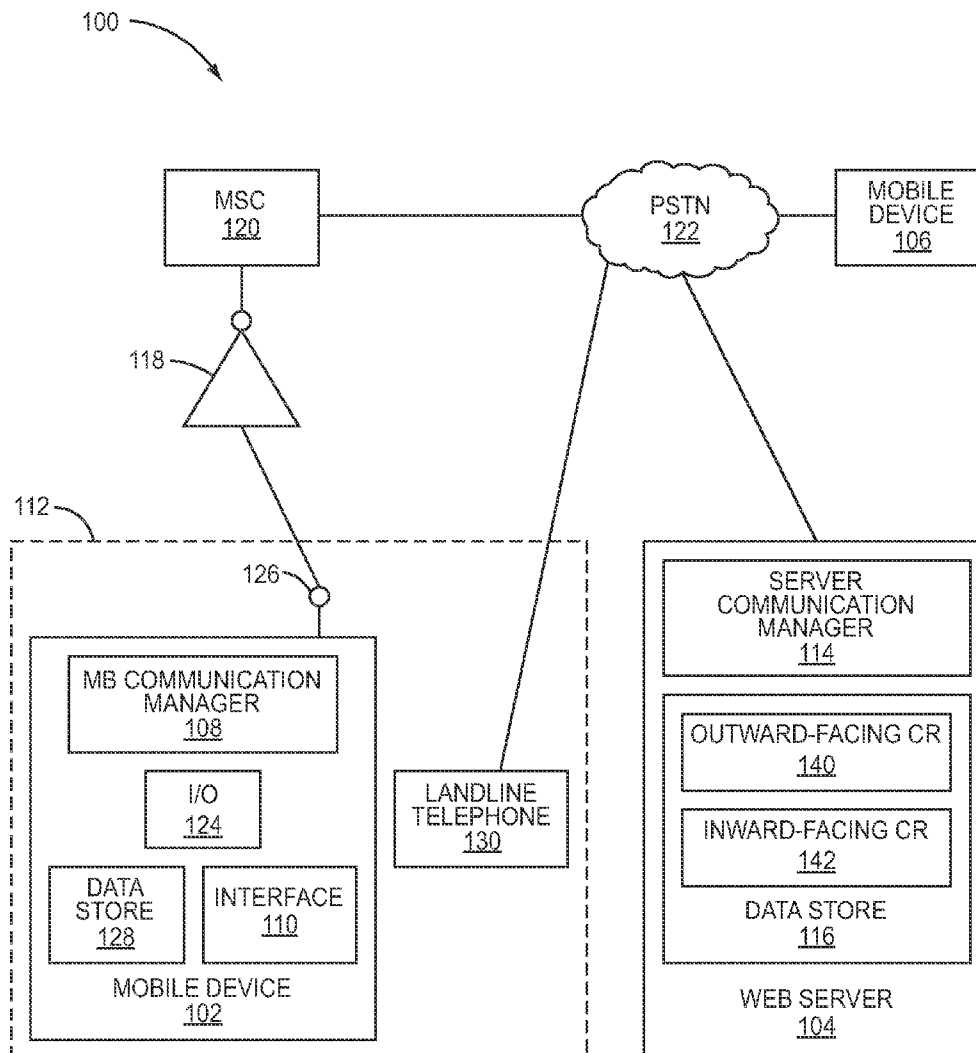




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Curtis et al.(10) **Pub. No.: US 2012/0135744 A1**(43) **Pub. Date: May 31, 2012**(54) **SYSTEMS AND METHODS FOR
GENERATING AND MANAGING
COMMUNICATION RULES ASSOCIATED
WITH GEOGRAPHIC LOCATIONS****Publication Classification**(51) **Int. Cl.**
H04W 64/00 (2009.01)(52) **U.S. Cl.** **455/456.1**(75) **Inventors:** **Scott Curtis**, Durham, NC (US);
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Wilmington, DE (US)(21) **Appl. No.:** **12/838,634**(22) **Filed:** **Jul. 19, 2010****Related U.S. Application Data**(60) Provisional application No. 61/227,192, filed on Jul.
21, 2009.(57) **ABSTRACT**

Disclosed herein are methods and systems for generating and managing communication rules associated with geographic locations. According to embodiments of the present disclosure, a method may include storing a communication rule associated with a geographic location and a user. The method also includes receiving a communication identifying the geographic location. Further, the method includes applying the communication rule for routing the communication to the user.



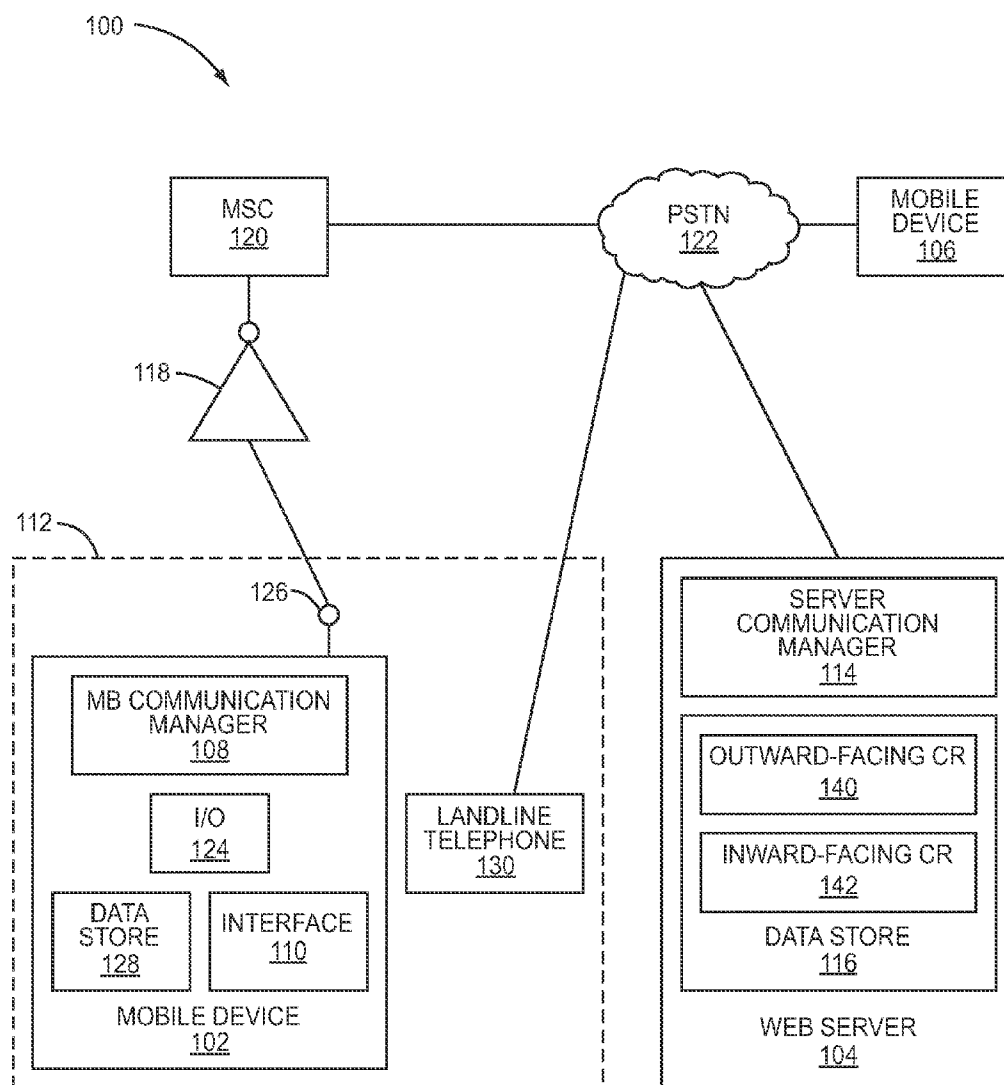
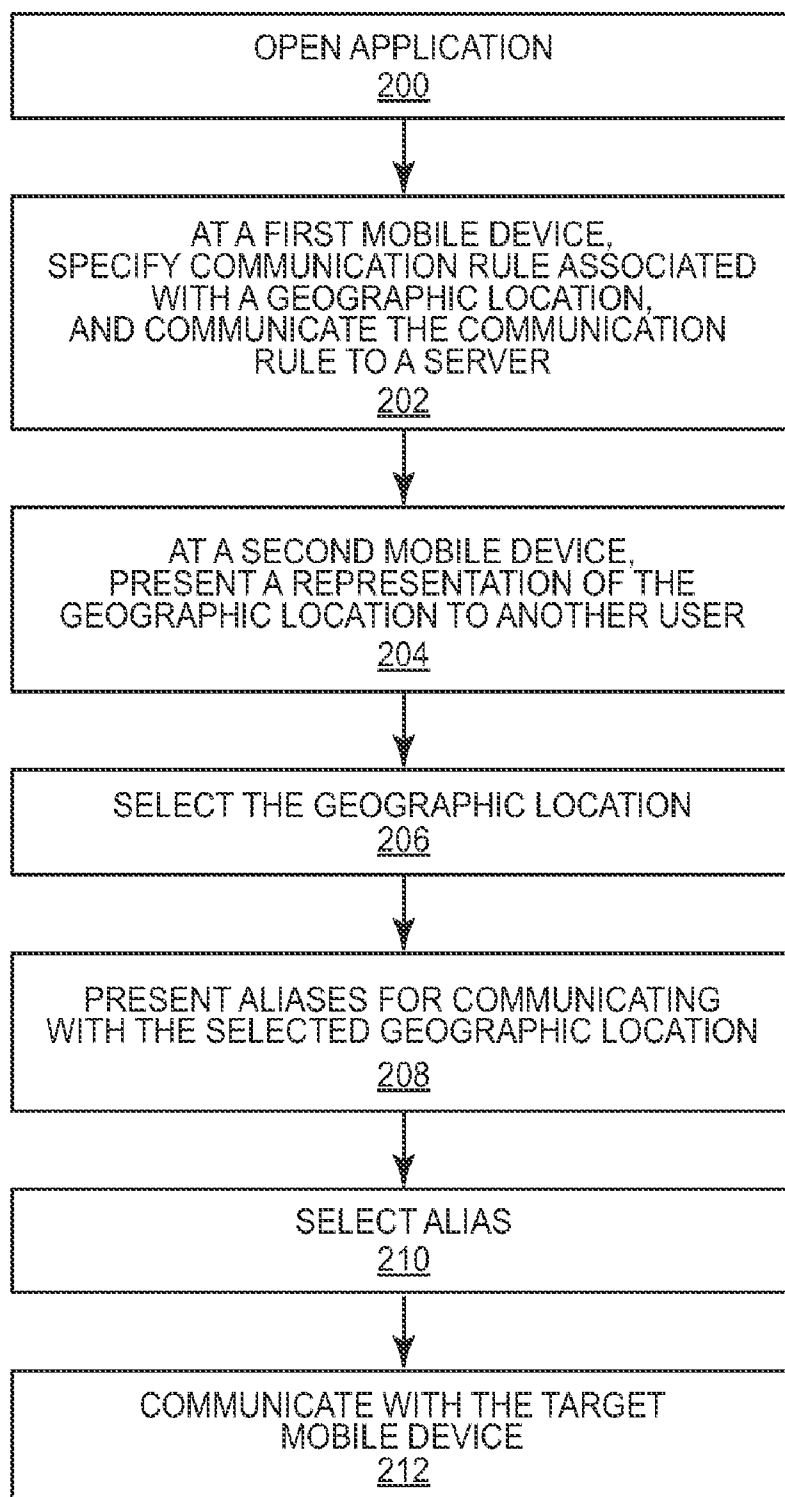


FIG. 1

**FIG. 2**

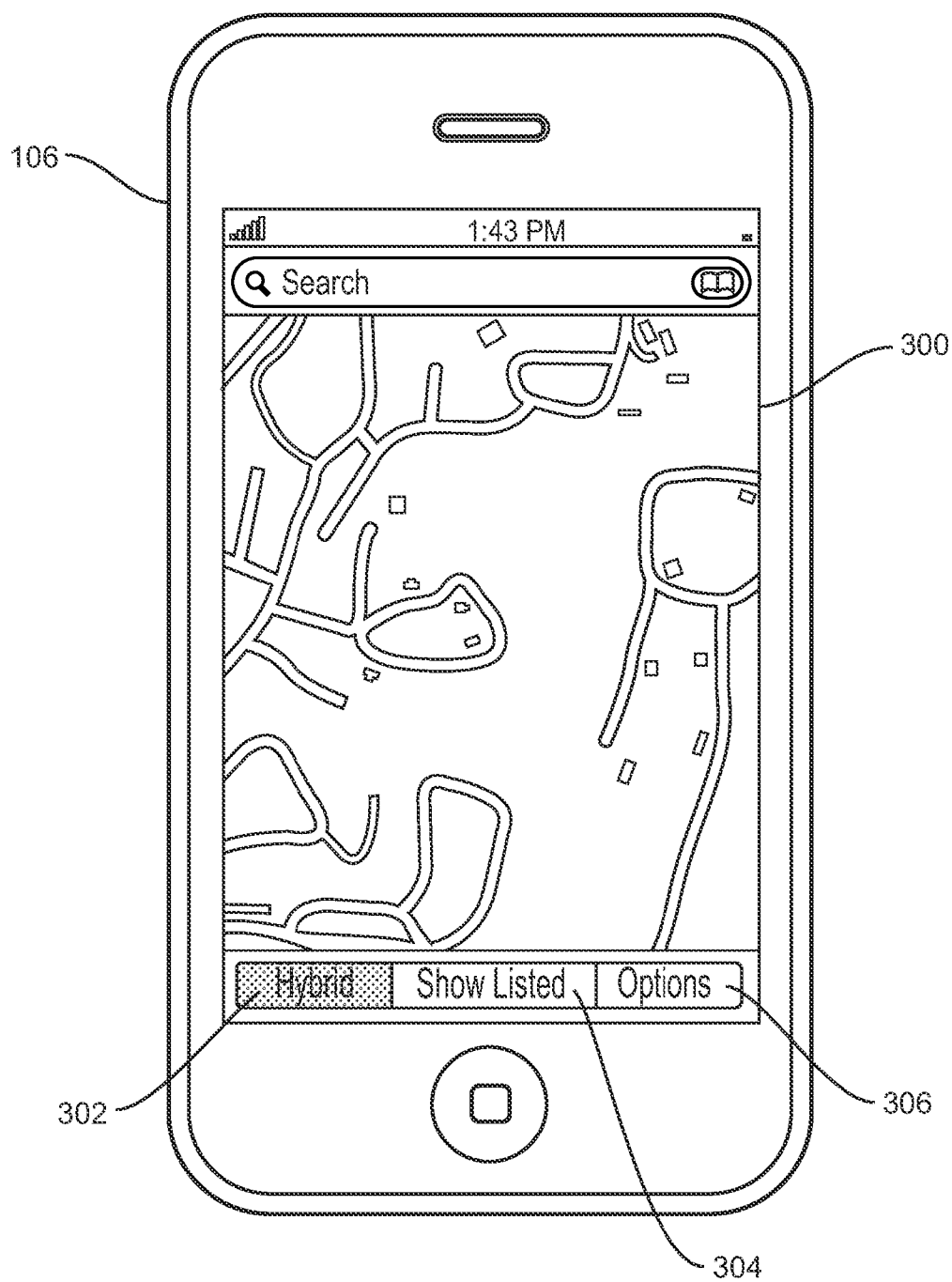


FIG. 3

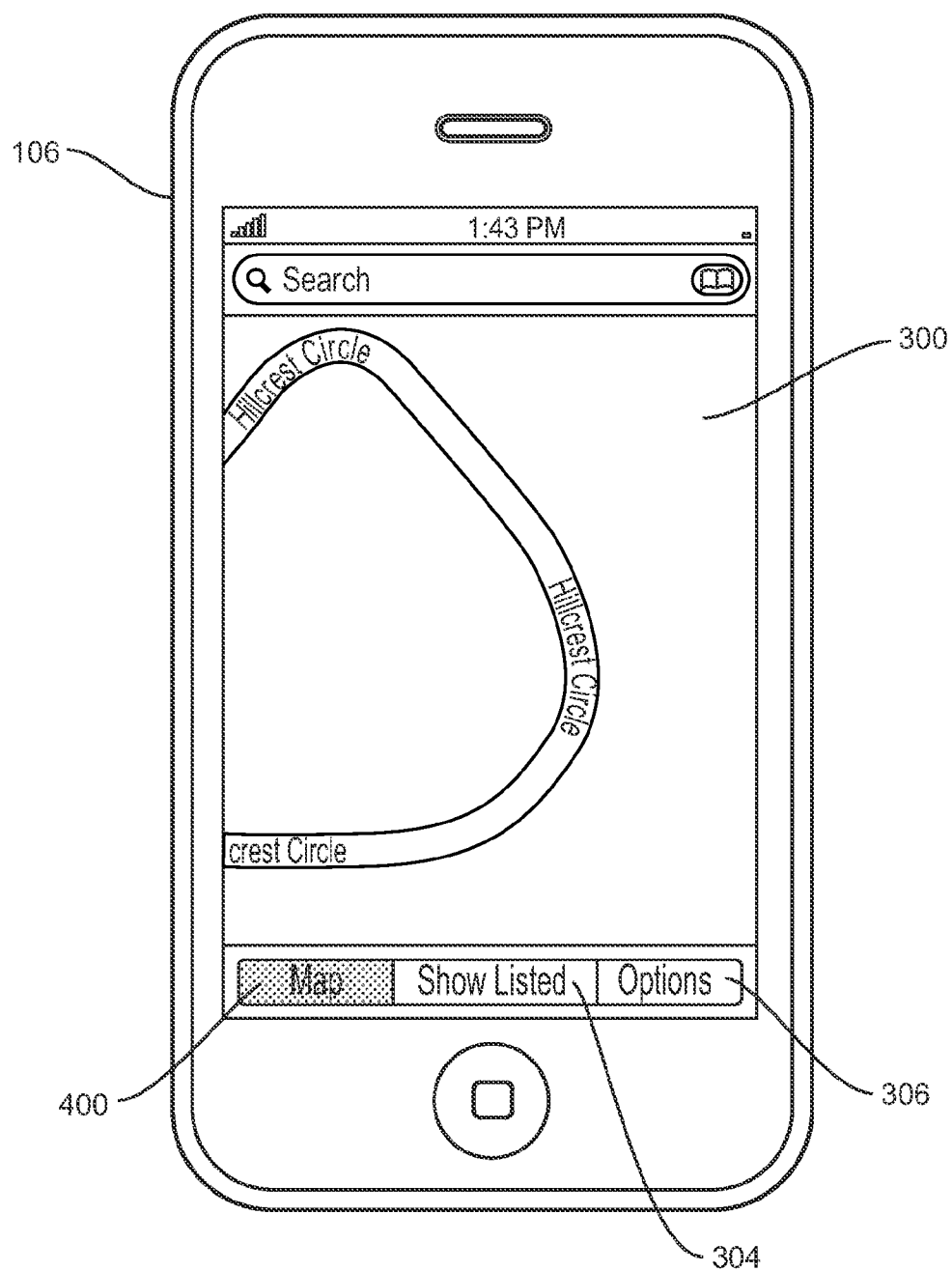
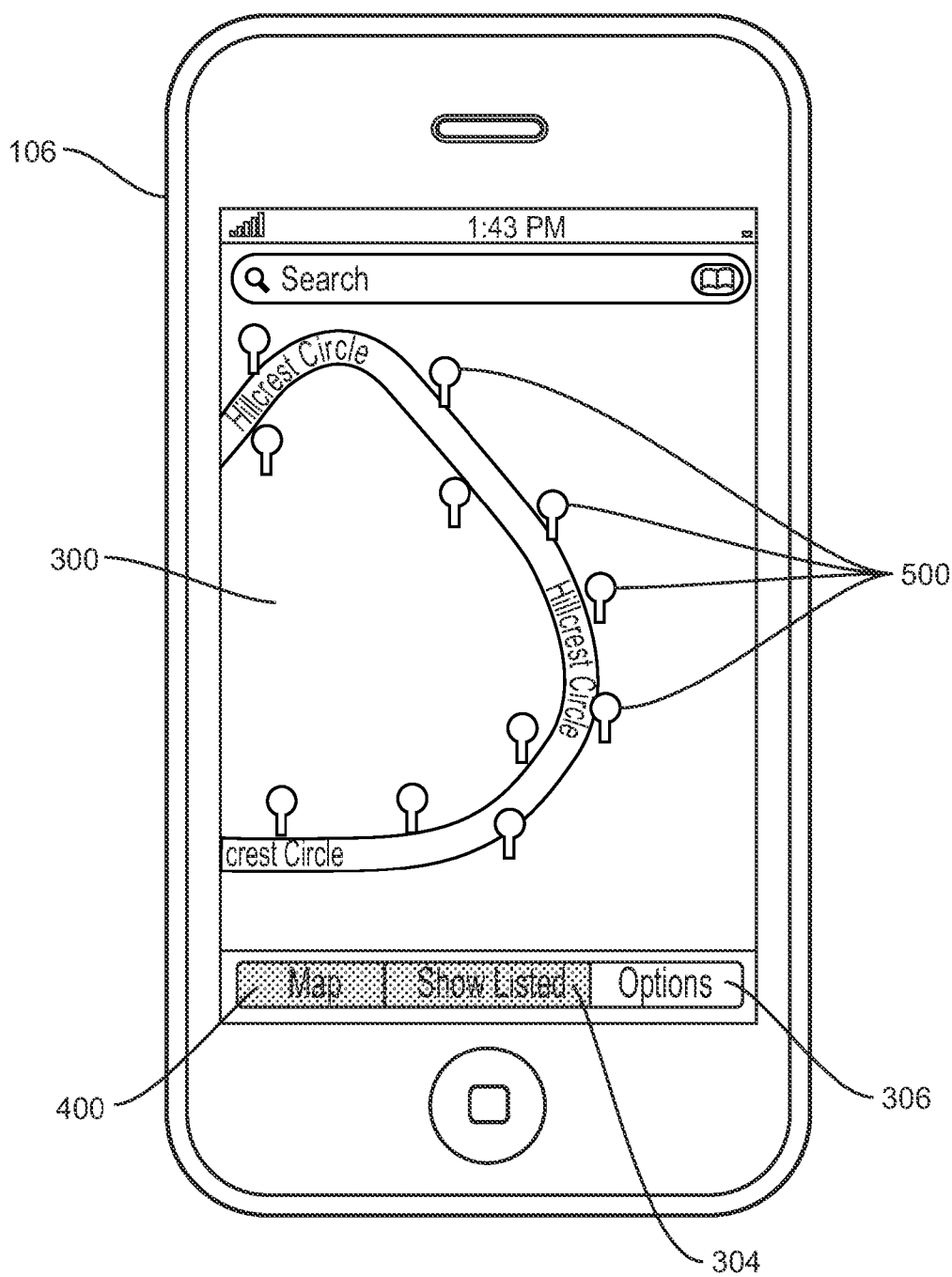


FIG. 4



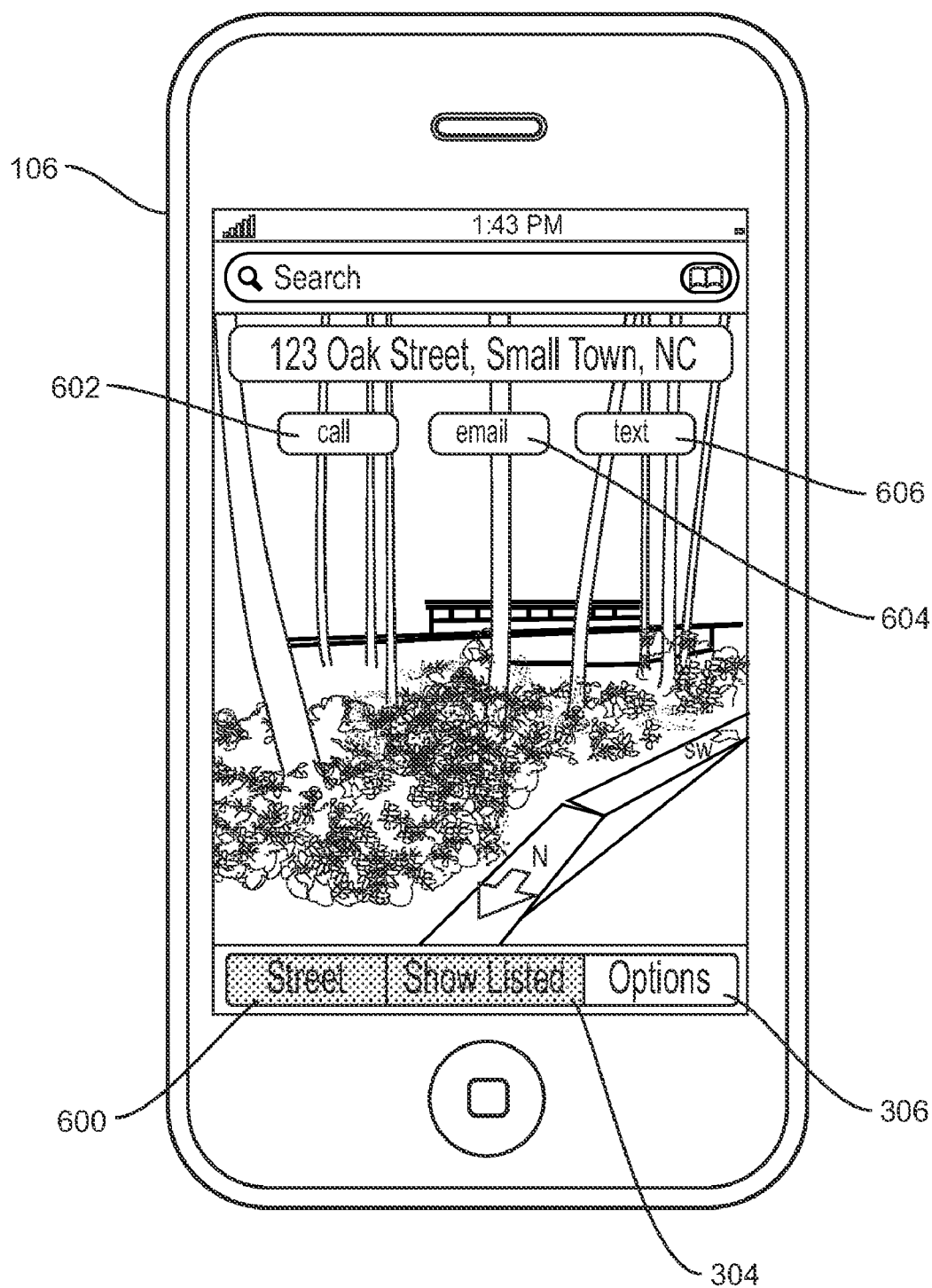
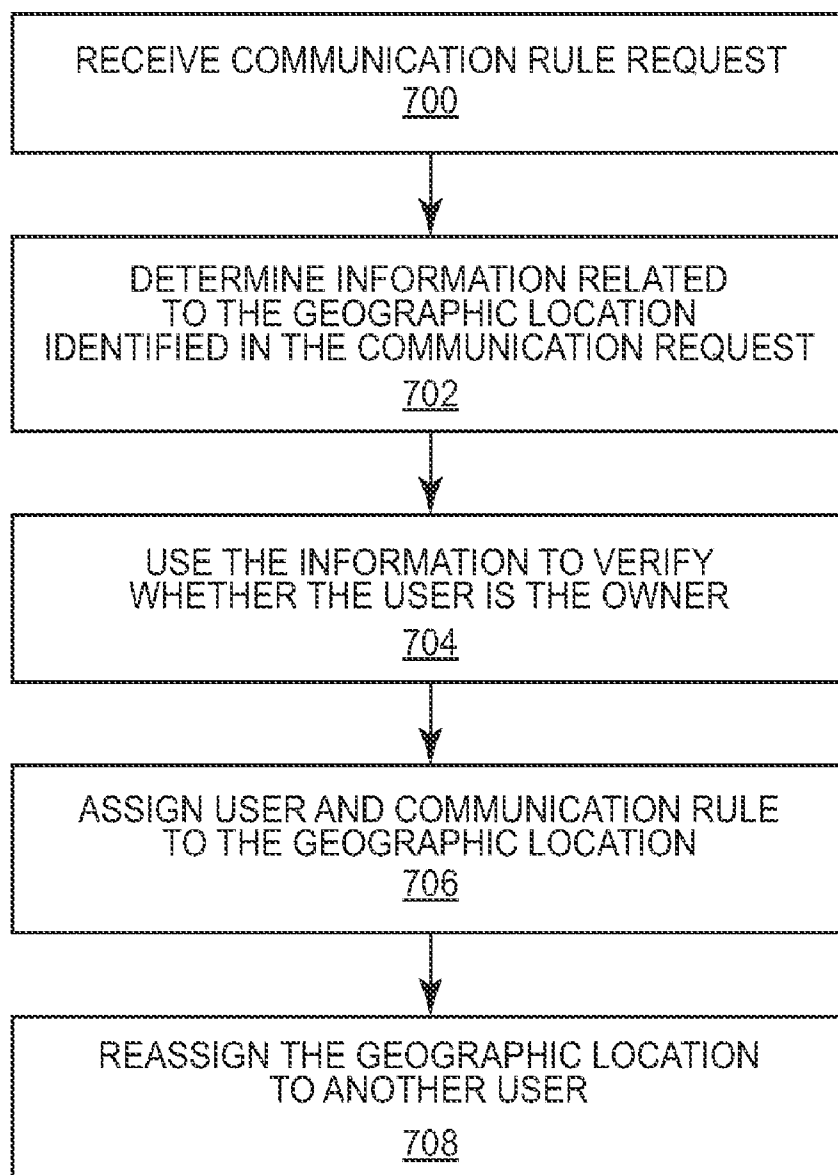


FIG. 6

**FIG. 7**

SYSTEMS AND METHODS FOR GENERATING AND MANAGING COMMUNICATION RULES ASSOCIATED WITH GEOGRAPHIC LOCATIONS

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. provisional patent application no. 61/227,192, filed Jul. 21, 2009 and titled LOCATION BASED COMMUNICATION ADDRESSES, the content of which is hereby incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to systems and methods for generating and managing communication rules associated with geographic locations.

BACKGROUND

[0003] Mobile devices having smart phone capabilities have become ubiquitous in today's society. Such computing devices can provide basic wireless telephone service and various other features available on desktop and laptop computers. Further, such computing devices are Internet-accessible and include highly efficient processors and display functionality for rendering rich graphical information that is available to be downloaded to the device over the Internet. In addition, these devices include global positioning system (GPS) capabilities, personal information management (PIM) functions, such as address books, appointment calendars, and the like. These devices may also have the ability to handle multiple functions at once.

[0004] It is becoming increasingly common for individuals or families to use mobile devices for telephone communications rather than having a landline telephone installed at their residence or business. As a result, a residence or business will not have a telephone that is physically tied to the geographic location of the residence or business. In this case, it may be difficult for a person to call or otherwise initiate communication with persons at the geographic location. It may also be desired to be able to reach a landline telephone within a geographic location when the telephone number of the landline telephone is unlisted. Accordingly, it is desirable to provide systems and methods for routing communications to a desired destination based on geographic location information.

SUMMARY

[0005] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

[0006] Disclosed herein are methods and systems for generating and managing communication rules associated with geographic locations. According to embodiments of the present disclosure, a method may include storing a communication rule associated with a geographic location and a user. The method also includes receiving a communication identifying the geographic location. Further, the method includes applying the communication rule for routing the communication to the user.

[0007] In accordance with other embodiments of the present disclosure, a method includes assigning a first user and a communication rule to a geographic location. The method also includes receiving information for reassigning the geographic location to a second user. The method also includes using the communication rule for routing communications to the second user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The foregoing summary, as well as the following detailed description of preferred embodiments, is better understood when read in conjunction with the appended drawings. For the purposes of illustration, there is shown in the drawings exemplary embodiments; however, the presently disclosed subject matter is not limited to the specific methods and instrumentalities disclosed. In the drawings:

[0009] FIG. 1 is a schematic diagram of a system for generating and managing communication rules associated with geographic locations according to embodiments of the present disclosure;

[0010] FIG. 2 is a flow chart of an exemplary method for establishing a communication with a mobile device by use of a communication rule associated with a geographic location in accordance with embodiments of the present disclosure;

[0011] FIGS. 3, 4, 5, and 6 illustrate a front view of an exemplary mobile device including a touch screen display for displaying a graphical map and interactive features for navigating the map to display a particular geographic location in accordance with embodiments of the present disclosure; and

[0012] FIG. 7 is a flow chart of an exemplary method for verifying ownership of a geographic location, for assigning a user and a communication rule to a geographic location, and for reassigning the geographic location to another user in accordance with embodiments of the present disclosure.

DETAILED DESCRIPTION

[0013] The presently disclosed subject matter is described with specificity to meet statutory requirements. However, the description itself is not intended to limit the scope of this patent. Rather, the inventors have contemplated that the claimed subject matter might also be embodied in other ways, to include different steps or elements similar to the ones described in this document, in conjunction with other present or future technologies. Moreover, although the term "step" may be used herein to connote different aspects of methods employed, the term should not be interpreted as implying any particular order among or between various steps herein disclosed unless and except when the order of individual steps is explicitly described.

[0014] Embodiments of the present disclosure enable a computing device to specify one or more communication rules for routing communications to the computing device based on a geographic location identified in the communications. The communication rules may be stored at a server remote from the computing device, and may be associated with or assigned to the geographic location and a user of the computing device. When a communication is received that identifies the geographic location, the communication rule may be applied for routing the communication to the user. Other embodiments of the present disclosure enable reassignment of the geographic location to another user such that the communication rule may then be used for routing communications to the other user. Further, other embodiments enable

other features and communication rules of the presently disclosed subject matter in a computing device and/or server as will be described in further detail herein.

[0015] As referred to herein, the term “computing device” should be broadly construed. It can include any type of mobile device, for example, a smart phone, a cell phone, a pager, a personal digital assistant (PDA, e.g., with GPRS NIC), a mobile computer with a smart phone client, or the like. A computing device can also include any type of conventional computer, for example, a desktop computer or a laptop computer. A typical mobile device is a wireless data access-enabled device (e.g., an iPhone® smart phone, a BLACKBERRY® smart phone, a NEXUS ONE™ smart phone, an iPad™ device, or the like) that is capable of sending and receiving data in a wireless manner using protocols like the Internet Protocol, or IP, and the wireless application protocol, or WAP. This allows users to access information via wireless devices, such as smart phones, mobile phones, pagers, two-way radios, communicators, and the like. Wireless data access is supported by many wireless networks, including, but not limited to, CDPD, CDMA, GSM, PDC, PHS, TDMA, FLEX, ReFLEX, iDEN, TETRA, DECT, DataTAC, Mobitex, EDGE and other 2G, 3G, 4G and LTE technologies, and it operates with many handheld device operating systems, such as PalmOS, EPOC, Windows CE, FLEXOS, OS/9, JavaOS, iOS and Android. Typically, these devices use graphical displays and can access the Internet (or other communications network) on so-called mini- or micro-browsers, which are web browsers with small file sizes that can accommodate the reduced memory constraints of wireless networks. In a representative embodiment, the mobile device is a cellular telephone or smart phone that operates over GPRS (General Packet Radio Services), which is a data technology for GSM networks. In addition to a conventional voice communication, a given mobile device can communicate with another such device via many different types of message transfer techniques, including SMS (short message service), enhanced SMS (EMS), multi-media message (MMS), email WAP, paging, or other known or later-developed wireless data formats. Although many of the examples provided herein are implemented on a mobile device, the examples may similarly be implemented on any suitable computing device.

[0016] As referred to herein, an “interface” is generally a system by which users interact with a computing device. An interface can include an input for allowing users to manipulate a computing device, and can include an output for allowing the system to present information and/or data, indicate the effects of the user’s manipulation, etc. An example of an interface on a computing device (e.g., a mobile device) includes a graphical user interface (GUI) that allows users to interact with programs in more ways than typing. A GUI typically can offer display objects, and visual indicators, as opposed to text-based interfaces, typed command labels or text navigation to represent information and actions available to a user. For example, an interface can be a display window or display object, which is selectable by a user of a mobile device for interaction. The display object can be displayed on a display screen of a mobile device and can be selected by, and interacted with by, a user using the interface. In an example, the display of the mobile device can be a touch screen, which can display the display icon. The user can depress the area of the display screen at which the display icon is displayed for selecting the display icon. In another example, the user can

use any other suitable interface of a mobile device, such as a keypad, to select the display icon or display object. For example, the user can use a track ball or arrow keys for moving a cursor to highlight and select the display object.

[0017] Operating environments in which embodiments of the presently disclosed subject matter may be implemented are also well-known. In a representative embodiment, a computing device, such as a mobile device, is connectable (for example, via WAP) to a transmission functionality that varies depending on implementation. Thus, for example, where the operating environment is a wide area wireless network (e.g., a 2.5G network, a 3G network, or the proposed 4G network), the transmission functionality comprises one or more components such as a mobile switching center (MSC) (an enhanced ISDN switch that is responsible for call handling of mobile subscribers), a visitor location register (VLR) (an intelligent database that stores on a temporary basis data required to handle calls set up or received by mobile devices registered with the VLR), a home location register (HLR) (an intelligent database responsible for management of each subscriber’s records), one or more base stations (which provide radio coverage with a cell), a base station controller (BSC) (a switch that acts as a local concentrator of traffic and provides local switching to effect handover between base stations), and a packet control unit (PCU) (a device that separates data traffic coming from a mobile device). The HLR also controls certain services associated with incoming calls. Of course, the presently disclosed subject matter may be implemented in other and next-generation mobile networks and devices as well. The mobile device is the physical equipment used by the end user, typically a subscriber to the wireless network. Typically, a mobile device is a 2.5G-compliant device or 3G-compliant device (or the proposed 4G-compliant device) that includes a subscriber identity module (SIM), which is a smart card that carries subscriber-specific information, mobile equipment (e.g., radio and associated signal processing devices), a user interface (or a man-machine interface (MMI)), and one or more interfaces to external devices (e.g., computers, PDAs, and the like). The mobile device may also include a memory or data store.

[0018] The presently disclosed subject matter is now described in more detail. For example, FIG. 1 is a schematic diagram of a system **100** for generating and managing communication rules associated with geographic locations. Particularly, the system **100** can store a communication rule associated with a geographic location and a user, receive a communication identifying the geographic location, and apply the communication rule for routing the communication to the user according to embodiments of the present disclosure. In accordance with other embodiments of the present disclosure, the system **100** may also apply criteria and implement various other actions on receipt of a communication identifying the geographic location. In accordance with other embodiments of the present disclosure, the system **100** may assign a user and a communication rule to a geographic location, receive information for reassigning the geographic location to another user, and use the communication rule for routing communications to the second user.

[0019] Referring to FIG. 1, the system **100** includes a mobile device **102**, which may be any type of computing device capable of receiving communications from another device. The mobile device **102** comprises a number of functional components. This representation of the mobile device **102** is meant to be for convenience of illustration and descrip-

tion, and it should not be taken to limit the scope of the presently disclosed subject matter as one or more of the functions may be combined. Typically, these components are implemented in software (as a set of process-executable computer instructions, associated data structures, and the like). One or more of the functions may be combined or otherwise implemented in any suitable manner (e.g., in hardware, in firmware, in combined hardware and software, or the like). The mobile device **102** may include a graphics rendering engine for displaying information to the end user in the usual manner. The mobile device **102** is Internet-accessible and can interact with a web server **104** using known Internet protocols such as HTTP, HTTPS, and the like.

[0020] The representation of the web server **104** shown in FIG. **1** is meant to be for convenience of illustration and description, and it should not be taken to limit the scope of the presently disclosed subject matter as one or more of the functions may be combined. The functions described herein as being implemented by the web server **104** may in the alternative be implemented together with, or exclusively by, one or more other computing devices, such as another server, the mobile device **102**, and/or one or more other mobile devices, such as a mobile device **106**. The web server **104** may be capable of receiving communications from mobile device **102** as well as other computing devices, such as the mobile device **106**. The functional components of the web server **104** may be implemented in software (as a set of process-executable computer instructions, associated data structures, and the like). One or more of the functions may be combined or otherwise implemented in any suitable manner (e.g., in hardware, in firmware, in combined hardware and software, or the like). The web server **104** is Internet-accessible and can interact with a mobile device or other Internet-accessible computing devices using known Internet protocols. The web server **104** is shown as a single device but this is not a requirement either; one or more programs, processes, or other code may comprise the server and be executed on one or more machines (in one or more networked locations).

[0021] In accordance with embodiments of the present disclosure, the web server **104** may be capable of maintaining, at least in part, a graphical mapping service for access by users over a network such as, but not limited to, the Internet. The web server **104** may store information relating to geographic boundaries, sites, and other information related to geographic locations and maps. The information may include street maps, residence and business address information, route planning information, city and state boundary information, and the like. Users may use a computing device to access the web server **104** for receiving information to display and to interact with a graphical representation of a geographic location or map. The displayed representation of the geographic location may include information related to the geographic location that has been downloaded from the web server **104**. The displayed representation of the geographic location may be displayed and indicated on a mobile device using any suitable application residing on the mobile device.

[0022] A geographic location on a graphical map may be indicated by use of a “push pin” graphic, an icon, or any other suitable graphic positioned on or near a defined area of the graphical map. In an example, a single family home or single business may have only one push pin designating its geographic location on the graphical map, whereas, for example, an apartment building or multi-unit office building may have several push pins designating multiple geographic locations

within an area on the graphical map. A geographic location on a map may be defined by one or more shapes enclosing, at least partially, an area on the graphical map.

[0023] The operation of the system **100** can be described by the following example. As shown in FIG. **1**, the mobile device **102** and web server **104** may each include various functional components and associated data stores to facilitate their respective operations. The operation of the disclosed methods may be implemented using system components other than as shown in FIG. **1**.

[0024] In this example system, the mobile device **102** includes a mobile device communication manager **108** configured to receive user input for specifying communication rules in accordance with embodiments of the present disclosure. For example, a user may set a communication rule in accordance with embodiments of the present disclosure by interacting with an application residing on the mobile device **102**. The user may enter commands for specifying the communication rule by use of an interface **110**. In addition, the user may enter commands for communicating the communication rule to the web server **104** for management in accordance with embodiments of the present disclosure.

[0025] In accordance with embodiments of the present disclosure, a communication rule may be specified in response to the user of the mobile device **102** entering commands to specify a geographic location for association with the mobile device **102**. For example, an application residing on the mobile device **102** may display a graphical map with which the user can interact for specifying a representation of a geographic location **112**. The representation of the geographic location **112** on the graphical map may be indicated by a shape defining an area on the graphical map, an arrow pointing to an area on the map, or any other suitable technique for indicating a geographic location on a graphical map. The user may interact with the displayed graphical map in any suitable manner as understood by those in the art for specifying the geographic location. The user may also specify one or more criteria for association with the geographic location **112** as described in more detail herein. A criterion may be applied against user-specified conditions, information, and the like associated with a communication to determine whether the criterion is met. After the geographic location **112** and the one or more criteria have been specified, the communication rule may be communicated to the web server **104** in a suitable manner as will be understood to those of skill in the art. At the web server **104**, the communication rule, any criteria, and the user specifying the communication rule may be assigned to the geographic location **112** for application to incoming communications.

[0026] The web server **104** may include a server communication manager **114** for managing and applying communication rules. The server communication manager **114** may receive a communication rule from a computing device, such as the mobile device **102**. For example, the communication rule may be specified by use of a web site maintained by the web server **104**. In another example, the mobile device **102** may specify a communication rule by use of an application residing on the mobile device, and by communicating the communication rule to the web server **104**. On receipt of a communication rule, the server communication manager **114** may store the communication rule in a data store **116** of the web server **104**. On receipt of a communication identifying a geographic location, the server communication manager **114** may compare the identified geographic location in the com-

munication to the geographic locations identified in the stored communication rules to determine whether one or more of the communication rules should be applied in accordance with embodiments of the present disclosure.

[0027] A communication rule may be applied on receipt of a communication identifying a geographic location associated with the communication rule. For example, a mobile device, such as the mobile device **106**, or another computing device may access an application capable of displaying a representation of the geographic location **112** on a graphical map. The user of the mobile device **106** may then select the representation of the geographic location **112** in an attempt to initiate communication with a computing device associated with the geographic location **112**. For example, the mobile device **106** may access a web site maintained by the web server **104** that enables the mobile device **106** to display a representation of the geographic location **116** on a graphical map, and that allows the user of the mobile device **106** to specify the representation of the geographic location **112**. In this example, the web server **104** may communicate to the mobile device **106** information relating to the geographic location **112**. For example, the mobile device **106** may be provided with data for displaying a graphical map including the representation of the geographic location **112**. The user of the mobile device **106** may view the graphical map including the representation of the geographic location **112**. Along with the representation of geographic location **112**, the graphical map may provide indicia that the geographic location **112** may be selected for communicating with a computing device associated with the geographic location **112**.

[0028] To initiate communication with a computing device associated with the geographic location **112**, a user of the mobile device **106** may select the representation of the geographic location **112**. In response to the selection, the web server **104** may be notified of the selection by communication of a suitable message from the mobile device **106** to the web server **104**. The communication may identify the geographic location **112**. On receipt of the communication, the server communication manager **114** may determine whether the identified geographic location **112** is associated with one or more of the communication rules stored in the data store **116**. If the server communication manager **114** determines that the identified geographic location **112** is associated with a communication rule, the server communication manager **114** may apply the communication rule in accordance with embodiments of the present disclosure.

[0029] In an example of applying a communication rule, the communication rule may specify that when a communication is received from a computing device and identifies a user-specified geographic location, a communication may be established between the computing device sending the communication and a user-specified computing device associated with the communication rule. In an example, the server communication manager **114** may facilitate the establishment of a telephone call communication between the mobile device **102** and the mobile device **106** in response to determining that a communication sent from the mobile device **106** identifies the geographic location **112** associated with the communication rule and that any criteria specified in the communication rule are met.

[0030] In an example of establishing a communication between mobile devices, the server communication manager **114** may establish a Voice over IP (VoIP) call between the mobile device **102** and the mobile device **106**, in which case the mobile device **106** is the calling party. Once the call is answered at the mobile device **102**, the call is considered to be established. The telephone call link can be implemented via

suitable network components, such as, but not limited to, a base station **118**, an MSC **120**, PSTN **122**, and various other network components, which are not shown herein for ease of illustration. A wireless input/output (I/O) component **124** or any other suitable communication interface may be used for communicating data to other devices and for receiving communication data from other devices via a network as will be understood to those of skill in the art. The mobile device **102** may include an antenna **126** for wirelessly sending and receiving communications to the base station **118** or any other suitable communications unit. The user may use the interface **110** of the mobile device **102** for interacting with the mobile device. The mobile device **102** may also include a data store **128** which can be any suitable type of memory needed for communication or any other functions of the mobile device **102**.

[0031] A communication rule may be “outward-facing” in that the communication rule controls the presentation of information to potential callers, emailers, text messagers, instant messagers, or the like to a geographic location. For example, an outward-facing communication rule may specify that the mobile device **102** is to be associated with the geographic location **112**, and may specify that certain contact information is presented to potential callers. An outward-facing communication rule may specify, for example, that a potential caller (e.g., the mobile device **106**) viewing a graphical map including a representation of the geographic location **112** may also view a business name associated with the geographic location **112**. An outward-facing communication rule may also specify allowable actions, such as, for example, that a potential caller is allowed to view information that a telephone call may be placed to contact the user associated with the geographic location **112**. The web server **104** may store outward-facing communication rules **140** in the data store **116**.

[0032] In another example of a communication rule, a communication rule may be “inward-facing” in that the communication rule controls the handling or management of communications identifying a user-specified geographic location. For example, the inward-facing communication rule may also specify that one or more criteria must be met before an action specified by the rule is implemented. A user-specified action may include, but is not limited to, routing a communication to a particular computing device such as, for example, a user-specified mobile device. The web server **104** may store inward-facing communication rules **142** in the data store **116**.

[0033] As mentioned above, a communication rule may specify that one or more criteria must be met before an action is implemented. In one or more embodiments of a communication rule criterion, a communication rule may specify that communications originating from a user-specified geographic location are managed differently from communications originating from other geographic locations. For example, a communication rule may specify that calls originating from a geographic location within a user-specified distance from the geographic location **112** may be routed to the mobile device **102**, whereas communications originating from other geographic locations are blocked or routed to a voicemail service. In this case, the user may have specified such a communication rule because he or she desired to receive calls originating from a geographic location in proximity to or the same as his or her geographic location, and to ignore or pass other calls to voicemail. Such a communication rule is not limited to calls, but may also be applied to, for example, emails, text messages, instant messages, and the like.

[0034] In one or more embodiments of a communication rule criterion, a communication rule may specify that communications from a user-specified source are managed differently from communications originating from another source. For example, a user may specify a source for the criterion by entering a telephone number, an email address, or the like. The communication rule may specify that calls from the user-specified source may be routed to the user, whereas communications from other sources are blocked or routed to a voicemail service, for example. In this case, the user may desire to receive communications originating from the user-specified source, and to ignore other communications. In another example, the communication rule may specify to block a communication if the communication is received from an unknown source.

[0035] In one or more embodiments, a communication rule may specify that communications identifying a user-specified geographic location will be routed to a landline telephone. For example, the communication rule may specify a telephone number of the landline telephone. Communications originating from a user-specified geographic location will be routed to the landline telephone using the user-specified telephone number. Referring to FIG. 1, for example, a communication rule may specify that the communication will be routed to a landline telephone **130** within the geographic location **112**. In this way, a person can reach the landline telephone within the geographic location even if the telephone number of the landline telephone is unlisted.

[0036] In one or more embodiments, an inward-facing communication rule may specify that communications identifying a user-specified geographic location will be routed to a computing device located closer to a center point of the user-specified geographic location. For example, the communication rule may list two or more mobile devices to which incoming communications may be routed. The web server managing the communication rule may track the geographic locations of the listed mobile devices. When a communication is received identifying the user-specified geographic location, the web server may route the communication to the mobile device that is closest to the center of the user-specified geographic location. In this way, communications will be routed to computing devices located closest to the geographic location.

[0037] Further to communication rules that specify a source in accordance with embodiments of the present disclosure, an inward-facing communication rule may specify a priority list for a set of sources. For example, depending on a setting of a mobile device, a user-specified source associated with a user-specified priority may be handled differently from other user-specified sources. In an example, a mobile device may be set to a vibrate-only mode, and the communication rule may specify that incoming calls from user-specified sources at a user-specified priority override the vibrate-only setting such that the mobile device rings for notifying the user of the incoming call. The call priority list may be applied regardless of geographic location of the source. Such criteria may be combined with one or more other criteria described herein.

[0038] In one or more embodiments of a communication rule criterion, a communication rule may specify a time limit for an incoming call. For example, a communication rule may specify that if a call originated from a user-specified geographic location and/or from a user-specified source, the call can be established, but the call will be disconnected after expiration of a user-specified time. Such criteria may be combined with one or more other criteria described herein.

[0039] In an example of an inward-facing communication rule, the communication rule may specify that a communication identifying a user-specified geographic location will be routed to a user-specified computing device or account based on one or more criteria. For example, the communication rule may specify that incoming emails from a user-specified source will be sent to a user-specified email account, rather than the destination email account identified in the incoming email. In another example, the communication rule may specify that incoming calls will be sent to a user-specified telephone number. Such criteria may be combined with one or more other criteria described herein.

[0040] In an example of an outward-facing communication rule, the communication rule may specify that potential callers are only provided with an option to initiate a call with the mobile device **102** associated with the geographic location **112**. The communication rule may be specified using the mobile device **102** or another computing device, and may be communicated to the web server **104**. To select a geographic location for initiating communications, for example, the mobile device **106** may be used to access the web server **104**. The web server **104** may communicate to the mobile device **106** a graphical map for display on the mobile device **106**. The graphical map may be displayed on a display of the mobile device **106** and include a representation of the geographic location **112**. A user of the mobile device **106** may select the representation of the geographic location **112** for initiating a communication with the mobile device **102** associated with the geographic location **112**. On selection of the representation of the geographic location, the mobile device **106** may display a button having the text "Call" in accordance with the communication rule specified for the geographic location **112**. The communication rule may specify that no other information is displayed and that a telephone call is the only form for communications associated with the geographic location **112**. The user of the mobile device **106** may select the "Call" button for calling the mobile device **102**. On selection of the "Call" button, a call may be initiated between the mobile devices **102** and **106** in accordance with techniques understood by those of skill in the art. For example, the call may be initiated using suitable VoIP techniques.

[0041] Further to the aforementioned example of using a "Call" button for initiating a call with a mobile device associated with a geographic location, the communication rule may specify whether a telephone number used for calling is provided to the caller. For example, the communication rule may specify that the mobile device **106** does not receive or display the telephone number of the mobile device **102**. In this way, the potential caller may be allowed to initiate a call with the mobile device **102**, but the potential caller will not be presented with the telephone number of the mobile device **102**. Alternatively, the communication rule may specify that the mobile device **106** receives or displays the telephone number of the mobile device **102**. Such a communication rule may also be applied to other forms of communicating with a computing device, such as, but not limited to, emailing, text messaging, instant messaging, and the like.

[0042] Similar to the aforementioned example of initiating a call, a communication rule may specify other forms of communications for allowing a mobile device to communicate with a computing device associated with a geographic location. For example, a communication rule may specify that one or more of emailing, text messaging, and the like may be used for communication. For a potential communicator, a button for selecting one of the forms of communicating may be displayed on the mobile device. For example, a button having the text "Email" may be displayed for allowing the

potential communicator to send an email. On selection of the button, communication between the mobile devices may be initiated using the selected communication form.

[0043] In another example of a communication rule, the communication rule may specify criteria identifying one or more sources and a time of receipt for communications. One or more sources may be identified as acceptable sources for routing communications. The time identified by the criteria may be a time specified by the user as being acceptable for receipt of communications from the potential communicator. For example, the communication rule may specify that a communication will be routed to a computing device of the user in response to receipt of a communication from a user-specified source at a user-specified time. If the criteria are not met, the communication will be blocked, or otherwise handled as specified by the communication rule.

[0044] FIG. 2 illustrates a flow chart of an exemplary method for establishing a communication with a mobile device by use of a communication rule associated with a geographic location in accordance with embodiments of the present disclosure. Referring to FIG. 2, a user opens an application residing on his or her mobile device to set a communication rule (step 200). At step 202, the user may specify the communication rule associated with a geographic location, and use the mobile device to communicate the communication rule to a web server. For example, the user may use the mobile device 102 to enter a communication rule that specifies that the communication rule will be applied to communications identifying the geographic location 112. In an example, the communication rule may be outward-facing in that the rule specifies that the only communication mode for reaching the user is by a telephone call.

[0045] At step 204 of FIG. 2, another mobile device may present a representation of the geographic location to another user. For example, a user of the mobile device 106 may have met another person at a party at the other person's house. The user of the mobile device 106 may have neglected to obtain the contact information of the other person but would like to contact the other person. The user of the mobile device 106 may at least generally know the location of the house. In an effort to contact the other person, the user of the mobile device 106 may use the mobile device 106 to access a web site maintained by the web server 104. Using the application to access the web site in accordance with embodiments of the present disclosure, the mobile device 106 may display a graphical map. By navigating the graphical map using the interface 110, the user may locate the geographic location of the house for display.

[0046] As a further example of a user navigating a graphical map to locate a particular geographic location, FIGS. 3, 4, 5, and 6 illustrate a front view of an exemplary mobile device including a touch screen display for displaying a graphical map 300 and interactive features for navigating the map to display a particular geographic location in accordance with embodiments of the present disclosure. Referring to FIG. 3, the touch screen display of the mobile device 106 shows a "Hybrid" button 302, a "Show Listed" button 304, and an "Options" button 306 for navigating the graphical map 300 to locate a geographic location and for selecting the geographic location. The user may select the "Hybrid" button 302 for scrolling and zooming into the graphical map 300 until a suspected area of the geographic location (i.e., the house of the other person) is displayed or otherwise indicated. In FIG. 3, representations of various streets are displayed.

[0047] Referring to FIG. 4, the user of the mobile device 106 may select a "Map" button 400 to switch to a map view. The user may enter commands to zoom into an area of the

map where she or he suspects that the house is located. When a zoomed in area is displayed as shown in FIG. 5, for example, the user may select the "Show Listed" button 304 for displaying various indicia for selecting a representation of a geographic location in accordance with embodiments of the present disclosure. The example of FIG. 5 shows push pin graphics 500 at each geographic location that may be selected by the user for initiating a communication in accordance with embodiments of the present disclosure. These designated geographic locations are associated with published contact information by way of communication rules in accordance with embodiments of the present disclosure. For example, an outward-facing communication rule may specify a manner in which such contact information is made known.

[0048] Continuing with the aforementioned example, the user may view the graphical map 300 as shown in FIG. 5 and determine that one of the push pin graphics 500 is at the location of the house. The graphical map 300 at the level shown in FIG. 5 may show names of the displayed streets. In this way, the user may recognize that the house was located on one of the identified streets.

[0049] Referring to FIG. 2, the user may select the geographic location (step 206). For example, referring to FIG. 5, the user may select the push pin graphic 500 where it is believed that the house is located. To confirm the location, the user may select a street view for display of an actual photo of the street. By viewing the actual photo of the street, the user may confirm that the displayed geographic location in the photo is the geographic location desired for communication. One of the push pin graphics 500 may be selected by touching the display screen at a location of the graphic.

[0050] Referring to FIG. 2, the mobile device may present aliases for communicating with the selected geographic location (step 208). Referring to FIG. 6, for example, in response to the selection of the geographic location and a "Street" button 600, the mobile device 106 may display a photo of the geographic location and a name of the address of the geographic location. The photo and geographic location may have been specified when a user specified a communication rule in accordance with embodiments of the present disclosure. The display shown in FIG. 6 may also show a "Call" button 602, an "Email" button 604, and a "Text" button 606 as aliases for communicating with the selected geographic location. In an example, the geographic location displayed on the mobile device 106 may correspond to the geographic location 112 shown in FIG. 1 that is associated with a communication rule in accordance with embodiments of the present disclosure.

[0051] Referring to FIG. 2, the user may select an alias (step 210). For example, referring to FIG. 6, the user may select one of buttons 602, 604, and 606 for calling, sending an email to, or sending a text message to, respectively, the mobile device 102 associated with the geographic location 112. After selection of one of the aliases, data indicating the selection may be communicated to the web server 104. In response to receipt of the selection, the web server 104 may establish the selected form of communication between the mobile devices 102 and 106. For example, if a call is selected, a call may be initiated between the mobile devices 102 and 106. In this manner, the user of the mobile device 106 can use a web server, for example, to communicate with a target mobile device at a known geographic location (step 212).

[0052] As mentioned above, a communication rule may associate a user with a geographic location. In effect, in accordance with embodiments of the present disclosure, such a communication rule may be used with other communication rules as described herein to establish a database of secure

communication and contact information for verifiable owners of geographic locations in the physical environment. Such geographic locations, specified with communication rules, may be represented by physical coordinates, locations, or shapes represented on graphical maps. For example, Internet users may access a web site (e.g., a web site maintained by the web server **104**) for displaying a graphical map indicating verifiable owners of geographic locations indicated on the graphical map. Communication rules may also be linked to third party mapping services such as, for example, GOOGLE MAPS™ or MAPQUEST™ mapping services, for implementing embodiments according to the present disclosure.

[0053] As mentioned above, multiple criteria may be combined for association with a communication rule. A communication rule may specify that all of the criteria must be met before the communication rule will be applied. In an example, a communication rule may specify that an incoming communication from a source (e.g., a mobile device) will be sent to a user associated with the communication rule if the source is identified as being a friend or a “friend-of-a-friend” as determined by a social networking service; if the incoming communication is placed within a user-specified time period; and if the source is located within a user-specified distance of the geographic location.

[0054] In another example, a communication rule may specify that an incoming communication from a source will be sent to a user associated with the communication rule if the source is determined to be from an officially verifiable source (e.g., a postal service, police, and the like); and if the destination mobile device is determined to be more than a user-specified distance from the location of the source of the communication.

[0055] In yet another example, a communication rule may specify that an incoming communication from a source will be sent to a user associated with the communication rule if the source is identified as being a friend or a “friend-of-a-friend” as determined by a social networking service. The communication rule may also specify that all communications from all sources will be sent to a mobile device of the user if the source is determined to be less than a user-specified distance from the mobile device.

[0056] In accordance with embodiments of the present disclosure, systems and methods for verifying geographic location ownership are disclosed. These systems and methods may provide a secure and consistent methodology for verifying the right of a claimant to a particular geographic location (e.g., a physical property, an address, a geo-based shape, a set of geo-coordinates (“geo-communication domains”), and the like. Further, these systems and methods may provide an official communication channel for incoming communications to those geographic locations. The geographic locations may be mapped to their lawful owners using communication rules in accordance with embodiments of the present disclosure.

[0057] These systems and methods may provide, for example, a wiki-based adjudication mechanism for resolving disputes over ownership of the communication channel into a particular geographic location. Such a mechanism may involve a series of escalating burdens of proof for establishing who among several claimants to a particular geographic location actually own the geographic location. A communication-based verification methodology (e.g., a wiki-based system in which users can edit and comment on ownership of a geographic location) may be used to manage disputes between parties. This adjudication system may be administered by a third party. Challenges may be submitted to the adjudication system for determining ownership of a communication chan-

nel. If it is determined that the challenger is the rightful owner, the geographic location may be reassigned to the rightful owner from the previous owner. Reassignment procedures are disclosed in more detail herein.

[0058] In accordance with embodiments of the present disclosure, when a communication rule is received for management by a server as described herein, the server may verify with a third party that the user associated with the communication rule is the rightful claimant (e.g., owner) of the geographic location specified in the communication rule. For example, in response to receiving a communication rule from the mobile device **102**, the server communication manager **114** may control communication of a verification request to another server, which may be controlled under a wiki-based adjudication mechanism. The third party server may verify that the user is the owner and report the verification to the web server **104**. If the ownership is verified, the server communication manager **114** establishes the communication rule. If ownership is not verified, the communication rule will not be established by the web server **104**.

[0059] FIG. 7 illustrates a flow chart of an exemplary method for verifying ownership of a geographic location, for assigning a user and a communication rule to a geographic location, and for reassigning the geographic location to another user in accordance with embodiments of the present disclosure. Verification, assignment, and reassignment may be implemented entirely or in part by a web server, such as the web server **104**, or by the web server and a third party server in accordance with embodiments of the present disclosure. Referring to FIG. 7, a communication rule identifying a user and a geographic location may be received (step **700**). For example, the web server **104** may receive a communication request from the mobile device **102** for assigning a user and a communication rule to the geographic location **112**.

[0060] In response to receipt of the communication request, the server communication manager **114** may determine information related to the geographic location identified in the communication request (step **702**). For example, the server communication manager **114** may identify a postal address within boundaries defined by the user-specified geographic location. The information (e.g., the postal address) may be used for verifying, with a postal address database maintained by a third party server, for example, whether the user is an owner of the property associated with the postal address (**704**). For example, if one postal address is identified, the server communication manager **114** may look up an occupant in the postal address database to check for a match with the user. If no postal address is found, the user and communication rule may be assigned to the geographic location (step **706**). If two or more postal addresses are found, the server communication manager **114** may look up the occupants for each check for assignment of geographic locations based upon the matches.

[0061] After assignment of a user to a geographic location, the geographic location may be reassigned to another user. Referring to FIG. 7, for example, the geographic location may be reassigned to another user (step **708**). The geographic location may be reassigned, for example, if the property owner or occupant of the geographic location changes. In this case, the new property owner or occupant may desire to have the geographic location reassigned. After reassignment, the new property owner or occupant may access and configure the communication rule associated with the geographic location, delete or disable the communication rule, or associate one or more additional communication rules with the geographic location.

[0062] Reassignment of a geographic location may include changing information (e.g., contact information) and rights of a previous user associated with the geographic location to a new user. For example, a login name and password may be changed for the new user. The communication rules of the previous user may be deleted. After reassignment, the new user may add communication rules, change information, and change settings and preferences.

[0063] An unverified geographic location or a geographic location for which there is no claimant may be indicated by a web server. For example, the web server **104** may store information indicating that a geographic area has not been verified as being associated with a user or there is no claimant. This information may be stored in the data store **116**.

[0064] In accordance with embodiments of the present disclosure, an owner or occupant of a geographic location may claim the geographic location. For example, an owner of a single family home may want to claim the geographic location for the home. The owner may locate a representation of the geographic location on a graphical map provided by a web server and displayed using a computing device. The owner may also select the representation of the geographic location using the computing device for claiming the geographic location. Initially, the owner may create an account with the web server, including providing a name, address, contact information, and the like. The owner may then send a request to the web server to claim the geographic location. The web server may check the information provided against a postal service occupant listing for verifying the claim. If the information provided by the owner matches the information provided by the postal service occupant listing for the geographic location, the user may be granted access to the geographic location and may associate communication rules with the geographic location.

[0065] Some users may attempt to control geographic locations which do not belong to them, or the users will assume the identity of someone else for accessing the geographic location under false pretenses. To challenge ownership of a geographic location, verification documents may be sent to the third party authority. For example, a current utility notice, state identification card, and the like may be submitted as reliable proof of occupancy, thus making it possible to reassign the geographic location to a deserving second user. Other proof may be submitted (e.g., title deed) or proof of lease agreement (e.g., lease agreement) may be provided for proving ownership or occupancy of a geographic location. Further, legal action may be needed to establish ownership or occupancy of a geographic location.

[0066] In one or more embodiments, a property owner may sub-lease portions of the property to other people and allow the lessees to claim ownership of their portions of the property in the context of the presently disclosed subject matter. For example, the lessees may specify one or more communication rules in accordance with the present disclosure. In an example, the property owner may manage an account in which the lessees can register for specifying communication rules for reaching them on their computing device or landline telephone.

[0067] The various techniques described herein may be implemented with hardware or software or, where appropriate, with a combination of both. For example, the mobile device **102** shown in FIG. 1 may include suitable hardware, software, or combinations thereof configured to implement the various techniques described herein. Further, for example, the web server **104** shown in FIG. 1 may include suitable hardware, software, or combinations thereof configured to implement the various techniques described herein. Thus, the

methods and apparatus of the disclosed embodiments, or certain aspects or portions thereof, may take the form of program code (i.e., instructions) embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other machine-readable storage medium, wherein, when the program code is loaded into and executed by a machine, such as a computer, the machine becomes an apparatus for practicing the presently disclosed subject matter. In the case of program code execution on programmable computers, the computer will generally include a processor, a storage medium readable by the processor (including volatile and non-volatile memory and/or storage elements), at least one input device and at least one output device. One or more programs are preferably implemented in a high level procedural or object oriented programming language to communicate with a computer system. However, the program(s) can be implemented in assembly or machine language, if desired. In any case, the language may be a compiled or interpreted language, and combined with hardware implementations.

[0068] The described methods and apparatus may also be embodied in the form of program code that is transmitted over some transmission medium, such as over electrical wiring or cabling, through fiber optics, or via any other form of transmission, wherein, when the program code is received and loaded into and executed by a machine, such as an EPROM, a gate array, a programmable logic device (PLD), a client computer, a video recorder or the like, the machine becomes an apparatus for practicing the presently disclosed subject matter. When implemented on a general-purpose processor, the program code combines with the processor to provide a unique apparatus that operates to perform the processing of the presently disclosed subject matter.

[0069] While the embodiments have been described in connection with the preferred embodiments of the various figures, it is to be understood that other similar embodiments may be used or modifications and additions may be made to the described embodiment for performing the same function without deviating therefrom. Therefore, the disclosed embodiments should not be limited to any single embodiment, but rather should be construed in breadth and scope in accordance with the appended claims.

1. A method comprising:
 - storing a communication rule associated with a geographic location and a user;
 - receiving a communication identifying the geographic location, wherein the communication comprises a telephone call; and
 - applying the communication rule for routing the communication to the user.
2. The method of claim 1 wherein the user is a verified property owner of the geographic location.
3. The method of claim 1 wherein the user is a first user associated with the geographic location,
 - wherein the method further comprises presenting to a second user an alias address for the first user for use in communicating with the first user at the geographic location,
 - wherein the communication identifies the alias address, and
 - wherein applying the communication rule comprises using the alias address for routing the communication to the first user.
4. The method of claim 3 further comprising preventing the second user from accessing an actual address of the first user.

5. The method of claim 1 wherein the communication rule specifies meeting one or more criteria for managing communications to be routed to the user.

6. The method of claim 5 wherein the geographic location is a first geographic location, and

wherein the one or more criteria include one or more of: communications being from a predefined source, the communications being received at a predefined time, and the communications originating from a second geographic location.

7. The method of claim 6 further comprising determining whether the one or more criteria are met, and

wherein applying the communication rule comprises routing the communication to the user in response to determining that the one or more criteria are met.

8. The method of claim 6 wherein the communication rule specifies selection of an address for routing the communication to the user based on meeting the one or more criteria,

wherein the method further comprises determining whether the one or more criteria are met, and

wherein applying the communication rule comprises routing the communication to the user in response to determining that the one or more criteria are met.

9. The method of claim 1 wherein the communication rule specifies criteria for accepting communications to be routed to the user.

10. The method of claim 9 wherein the communication identifies at least one of a source and a time of receipt of the communication, and

wherein the method further comprises:

determining whether the at least one of the source and the time of receipt of the communication meets the criteria; and

in response to determining that the at least one of the source and the time of receipt of the communication meets the criteria, routing the communication to the user.

11. The method of claim 10 further comprising:

determining whether the source of the communication meets the criteria; and

in response to determining that the source meets the criteria, routing the communication to the user.

12. The method of claim 11 wherein the criteria includes identification of an acceptable source for communications.

13. The method of claim 1 wherein the geographic location is a first geographic location,

wherein the communication rule specifies routing communications originating from a second geographic location to the user,

wherein the method further comprises determining whether the communication originated from the second geographic location, and

wherein applying the communication rule comprises routing the communication to the user in response to determining that the communication originated from the second geographic location.

14. The method of claim 13 wherein the first geographic location is adjacent to the second geographic location.

15. The method of claim 1 further comprising receiving a second communication, wherein receiving the second communication comprises receiving at least one of a second telephone call, an email, a text message, and an instant message.

16. The method of claim 1 wherein the communication rule specifies routing the communication to at least one of an email account and a telephone associated with the user, and wherein applying the communication rule comprises routing the communication to the at least one of the email account and the telephone associated with the user.

17. The method of claim 1 wherein the communication rule specifies routing the communication to one of two or more mobile devices located closest to the geographic location, and wherein applying the communication rule comprises routing the communication to the one of the two or more mobile devices located closest to the geographic location.

18. The method of claim 1 wherein the communication rule specifies a priority list of sources for routing communications to the user, and

wherein applying the communication rule comprises routing the communication to the user in accordance with the priority list.

19. The method of claim 1 further comprising receiving information for verifying that the user is a property owner of the geographic location.

20-26. (canceled)

27. A system comprising:

a communication interface configured to receive a telephonic communication identifying a geographic location;

a communication manager configured to: store a communication rule associated with the geographic location and a user; and apply the communication rule for routing the communication to the user.

28. (canceled)

29. A computer-readable storage medium having stored thereon computer executable instructions for performing the following steps:

storing a communication rule associated with a geographic location and a user;

receiving from a smart phone a communication identifying the geographic location; and

applying the communication rule for routing the communication to the user.

30. (canceled)

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