehicles 106b, 108b, 110b, and cellular telephone numbers corresponding to the navigation systems 300d, 300e, 300f. The group information may also contain other information, such as information regarding the applications, available on the respective navigation systems 300d, 300e, 300f for interaction with other members of the group.

[0035] Similar to the group interaction system 100a in FIG. 1A, the group interaction system 100b according to the present invention may be used to establish a group of members for interaction, track the location of the members, and to communicate or interact with selected members of the group by wireless communication. However, the group interaction system 100b of FIG. 1B is different from the group interaction system 100a of FIG. 1A, in that it is capable of peer-to-peer communications among the members without the use of a vehicle network server 102. Here, the vehicle navigation system 300d, 300e, 300f initiating the group interaction process will establish the group and share the group information with other members of the group by transmitting such group information to the other vehicle navigation systems 300d, 300e, 300f via direct wireless communication 140, 146, 150. The manner in which members in the group are selected using the navigation systems and wireless communication or interaction among the selected members is accomplished will be described in detail below with reference to FIGS. 2-5, 6A-6B, and 7A-7B.

[0036] FIG. 2 is a block diagram illustrating a vehicle network server 102 according to one embodiment. The vehicle network server 102 is used with the group interaction system 100a shown in FIG. 1A in order to provide interaction among members of a group of vehicle navigation systems 300a, 300b, 300c.

[0037] Referring to FIG. 2, the vehicle network server 102 includes an input device 204, a processor 206, a memory device 208, a display device 210, a data communication module 214, and a wireless communications module 216. The wireless communications module 216 is preferably a cellular telephone interface, although other types of wireless communication such as satellite communication, short-range radio communication, or communication according to the IEEE 802.11b standard, may be used. The wireless communication module 216 is capable of communicating with the various navigation systems 300a, 300b, 300c of FIG. 1 via the communications service provider 104a. The wireless communication 124 between the vehicle network server 102 and the communications service provider 104a is preferably cellular telephone communication. The wireless communications module 216 receives various control information from the navigation systems 300a, 300b, 300c, such as information regarding selection of a group, selection of members in the group, various information regarding the members of the group (e.g., identification of the members, cellular telephone numbers, etc.), selection of an application

to launch among selected members, GPS information of the member vehicle navigation systems, etc. via the communication service provider 104a. Such control information is transmitted via text messaging of the cellular communication 124 between the communications service provider 104a and the vehicle network server 102. Such control information received by the wireless communications module 216 is stored in the memory device 208 for use by the vehicle network server 102. The wireless communications module 216 also transmits and receives interactive application data, such as actual voice data and associated control signals for cellular telephone calls, to and from the vehicle navigation systems 300a, 300b, 300c via the communications service provider 104a using cellular communication 124.

[0038] The data communication module 214 is a conventional interface that enables connection to a data communication networks such as the Internet. The data communication module 214 may be a standard Ethernet interface or the like. The data communication module 214 receives various information from the Internet 112. For example, users of the navigation systems 300a, 300b, 300c may establish a group for interaction on a web server using a web page on the Internet 112, with all the information (e.g., identification of members, cellular telephone numbers of members, etc.) used for establishing the group and communicating or interacting with members in the group. Such group information may also be used as the default group information in case no group information is input to the vehicle navigation systems 300a, 300b, 300c. The vehicle network server 102 may also operate as the web server on the Internet 112. The group information stored on the web server on the Internet 112 may be downloaded to the vehicle network server 102 via the data communication module 214 and eventually transmitted to the navigation systems 300a, 300b, 300c via the wireless communications module 216 and the communications service provider 104a. Each vehicle navigation system 300a, 300b, 300c stores the group information in the memory device 208.

[0039] The processor 206 controls the operation of the various components in the vehicle network server 102, including the input device 204, the memory device 208, the display device 210, the data communications module 214, the wireless communications module 216, via the bus 218. To this end, the processor 206 executes instructions or programs stored in the memory device 208 to provide various functionalities of the vehicle network server 102, such as establishing a group, establishing communication among selected members of the group, running an application associated with selected members of the group, and the like.

[0040] The memory device 208 operates as a working memory for the processor 206 and also stores various information used by the vehicle network server 102 and/or the vehicle navigation systems 300a, 300b, 300c. The memory device 208 includes a group data module 220, an O/S (operating system) module 222, a group

establishment module 224, and an applications module 226. The O/S module 222 stores the operating systems or boot-up sequences for the vehicle network server 102. The group data module 220 stores all the group information such as group member list, identification of the group members, and the like. The group establishment module 224 stores instructions and programs for establishing a group of members according to the methods described in FIGS. 6A and 6B. The applications module 226 stores various applications for interaction with selected members of the group, such as a cellular telephone application, game application, and the like. The memory device 208 is preferably a rewritable memory such as an SRAM, flash memory, or hard disk.

[0041] In a more distributed system according to another embodiment, the memory device 208 may store less information, such that the group information, the applications, and/or the information for establishing a group are stored in the vehicle navigation systems 300a, 300b, 300c themselves rather than the in the vehicle network server 102.

[0042] The display device 210 displays information used for interaction with live operators when the live operators are directly using the vehicle network server 102 to service the vehicle navigation systems 300a, 300b, 300c. In such case, the input device 204 is used by the live operators to input data and commands to the vehicle network server 102. The input device 204 may be any type, such as a keyboard, a touch screen input, or the like. For example, live operators may manually input group information in response to a request received from a user of a vehicle navigation system 300a, 300b, 300c via the wireless communications module 216. As discussed above, the live operators may also be based in a service operator 103 communicatively coupled to the vehicle network server 102, in which case the display device 210 and the input device 204 is optional components of the vehicle network server 102.

[0043] The vehicle network server 102 operate in conjunction with the vehicle navigation systems 300a, 300b, 300c to provide the group interaction functions of the present invention. For example, the vehicle network server 102 may store group information (member list, member identification, members' cellular telephone numbers, etc.) in group data module 220 of the memory device 208 for use by the vehicle navigation systems 300a, 300b, 300c. The processor 206 in the vehicle network server 102 may also download such group information to the vehicle navigation systems 300a, 300b, 300c via the wireless communications module 216. The vehicle network server 102 may receive a request to establish communication or run a selected application (e.g., a cellular telephone call or an interactive game) with respect to selected members in the group from the vehicle navigation systems 300a, 300b, 300c via the wireless communications module 216. In response, the processor 206 in the vehicle network server 102 may run the selected application stored in the application module 226 of the mem-

ory device 208 with respect to the selected members via the wireless communications module 216 and the communications service provider 104 or establish wireless communications by placing a group call to the selected members.

[0044] FIG. 3A is a block diagram illustrating a vehicle navigation system 300a according to a first embodiment. The vehicle navigation system 300a in FIG. 3A is used with the group interaction system 100a in FIG. 1A. Referring to FIG. 3A, the vehicle navigation system 300a includes a touch sensitive screen 301, a GPS module 302, an input device 304, a speech recognition/synthesis module 305, a processor 306, a memory device 308, a display device 310, a wireless communications module 316, and a bus 318. The vehicle navigation system 300a is capable of performing the group establishment and interaction functions according to the present invention in addition to the functions of conventional vehicle navigation systems such as displaying the location of the vehicle in which the vehicle navigation system 300a resides on a displayed map.

[0045] The wireless communications module 316 is preferably a cellular telephone interface (such as a GSM telephone interface). The wireless communications module 216 is capable of communicating with the various navigations systems 300 and the vehicle network server 102 using cellular communication via the communications service provider 104a. The wireless communications module 316 communicates various information to/from the vehicle network server 102 via the communications service provider 104, such as control data regarding selection of a group, selection of members in the group, various information regarding the members (e.g., identification of the members, cellular telephone numbers, etc.), selection of an application to run among the selected members, GPS information of the vehicle or other vehicles of the group, etc. These control data are transmitted by text messaging of the cellular communication. On the other hand, application data (such as voice data for cellular telephone calls) is transmitted and received using typical cellular communication.

[0046] The processor 306 controls the operation of the various components in the vehicle navigation system 300, including the input device 304, the speech recognition/synthesis module 305, the memory device 308, the display device 310, the wireless communications module 316, the GPS module 302, and the touch sensitive screen 301. To this end, the processor 306 executes instructions or programs stored in the memory device 308 to provide various functionalities of the vehicle navigation system 300, such as establishing a group, requesting communication among selected members of the group to the vehicle network server 142, running an application associated with selected members of the group, and the like.

[0047] The memory device 308 operates as a working memory for the processor 306 and also stores various information used by the vehicle navigation system 300a. The memory device 308 includes a group data module

320, an O/S (operating system) module 322, a group establishment module 324, and an applications module 326. The O/S module 322 stores the operating systems or boot-up sequences for the vehicle network server 102. The group data module 320 stores all the group information such as group member list, identification of the group members, and the like. The group establishment module 324 stores instructions and programs for establishing a group of members according to the methods described in FIGS. 6A and 6B. The applications module 326 stores various applications for interaction with selected members of the group, such as a cellular telephone application, game application, and the like. The applications module 326 also stores a GPS application and associated map information for determining and displaying the location of the vehicle navigation systems 300a. The memory device 308 is preferably a rewritable memory such as an SRAM, flash memory, or hard disk.

[0048] In a less distributed system according to another embodiment, the memory device 208 may store less information such that the group information, the applications, and/or the application information for establishing wireless communication is stored in the vehicle network server 102 rather than in the vehicle navigation system 300a.

[0049] The display device 310 displays information used for interaction with the user of the vehicle navigation system 300a. For example, the display device 310 displays an interactive map as shown in FIG. 4 in order to indicate the location of the group members and facilitate selection of members and launching of associated applications with respect to the selected members. The display device 310 is preferably a liquid crystal display (LCD) although other types of display devices may be used.

[0050] The touch sensitive screen 301 is overlapped with the display device 310 in order to provide the user with capabilities of entering commands and data on an interactive display. The touch sensitive screen 301 is preferably a conventional resistive touch sensitive screen although other types of touch sensitive screens may be provided. The display device 310 and the touch sensitive screen 301 will be explained in more detail with reference to FIG. 4.

[0051] Alternative input and output means are also present in the vehicle navigation system 300a. For example, the user may enter various data and commands to the vehicle navigation system 300a using the input device 304 such as physical keys. The user may also enter data and commands for interaction with group members using the speech recognition/synthesis module 305. Alternatively, the information shown on the display device 310 may be converted to a form of speech by the speech recognition/synthesis module 305 to convey the information therein to the user in audio form. The speech recognition/synthesis module 305 is a conventional speech recognition and synthesis module including a microphone (not shown), a speaker (not shown) and the software capabilities to recognize and synthesize

speech. The operations of the conventional speech recognition/synthesis module 305 is well known to one skilled in the art and a detailed description of such operations is not necessary for an understanding of the present invention.

[0052] The GPS module 302 receives GPS information from GPS satellites via a GPS sensor (not shown) and determines the current location of the vehicle in which the vehicle navigation system 300a resides by way of conventional triangulation schemes. The determined location is shown on the display device 310 along with the locations of other vehicles of the group received from the other vehicle navigation systems 300 via the wireless communications module 316. As stated above, information regarding the locations of other vehicles is transmitted by text messaging in cellular communication (such as GSM).

[0053] The vehicle navigation system 300a operates in conjunction with the vehicle network server 102 and other vehicle navigation systems 300b, 300c in other vehicles 108a, 110a of the group to provide the group interaction functions, as explained in FIGS 5, 6, and 7A-7C. For example, the vehicle navigation system 300 may store group information (member list, member identification, members' cellular telephone number, etc.) in the memory device 308. The vehicle navigation system 300 may also transmit a request to make a cellular telephone call or launch a selected application (such as an interactive game) with respect to selected members in the group to the vehicle network server 102 via the wireless communications module 216. The vehicle navigation system 300 may also store and run such applications in the memory 308 of the vehicle navigation system 300 itself.

[0054] FIG. 3B is a block diagram illustrating a vehicle navigation system 300d according to the present invention. The vehicle navigation system 300d in FIG. 3B is used with the group interaction system 100b in FIG. 1B. The vehicle navigation system 300d is same as the vehicle navigation system 300a described in FIG. 3A except that it includes a peer-to-peer communication module 317 for communicating directly with other vehicle navigation systems 300d. Control data such as selection of a group, various information regarding the members (e.g., identification of the members, cellular telephone numbers, etc.), and GPS information of the vehicle or other vehicles of the group, etc are transmitted via the peer-to-peer communication module 317. The peer-to-peer communication module 317 is preferably a short-range radio communication interface, although other types of communication interfaces, such as IEEE 802.11b standard communication interfaces, may be used. On the other hand, selection of an application to run among the selected members, selection of members in the group for interaction, and actual application data (such as voice data for cellular telephone calls) is transmitted and received via the wireless communication module 316 by using typical cellular-communication. In addition, the data and programs in the O/S module 322 and

the group establishment module 324 and the operations of the professor 306 are modified from those in the vehicle navigation system 300a to accommodate the functionalities of the peer-to-peer communication module 317.

[0055] FIG. 4 is a graphical representation of the screen of the display device of the vehicle navigation system 300a or 300d according to one embodiment of the present invention. Map 406 is shown on a display device 310 overlapped with a touch sensitive screen 301. Referring to FIG. 4, the map 406 is displayed indicating the location and names of various streets. The locations of three cars (car 1, car 2, and car 3) of a given group are also displayed on the map 306, although it should be clear to one skilled in the art that any number of cars may be shown on the map 406 depending upon the number of members in the group. Assuming that the display device 310 is one in the vehicle navigation system 300a or 300d of car 1, the location of car 1 is determined by the GPS module 302 and displayed on the map 406. The locations of other vehicles (car 2 and car 3) of the group are received via the wireless communications module 316 from the vehicle navigation systems 300b, 300c in cars 2 and 3 or via the peer-to-peer communications module 317 from the vehicle navigation systems 300e, 300f in cars 2 and 3 and are likewise displayed on the map 406. The user of the vehicle navigation system 300a, 300d may select a certain car by touching the icon (indication) corresponding to the car in order to launch or run an application with respect to such selected car. For example, the user may touch the indication of car 2 on the map 406 to select car 2 and launch an application (such as making a cellular telephone call) with respect to car 2. The display device 310 is overlapped with a touch sensitive screen 301, so the touch sensitive screen 301 may determine which car is selected by detecting the location of the user's touch.

[0056] The list of applications, 404 shows various applications, such as the cellular telephone application, an interactive game application, and two other applications available to the vehicle navigation system 300 with respect to the selected members in the group. The user may select a desired application by touching the part of the screen that indicates the desired application in the list of applications 404.

[0057] The input icons 402 on the touch sensitive screen 301 are used to enter various data and commands to the vehicle navigation system 300. The input icons 402 preferably include various icons corresponding to commands and data for navigating through a menu and selecting a particular item on the menu, so that a user may input various data and commands for establishing an interactive group or launching an application with respect to selected members.

[0058] In actual use, the user of the vehicle navigation system 300 selects one or more cars in the group with which the user wishes to interact by touching the icons corresponding to the desired cars on the map 406, and selects an application to be launched with respect to the

members in the group by touching the icon corresponding to the desired application in the list of applications 404. For example, when the user in car 1 wishes to place a cellular telephone call with car 2, the user selects car 2 by touching the indication of car 2 on the map 406, and selects the cellular telephone application by touching the corresponding icon of the cellular telephone application among the list of applications 404. In response, the vehicle navigation system 300 launches the selected application (cellular telephone application) with respect to car 2 according to the method described below with reference to FIGS. 7A and 7B.

[0059] The graphical representation of the display device 310 illustrated in FIG. 4 is a mere example of a user interface for the vehicle navigation system 300a, 300d. It should be obvious to one skilled in the art that any type or form of user interface may be used in the vehicle navigation systems 300a, 300d to interact with the users.

[0060] FIG. 5 is a flowchart illustrating a method of interacting with selected members within an enabled group using the vehicle navigation system 300a, 300d according to one embodiment of the present invention. As the process begins 502, the user of the vehicle navigation system 300 establishes 504 a group of members (cars or vehicle navigation systems) with which the user wishes to interact. The information used in establishing the group of members may include the member's identification (e.g., a cellular telephone number corresponding to the member or vehicle identification number corresponding to the vehicle) and the applications available to each group member. Step 504 is illustrated in more detail below with reference to FIGS. 6A and 6B.

[0061] Once the group is established, the vehicle navigation system 300 receives 506 information regarding the location of each member in the group from each vehicle navigation system 300 corresponding to the members via the wireless communications module 316. Such locations are displayed 508 on the display device 310 as icons on the map 406 and repetitively updated until a user input is received 509.

[0062] The user selects one or more of the members by touching the icons corresponding to the desired members -on the map 406, and the vehicle navigation system 300a, 300d receives 510 such selection of the members. Then, the vehicle navigation system 300a, 300d receives 511 a selection of an application from the user. For example, the vehicle navigation system 300 may receive a selection to make a cellular telephone call to the selected members. In response, the vehicle navigation system 300 launches 512 the selected application with respect to the selected members within the group. For example, if the selected application is a cellular telephone call, the vehicle navigation system 300a, 300d makes a cellular telephone call or requests the vehicle network server 102 to make a cellular telephone call to the selected member (s). If selected application is an interactive game, the vehicle navigation system 300a, 300d launches the interactive game application or requests the vehicle network

server 102 to launch the interactive game application among the selected member(s). Step 512 is illustrated in more detail with reference to FIGS. 7A and 7B. The process then return to step 506 for further real-time tracking of the members' locations and receipt of selection of members and applications.

[0063] FIG. 6A is a flowchart illustrating the step 504a of establishing a group of members according to a first embodiment. The step 504a of FIG. 6A establishes the group of members by cooperation of the vehicle navigation system 300a and the vehicle network server 102 and is used with the group interaction system 100a described in FIG. 1A.

[0064] Referring to FIG. 6A, as the process begins 502, the vehicle navigation system 300a receives 604 selection of the members to be included in the group. Such selection of members may be input by using the touch sensitive screen 301 or the input device 302. The vehicle navigation system 300a transmits 606 such selection of group members to the vehicle network server 102. The vehicle network server 102 establishes 608 communications with the selected group members and requests 610 each selected member for permission to add the member to the group. Then, the vehicle network server 102 transmits 612 the results of the requests 610 back to the vehicle navigation system 300a. Thereafter, the vehicle network server 300a adds 614 the members giving permission to the enabled group. This group information may be shared with other members of the group. To this end, the vehicle navigation system 300a transmits 616 the established group information to the vehicle navigation system 102, and the vehicle navigation system 102 in turn transmits 618 such established group information to the members of the group, and the process continues with step 506.

[0065] FIG. 6B is a flowchart illustrating step 504b of establishing a group of members according to a second embodiment. The step 504b of FIG. 6B establishes the group of members in the vehicle network server 102 using information downloaded from an external source and downloads the group information to the vehicle navigation systems 300a.

[0066] Referring to FIG. 6B, as the process begins 502, the vehicle network server 102 receives 632 a list of members from an external source. For example, the vehicle network server 102 may download the list of members of the group from an Internet web server via its data communication module 212. As another example, a live operator may manually input the list of members of the group by using the input keys 204. The vehicle network server 102 establishes 634 the group of members for interaction by using the received list of members. Then, the vehicle network server 102 downloads 636 the established group information to the vehicle navigation systems 300a, 300b, 300c in the group, and the process continues with step 506.

[0067] Although two embodiments of establishing a group has been described above with reference to FIGS.

6A and 6B, the group may also be established simply by manually inputting the group information in the vehicle navigation systems 340a, 300d using the touch sensitive screen 301 or the input devices 304. In addition, the group may also be simply selected in the vehicle navigation systems 300a, 300d from a predetermined set of group lists which are stored in the vehicle navigation systems 300a, 300d based upon previous use or setting by its users.

[0068] FIG. 7A is a flowchart illustrating the step 512a of running the selected application with respect to the vehicle navigation system 102 and the selected members according to one embodiment. Step 512a illustrated in FIG. 7A runs the selected application stored in a vehicle network server 102 by cooperation of the vehicle navigation system 300a and the vehicle network server 102.

[0069] Referring to FIG. 7A, as the process continues 511, the vehicle navigation system 300a establishes 704 communications with the vehicle network server 102 and transmits 706 the selected member and selected application information to the vehicle network server 102. For example, the vehicle navigation system 300 transmits to the vehicle network server 102 a request to make a cellular telephone conference call to Car 2 and Car 3 in the group. The vehicle network server launches 708 the selected application with respect to the vehicle navigation system 300a transmitting such information and to the selected members, and the process continues 810. For example, the vehicle network server 102 makes a cellular telephone call between the vehicle network server 300a transmitting such information and all the selected members by running a cellular telephone application stored in the applications module 226 of the memory device 208.

[0070] FIG. 7B is a flowchart illustrating a step 512b of launching the selected application with respect to the vehicle navigation system and the selected members according to the present invention. Step 512b illustrated in FIG. 7B launches the selected application stored in the vehicle navigation system 300d and thus does not involve communication with the vehicle network server 102. As such, step 512b is used by the vehicle navigation system 300d when it is used in the group interaction system 100b capable of peer-to-peer communication. That is, step 512b may be used when the vehicle navigation system 300d communicates with other members directly via short-range radio communication or the like, without the use of the vehicle network server 102.

[0071] Referring to FIG. 7B, as the process continues 511, the vehicle navigation system 300d establishes 722 communications with the selected members directly via the wireless communications module 316 through the communications service provider 104. Then, the vehicle navigation system 300 launches 724 the selected application with respect to the vehicle navigation system 300d and the selected members by running the selected application stored therein, and the process continues with step 506. For example, the vehicle navigation system 300d may place a cellular telephone call to the selected

members through the communication service provider 104.

[0072] FIG. 7C is a flowchart illustrating the step 512c of running the selected application with respect to the vehicle navigation system and the selected members according to still another embodiment. Step 512c illustrated in FIG. 7C runs a selected application stored in a vehicle network server 102 by cooperation of the vehicle navigation system 300a and the vehicle network server 102. The application run in FIG. 7C is one that requires constant interaction and communication of control signals among the selected members of the group, such as an interactive game.

[0073] Referring to FIG. 7C, as the process continues 511, the vehicle navigation system 300a establishes 744 communications with the vehicle network server 102 and transmits 746 the selected member and selected application information to the vehicle network server 102. For example, the vehicle navigation system 300 transmits to the vehicle network server 102 a request to run an interactive game with respect to Car 2 and Car 3 in the group. The vehicle network server launches 748 the selected application with respect to the vehicle navigation system 300a transmitting such information and to the selected members. For example, the vehicle network server 102 launches the interactive game application with respect to the vehicle network server 300a transmitting such information and all the selected members (cars 2 and 3). The interactive game application is stored in the applications module 226 of the memory device 208. Thereafter, the vehicle network server receives 750 other controls used in the launched application (e.g., control signals for interactive game application) from the selected members (cars 2 and 3). The vehicle navigation system 300a also transmits 752 control signals used in the interactive application to the vehicle navigation system 102 so that the vehicle navigation system can run the interactive application based upon the control signals from the vehicle navigation systems 300a and other selected members. Steps 750 and 752 are repeated until a command to terminate the application is received 752 by the vehicle navigation system 300a. Then, the process continues with step 506.

[0074] Although the present invention has been described above, various modifications can be made within the scope of the present invention. The type of communication used among the vehicle navigation systems or between the vehicle navigation system and the vehicle network server is not limited to those described above, and any type of wireless communication may be used according to the present invention. The information required for establishing a group of members may vary depending upon the type of applications to run among the selected members and is not limited to the type of information described above. It should be obvious that the present invention may be used with any number of members of a group. The type of applications that is run among the selected members is not limited to cellular

telephone calls, short text messaging, or interactive games as described above and it should be obvious to one skilled in the art that any type of application may be used with respect to selected members of the group. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

10 Claims

1. A vehicle navigation system (**300d**) capable of interacting with a plurality of other vehicle navigation systems (**300e**, **300f**) of a group, the vehicle navigation system comprising:

a memory device (**308**) including a group data module (**320**), a group establishment module (**324**), and an applications module (**326**), the group data module (**320**) having information regarding members of the group, the group establishment module (**324**) having an application for establishing the group, and the applications module (**326**) having a plurality of applications for interaction with selected members of the group; and

a processor (**306**) coupled to the memory device for running the application for establishing the group and the application for interaction with selected members of the group, further comprising a peer-to-peer communication module (**317**) configured to establish a direct communication with the other vehicle navigation systems, wherein the group establishment module (**324**) is configured to establish the group via the direct communication, and the vehicle navigation system (**300d**) is capable of selecting members of the group and receiving location information of the selected members of the group via the direct communication.

2. The vehicle navigation system of claim 1, wherein the applications module (**326**) further has a global position system application for determining locations of the members of the group.
3. The vehicle navigation system according to claim 1, wherein the vehicle comprising the vehicle navigation system is referred to as a first vehicle, the vehicle navigation system comprising:

a global positioning system (**GPS**) module (**302**) receiving a GPS signal and determining a location of the first vehicle based upon the GPS signal;
wherein the peer-to-peer communication module serves for communicating with the other vehicle navigation systems of the group and re-

- ceiving location information corresponding to second vehicles in which the other vehicle navigation systems are placed from the other vehicle navigation systems;
- a display device (310) coupled to the GPS module and the peer-to-peer communication module and displaying the location of the first vehicle and the second vehicles on a map and a list of one or more applications; and
- a touch sensitive screen (301) coupled to the display device and capable of receiving input commands corresponding to a selection of one or more of the second vehicles on the map and a selection of one of the applications;
- wherein the processor (306) is coupled to the touch sensitive screen for running the selected application with respect to the other vehicle navigation systems in the selected second vehicles.
4. The vehicle navigation system of claim 3, wherein the memory device (308) is adapted to store the map, the applications and identification information corresponding to the other vehicle navigation systems in the second vehicles.
 5. The vehicle navigation system of claim 4, wherein the identification information is a cellular telephone number corresponding to each of the other vehicle navigation systems in the second vehicles or a vehicle identification number corresponding to each of the second vehicles.
 6. The vehicle navigation system of claim 4, wherein the vehicle navigation system is adapted to receive the identification information corresponding to the other vehicle navigation systems in the second vehicles by receiving input to the vehicle navigation system on the touch sensitive screen (301).
 7. The vehicle navigation system of claim 1, further comprising a wireless communications module (316) which is a cellular telephone interface.
 8. The vehicle navigation system of claim 3, wherein the selected application is a cellular telephone application and the processor (306) is adapted to enable establishment of a cellular telephone call between the vehicle navigation system in the first vehicle and the selected vehicle navigation systems in the second vehicle.
 9. The vehicle navigation system of claim 3, wherein the locations of the first vehicle and the second vehicles are indicated on the display device (310) as icons on the map and one or more of the second vehicles are selected for
 10. A method, being carried out in a first vehicle navigation system (300d), of interacting with a second vehicle navigation system (300e, 300f), the method comprising:

tion system (300d), of interacting with a second vehicle navigation system (300e, 300f), the method comprising:

establishing (504) a group including the first vehicle navigation system and the second vehicle navigation system; selecting the second vehicle navigation system as a member of the group receiving (506) information regarding the locations of the first vehicle navigation system and the second vehicle navigation system, the information regarding the location of the second vehicle being received via a peer-to-peer communication which establishes a direct communication between the first vehicle navigation system and the second vehicle navigation system; displaying (508) the locations of the first and second vehicle navigation system; receiving (509, 510) a selection of the second vehicle navigation system; receiving (511) a selection of an application; and running (512) the application with respect to the first vehicle navigation system and the selected second vehicle navigation system, wherein establishing of the group and selecting the second vehicle navigation system as a member of the group is made via the direct communication. interaction by touching the corresponding icons as the input commands to the touch sensitive screen.

11. The method of claim 10, wherein establishing a group comprises:

receiving (608) identification information corresponding to the first vehicle navigation system and the second vehicle navigation system; establishing (610) communication with the second vehicle navigation system based upon the identification information and requesting the second vehicle navigation system for permission to be added to the group; and adding (614) to the group the second vehicle navigation system giving permission.

12. The method of claim 11, wherein the identification information is a cellular telephone number corresponding to each of the first and second vehicle navigation system.

13. The method of claim 10, wherein running the application comprises:

establishing (704) communication with a vehicle network server communicatively coupled to the first and the second vehicle navigation system, the vehicle network server storing the selected application and capable of running the applica-

tion; and
transmitting (706) the selection of the application and the selection of the second vehicle navigation system to the vehicle network server.

14. The method of claim 10, wherein the selected application is a cellular telephone application and running the application comprises establishing a cellular telephone call between the first vehicle navigation system and the selected second vehicle navigation system.

Patentansprüche

1. Fahrzeugnavigationssystem (300d), das dazu in der Lage ist, mit einer Vielzahl von anderen Fahrzeugnavigationssystem (300e, 300f) einer Gruppe zu interagieren, wobei das Fahrzeugnavigationssystem aufweist:

eine Speichereinrichtung (308), die ein Gruppendatenmodul (320), ein Gruppenerstellungsmodul (324), und ein Anwendungsmodul (326) umfasst, wobei das Gruppendatenmodul (320) Informationen bezüglich Mitgliedern der Gruppe aufweist, das Gruppenerstellungsmodul (324) eine Anwendung zum Erstellen der Gruppe aufweist, und das Anwendungsmodul (326) eine Vielzahl von Anwendungen zur Interaktion mit ausgewählten Mitgliedern der Gruppe aufweist; und
einen Prozessor (306), der mit der Speichereinrichtung gekoppelt ist, zum Ausführen der Anwendung zum Erstellen der Gruppe und der Anwendung zum Interagieren mit ausgewählten Mitgliedern der Gruppe, weiterhin mit einem Peer-to-Peer-Kommunikationsmodul (317), das dazu konfiguriert ist, eine direkte Kommunikation mit den anderen Fahrzeugnavigationssystemen herzustellen, wobei das Gruppenerstellungsmodul (324) dazu konfiguriert ist, die Gruppe über die direkte Kommunikation zu erstellen, und
das Fahrzeugnavigationssystem (300d) dazu in der Lage ist, über die direkte Kommunikation, Mitglieder der Gruppe auszuwählen und Aufenthaltsortinformationen der ausgewählten Mitglieder der Gruppe zu empfangen.

2. Fahrzeugnavigationssystem gemäß Anspruch 1, wobei das Anwendungsmodul (326) weiterhin eine Anwendung eines globalen Ortsbestimmungssystems zum Bestimmen von Aufenthaltsorten der Mitglieder der Gruppe aufweist.
3. Fahrzeugnavigationssystem gemäß Anspruch 1, wobei das Fahrzeug, das das Fahrzeugnavigationssystem

umfasst, als ein erstes Fahrzeug bezeichnet wird, wobei das Fahrzeugnavigationssystem aufweist:

ein Modul eines globalen Ortsbestimmungssystems (GPS) (302), das ein GPS-Signal empfängt und einen Aufenthaltsort des ersten Fahrzeugs basierend auf dem GPS-Signal bestimmt; wobei das Peer-to-Peer-Kommunikationsmodul zur Kommunikation mit den anderen Fahrzeugnavigationssystemen der Gruppe und zum Empfangen von Aufenthaltsortinformationen entsprechend den zweiten Fahrzeugen, in denen die anderen Fahrzeugnavigationssysteme platziert sind, von den anderen Fahrzeugnavigationssystemen dient;
eine Anzeigvorrichtung (310), die mit dem GPS-Modul und dem Peer-to-Peer-Kommunikationsmodul gekoppelt ist, und den Aufenthaltsort des ersten Fahrzeugs und der zweiten Fahrzeuge auf einer Karte und eine Liste von einer oder mehreren Anwendungen anzeigt; und
einen berührungsempfindlichen Bildschirm (301), der mit der Anzeigvorrichtung gekoppelt ist, und dazu in der Lage ist, Eingabeanweisungen entsprechend einer Auswahl von einem oder mehreren der zweiten Fahrzeuge auf der Karte und eine Auswahl von einer der Anwendungen zu empfangen;
wobei der Prozessor (306) mit dem berührungsempfindlichen Bildschirm gekoppelt ist, zum Ausführen der ausgewählten Anwendung mit Bezug auf die anderen Fahrzeugnavigationssysteme in den ausgewählten zweiten Fahrzeugen.

4. Fahrzeugnavigationssystem gemäß Anspruch 3, wobei die Speichervorrichtung (308) dazu angepasst ist, die Karte, die Anwendungen und Identifikationsinformationen entsprechend den anderen Fahrzeugnavigationssystemen in den zweiten Fahrzeugen zu speichern.
5. Fahrzeugnavigationssystem gemäß Anspruch 4, wobei die Identifikationsinformationen eine Mobiltelefonnummer entsprechend jedem der anderen Fahrzeugnavigationssysteme in den zweiten Fahrzeugen oder eine Fahrzeugidentifikationsnummer entsprechend jedem der zweiten Fahrzeuge ist.
6. Fahrzeugnavigationssystem gemäß Anspruch 4, wobei das Fahrzeugnavigationssystem dazu angepasst ist, Identifikationsinformationen entsprechend den anderen Fahrzeugnavigationssystemen in den zweiten Fahrzeugen durch Empfangen einer Eingabe in das Fahrzeugnavigationssystem auf dem berührungsempfindlichen Bildschirm (301) zu empfangen.

7. Fahrzeugnavigationssystem gemäß Anspruch 1, weiterhin mit einem Modul zur drahtlosen Kommunikation (316), welches eine Mobiltelefonschnittstelle ist.

8. Fahrzeugnavigationssystem gemäß Anspruch 3, wobei die ausgewählte Anwendung eine Mobiltelefonanwendung ist, und der Prozessor (306) dazu angepasst ist, eine Herstellung eines Mobiltelefonats zwischen dem Fahrzeugnavigationssystem in dem ersten Fahrzeug und dem ausgewählten Fahrzeugnavigationssystem in dem zweiten Fahrzeug zu ermöglichen.

9. Fahrzeugnavigationssystem gemäß Anspruch 3, wobei die Aufenthaltsorte des ersten Fahrzeugs und der zweiten Fahrzeuge auf der Anzeigevorrichtung (310) als Symbole auf der Karte angegeben werden und eines oder mehrere der zweiten Fahrzeuge zur Interaktion durch Berührung des entsprechenden Symbols als die Eingabeweisungen auf dem berührungsempfindlichen Bildschirm ausgewählt wird.

10. Verfahren, das in einem ersten Fahrzeugnavigationssystem (300d) ausgeführt wird, des Interagierens mit einem zweiten Fahrzeugnavigationssystem (300e, 300f), wobei das Verfahren aufweist:

Erstellen (504) einer Gruppe inklusive dem ersten Fahrzeugnavigationssystem und dem zweiten Fahrzeugnavigationssystem;
Auswählen des zweiten Fahrzeugnavigationssystems als ein Mitglied der Gruppe;
Empfangen (506) von Informationen bezüglich der Aufenthaltsorte des ersten Fahrzeugnavigationssystems und des zweiten Fahrzeugnavigationssystems, wobei die Informationen bezüglich des Aufenthaltsorts des zweiten Fahrzeugs über eine Peer-to-Peer-Kommunikation, die eine direkte Kommunikation zwischen dem ersten Fahrzeugnavigationssystem und dem zweiten Fahrzeugnavigationssystem herstellt, empfangen wird;
Anzeigen (508) der Aufenthaltsorte des ersten und zweiten Fahrzeugnavigationssystems;
Empfangen (509, 510) einer Auswahl des zweiten Fahrzeugnavigationssystems;
Empfangen (511) einer Auswahl einer Anwendung; und
Ausführen (512) der Anwendung mit Bezug auf das erste Fahrzeugnavigationssystem und das ausgewählte zweite Fahrzeugnavigationssystem,
wobei eine Erstellung der Gruppe und ein Auswählen des zweiten Fahrzeugnavigationssystems als ein Mitglied der Gruppe durch die direkte Kommunikation vorgenommen werden.

11. Verfahren gemäß Anspruch 10, wobei ein Erstellen der Gruppe umfasst:

Empfangen (608) von Identifikationsinformationen entsprechend dem ersten Fahrzeugnavigationssystem und dem zweiten Fahrzeugnavigationssystem;
Herstellen (610) einer Kommunikation mit dem zweiten Fahrzeugnavigationssystem basierend auf den Identifikationsinformationen und Auffordern des zweiten Fahrzeugnavigationssystems für eine Erlaubnis, zu der Gruppe hinzugefügt zu werden; und
Hinzufügen (614) des zweiten Fahrzeugnavigationssystems, das eine Erlaubnis gibt, zu der Gruppe.

12. Verfahren gemäß Anspruch 11, wobei die Identifikationsinformation eine Mobiltelefonnummer entsprechend jedem des ersten und zweiten Fahrzeugnavigationssystems ist.

13. Verfahren gemäß Anspruch 10, wobei ein Ausführen der Anwendung umfasst:

Herstellen (704) einer Kommunikation mit einem Fahrzeugnetzwerkserver, der kommunikativ mit dem ersten und zweiten Fahrzeugnavigationssystem gekoppelt ist, wobei der Fahrzeugnetzwerkserver die ausgewählte Anwendung speichert und dazu in der Lage ist, die Anwendung zu auszuführen; und
Übertragen (706) der Auswahl der Anwendung und der Auswahl des zweiten Fahrzeugnavigationssystems an den Fahrzeugnetzwerkserver.

14. Verfahren gemäß Anspruch 10, wobei die ausgewählte Anwendung eine Mobiltelefonanwendung ist und ein Ausführen der Anwendung ein Herstellen eines Mobiltelefonanrufs zwischen dem ersten Fahrzeugnavigationssystem und dem ausgewählten zweiten Fahrzeugnavigationssystem umfasst.

Revendications

1. Système (300d) de navigation pour véhicule capable d'interagir avec une pluralité d'autres systèmes (300e, 300f) de navigation pour véhicules d'un groupe, le système de navigation pour véhicule comprenant :

un dispositif de mémoire (308) comportant un module (320) de données du groupe, un module (324) d'établissement de groupe, et un module (326) d'applications, le module (320) de données du groupe ayant des informations concernant les membres du groupe, le module (324)

- d'établissement de groupe ayant une application destinée à établir le groupe, et le module (326) d'applications ayant une pluralité d'applications pour l'interaction avec des membres sélectionnés du groupe ; et
 un processeur (306) couplé au dispositif de mémoire destiné à exécuter l'application destinée à établir le groupe et l'application destinée à interagir avec des membres sélectionnés du groupe, comprenant en outre
 un module (317) de communication poste à poste configuré pour établir une communication directe avec les autres systèmes de navigation pour véhicules, où le module (324) d'établissement de groupe est configuré pour établir le groupe à travers la communication directe, et le système (300d) de navigation pour véhicules est capable de sélectionner des membres du groupe et de recevoir des informations de localisation des membres sélectionnés du groupe par le biais de la communication directe.
2. Système de navigation pour véhicule de la revendication 1, dans lequel le module (326) d'applications a en outre une application du système de localisation GPS destinée à déterminer les emplacements des membres du groupe.
 3. Système de navigation pour véhicule selon la revendication 1, dans lequel le véhicule comprenant le système de navigation pour véhicule est désigné par premier véhicule, le système de navigation pour véhicule comprenant
 - un module (302) de système de localisation GPS qui reçoit un signal GPS et qui détermine l'emplacement du premier véhicule sur la base du signal GPS ;
 - dans lequel le module de communication poste à poste sert à communiquer avec les autres systèmes de navigation pour véhicules du groupe et pour recevoir des informations de localisation correspondant à des deuxième véhicules où les autres systèmes de navigation pour véhicules sont placés à partir des autres systèmes de navigation pour véhicules ;
 - un dispositif d'affichage (310) couplé au module GPS et au module de communication poste à poste et affichant l'emplacement du premier véhicule et des deuxième véhicules sur une carte et une liste d'une ou de plusieurs applications ; et
 - un écran tactile (301) couplé au dispositif d'affichage et capable de recevoir des commandes d'entrée correspondant à une sélection d'un ou de plusieurs des deuxième véhicules sur la carte et une sélection de l'une des applications ; où le processeur (306) est couplé à l'écran tactile pour exécuter l'application sélectionnée par rapport aux autres systèmes de navigation pour véhicules dans les deuxième véhicules sélectionnés.
 4. Système de navigation pour véhicule de la revendication 3, dans lequel le dispositif de mémoire (308) est adapté pour stocker la carte, les informations d'identification et d'applications correspondant aux autres systèmes de navigation pour véhicules dans les deuxième véhicules.
 5. Système de navigation pour véhicule de la revendication 4, dans lequel les informations d'identification sont un numéro de téléphone cellulaire correspondant à chacun des autres systèmes de navigation pour véhicules dans les deuxième véhicules ou un numéro d'identification de véhicule correspondant à chacun des deuxième véhicules.
 6. Système de navigation pour véhicule de la revendication 4, dans lequel le système de navigation pour véhicule est adapté pour recevoir les informations d'identification correspondant aux autres systèmes de navigation pour véhicules dans les deuxième véhicules en recevant une entrée au système de navigation pour véhicule sur l'écran tactile (301).
 7. Système de navigation pour véhicule de la revendication 1, comprenant en outre un module (316) de communication sans fil qui est une interface de téléphone cellulaire.
 8. Système de navigation pour véhicule de la revendication 3, dans lequel l'application sélectionnée est une application de téléphonie cellulaire et le processeur (306) est adapté pour permettre l'établissement d'un appel de téléphonie cellulaire entre le système de navigation pour véhicule dans le premier véhicule et les systèmes de navigation pour véhicules sélectionnés dans les deuxième véhicules.
 9. Système de navigation pour véhicule de la revendication 3, dans lequel les emplacements du premier véhicule et des deuxième véhicules sont indiqués sur le dispositif d'affichage (310) sous forme d'icônes sur la carte et un ou plusieurs des deuxième véhicules sont sélectionnés pour une interaction en touchant les icônes correspondantes comme commandes d'entrée à l'écran tactile.
 10. Procédé, étant réalisé dans un premier système (300d) de navigation pour véhicules, qui consiste à interagir avec un deuxième système (300e, 300f) de navigation pour véhicules, le procédé comprenant le fait :
 - d'établir (504) un groupe comportant le premier

système de navigation pour véhicule et le deuxième système de navigation pour véhicule ; de sélectionner le deuxième système de navigation pour véhicule comme membre du groupe ;
 5 de recevoir (506) des informations concernant les emplacements du premier système de navigation pour véhicule et du deuxième système de navigation véhicule, les informations concernant l'emplacement du deuxième véhicule étant
 10 reçues par une communication poste à poste qui établit une communication directe entre le premier système de navigation pour véhicule et le deuxième système de navigation pour véhicule ;
 15 d'afficher (508) les emplacements des premier et deuxième systèmes de navigation pour véhicules ;
 de recevoir (509, 510) une sélection du deuxième système de navigation pour véhicule ;
 20 de recevoir (511) une sélection d'une application ; et
 d'exécuter (512) l'application par rapport au premier système de navigation pour véhicule et au
 25 deuxième système de navigation pour véhicule sélectionné, où l'établissement du groupe et la sélection du deuxième système de navigation pour véhicule comme membre du groupe est réalisé à travers la communication directe.

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11. Procédé de la revendication 10, dans lequel l'établissement d'un groupe comprend le fait :

de recevoir (608) des informations d'identification correspondant au premier système de navigation pour véhicule et au deuxième système de navigation pour véhicule ;
 35 d'établir (610) une communication avec le deuxième système de navigation pour véhicule sur la base des informations d'identification et de demander la permission d'ajout du deuxième
 40 système de navigation pour véhicule au groupe ; et
 d'ajouter (614) au groupe le deuxième système de navigation pour véhicule ayant la permission.

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12. Procédé de la revendication 11, dans lequel les informations d'identification sont un numéro de téléphone cellulaire correspondant à chacun des premier et deuxième systèmes de navigation pour véhicules.

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13. Procédé de la revendication 10, dans lequel l'exécution de l'application comprend le fait :

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d'établir (704) une communication entre un serveur réseau de véhicule couplé en communication aux premier et deuxième systèmes de com-

munication de véhicule, le serveur de réseau de véhicule stockant l'application sélectionnée et capable d'exécuter l'application ; et de transmettre (706) la sélection de l'application et la sélection du deuxième système de navigation pour véhicule au serveur réseau de véhicule.

14. Procédé de la revendication 10, dans lequel l'application sélectionnée est une application de téléphonie cellulaire et l'exécution de l'application comprend le fait d'établir un appel de téléphonie cellulaire entre le premier système de navigation pour véhicule et le deuxième système de navigation pour véhicule sélectionné.

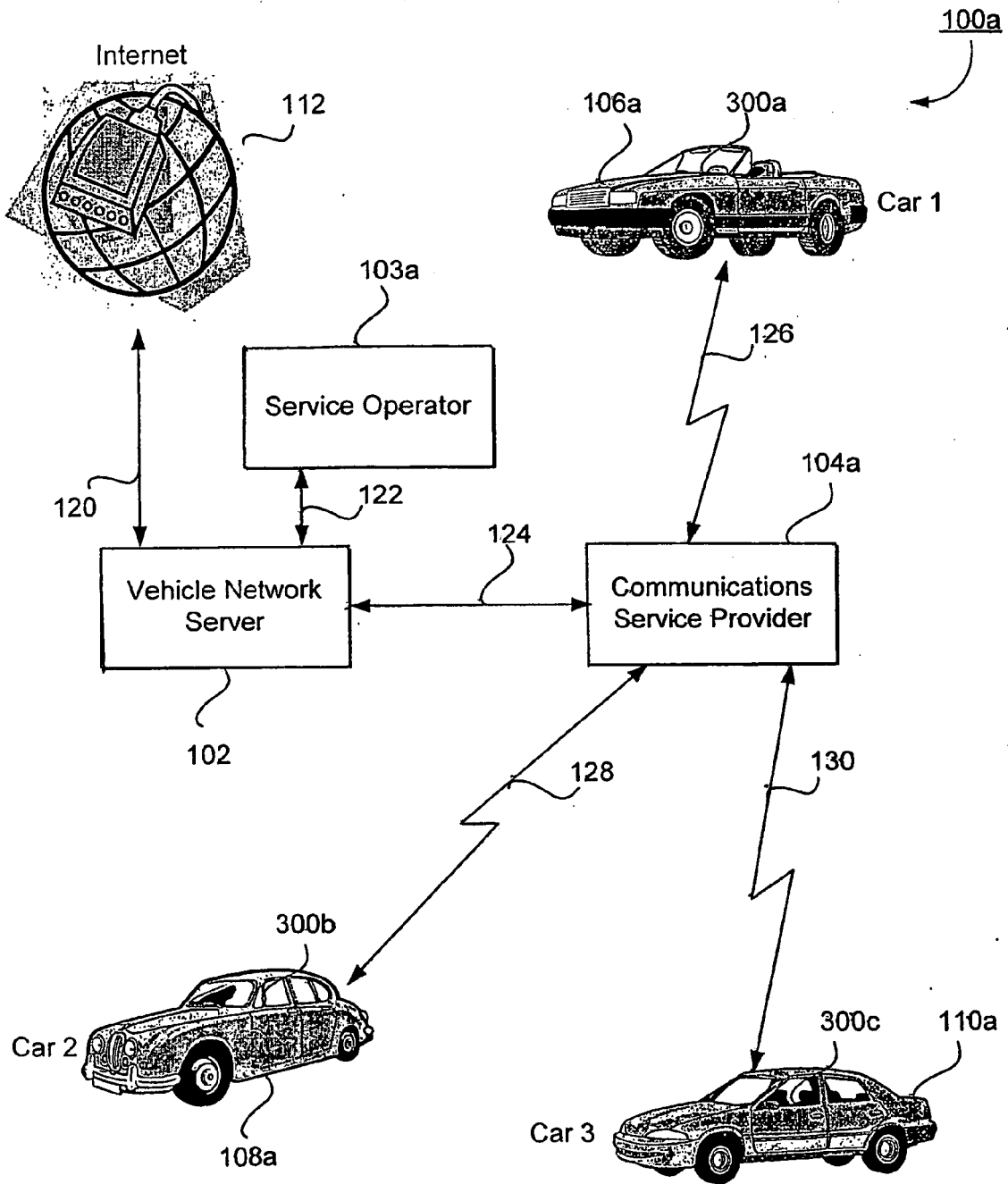


FIG. 1A

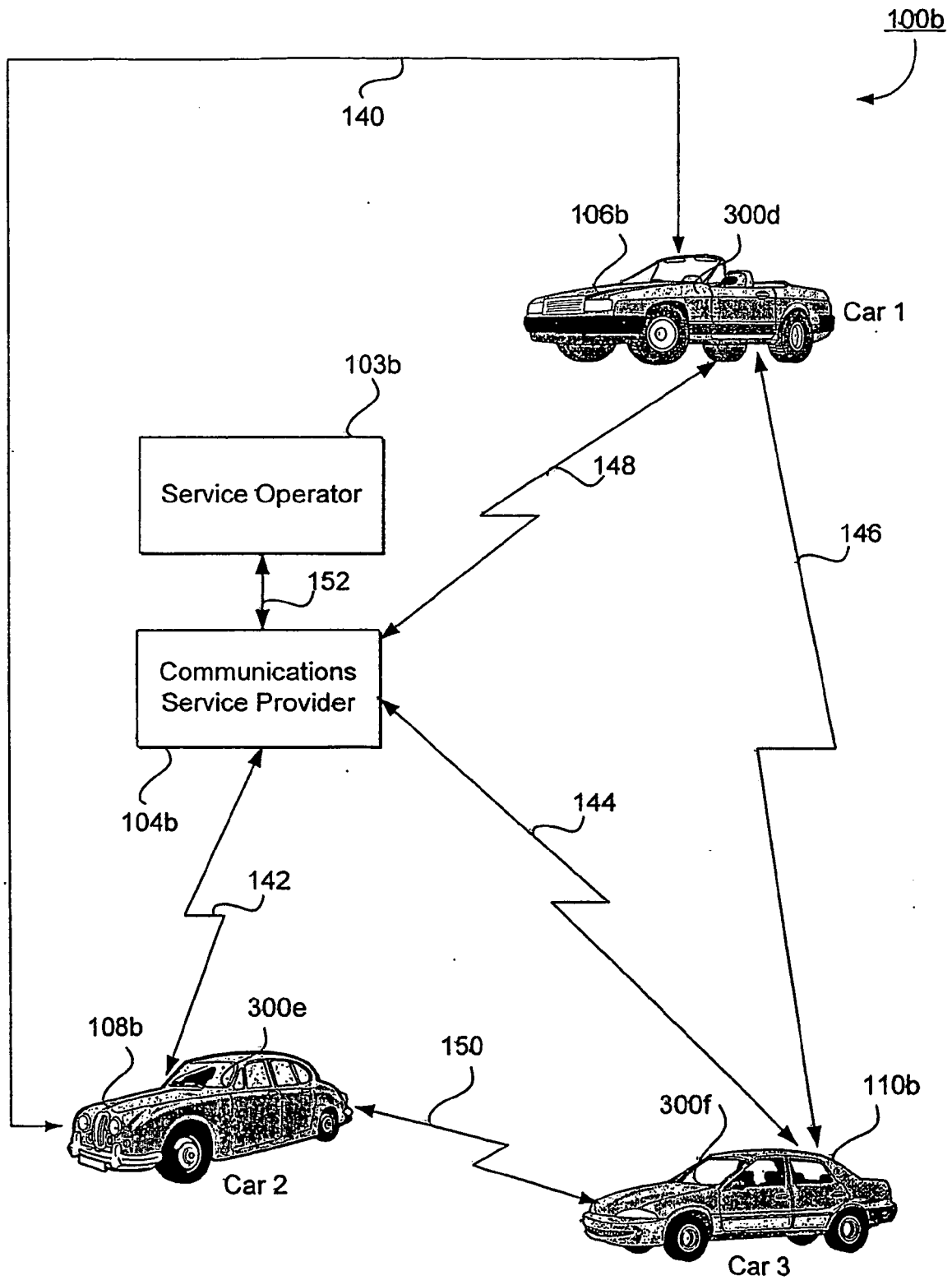


FIG. 1B

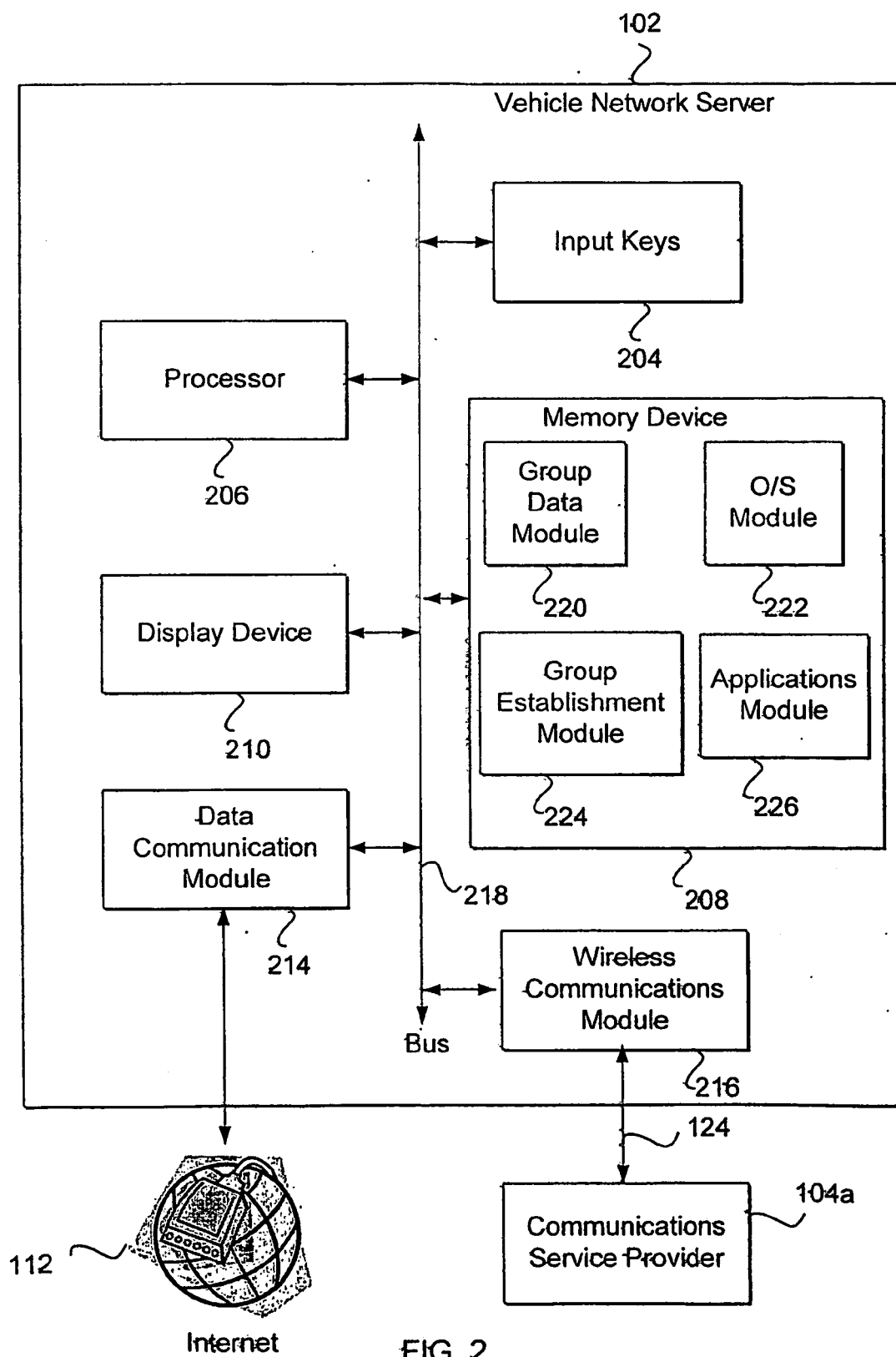


FIG. 2

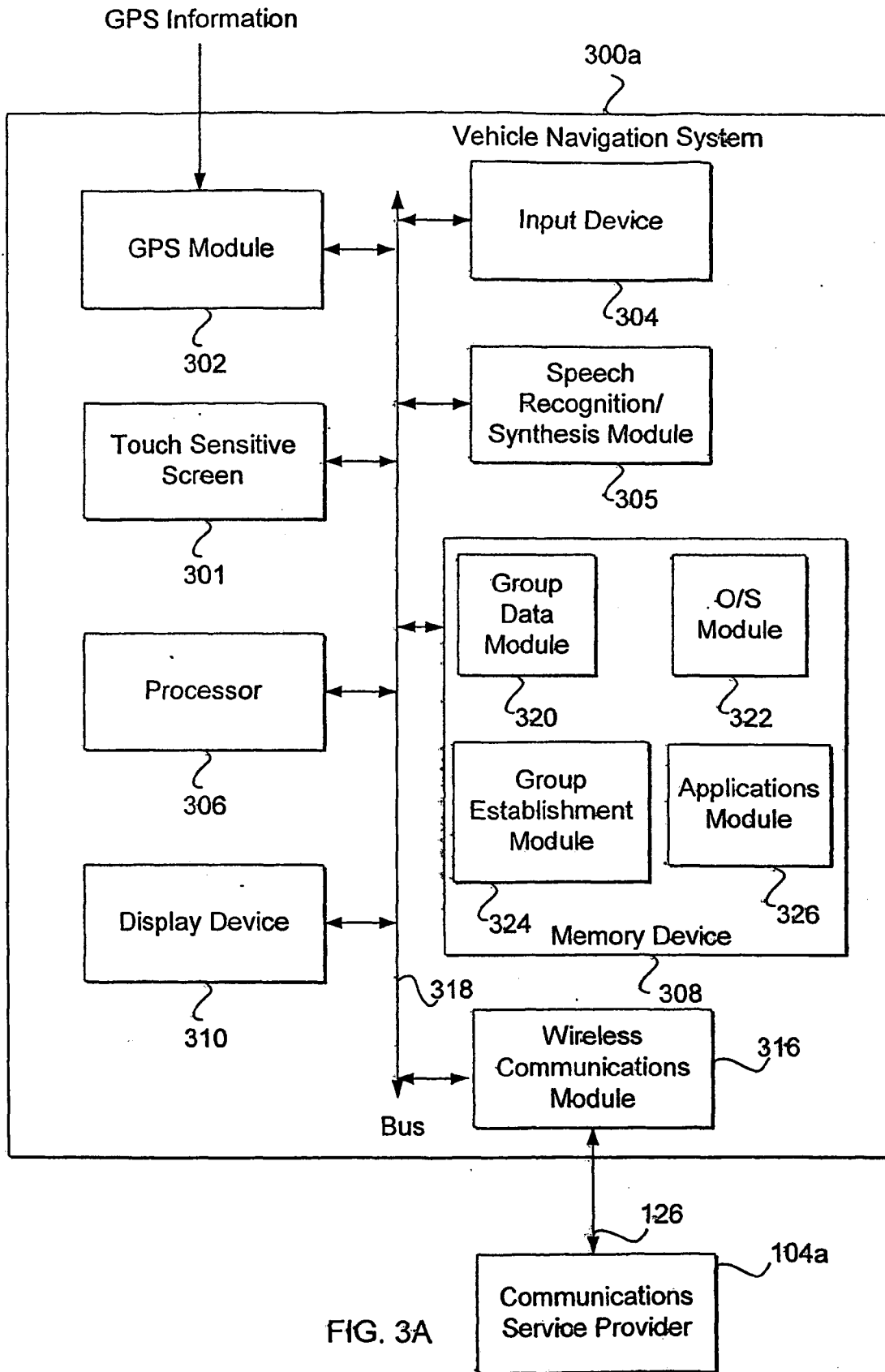
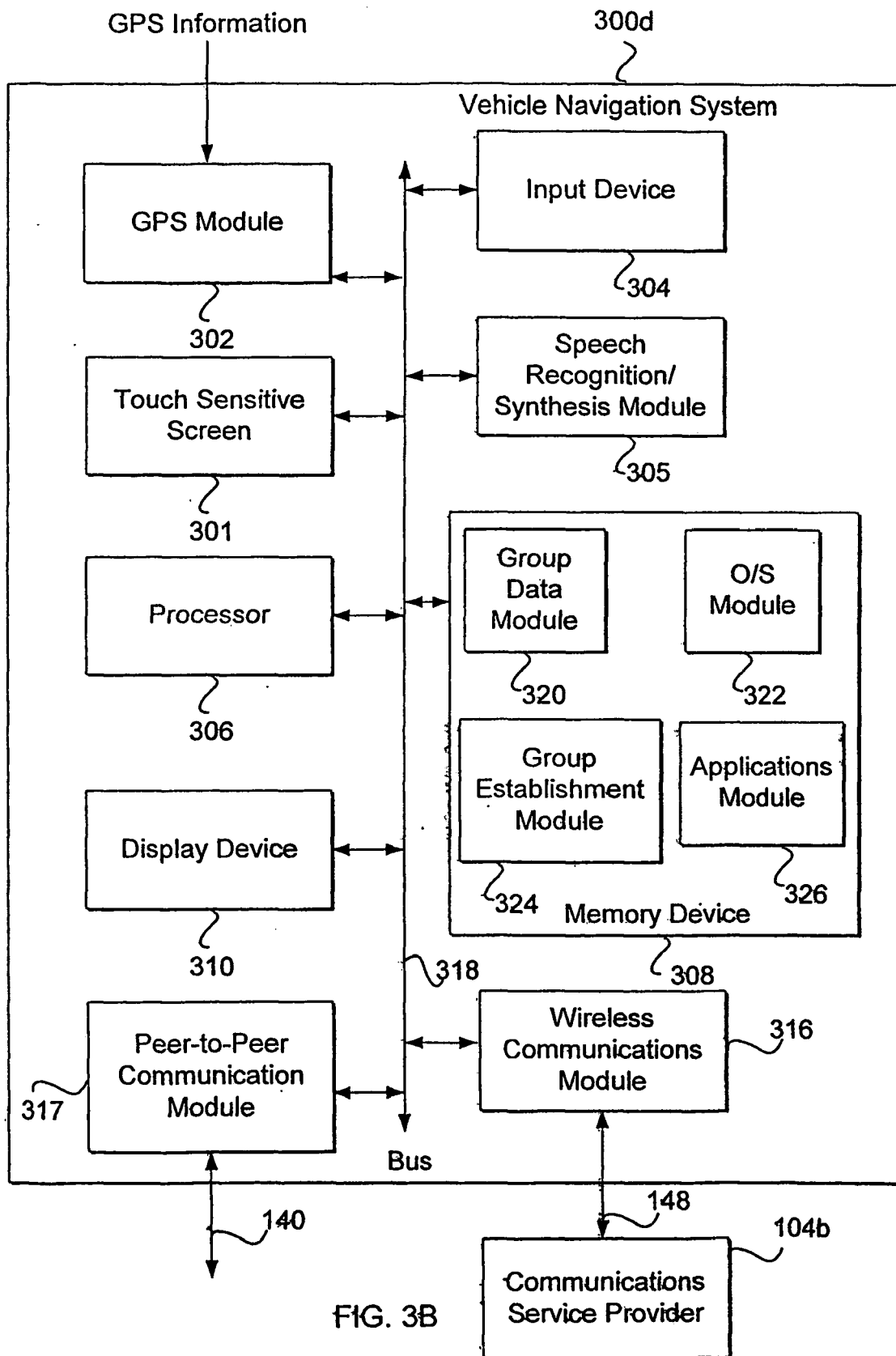
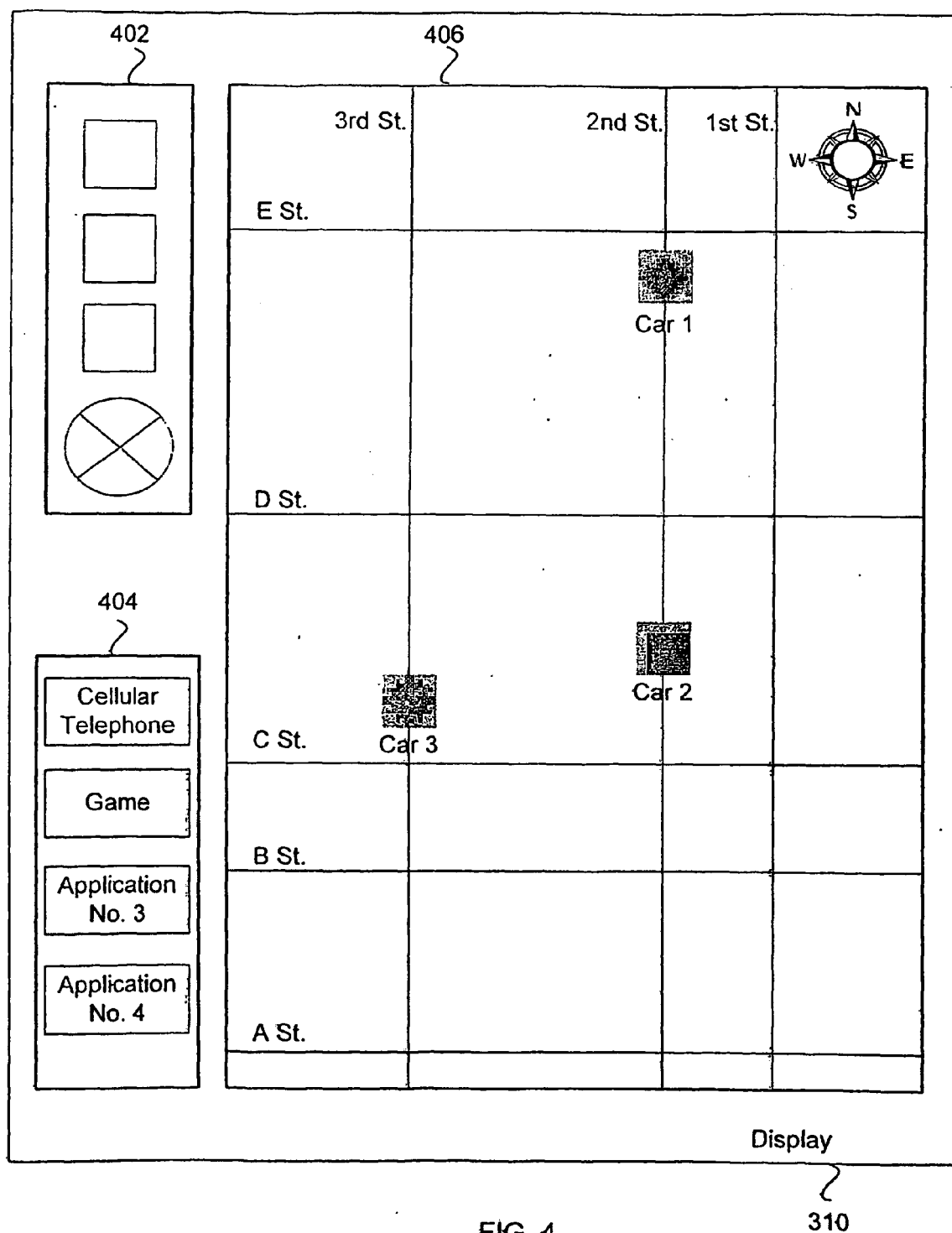


FIG. 3A





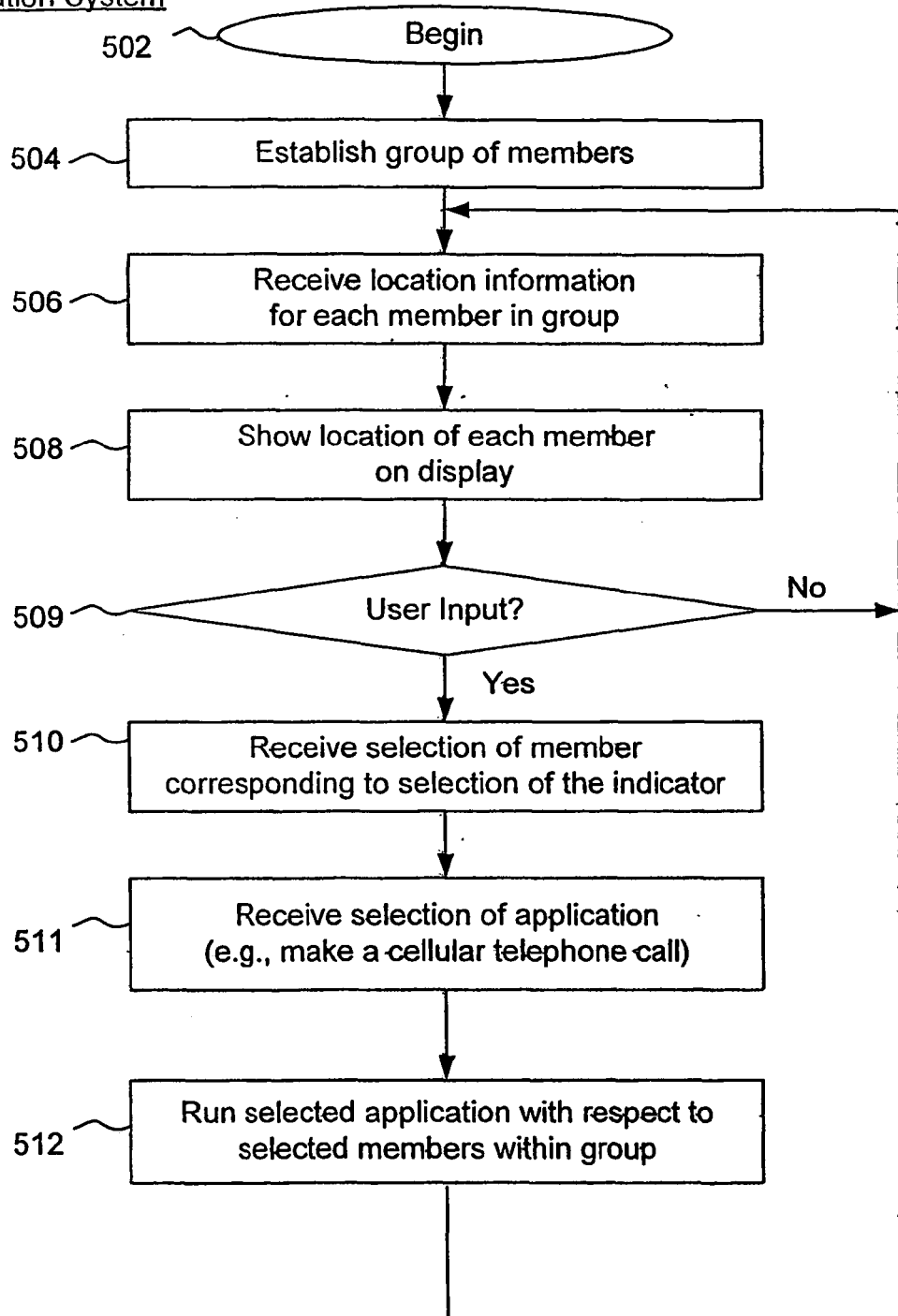
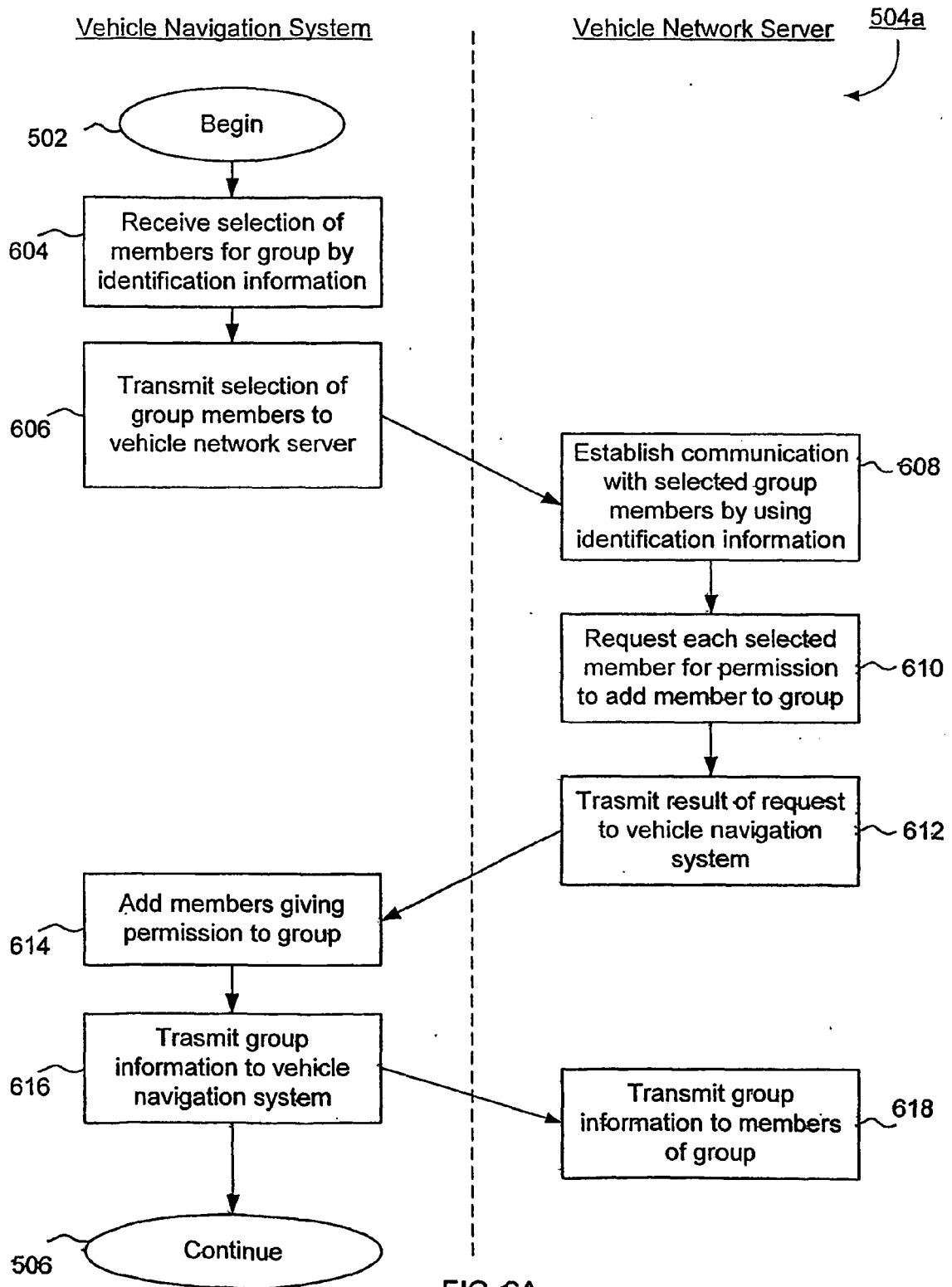
Vehicle Navigation System

FIG. 5



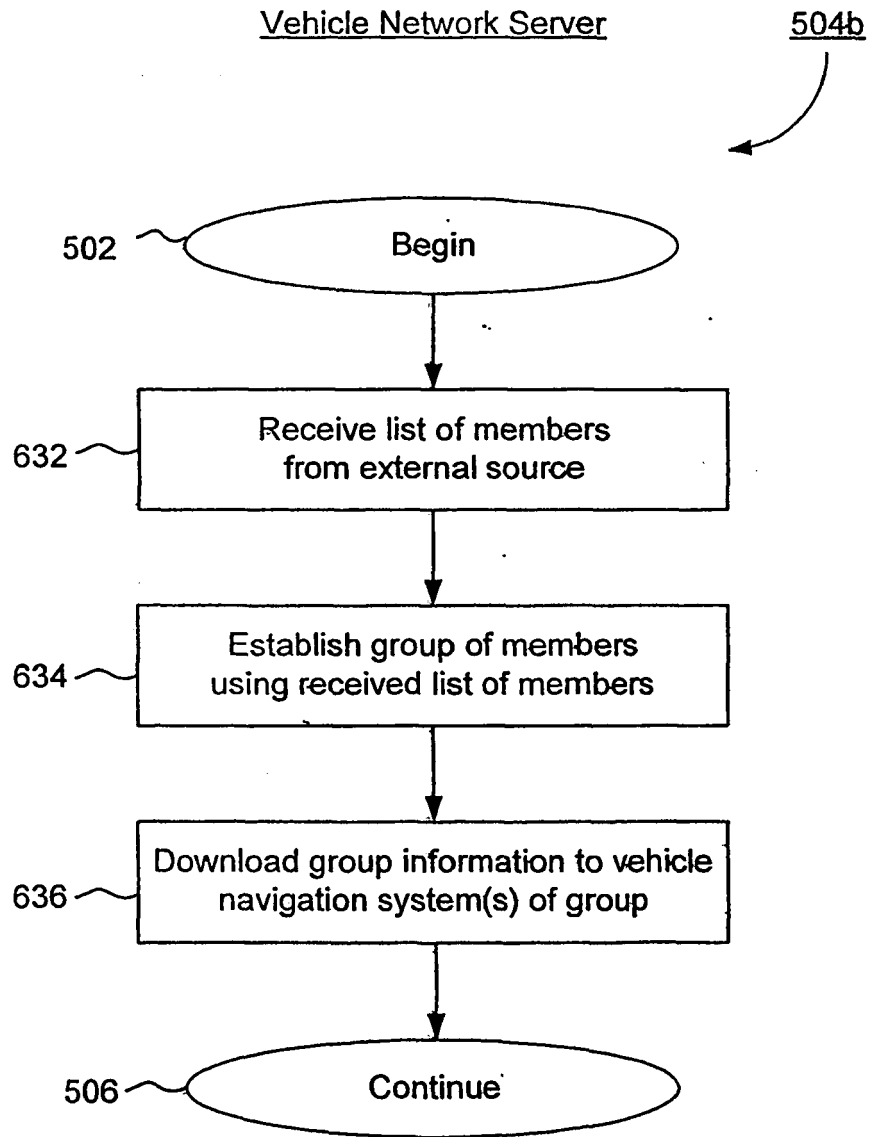


FIG. 6B

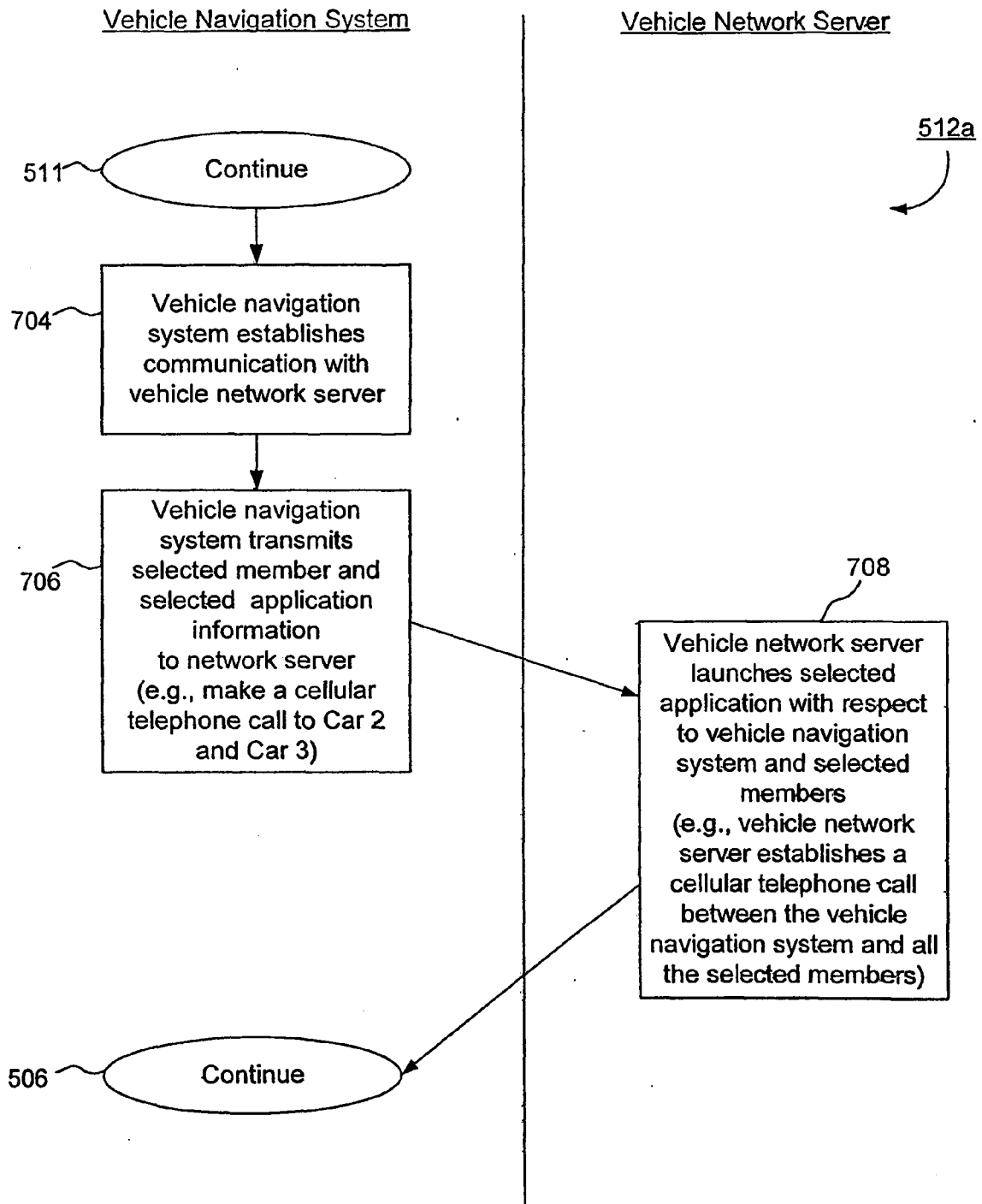


FIG. 7A

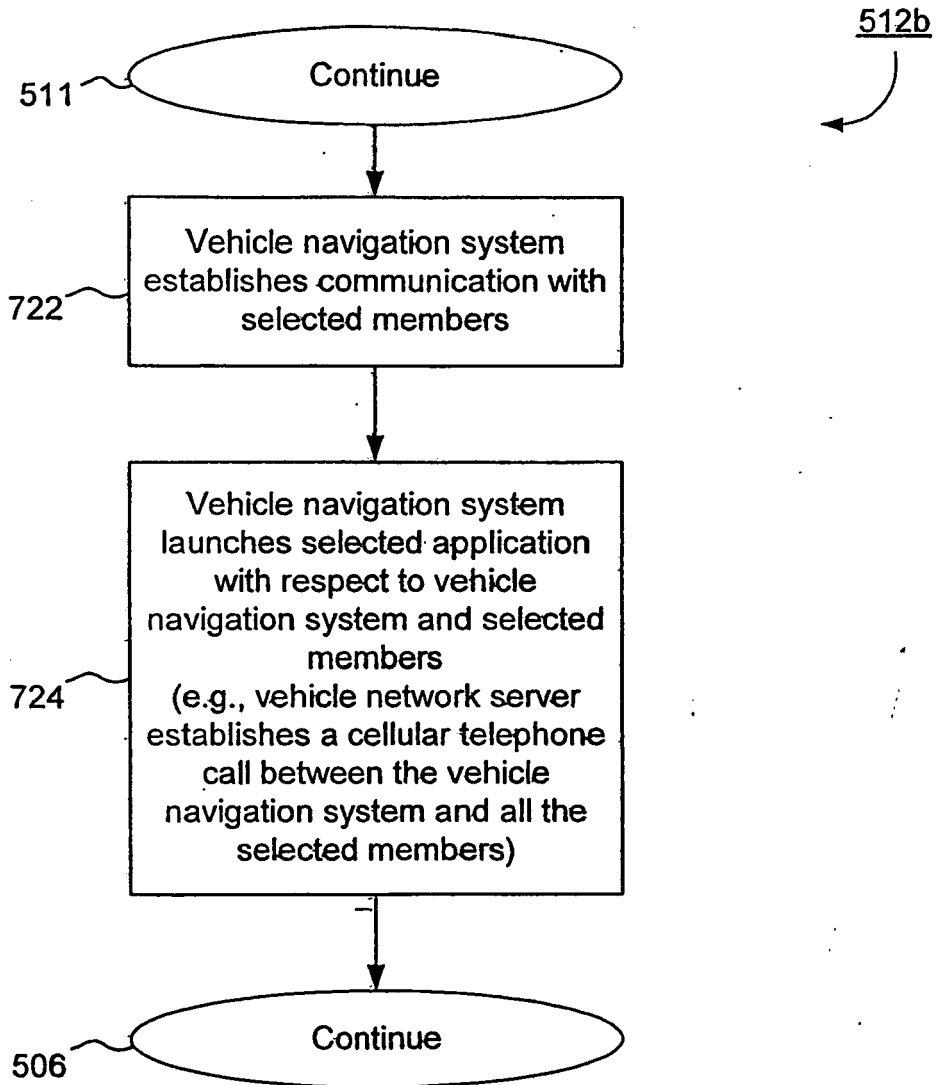
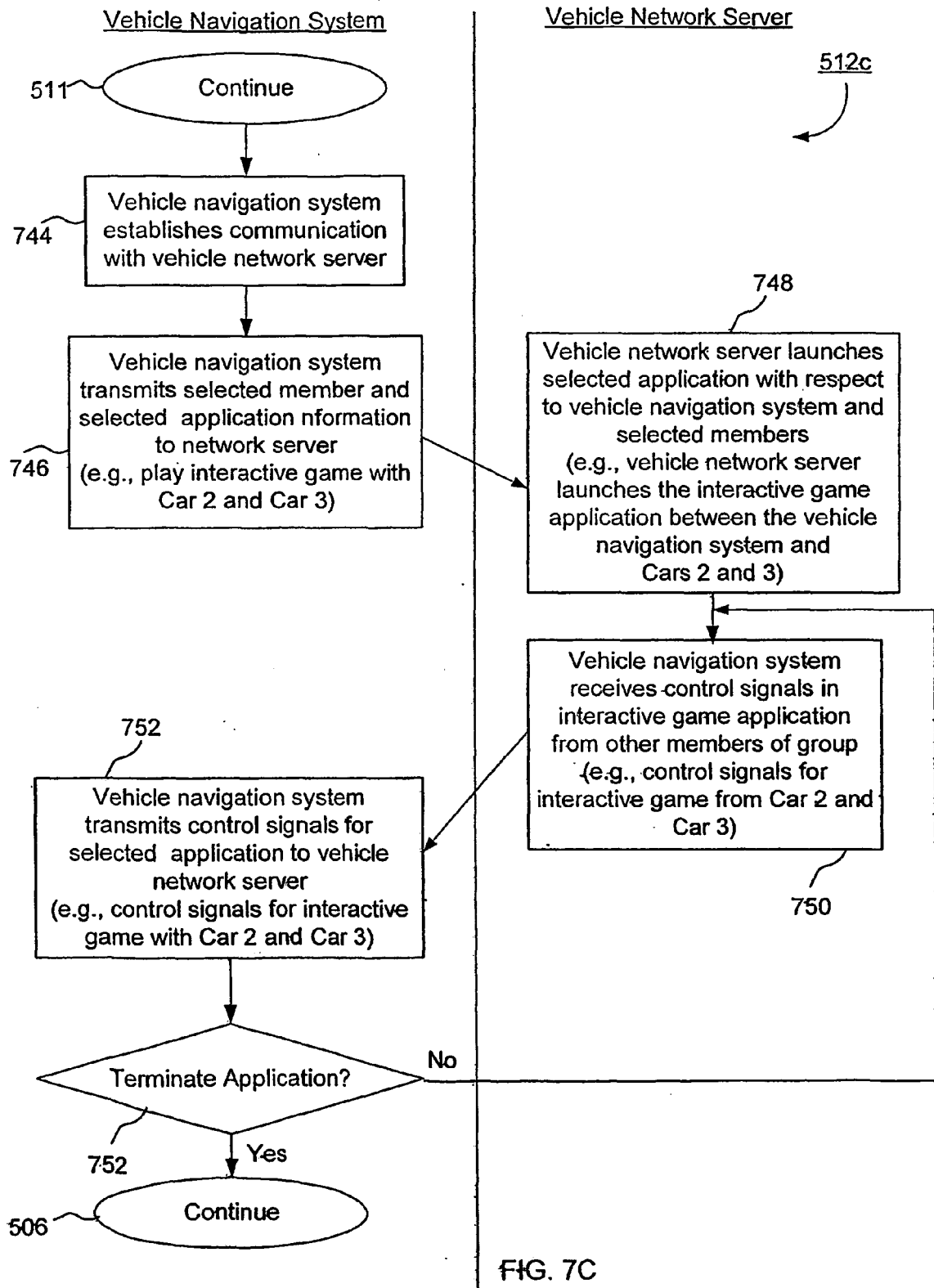
Vehicle Navigation System

FIG. 7B



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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