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(54) **MOBILE COMMUNICATIONS DEVICE**

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(51) **Int. Cl.**

H04L 29/08	(2006.01)
H04L 12/58	(2006.01)
H04W 88/04	(2009.01)
H04B 7/212	(2006.01)

(52) **U.S. Cl.**
CPC ***H04L 67/24*** (2013.01); ***H04L 12/581*** (2013.01); ***H04W 88/04*** (2013.01); *H04B 7/2126* (2013.01); *H04L 69/329* (2013.01)

(58) **Field of Classification Search**
USPC 455/557, 435.1, 424, 425, 561, 550.1, 455/456.1, 456.3, 456.5, 456.6, 433, 432.1, 455/440, 448, 452.2, 457, 404.2; 709/206, 709/203, 219, 227, 217, 218, 238, 205; 379/88.13, 88.14, 88.17, 201.1, 379/201.09, 900, 218.01; 370/335, 352
See application file for complete search history.

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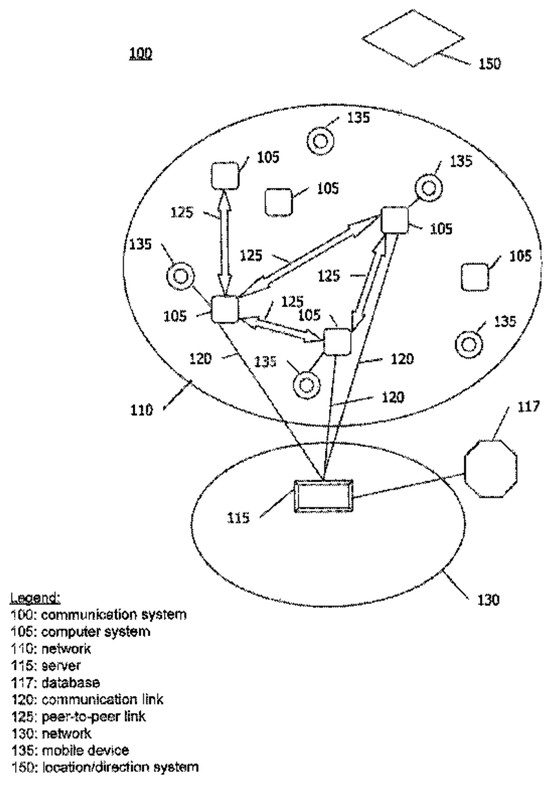
(57) **ABSTRACT**

A mobile communications device includes a controller, a connector device configured to couple with a computer system, an interface device, and memory. The interface device is coupled to the controller and configured to communicate an electromagnetic signal. The memory stores instructions performed by the controller to cause the interface device to communicate an electromagnetic signal including information associated with a user of the mobile device or of another mobile device, and to cause the connector device to communicate the information associated with the user to or from the computer system.

19 Claims, 9 Drawing Sheets



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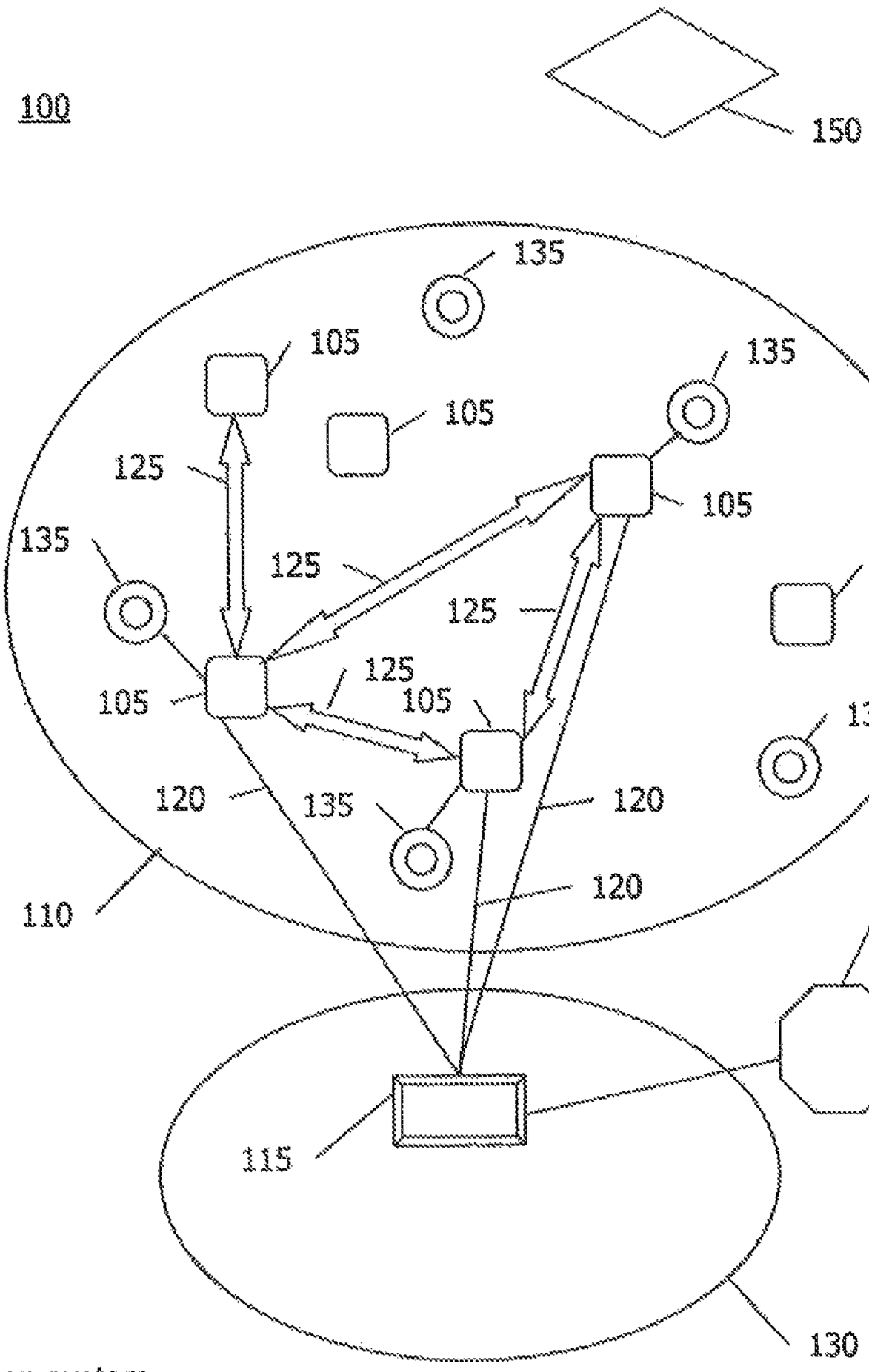

Legend:
100: communication system
105: computer system
110: network
115: server
117: database
120: communication link
125: peer-to-peer link
130: network
135: mobile device
150: location/direction system

Fig. 1

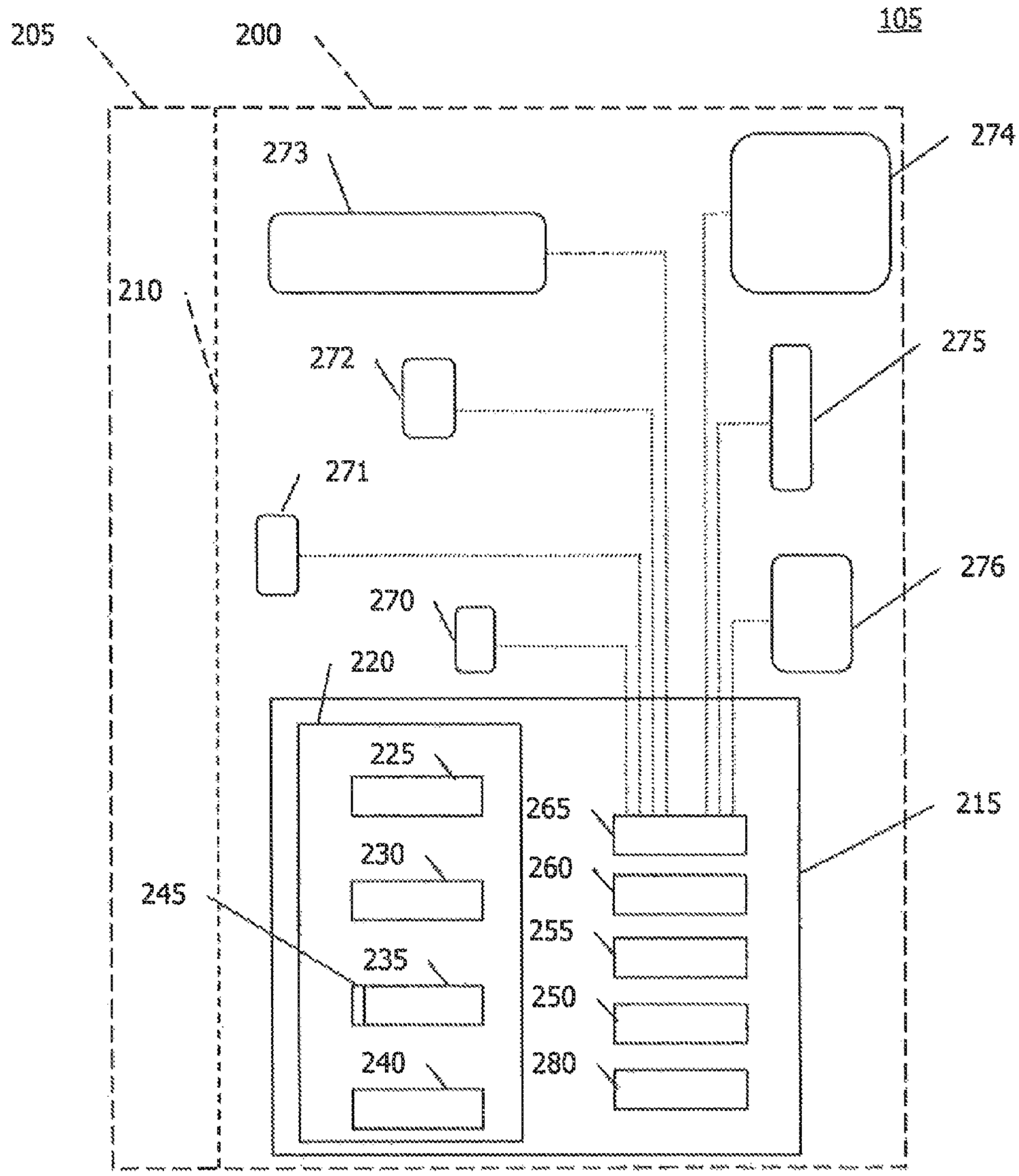

Fig. 2

Legend:

105: computer system
200: computing device
205: controller
210: interface
215: computing system
220: storage device
225: operating system
230: application program
235: peer-to-peer application
240: browser application
245: plug-in application
250: processor
255: communication device
260: tuner
265: input/output interface
270: mouse
271: mobile phone
272: personal digital assistant
273: keyboard
274: display
275: remote controller
276: video control system
280: interface

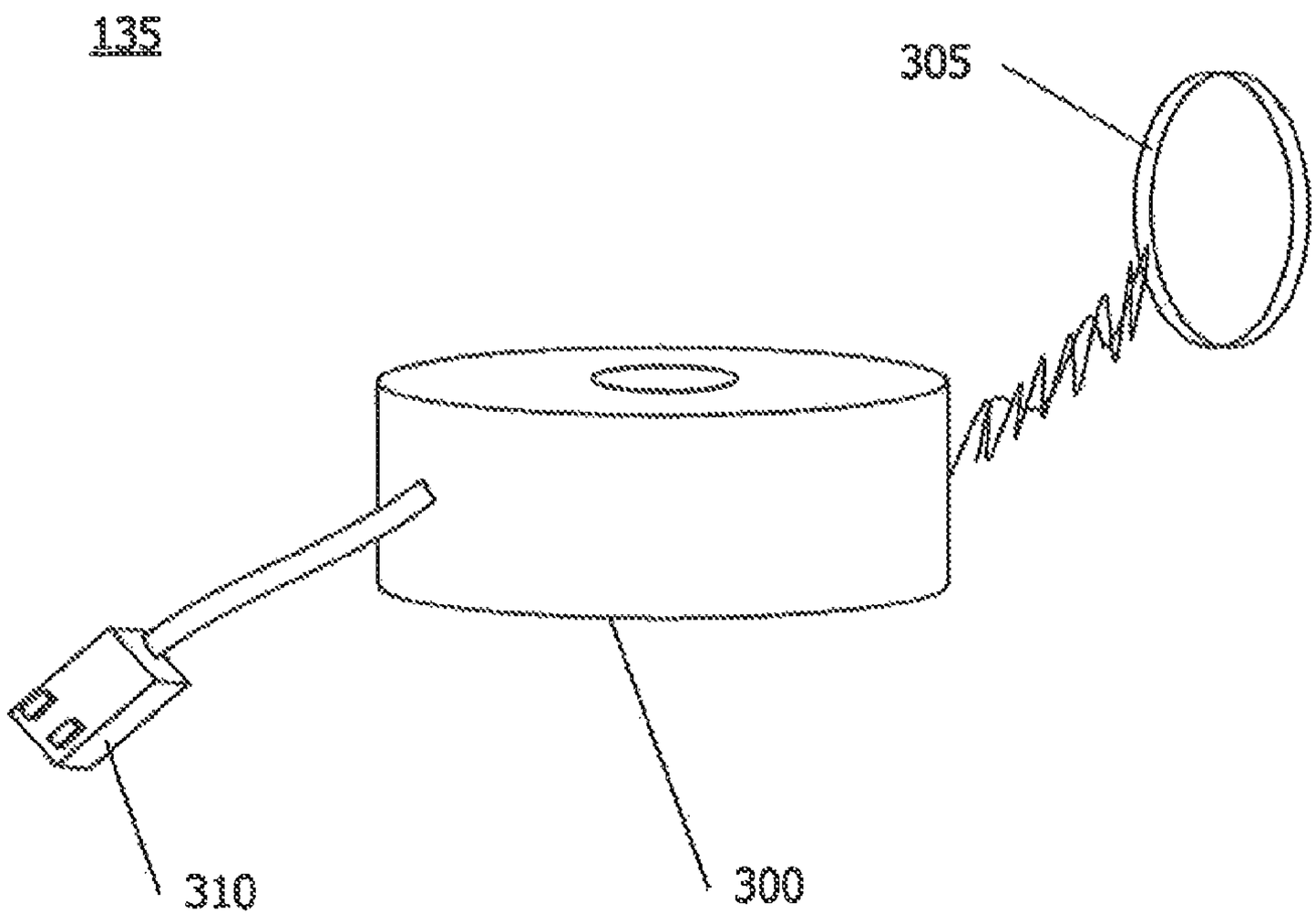

Fig. 3

Legend:
135: mobile device
300: body
305: keyring
310: connector device

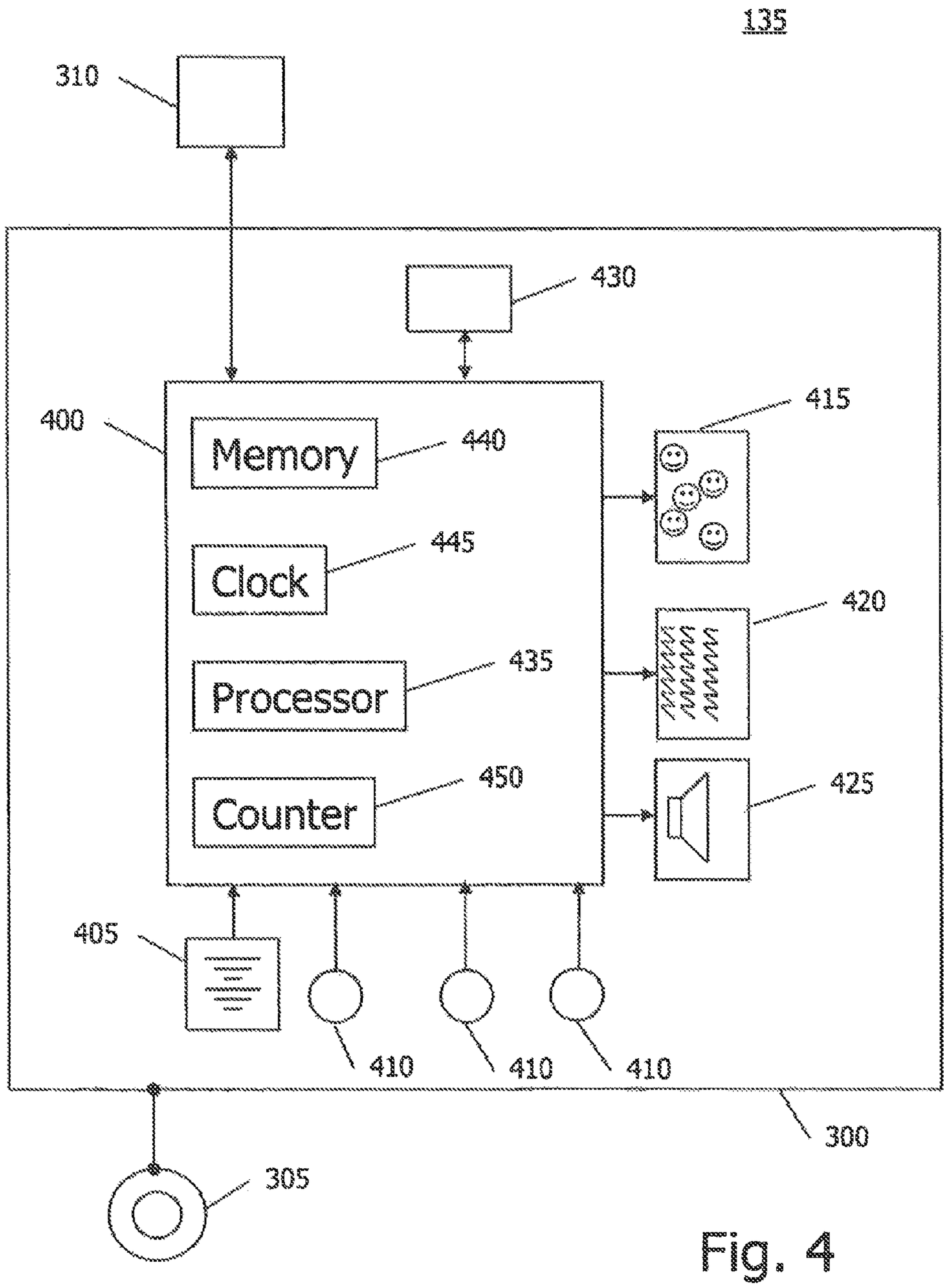

Fig. 4

Legend:

135: mobile device
300: body
305: keyring
310: connector device
400: controller
405: power source
410: input device
415: visual output device
420: tactile output device
425: audio output device
430: interface
435: processor
440: memory
445: clock
450: counter

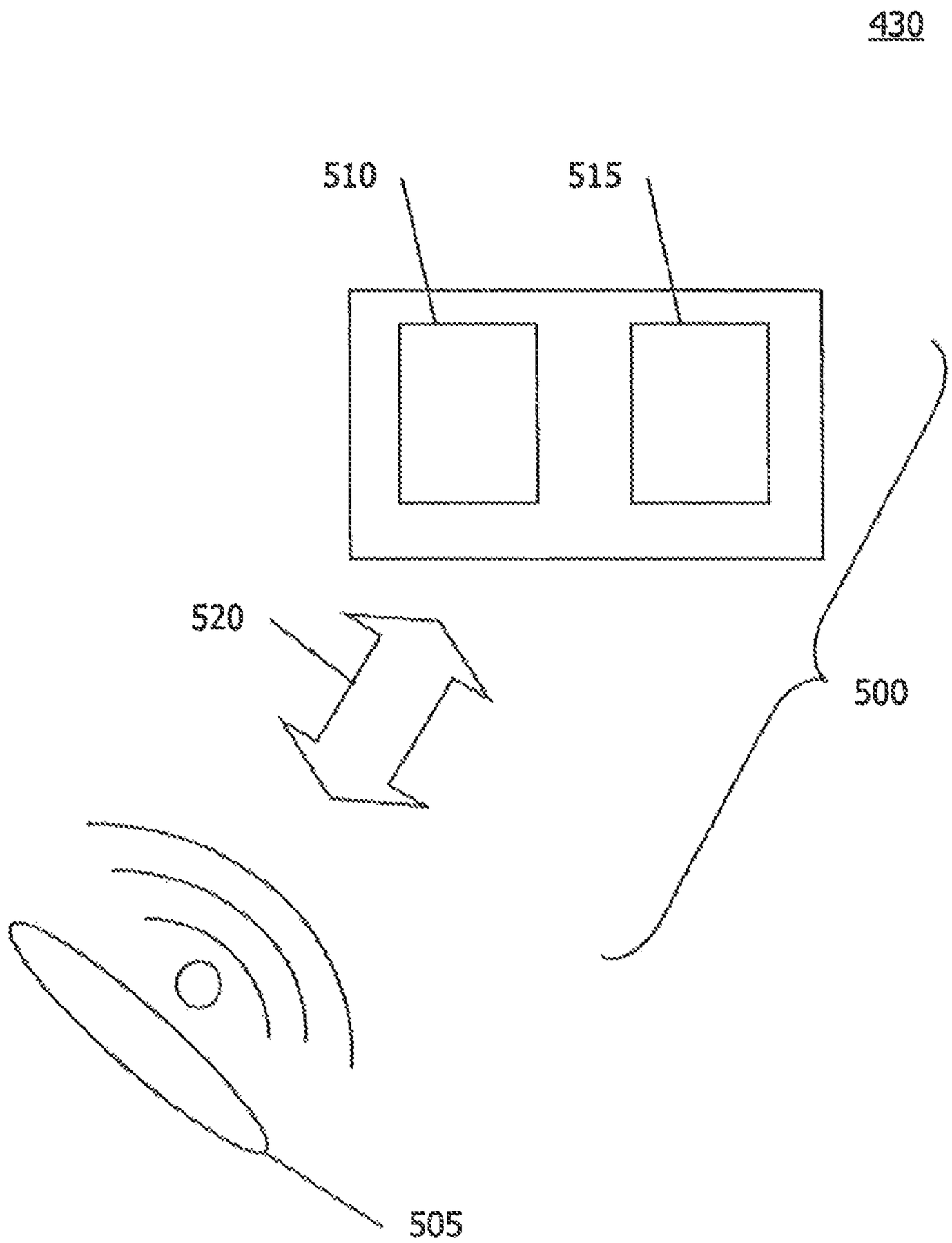

Fig. 5

Legend:
430: interface
500: interrogator
505: transponder
510: reader
515: writer
520: antenna

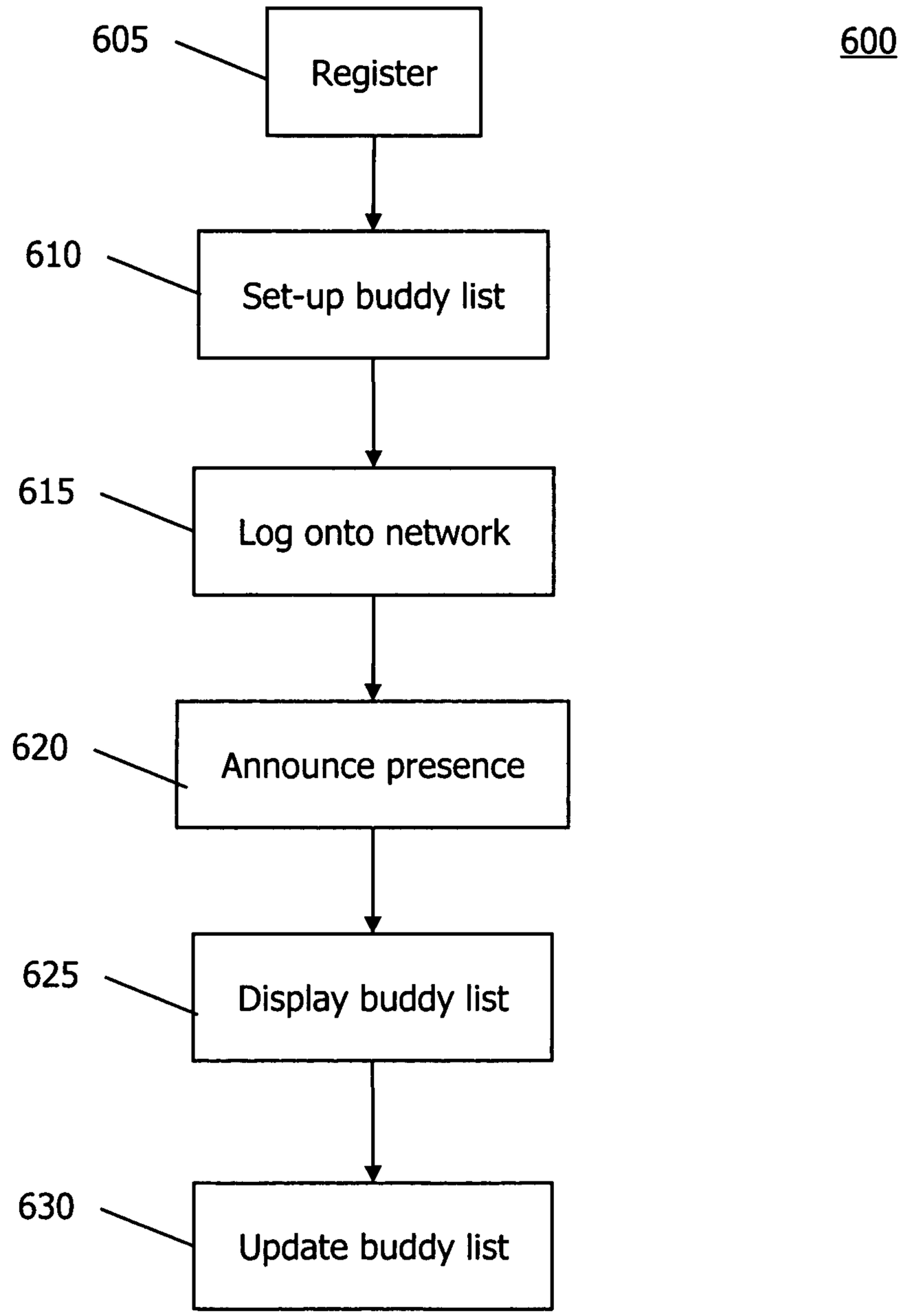
600
605
Register
610
Set-up buddy list
615
Log onto network
620
Announce presence
625
Display buddy list
630
Update buddy list

Fig. 6

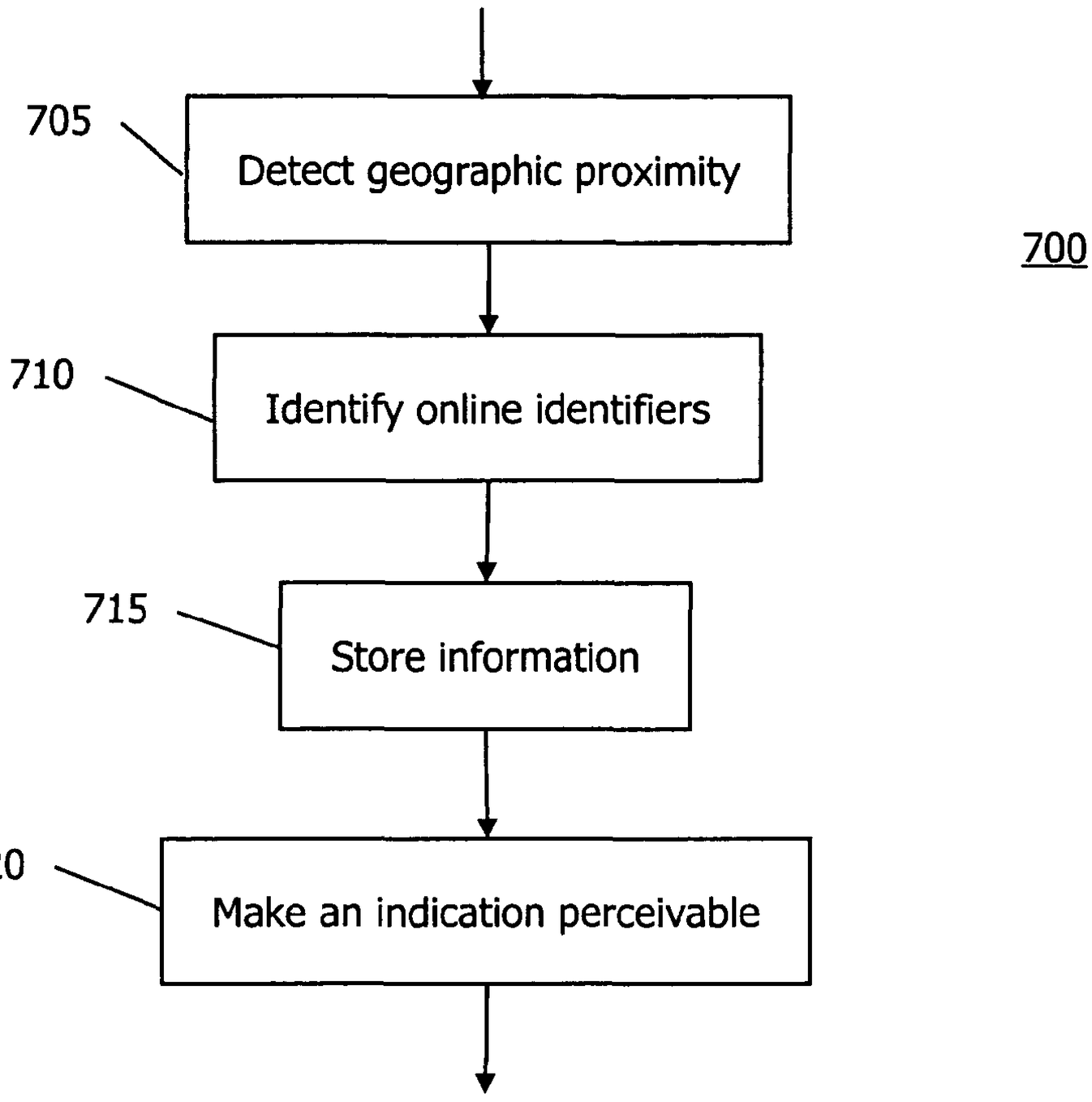
700
705
Detect geographic proximity
710
Identify online identifiers
715
Store information
720
Make an indication perceivable

Fig. 7

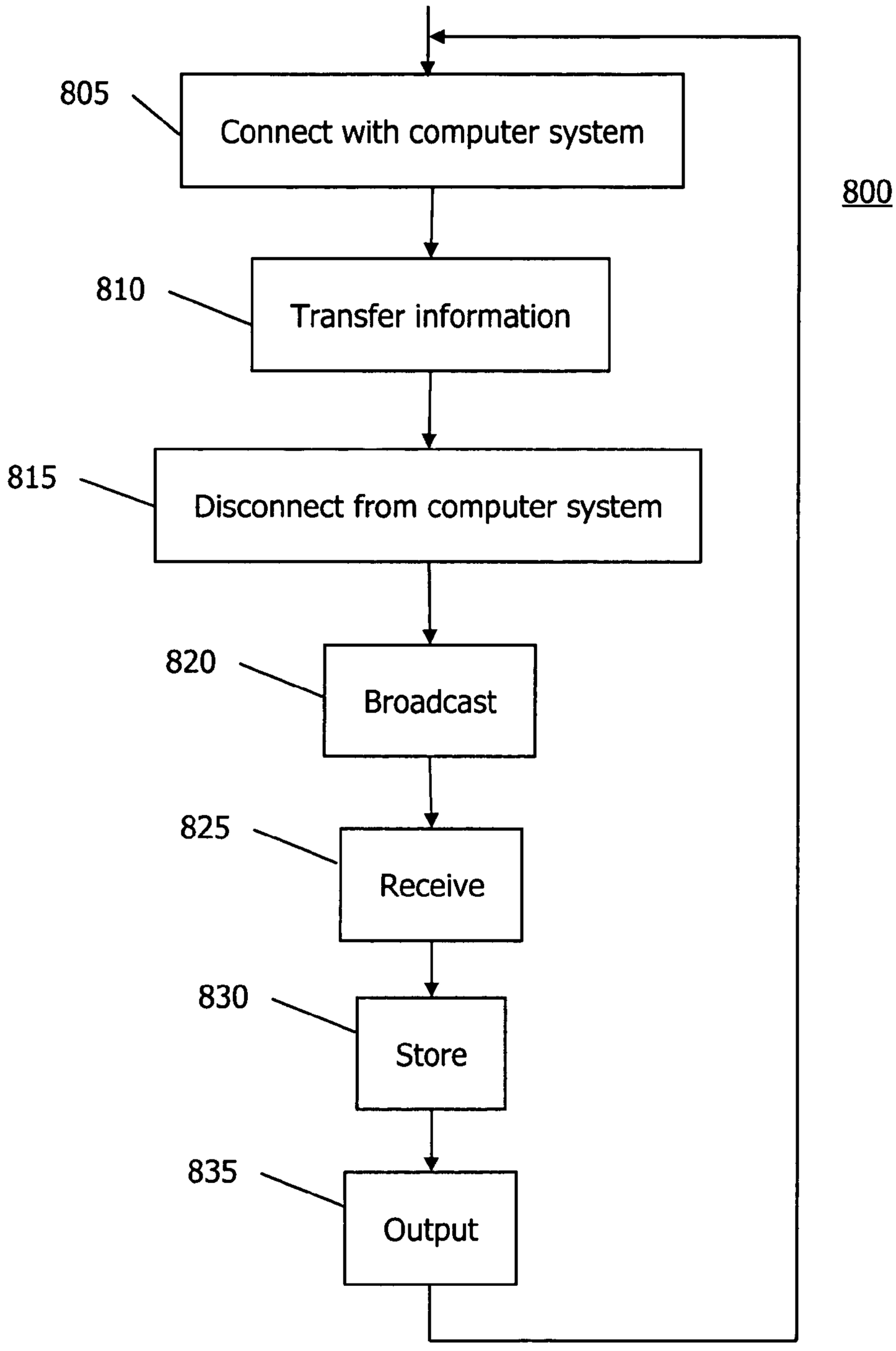
805
Connect with computer system
800
810
Transfer information
815
Disconnect from computer system
820
Broadcast
825
Receive
830
Store
835
Output

Fig. 8

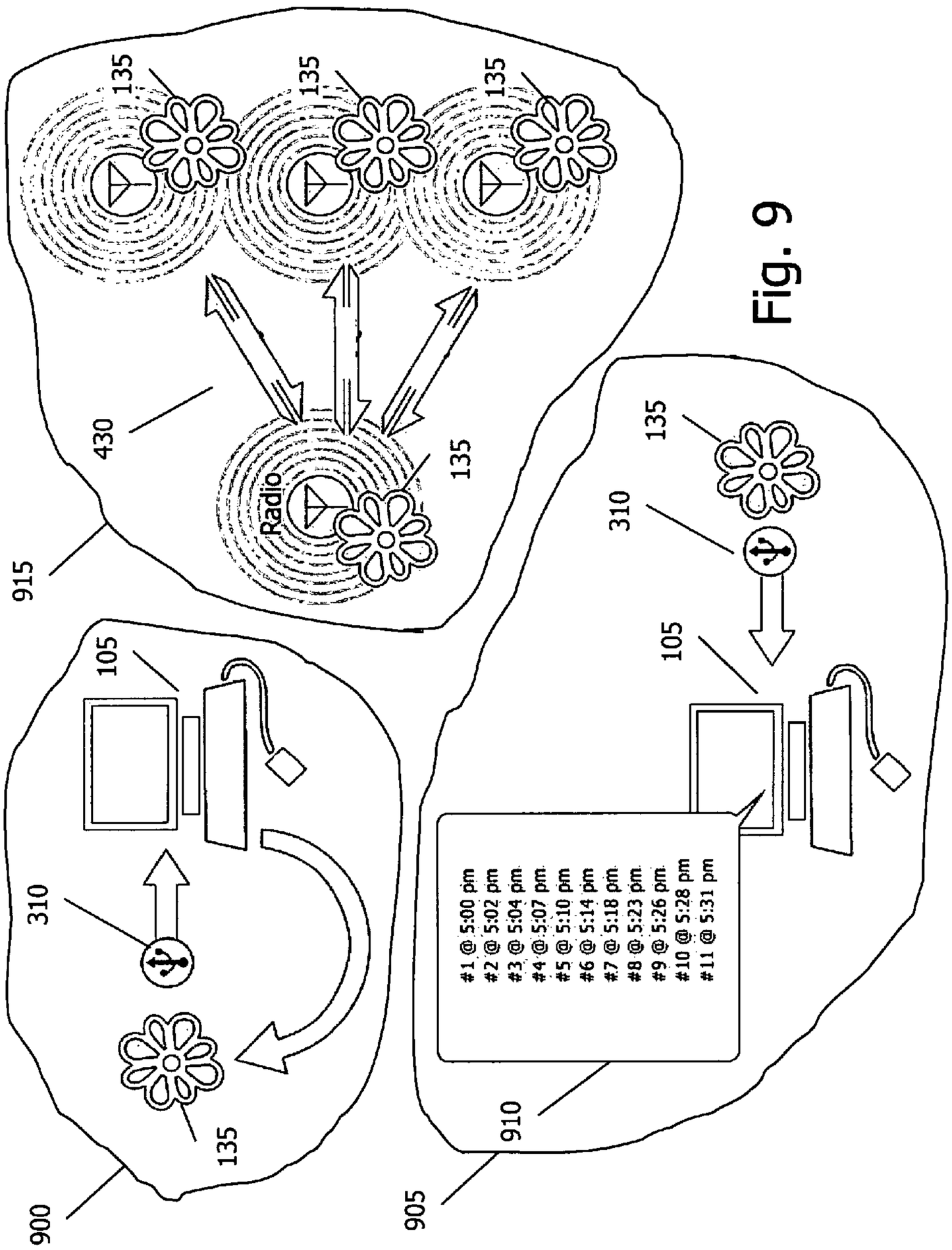
135
135
135
430
Radio
135
915
105
310
135
900
310
135
105
#1 @ 5:00 pm
#2 @ 5:02 pm
#3 @ 5:04 pm
#4 @ 5:07 pm
#5 @ 5:10 pm
#6 @ 5:14 pm
#7 @ 5:18 pm
#8 @ 5:23 pm
#9 @ 5:26 pm
#10 @ 5:28 pm
#11 @ 5:31 pm
910
905

Fig. 9

MOBILE COMMUNICATIONS DEVICE

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/600,384, filed Aug. 11, 2004, and titled "Portable Interface Device," which is incorporated herein by reference.

TECHNICAL FIELD

This description relates to a mobile communications device for use in a communication system.

BACKGROUND

Users of an instant messaging service can communicate virtually and in real time with other instant messaging users. Users may manually create a buddy list of user names or online identifiers of other users of the instant messaging service, and may use such a buddy list to facilitate establishment of instant messaging sessions with those users included in the buddy list or to perceive the availability of those other users, commonly references as "presence."

SUMMARY

In one general aspect, a mobile communications device includes a controller, a connector device configured to couple with a computer system, an interface device, and memory. The interface device is coupled to the controller and configured to communicate an electromagnetic signal. The memory stores instructions performed by the controller to cause the interface device to communicate an electromagnetic signal including information associated with a user of the mobile device or of another mobile device, and to cause the connector device to communicate the information associated with the user to or from the computer system.

Implementations may include one or more of the following features. For example, the memory may store instructions performed by the controller to cause the interface device to receive an electromagnetic signal including information associated with a user of another mobile device. The memory may also store instructions performed by the controller to cause the connector device to transmit the information associated with the user to the computer system. The memory may store instructions performed by the controller to cause the interface device to transmit an electromagnetic signal including information associated with a user of the mobile device. The memory may also store instructions performed by the controller to cause the connector device to receive the information associated with the user from the computer system. The memory may store instructions performed by the controller to cause the interface device to automatically communicate the electromagnetic signal.

The mobile device may further include an output device coupled to the controller. The mobile device may further include an input device coupled to the controller.

The interface device may be configured to transmit an electromagnetic signal. The interface device may be configured to receive an electromagnetic signal. The connector device may be coupled to the controller. The interface device may include a radio frequency identification (RFID) interface. The connector device may include a Universal Serial Bus (USB) device.

In another general aspect, a method is described for identifying online identifiers that are geographically proximate to a mobile communications device. A geographic proximity is detected between a mobile communications device and one or more mobile counterpart devices with which the mobile communications device communicates. An online identifier associated with each mobile counterpart device for which geographic proximity is detected is identified and information reflective of the detected geographic proximity and the associated online identifier is stored. An indication of at least one associated online identifier associated with a mobile counterpart device for which geographic proximity to the mobile communications device was detected is made perceivable.

Implementations may include one or more of the following features. For example, the storing may include maintaining a list of online identifiers for which geographic proximity has been detected.

The list may correspond to a buddy list maintained for an operator of the mobile communications device. The list may be limited to online identifiers that appear on a buddy list maintained for an operator of the mobile communications device.

Making the indication perceivable may include making the indication perceivable independently of perception of a buddy list. Making the indication perceivable independently of perception of a buddy list may include outputting a sound. Making the indication perceivable may include outputting a beep. Making the indication perceivable may include distinguishing online identifiers for which detected geographic proximity was detected after a buddy list was last made perceivable to an operator of the mobile communications device.

Making the indication perceivable may include downloading, from the mobile communications device to a general purpose computer, the stored information that is reflective of the detected geographic proximity, and enabling a display of the information at the general purpose computer. Making the indication perceivable may include displaying the information using an imaging device at the mobile communications device. Displaying may include enabling display of the indication using a monitor. Displaying may include using a light to display an indication of current geographic proximity by a user-designated online identifier. The user-designated online identifier may be identified through reference to a user-designated buddy list configured for use in an instant messaging communications application.

The indication may distinguish the online identifiers associated with at least two mobile counterpart devices for which geographic proximity to the mobile communications device was detected. The indication may distinguish the online identifiers associated with at least two mobile counterpart devices for which geographic proximity to the mobile communications device was previously detected but is not detected at the time of making the indicator perceivable. The detecting, identifying, and storing may begin upon logical separation of the mobile communications device from a general purpose computer. The detecting may include detecting information stored using an RFID of a mobile counterpart device for which geographic proximity is detected.

In another general aspect, a method of interaction includes receiving information from a first mobile device, and using that information within the instant messaging application. The information relates to a user of a second mobile device and is obtained independently of an instant messaging application.

Implementations may include one or more of the following features. For example, the method may further include running the instant messaging application at a computer system

to which the first mobile device is configured to communicate. Using the information within the instant messaging application may include correlating a user identifier and a geographic proximity to the user information. Using the information within the instant messaging application may include displaying the user identifier and the geographic proximity in a buddy list.

Aspects of the methods and systems can include one or more of the following advantages. User information (including online identifiers) can be simply broadcasted, received, and gathered using a radio wave transmitter/receiver and using only a small amount of memory. For example, with less than 8 kilobytes of memory, a user of the portable device can store more than 1000, 10-digit user identification numbers.

The mobile device can be prevented from broadcasting other user's online identifiers with a simple security procedure that links to a database, which procedure can be invoked during the initialization of the mobile device.

The mobile device creates a link between the real (or tangible) world of people that a user encounters throughout the day and the online world that already exists within the network of users of the computer systems.

In one implementation, the mobile device automatically broadcasts or pushes information while simultaneously and also automatically receiving information from other mobile devices in a given area or range, referred to as a geographic proximity. Both of these features (that is, broadcasting and receiving) are implemented within a single mobile device, which is configured to connect to a computer system through a USB port (or otherwise) to enable rapid exchange of information.

Other features will be apparent from the description, the drawings, and the claims.

DESCRIPTION OF DRAWINGS

FIG. **1** is a block diagram of a communication system.

FIG. **2** is a block diagram of a computer system within the communication system of FIG. **1**.

FIG. **3** is a perspective view of a mobile communications device within the communication system of FIG. **1**.

FIG. **4** is a block diagram illustrating aspects of the mobile device of FIG. **3**.

FIG. **5** is a block diagram of an electromagnetic interface of the mobile device of FIG. **3**.

FIG. **6** is a flow chart of a procedure for setting up and updating presence on a network of computer systems within the communication system of FIG. **1**.

FIG. **7** is a flow chart of a procedure for operating the communication system of FIG. **1**.

FIG. **8** is a flow chart of a procedure for operating the mobile device of FIG. **3**.

FIG. **9** is an illustration of component actions that may be performed incident to the procedure of FIG. **8**.

Like reference symbols in the various drawings may indicate like elements.

DETAILED DESCRIPTION

A mobile communications device is configured to operate in connected mode with a computer system and in stand-alone mode, that is, disconnected from the computer system. While in stand-alone mode, the mobile communications device broadcasts information to and receives information from other mobile communications devices that are located within a geographic proximity or range of the mobile communications device. While in connected mode, the mobile communications device uploads information collected during stand-alone mode to the computer system with which it connects, and initiates a process to analyze, utilize, and manipulate the information at the computer system.

Referring to FIG. **1**, a communication system **100** includes one or more user computer systems **105** within a multi-user network **110**. Each computer system **105** is configured to communicate with a server **115** through a communication link **120** or otherwise. The server **115** accesses a database **117** that stores information relating to users of the computer systems **105**. For simplicity, links **120** are shown in FIG. **1** between only three computer systems **105** and the server **115**. Nevertheless, any number of computer systems **105** can be communicating with the server **115** at any one moment. Moreover, while any number of computer systems **105** within the network **110** may be communicating with the server **115** at any one moment, any number of computer systems **105** may be operating in stand-alone mode, that is, not communicating with the server **115** (three of such stand-alone computer systems **105** are shown in FIG. **1** for illustrative purposes only).

The computer system **105** may include one or more general-purpose computers (for example, personal computers), one or more special-purpose computers (for example, devices specifically programmed to communication with each other and/or the computer system **105**), or a combination of one or more general-purpose computers and one or more special-purpose computers. The computer system **105** may be arranged to operate within or in concert with one or more other systems, such as, for example, one or more LANs and/or one or more WANs.

Each of the computer systems **105** can be linked by a peer-to-peer link **125** to another computer system **105**. The peer-to-peer link **125** enables a direct exchange of computer resources and services between the computer systems **105**, as discussed in detail below. Thus, each computer system **105** can initiate requests of other computer systems **105** and can respond to requests from other computer systems **105** in the network **110**, independently of the communication with the server **115** through the link **120**. In this way, users of the computer systems **105** are able to form an autonomous online community.

The server **115** is able to communicate with other servers or devices within an inter-network **130**. The inter-network **130** can be, for example, an Internet Protocol-based network (such as, for example, the Internet, the World Wide Web, a Wide Area Network (WAN), a Local Area Networks (LAN), and an analog or digital network); an X-25 protocol-based network; an analog or digital, wired or wireless telephone-based network (such as, for example, plain old telephone service (POTS); an asymmetric digital subscriber line (aDSL); a public switched telephone network (PSTN); an integrated services digital network (ISDN); or a digital subscriber line (DSL)). Each of the communication pathways within the inter-network **130** may include, for example, a wired, wireless, cable, or satellite communication pathway. The server **115** also may enable delivery of messages from other servers within the inter-network **130** to the computer system **105** through the link **120**. Each of the computer systems **105** may be configured to communicate with other servers within the inter-network **130**.

The communication system **100** includes mobile communications devices ("mobile devices") **135** that are configured to communicate with one or more computer systems **105**. The mobile devices **135** are able to operate in stand-alone mode, that is, without communicating with the computer systems **105**. As an example, two such stand-alone mobile devices **135**

are shown in FIG. **1**. In general, while in stand-alone mode, the mobile device **135** can transmit and receive an electromagnetic signal that includes information associated with a user of the mobile device **135** or a user of another mobile device **135**. Furthermore, while communicating with the computer system **105**, the mobile device **135** can transmit to and receive from the computer system **105** the information associated with the user of the mobile device **135** or with the user of the other mobile device **135**. While communicating with the computer system **105**, the mobile device **135** links to an instant messaging program of the computer system **105**. In this way, the mobile device **135** encourages users of the computer systems **105** to interact using both the instant messaging program and the mobile device **135**.

In one implementation, the communication system **100** includes a location or direction determining apparatus **150** such as a global positioning system (GPS) that is configured to detect locations of each of the mobile devices **135** that are operating in stand-alone mode. Generally, the location or direction determining apparatus **150** can be any satellite that uses a wireless receiver/transmitter.

Referring to FIG. **2**, the computer system **105** typically includes one or more devices **200** and/or controllers **205** capable of responding to and executing instructions in a defined manner. The device **200** is any device that is generally capable of executing instructions under the command of the controller **205** by a wired or wireless data interface **210** capable of delivering data. The device **200** and the controller **205** each typically include one or more hardware components and/or software components. An example of a device **200** is a general-purpose computer capable of responding to and executing instructions in a defined manner. Other examples include a special-purpose computer, a workstation, a server, a device, a component, other physical or virtual equipment, or some combination of the above capable of responding to and executing instructions.

In one implementation, the device **200** includes a computer **215** having an internal or external storage **220** for storing data and programs such as an operating system **225** (for example, DOS, Windows™, Windows 95™, Windows 98™, Windows 2000™, Windows XP™, Windows NT™, OS/2, or Linux) and one or more application programs. Examples of application programs include authoring applications **230** (for example, word processing, database programs, spreadsheet programs, email program, calendar programs, or graphics programs) capable of generating and/or editing documents or other electronic content; client and peer-to-peer applications **235** (for example, AOL client, CompuServe client, AIM client, AOL TV client, ISP client, or ICQ application) capable of communicating with other computer users, accessing various computer resources, and viewing, creating, or otherwise manipulating electronic content; and browser applications **240** (for example, Netscape's Navigator or Microsoft's Internet Explorer) capable of rendering Internet content.

The computer **215** also includes a central processing unit (CPU) **250** for executing instructions in response to commands from the controller **205**. In one implementation, the controller **205** includes one or more of the application programs installed on the internal or external storage **220** of the computer **215**. In another implementation, the controller **205** includes application programs externally stored in and executed by one or more devices external to the computer **215**.

The computer **215** typically includes a communication device **255** for sending and receiving data. One example of the communication device **255** is a modem. Other examples include a transceiver, a set-top box, a communication card, a satellite communications hardware, an antenna, or another network adapter capable of transmitting and receiving data over the communication link **120** through a wired or wireless data pathway. The computer **215** also may include a television (TV) tuner **260** for receiving television programming in the form of broadcast, satellite, and/or cable TV signals. As a result, the device **200** can selectively and/or simultaneously display network content received by the communication device **255** and television programming content received by the TV tuner **260**.

The computer **215** typically includes an input/output interface **265** to enable a wired or wireless connection to various peripheral devices **270**, **271**, **272**, **273**, **274**, **275**, and **276**. Examples of peripheral devices include, but are not limited to, a mouse **270**, a mobile telephone **271**, a personal digital assistant (PDA) **272**, a keyboard **273**, a display monitor **274**, a TV remote control **275** for receiving information from and rendering information to subscribers, and a video control system **276**. Other examples of peripheral devices include voice recognition and synthesis devices.

Although the peripheral devices in FIG. **2** are illustrated as being peripheral with respect to the computer **215**, in another implementation, such devices may themselves include the functionality of the computer **215** and operate as the device **200**. For example, the mobile telephone **271** or the PDA **272** may include computing and networking capabilities, and may function as a device **200** by accessing the server **115** through the communication link **120** and by communicating with other computer systems **105** in the network **110**.

The computer **215** also includes a general-purpose interface **280** for linking to the portable device **135**. The general-purpose interface **280** may be any interface with data rates suitable for data transfer between the computer **215** and the portable device **135**. For example, in one implementation, the interface **280** is a Universal Serial Bus (USB) port. In another implementation, the interface **280** is a serial port or a parallel port.

An example of the controller **205** is a software application loaded on the device **200** for commanding and directing communications enabled by the device **200**. Other examples include a program, a piece of code, an instruction, a device, a computer, a computer system, or a combination of the above, for independently or collectively instructing the device **200** to interact and operate as described. The controller **205** may be embodied permanently or temporarily in any type of machine, component, physical or virtual equipment, storage medium, or propagated signal capable of providing instructions to the device **200**.

Additionally, the device **200** includes one or more plug-in applications **245** that are installed and used as a part of the client applications **235**. The plug-in applications **245** enable the device **200** to transmit messages to and from the server **115**. Plug-in applications **245** include one or more of: a description of internal protocols; a message application that is activated when a message is received through the server **115**; an interface application that implements user interface components and business rules; and a status application that establishes the status of the message based on information from the application or the message itself.

Referring also to FIG. **3**, the mobile device **135** includes a body **300** that forms a cavity configured to house various components that control operation of the mobile device **135**, as discussed in greater detail below. The body **300** is made of any of the various materials that have suitable properties (such as, durability, low weight, rigidity, and safety) for such a device. For example, suitable materials include, but are not limited to, plastics such as resins, polymers, elastomers, or

thermoplastics. The body **300** may be formed using any suitable molding technique, such as, for example, injection molding. The size of the body **300** facilitates portability of the device **135**. For example, the body **300** may be the size of an object for use on a key-chain, thus enabling a user to carry the mobile device **135** on her person (her clothes, her bags, her hands or wrist, or any other object with the user).

The mobile device **135** may include an attachment device such as a key ring **305** for attaching to the user's person, thus enabling the user to carry the mobile device **135** away from the computer system **105** and out into the public while in stand-alone mode. The mobile device **135** also includes a connector device **310** for coupling with the computer system **105**. The connector device **310** is any connector that is able to link with the general-purpose interface **280** of the computer system **105**. In the implementation in which the general-purpose interface **280** is a USB port, the connector device **310** is a USB device.

If the interface **280** is a wireless data port, then the connector device **310** may include a device for wireless coupling between the mobile device **135** and the computer system **105**. For example, the connector device **310** may enable communication between the mobile device **135** and the computer system **105** without a wired connection.

In one implementation, the connector device **310** is retractable in and out of a region of the body **300** of the mobile device **135**.

Referring also to FIG. **4**, the body **300** of the mobile device **135** houses a controller **400**, a power source **405** such as a battery that provides power to the controller **400**, one or more input devices **410** that enable the mobile device **135** to obtain input from a user, and one or more output devices **415**, **420**, **425**.

The output device **415** is an imaging device such as a light (for example, a light emitting diode or LED), a video display (for example, a liquid crystal display or LCD), or a monitor. The output device **420** is a motion producer such as a vibrator or a buzzer and the output device **425** is an audio device such as a speaker. One or more openings may be formed on the body **300** adjacent the audio device **425** to permit audio output (for example, music or speech) to emanate from the audio device **425** without being muffled.

The body **300** may include a compartment (not shown) for housing the power source **405**. The compartment may be opened and closed using, for example, a screwdriver or a snap-fit latch.

The controller **400** includes a processor **435** that performs the controller's tasks using additional information obtained from memory **440**, a clock **445**, and a counter **450**. The memory **440** within a particular mobile device **135** stores an identification of a user of that device **135** and a table that includes the online identifiers for one or more owners of mobile devices in the network **110** in the form of a buddy list, and a geographic proximity for each online identifier. The geographic proximity is determined for a particular online identifier while the mobile device **135** is operating in stand-alone mode, as discussed below.

In one implementation, the body **300** of the mobile device **135** houses an electromagnetic interface **430** that is used to detect geographic proximities of mobile counterpart devices **135** within the network **110**. In one implementation, the electromagnetic interface **430** is any suitable radio transceiver, that is, a two-way radio that combines both a radio transmitter and a receiver that exchanges information using an electromagnetic signal operating in the radio frequencies. For example, in one implementation, the interface **430** is a Bluetooth interface, which is a short-range radio technology.

In one implementation, the mobile device **135** includes a location or direction determining apparatus such as a GPS that is able to detect a location or direction of the mobile counterpart devices **135** within geographic proximity of the mobile device **135**.

In general, the controller **400** receives input from the power source **405**, from the input devices **410**, from the connector device **310**, and from the electromagnetic interface **430** or from the location or direction determining apparatus **150**, depending on how geographic proximities are detected within the system **100**. The controller **400** performs tasks such as sending output signals to one or more output device **415**, **420**, **425**, and sending information to the computer system **105** through the connector device **310**.

If the mobile device **135** houses the interface **430**, then the controller **400** also sends signals to the electromagnetic interface **430** to cause the interface **430** to emit electromagnetic radiation, and receives a signal from the interface **430** if the interface **430** has detected electromagnetic radiation.

If the mobile device **135** includes the location or direction determining apparatus, then the controller **400** may store information in the memory **440** relating to the location or direction of a particular user along with the other information stored in the memory **440** for that user. In this way, the user can then determine where that particular user was detected while in stand-alone mode. Additionally, if the mobile device **135** includes the location or direction determining apparatus **150**, the controller **400** may be configured to send a signal to the imaging device **415** to display a map of the location or direction of the other mobile device **135**.

If the communication system **100** includes the location or direction determining apparatus **150** or satellite, then the mobile device **135** may or may not include its own location or direction determining apparatus. In this way, the satellite of the communication system **100** may be configured to detect the locations of each of the mobile devices **135** within the network **110** using wireless communication. The satellite **150** could be linked to a service for the users of the mobile devices **135**. The service monitors the relative positions of each of the mobile devices **135** within the network **110** and reports the positions to a web interface that can be accessed by users either through the mobile devices **135** or through the computer systems **105**. In this way, each mobile device **135** need not store information but only need to transmit a signal that can be detected by the satellite **150**.

In contrast to the design of FIG. **4**, the mobile device **135** may be a relatively simple device that includes only one output device, such as, for example, an audio device **425**. For example, the mobile device **135** shown in FIG. **3** lacks an imaging device or a motion producer and is a relatively simple device.

In contrast to the design of FIG. **4**, the mobile device **135** may be a more complex computing device and may be designed like the computer system **105** shown in FIG. **2**. For example, the mobile device **135** may be a laptop computer or a PDA.

In another implementation, at least one of the mobile devices **135** of the network is configured differently from one or more other mobile devices **135** of the network. For example, one of the mobile devices **135** may be configured as a laptop, one of the mobile devices **135** may be configured as a PDA, and one of the mobile devices **135** may be configured as a dongle. Each of the different configurations of mobile devices **135** may be used, in aggregate, to create the mobile network.

Referring also to FIG. **5**, in one implementation in which the mobile device **135** houses the interface **430**, the electro-

magnetic interface **430** is a radio frequency identification (RFID) interface that transmits and receives information in the form of an electromagnetic signal in the radio frequency (RF) portion of the electromagnetic spectrum. The RFID interface includes an interrogator **500** and a transponder **505**, or tag. The interrogator **500** includes a reader **510**, a writer **515**, and an antenna **520**. The interrogator **500** directly couples to the controller **400**. The tag **505** includes an integrated circuit (IC) or chip and an antenna. The IC includes read/write memory and some form of processing capability. The tag **505** can come in a variety of shapes and it may be embedded, for example, in a glass or an epoxy resin.

The antenna in the tag **505** is the physical interface for the RF signal to be received and transmitted. Its construction varies depending on the configuration of the tag **505** and the frequency at which the tag **505** operates. A low frequency tag **505** can use coils of wire, whereas a high frequency tag **505** can be printed with conducting inks. Any suitable frequency can be used, depending on the design of the tag and the signal to be transmitted and received.

The tag **505** can be passively powered by the interrogator **500**, that is, without the use of the power source **405**. A passive tag **505** gets all of its power from a radio wave signal sent by the interrogator **500**. The tag **505** converts the radio wave signal into power. This radio wave signal may also be used to carry data from the interrogator **500** to the tag **505**. In this way, the tag **505** is powered only when it is exposed to the beam of the interrogator **500**. The tag **505** uses a technique called backscatter to reply to the interrogator **500**. In the backscatter technique, the carrier wave from the interrogator **500** is reflected from the tag **505** without the use of a transmitter within the tag **505**.

In another implementation, the tag **505** is powered by the power source **405**. The powered tag **505** still uses the backscatter technique, but it receives power to operate the IC from the power source **405**. In this way, the tag **505** is not dependent on the strength of the carrier signal from the interrogator **500** to provide the power it needs. Instead, the powered tag **505** can use all the power from the power source **405** and is able to work at a greater distance from the interrogator **500**.

In another implementation, the tag **505** is active, that is, it uses not only the power source **405**, but also some form of transmitter internal to the tag **505**. The signal transmission range of the tag **505** can be increased substantially when compared with range of non-active tags (discussed above).

The tag **505** of a particular mobile device **135** "talks" to the interrogator **500** of an nearby mobile counterpart device **135** using an air interface, which is a specification for how they talk to each other that includes the frequency of the carrier, the bit data rate, the method of encoding and any other parameters that may be needed. ISO 18000 is the standard for the air interface. Additionally, the air interface may include an anti-collision protocol that allows many tags in the field to talk to each other at the same time.

In one implementation, the interface **430** may be a Reader talks first (RTF) interface, in which the tag **505** just sits there until it receives a request from the interrogator **500** of another mobile device **135**. Even though the tag **505** may be receiving power from the interrogator **500**, the tag **505** does not "talk" until it is "asked a question" by the interrogator **500**.

In another implementation, the interface **430** may be a Tag talks first (TTF) interface, in which the tag **505** talks as soon as it gets power, or in the case of a power-assisted tag or an active tag, it talks for short periods of time, all the time.

Once the tag **505** of a particular mobile device **135** is powered up, it can continuously transmit an RF signal by damping the incoming RF power from the interrogator **500** within the particular mobile device **135**. For example, the tag **505** may initiate or pulse every five seconds. Or, as discussed above, the tag **505** may only initiate a pulse in response to an incoming RF signal from an interrogator **500** of another mobile device **135**.

The tag **505** has a small size and may be formed into any suitable form, thus reducing the size requirements of the mobile device **135**. Moreover, the RFID interface **430** does not require contact or line-of-sight between two mobile devices **135**. In this way, the RFID interface **430** permits great freedom of movement for a user of the mobile device **135** and enables flexibility in the placement of the tag **505** and the interrogator **500** within the interface **430**, thus reducing size requirements of the mobile device **135**.

Referring also to FIG. **6**, a user who wishes to join the network **110** engages in a procedure **600**. The user initially registers at the server **115** (step **605**), at which time the user receives a unique identifier. The user is also given the option of providing additional personal information. Once the user registers, the user can define and maintain a buddy list (step **610**), that is, a list of other co-users of the network **110** (that is, buddies) that enables the user to perceive presence information for the co-users in a unique graphical user interface (GUI) and to track changes to presence status for the co-users in substantially real-time automatically, where presence indicates the availability of a co-user to presently communicate over the network **110** (for example, logon status of a co-user). The buddy list also provides the user with a mechanism to initiate communications (for example, instant messages (IMs), electronic mail (e-mail), chat, and other communications) with the co-users. The user may create separate buddy lists of co-users, either with intersecting or disjoint lists of users, and label these buddy lists according to the user's preferences or otherwise.

Each user account may have one or more buddy lists. When a user logs on to a network **130** or **110** (step **615**), the user's presence may be announced (step **620**) to other online users of the network **110** and the user's set of buddy lists is presented to a buddy list system. The buddy list system attempts to match co-users currently logged into the system with the entries on the user's buddy list. Any matches are displayed to the user (step **625**). As co-users logon and logoff, a user's buddy list is updated to reflect these changes (step **630**). An indication also may be added to show that a co-user just logged on or logged off the system.

Referring to FIG. **7**, the communication system **100** performs a procedure **700** for identifying online identifiers that are geographically proximate to a mobile communications device **135**. Initially, the system **100** detects a geographic proximity between a mobile device **135** and one or more mobile counterpart devices **135** with which the mobile device **135** communicates (step **705**). Any component of the system **100** may be configured to detect the geographic proximity.

For example, if the system **100** includes the location or direction determining apparatus **150**, then the location or direction determining apparatus **150** may determine that one or more mobile counterpart devices **135** are geographically proximate to the mobile device **135**. The location or direction determining apparatus **150** can send a signal to the mobile device **135** indicating the presence of and information about the geographically proximate counterpart devices **135**. The information can then be stored in the memory **440** of the mobile device **135** through a wireless transmission between the location or direction determining apparatus **150** and the mobile device **135**.

As another example, if the mobile device **135** includes the interface **430**, then the mobile device **135** is configured to

detect geographic proximity of mobile counterpart devices **135** in the network **110**. If the interface **430** is an RFID interface, then the mobile device **135** detects a geographic proximity of a mobile counterpart device **135** by detecting information stored within the mobile counterpart device **135** and transmitted from the mobile counterpart device **135** using RFID.

Next, the system **100** identifies an online identifier associated with each mobile counterpart device **135** for which geographic proximity is detected (step **710**). If the system **100** includes the location or direction determining apparatus **150**, then the location or direction determining apparatus **150** identifies the online identifiers for those geographically proximate mobile counterpart devices **135**. Or, if the mobile device **135** includes the interface **430**, then the interface **430** identifies the online identifiers for those geographically proximate counterpart devices **135**.

The online identifier may be a user-designated online identity set up during the registration (step **605**) in the procedure **600** of FIG. **6**. These online identifiers may be used in the buddy list of an instant messaging communications application. In this case, the user-designated online identity can be identified through reference to a user-designated buddy list.

The indication may distinguish the online identifiers associated with at least two mobile counterpart devices **135** for which geographic proximity to the mobile device **135** was detected.

The system **100** stores information reflective of the detected geographic proximity and the associated online identifier (step **715**). The information may be stored within the memory **440** of the mobile device **135** or it may be stored at the location or direction determining apparatus **150** if the system **100** includes the location or direction determining apparatus **150**.

The storage of the information can include maintenance of a list of online identifiers for which geographic proximity was detected. Furthermore, the list may correspond to a buddy list maintained for the user of the mobile device **135**. The list can be limited to online identifiers that appear on a buddy list maintained for the user of the mobile device **135**.

Additionally, the system **100** makes perceivable an indication of at least one associated online identifier associated with a mobile counterpart device **135** for which geographic proximity to the mobile device **135** was detected (step **720**).

The indication can be made perceivable in any suitable manner. For example, the information stored at step **715** that is reflective of the detected geographic proximity can be downloaded from the mobile device **135** to the computer system **105**. Then, the display of that information is an indication that is enabled at the computer system **105**, for example, at the monitor **274**. As another example, the information may be displayed as an indication at the imaging device **415** of the mobile device **135**.

In one implementation, the indication is made perceivable independently of perception of the table of online identifiers or the buddy list that is stored within memory **440** of the mobile device **135** or within memory **220** of the computer system **105**. In this way, the indication is not made perceivable through the display of the table or the buddy list. Rather, the indication is made perceivable through the output of a signal to one or more output devices **415**, **420**, **425** at the mobile device **135**. For example, the indication is made perceivable through the output of an audio signal (such as a beep or any suitable sound or combination of tones) at the audio device **425** of the mobile device **135**. As another example, the indication is made perceivable through the output of a flashing light at the imaging device **415** of the mobile device **135**. Furthermore, the indication may be made perceivable by distinguishing online identifiers for which the detected geographic proximity was detected after a buddy list or the table was last made perceivable to a user of the mobile device **135**.

At step **710**, the indication may distinguish the online identifiers associated with at least two mobile counterpart devices **135** for which geographic proximity to the mobile device **135** was previously detected but is not detected at the time of making the indication perceivable (step **720**).

The steps of detecting (step **705**), identifying (step **710**), and storing (step **715**) may begin upon logical separation of the mobile communications device **135** from the computer system **105**, that is, while the device **135** is operating in stand-alone mode.

Referring to FIG. **8**, in one implementation in which the mobile device **135** includes the interface **430**, the mobile device **135** performs a procedure **800** for interacting with the computer system **105** and the mobile counterpart devices **135**. In the illustration of FIG. **8**, reference is made to the implementation of the mobile device **135** of FIG. **4**. However, other implementations of the mobile device **135** may alternatively be used. The mobile device **135** performs the procedure **800** under the control of the controller **400**. This procedure is represented by the illustration in FIG. **9**. Initially, the mobile device **135** is connected to the computer system **105** through the connector device **310** (step **805**).

During connection with the computer system **105**, the mobile device **135** transmits information through the connector device **310** with the computer system **105** (step **810**). As an example (shown by block **900**), the mobile device **135** can obtain user information from the computer system **105** such as a user's online identifier (for example, a user identification number, a user's name, or a user's screen name). In this case, the user information may be information relating to the user of the mobile device **135** that the mobile device **135** later transmits while in stand-alone mode. Or, the user information may be information relating to buddies of the user of the mobile device **135**. The information relating to buddies would remain stored within the mobile device **135** and then be accessed during stand-alone mode to notify the user of the presence of a nearby buddy. As another example (shown by block **905**), the mobile device **135** can transmit user information such as a user's online identifier (for example, a user identification number, a user's name, or a user's screen name) to the computer system **105** through the connector device **310**. In this case, the user information may be information relating to one or more users of another mobile device **135**.

As mentioned above, the mobile device **135** stores the user information within memory **410**. The user information may be stored in a table that correlates each user's online identifier with other information about that user that is detected while the mobile device **135** operates in stand-alone mode. For example, the table may correlate a location or a time with the user's online identifier, with the location or time being detected when the mobile device **135** determines that that user's mobile device **135** is geographically proximate to the mobile device **135**.

If the mobile device **135** is connecting for the first time to the computer system **105** at step **805**, the mobile device **135** is initialized, that is, it retrieves and stores the user's information such as the user identification number. Moreover, the computer system **105**, and in particular, the server **115**, may detect the connection and transfer the necessary applications to store within the memory **220** of the computer system **105**, without the user being burdened with configuration and execution of the transfer. Thereafter, the computer system **105**

uses these applications to interact with the mobile device **135** when the mobile device is connected (step **805**).

Next, the mobile device **135** is disconnected from the computer system **105** (step **815**). Once disconnected, the mobile device **135** (in particular, the interface **430** within the mobile device **135**) broadcasts the user's information (such as the identification number) (step **820**). In one implementation, the mobile device **135** is configured to automatically and continuously broadcast the user's information. In another implementation, the mobile device **135** is configured to only activate the interface **430** to broadcast the user information upon manual activation from a user (that is upon receipt of user input through one of the input devices **430**).

Additionally, the mobile device **135** receives information about other users through the interface **430** from other mobile devices **135** that are geographically proximate to the mobile device **135** (step **825**). One device **135** is geographically proximate to another device **135** if the interface **430** in the device **135** is able to detect a presence of the other device **135**. For example, if the interface **430** is an RFID interface (described above), then one mobile device **135** is geographically proximate to another mobile device **135** if the mobile device **135** is within radio frequency range of the other mobile device **135**. Block **915** demonstrates the broadcast and receipt of the mobile device **135**.

The mobile device **135** stores the received information within its memory **440** (step **830**). The mobile device **135** may also output a signal to the user at any time during the procedure **800** (step **835**). The output signal may indicate that another user of the network **110** is in range of the mobile device **135**. Or, the output signal may indicate that a buddy in the network **110** is within range of the mobile device **135**. For example, the controller **400** may send a signal to the imaging device **415** to output a blinking light or an image. As another example, the controller **400** may send a signal to the motion producer **420** to vibrate or buzz. As a further example, the controller **400** may send a signal to the audio device **425** to beep or play another sound or music.

When the mobile device **135** is re-connected to the computer system **105** (step **805**), the mobile device **135** uploads all the user information that it has collected (step **810**). The computer system **105** may, at this time, open a window **910** (for example, a window that includes features that interact with a program or application of the computer system **105**) that shows the user information that it received from the mobile device **135**. The application that runs the window **910** may or may not reside on the computer system **105**. The computer system **105** automatically retrieves other appropriate user information from the database **117** that correlates with the downloaded information. For example, if the downloaded information includes a user identifier, the computer system **105** may retrieve information about the user's name, address, interests, or other accessible information that the user may have initially provided to the database **117** during registration (step **605**). The application that displays the window **910** allows the user to perform all the basic functions for any user that she "met" throughout the day with the mobile device **135**, such as, for example, add the other user to her contact list, send a message to the other user, retrieve more information about the other user.

In one implementation, the controller **400** sends a signal to the imaging device **415** to output a list of user information received during stand-alone mode **915**. In another implementation, the controller **400** sends a signal to the motion producer **420** to vibrate or buzz while the interface **430** is receiving data from another mobile device **135**. In a further implementation, the controller **400** sends a signal to the audio device **425** to beep or play a sound or music while the interface **430** is receiving data from another mobile device **135**. In a further implementation, the controller **400** sends a first signal to a first output device if the data received is from a buddy of the user and a second signal to a second output device if the data received is from a user who is not a buddy of the user.

Other implementations are within the scope of the following claims.

What is claimed is:

1. A method for identifying an online identifier associated with a mobile counterpart device that is geographically proximate to a mobile communications device associated with a user, the method comprising:

detecting, while in a mode disconnected from a computer system associated with the user, a geographic proximity between the mobile communications device and a mobile counterpart device based on an RFD signal received at the mobile communications device from the mobile counterpart device, the RFID signal identifying an online identifier associated with the mobile counterpart device;

identifying, based on the RFID signal received at the mobile communications device and from the mobile counterpart device, the online identifier associated with the mobile counterpart device for which geographic proximity is detected;

identifying, using a processor, a time associated with the receipt of the RFID signal;

storing, in a memory device of the mobile communications device while in the mode disconnected from the computer system, information reflective of the detected geographic proximity, the associated online identifier, and the time associated with the receipt of the RFID signal;

making perceivable an indication of the online identifier associated with the mobile counterpart device for which geographic proximity to the mobile communications device was detected;

uploading, from the memory device of the mobile communications device to the computer system, while in a mode connected to the computer system, the stored information reflective of the detected geographic proximity, the associated online identifier, and the time associated with the receipt of the RFID signal:

accessing, by the computer system, additional information corresponding to the uploaded online identifier, the additional information retrieved from a server configured to manage information corresponding to a plurality of online identifiers;

providing the additional information to the user at the computer system; and

enabling, by the computer system, the user to add the uploaded online identifier to a list of online identifiers designated by the user.

2. The method of claim **1** wherein storing includes maintaining a list of online identifiers for which geographic proximity has been detected.

3. The method of claim **2** wherein the list corresponds to a buddy list maintained for the user of the mobile communications device.

4. The method of claim **2** wherein the list is limited to online identifiers that appear on a buddy list maintained for the user of the mobile communications device.

5. The method of claim **1** wherein making the indication perceivable includes making the indication perceivable independently of perception of a buddy list.

6. The method of claim 5 wherein making the indication perceivable independently of perception of a buddy list includes outputting a sound.

7. The method of claim 1 wherein making the indication perceivable includes outputting a beep.

8. The method of claim 1 wherein making the indication perceivable includes distinguishing online identifiers for which detected geographic proximity was detected after a buddy list was last made perceivable to an operator of the mobile communications device.

9. The method of claim 1 wherein making the indication perceivable includes displaying the information using an imaging device at the mobile communications device.

10. The method of claim 9 wherein displaying includes enabling display of the indication using a monitor.

11. The method of claim 9 wherein displaying includes using a light to display an indication of current geographic proximity by a user-designated online identifier.

12. The method of claim 11 wherein the user-designated online identifier is identified through reference to a user-designated buddy list configured for use in an instant messaging communications application, and wherein the user-designated buddy list is stored on the mobile communications device while in a mode connected to the computer system.

13. The method of claim 1 wherein the indication distinguishes the online identifiers associated with at least two mobile counterpart devices for which geographic proximity to the mobile communications device was detected.

14. The method of claim 1 wherein the indication distinguishes the online identifiers associated with at least two mobile counterpart devices for which geographic proximity to the mobile communications device was previously detected but is not detected at the time of making the indicator perceivable.

15. The method of claim 1 wherein the detecting, identifying, and storing begin upon logical separation of the mobile communications device from the computer system.

16. A method for alerting a user associated with a mobile communications device of online identifiers associated with a mobile counterpart device in geographic proximity to the user, the method comprising:

detecting, using a processor and while in a mode disconnected from a computer system associated with the user, a geographic proximity between the user's mobile communications device and a mobile counterpart device based on an RFID signal received at the user's mobile communications device from the mobile counterpart device, the RFID signal identifying an online identifier associated with the mobile counterpart device;

distinguishing the mobile counterpart device, from at least one other device, as being geographically proximate to the user's mobile communications device;

determining, based on the RFID signal, the online identifier associated with the mobile counterpart device that is distinguished as being geographically proximate to the user's mobile communications device;

identifying, in a memory device of the user's mobile communications device, a list of online identities maintained for the user, the list being stored in the memory device while in a mode connected to the computer system;

identifying a time associated with the receipt of the RFID signal;

storing, in the memory device of the user's mobile communications device, information reflective of the detected geographic proximity, the associated online identifier, and the time associated with the receipt of the RFID signal;

comparing the determined online identifier with the online identifiers included within the list of online identifiers maintained for the user;

alerting the user of the mobile communications device of the online identifier associated with the mobile counterpart device that is deemed geographically proximate to the users mobile communication device based on whether the online identifier associated with the mobile counterpart device corresponds to one of the online identifiers included within the list of online identifiers maintained for the user;

uploading from the memory device of the mobile communications device to the computer system associated with the user, while in a mode connected to the computer system, the stored information reflective of the detected geographic proximity, the associated online identifier, and the time associated with the receipt of the RFID signal;

accessing, by the computer system, additional information for presentation to the user corresponding to the uploaded online identifier, the additional information retrieved from a server configured to manage information corresponding to a plurality of online identifiers; and

enabling, by the computer system, the user to add the uploaded online identifier to a list of online identifiers designated by the user.

17. The method of claim 16, wherein identifying the list includes permitting the user to designate a buddy list.

18. A method for identifying an online identifier associated with a mobile counterpart device in geographic proximity to a mobile communications device associated with a user, the method comprising:

detecting, using a processor and while in a mode disconnected from a computer system associated with the user, a geographic proximity between the users mobile communications device and a mobile counterpart device based on an RFID signal received at the user's mobile communications device from the mobile counterpart device, the RFID signal identifying an online identifier associated with the mobile counterpart device;

distinguishing the mobile counterpart device, from at least one other device, as being geographically proximate to the user's mobile communications device while the user's mobile communications device is in the mode disconnected from the computer system;

determining, while in the mode disconnected from the computer system, based on the RFID signal, the online identifier associated with the mobile counterpart device that is distinguished as being geographically proximate to the user's mobile communications device;

identifying a time associated with the receipt of the RFID signal;

uploading, from a memory device of the mobile communications device to the computer system, while in a mode connected to the computer system, information stored in a memory device of the mobile communications unit relating to the mobile counterpart device that was determined to be geographically proximate to the user's mobile communications device, information relating to the determined online identifier, and information relating to the identified time;

accessing, by the computer system, additional information corresponding to the uploaded online identifier, the additional information retrieved from a server configured to manage information corresponding to a plurality of online identifiers;

providing the additional information to the user at the computer system; and

enabling, by the computer system, the user to add the uploaded online identifier to a list of online identifiers designated by the user.

19. The method of claim **18**, wherein the retrieved additional information includes another user's name address, interests, or other accessible information provided to the server by the another user of the determined geographically proximate mobile counterpart device.

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