(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 December 2004 (09.12.2004)

PCT

(10) International Publication Number
WO 2004/107772 A2

(51) International Patent Classification[7]: H04Q

(21) International Application Number:
PCT/US2004/016320

(22) International Filing Date: 24 May 2004 (24.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/447,633 29 May 2003 (29.05.2003) US

(71) Applicant *(for all designated States except US)*: **MOTOROLA, INC., a corporation of the State of Delaware** [US/US]; 1303 East Algonquin Road, Schaumburg, Illinois 60196 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **SIERAWSKI, Jeffrey, A.** [US/US]; 1043 Fosters Mill Road, Boynton Beach, Florida 33436 (US). **BARROS, Mark, A.** [US/US]; 3542 Old Lighthouse Circle, Wellington, Florida 33414 (US). **BUJOLD, John, H.** [US/US]; 6363 Sand Hills Circle, Lake Worth, Florida 33463 (US).

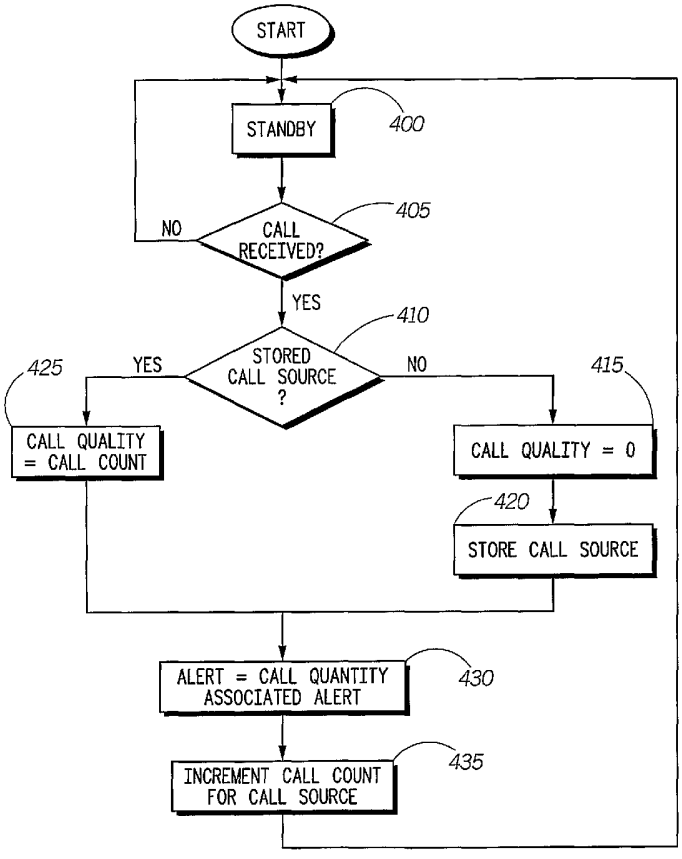
(74) Agents: **KARPINIA, Randi, L.** et al.; 8000 West Sunrise Boulevard, Room 1610, Plantation, Florida 33322 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: COMMUNICATION DEVICE WITH HISTORY BASED ALERTS AND METHOD THEREFOR



(57) Abstract: A communication device (100) includes a transceiver (115) for receiving a call, a received calls memory (145) for storing call sources (300) and for storing an associated call count (315) for each call source (310), and a processor (120). The processor (120) is programmed to: identify a call source of a received call, generate a command signal to an alert circuit (130) identify a unique alert associated with the call count, and increment the call count. The communication device (100) further includes the alert circuit (130) for alerting using the unique alert identified by the processor (120).

WO 2004/107772 A2

ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

COMMUNICATION DEVICE WITH HISTORY BASED ALERTS AND METHOD THEREFOR

Background of the Invention

Field of the Invention

This invention relates in general to electronic devices and more particularly to communication devices with alert personalization capability.

Description of the Related Art

Historically, communication devices, such as cellular telephones and two way messaging devices, have had the ability to receive data and/or voice messages sent from one or more communication systems, and perform standard functions in response to message or call receipt such as storing the message, displaying the message, or alerting the user of receipt of the message or incoming call. The user is alerted of receipt of a new message, an incoming call, or missed incoming call by an audible, visual, or vibratory alert. Many communication devices today include caller identification capability in which an identification of the caller party is displayed when a call is received. Typically, the caller identification is a telephone number of the source of the incoming call. Some communication devices include a phonebook application which ties incoming caller identification telephone numbers to stored

telephone numbers in the phonebook application and then displays the identification (such as caller's name) attached by the device user to that telephone number.

One drawback of the currently available technology is the inconvenience of viewing the display in order to identify the source of the incoming call. For example, when the device user is driving in an automobile, looking at the display of a cellular telephone or messaging device prior to answering a call can be distracting and potentially dangerous.

Some communication devices today provide functionality for unique alerts to be assigned to individual entries of a user's phone book. The device user manually assigns a different alert to each caller identification and stores the information in the phonebook. This can be time consuming and tedious, especially given that the phonebook size can be large and continuously changing.

Brief Description of the Drawings

The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below, are incorporated in and form part of the specification, serve to further illustrate various embodiments and to explain various principles and advantages all in accordance with the present invention.

FIG. 1 is an electronic block diagram of a communication device.

FIG. 2 illustrates a user preferences memory for use within the communication device of FIG.1.

FIG. 3 illustrates one embodiment of a received call memory for use within the communication device of FIG. 1.

FIG. 4 is a flowchart illustrating one embodiment of the operation of the communication device.

Detailed Description Of The Preferred Embodiment(s)

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which can be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting; but rather, to provide an understandable description of the invention.

The terms a or an, as used herein, are defined as one or more than one. The term plurality, as used herein, is defined as two or more than two. The term another, as used herein, is defined as at least a second or more. The terms including and/or having, as used herein, are defined as comprising (i.e., open language). The term coupled, as used herein, is defined as connected, although not necessarily directly, and not necessarily mechanically. The terms program, software application, and the like as used herein, are defined as a sequence of instructions designed for execution on a computer system. A program, computer program, or software application may include

a subroutine, a function, a procedure, an object method, an object implementation, an executable application, an applet, a servlet, a source code, an object code, a shared library/dynamic load library and/or other sequence of instructions designed for execution on a computer system.

FIG. 1 is an electronic block diagram of a communication device. As illustrated in FIG. 1, the communication device 100 includes a transceiver 115, a processor 120, a memory 125, an alert circuit 130, and a display 135. . It will be appreciated by one of ordinary skill in the art that the communication device 100 can be a wireless communication device such as a mobile cellular telephone, a mobile radio data terminal, a mobile cellular telephone having an attached data terminal, or a two way messaging device. Similarly, the communication device 100 can be a fixed network device which operates, for example, on a local area network (LAN) or a wide area network (WAN) or a combination of both. The fixed network device can be one of a plurality of spatially co-located computers which are typically located within a room, building or campus of buildings and are sharing common resources and communicating with each other on a computer network in a manner well known to one of ordinary skill in the art. In the following description, the term "communication device" refers to any of the devices mentioned above or an equivalent.

The transceiver 115 intercepts signals 110 transmitted from one or more communication systems 105. Preferably, each signal 110 includes a caller identification for identifying the source of the call associated with the signal 110. For example, the caller identification can be a telephone number from which the call originated. The transceiver 115 preferably employs conventional demodulation

techniques for receiving the signals 110. The transceiver 115 is coupled to the processor 120 and is responsive to one or more commands from the processor 120. For example, when the transceiver 115 receives a command from the processor 115, the transceiver 115 generates a signal for communication via the communication system 105. In general, the transceiver 115 provides the receive and transmit functionality for communicating within one or more communication calls.

In an alternative embodiment (not shown), the communication device 100 includes a receiver circuit and a transmitter circuit performing the functionality of the transceiver circuit (not shown). It will be appreciated by one of ordinary skill in the art that other similar electronic block diagrams of the same or alternate type can be utilized for the communication device 100.

Coupled to transceiver 115, is the processor 120 utilizing conventional signal-processing techniques for processing received signals. It will be appreciated by one of ordinary skill in the art that additional processors can be utilized as required to handle the processing requirements of the processor 120. The processor 120 decodes an address in the demodulated data of the received signal, compares the decoded address with one or more addresses stored in an address memory (not shown) of the memory 125; and when a match is detected, proceeds to process the remaining portion of the received signal.

Upon receipt and processing of a message, the processor 135 preferably also generates a command signal to the display 135 to generate a visual notification of the receipt of the signal 110. When the display 135 receives the command signal from the processor 120, a call indication is displayed. The call indication, for example can be

caller identification associated with a call source when the signal 110 is a telephonic call. The call indication, alternatively, can be a name or image associated with the caller identification received within the signal 110 that was manually set by the device user and stored in the memory 125 for later utilization. The display 135 can be, for example, a liquid crystal display utilized to display text and graphics. It will be appreciated by one of ordinary skill in the art that other similar displays such as cathode ray tube displays can be utilized for the display 135.

Upon receipt and processing of a message or call, the processor 120 generates a command signal to the alert circuit 130 as a notification that the signal 110 has been received. The alert circuit 130 can include a speaker (not shown) with associated speaker drive circuitry capable of playing melodies and other audible alerts, a vibrator (not shown) with associated vibrator drive circuitry capable of producing a physical vibration, or one or more light emitting diodes (LEDs) (not shown) with associated LED drive circuitry capable of producing a visual alert. It will be appreciated by one of ordinary skill in the art that other similar alerting means as well as any combination of the audible, vibratory, and visual alert outputs described can be used for the alert circuit 130. In general, the alert circuit 130 provides an alert notification of a received call.

To perform the necessary functions of the communication device 100, the processor 120 is coupled to the memory 125. The memory 125, in accordance with the present invention, includes a user preferences memory 140 and a received calls memory 145. The memory 125, for example, can include a random access memory

(RAM), a read-only memory (ROM), and an electrically erasable programmable read-only memory (EEPROM)(not shown).

In addition to the memory 125, the communication device 100 can be further coupled to an external memory storage device 150 to provide the memory requirements of the communication device 100 including to provide the functionality of the user preferences storage 140 and the received calls storage 145. The external memory storage device 150 can be connected directly to the communication device 100, or can be connected via a wireless connection such as an infrared, Bluetooth or radio frequency interface. The external memory storage device 150, for example, can be a subscriber identification module (SIM) card. A SIM card is an electronic device typically including a microprocessor unit and a memory suitable for encapsulating within a small flexible plastic card. The SIM card additionally includes some form of interface for communicating with an external device or system. The SIM card can be used to transfer a variety of information from/to the communication device 100 and/or any other compatible device.

FIG. 2 illustrates a user preferences memory 140 for use within the communication device of FIG.1. The user preferences memory 140, for example, can be memory storage space within the memory 125 or alternatively can be memory storage space within the external memory storage device 150. As illustrated in FIG. 2, the user preferences memory 140 preferably stores a plurality of call quantity categories 205 each associated with one or more quantities of received calls 200. A plurality of associated alerts 210 are also stored within the user preferences memory 140. Each call quantity category 215 has an associated alert 220. The association of

a particular alert to each category of call quantity provides the device user an indication of the type of caller without requiring any manual setup or customization.

FIG. 3 illustrates one embodiment of a received call memory 145 for use within the communication device of FIG. 1. The received call memory 145, for example, can be memory storage space within the memory 125 or alternatively can be memory storage space within the external memory storage device 150. The received call memory 145 preferably stores a plurality of call sources 300 identifying the call sources of all received calls for the communication device 100. The received call memory 145 further stores a plurality of call counts 305. Each call source 310 has an associated call count 315 tallying the quantity of calls and/or messages received from that call source 310. Each time a new call or message is received from the call source 310, the associated call count 315 for that call source 310 is incremented. The processor 120 preferably uses the associated call count 315 to categorize the call source 310 into one of the plurality of call quantity categories 205 each time that a call or message is received from the call source 310.

Referring back to FIG.1, the processor 120, in accordance with the present invention, is programmed to utilize the information stored in the user preferences memory 140 and the received calls memory 145 to identify the appropriate alert to utilize upon receipt of an incoming message or call. FIG. 4 is a flowchart illustrating one embodiment of the operation of the communication device in identifying the alert to be utilized.

The process of FIG. 4 begins with Step 400 in which the communication device 100 is in standby mode. Standby mode runs the communication device 100

with minimal power to conserve battery life. Next, in Step 405, the process checks for a received call. For example, the processor 120 periodically checks whether one or more signals 110 have been received from one or more communication systems 105 including a message and/or a voice call. When no call has been received, the process cycles back and periodically checks for a received call in Step 405. When a call has been received, the process continues to Step 410 in which the process checks whether the source of the received call is a stored source. For example, the processor 120 compares the caller identification of the call source of the received call with the plurality of call sources 300 stored in the received calls memory 145. In Step 415, when the source of the received call is not contained within the plurality of call sources 300, the call quantity for the call source is set to zero. Next, in Step 420, the received call source is stored. For example, the communication device 100 stores the new received call source within the received call memory 145. In Step 425, when the received call source is a stored call source in Step 410, the call quantity is set to the call count associated with that call source. For example, the processor 120 retrieves the call count 315 for the call source 310 when the call source 310 is the source of the received signal 110. Next, and after Step 420, the alert is set to the alert associated with the call quantity 430. For example, the processor 120 determines the call quantity category 215 by comparing the call count 315 with the call quantity ranges of each of the stored call quantity categories in the user preferences memory 140. The processor 120 then identifies the associated alert 220 for the call quantity category 215. Next, in Step 435, the call count is incremented for the call source of the received call. The process then cycles back to Step 400 in which the communication

device 100 returns to standby. It will be appreciated by those of ordinary skill in the art that the communication device 100 can further operate by alerting, displaying, participating in a communication call, etc. upon completion of the process of FIG. 4.

An exemplary scenario of the operation of FIG. 4 is illustrated below. To begin the process, the communication device receives a first communication call including a first caller identification of a first call source. For example, the first communication call is received by the transceiver from a communication system. The processor compares the first caller identification with each of a plurality of stored caller identifications of each of a plurality of stored calls sources store in the received calls memory. When the first caller identification does not match one or more of the plurality of stored caller identifications stored in the received calls memory, the processor sets a first call count to zero and stories the first call source and the first call count in the received calls memory. The processor then retrieves the first call count associated with the first call source from the received calls memory. Next, the processor compares the first call count with each call quantity range associated with each of a plurality of call quantity categories stored in the user preferences memory to identify a first call quantity category. The processor then sends a command to the alert circuit identifying the appropriate alert to use and in response the alert circuit alerts using a first alert associated with the first call quantity category. Preferably, the processor then increments the value of the first call count stored in the received calls memory.

Similarly, the communication device can thereafter receive a second communication call including a second caller identification of a second call source.

For example, the second communication call is received by the transceiver from a communication system. The processor compares the second caller identification with each of a plurality of stored caller identifications of each of a plurality of stored calls sources store in the received calls memory. When the second caller identification does not match one or more of the plurality of stored caller identifications stored in the received calls memory, the processor sets a second call count to zero and stories the second call source and the second call count in the received calls memory. The processor then retrieves the second call count associated with the second call source from the received calls memory. Next, the processor compares the second call count with each call quantity range associated with each of a plurality of call quantity categories stored in the user preferences memory to identify a second call quantity category. The processor then sends a command to the alert circuit identifying the appropriate alert to use and in response the alert circuit alerts using a second alert associated with the second call quantity category. Preferably, the processor then increments the value of the second call count stored in the received calls memory. It will be appreciated by those of ordinary skill in the art that this process can continue for a plurality of communication calls and a plurality of communication sources. It will further be appreciated by those of ordinary skill in the art that the second call quantity category can be the same as the first call quantity category or alternatively can be different from the first call quantity category. Further, the second alert can be the same or alternatively can be different from the first alert.

This disclosure is intended to explain how to fashion and use various embodiments in accordance with the invention rather than to limit the true, intended,

and fair scope and spirit thereof. The foregoing description is not intended to be exhaustive or to limit the invention to the precise form disclosed. Modifications or variations are possible in light of the above teachings. The embodiment(s) was chosen and described to provide the best illustration of the principles of the invention and its practical application, and to enable one of ordinary skill in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the invention as determined by the appended claims, as may be amended during the pendency of this application for patent, and all equivalents thereof, when interpreted in accordance with the breadth to which they are fairly, legally, and equitably entitled.

What is claimed is:

CLAIMS

1. A communication device comprising:

a transceiver for receiving a call and for communicating within the received call;

a memory comprising:

a received calls memory for storing a plurality of call sources identifying the call sources of one or more received calls and further for storing an associated call count for each call source;

a processor coupled to the transceiver, the alert circuit, and the memory, wherein the processor is programmed to:

process the received call including identifying a call source of the received call,

generate a command signal to the alert circuit identifying a unique alert associated with the call count, and

increment the call count; and

an alert circuit for alerting using the unique alert identified by the processor.

2. A communication device as recited in claim 1, wherein the memory further comprises a user preferences memory for storing a plurality of call quantity categories and a plurality of associated alerts, wherein each call quantity category has an associated alert, and further wherein the processor is further programmed to:

categorize the call source into a call quantity category prior to the generating the command signal step, and

identify the unique alert as an alert associated with the call quantity category.

3. A communication device as recited in claim 1 further comprising:

a display coupled to the processor for providing a visual notification of receipt of a call.

4. A method within a communication device for providing history-based alerts, the method comprising the steps of:

receiving a communication call from a call source;

retrieving a call count for the call source, wherein the call count is the quantity of calls received from the call source; and

setting an alert associated with the call count.

5. A method as recited in claim 4 further comprising the steps of:

determining whether the call source is stored in a memory of the communication device prior to the retrieving the call count step; and

when the call source is determined not to be stored, storing the call source in the memory.

6. A method as recited in claim 5 further comprising the step of:

incrementing the call count associated with the call source.

7. A method within a communication device for providing history-based alerts, the method comprising the steps of:

receiving a first communication call including a first caller identification of a first call source;

comparing the first caller identification with each of a plurality of stored caller identifications of each of a plurality of stored calls sources store in a memory;

setting a first call count to zero and storing the first call source and the first call count in memory when the first caller identification does not match one or more of the plurality of stored caller identifications;

retrieving the first call count associated with the first call source from the memory;

comparing the first call count with each call quantity range associated with each of a plurality of call quantity categories to identify a first call quantity category;

alerting using a first alert associated with the first call quantity category; and

8. A method as recited in claim 7 further comprising the step of:

incrementing the first call count.

9. A method as recited in claim 7 further comprising the steps of:

receiving a second communication call including a second caller identification of a second call source;

comparing the second caller identification with each of the plurality of stored caller identifications of each of the plurality of stored calls sources store in the memory;

setting a second call count to zero and storing the second call source and the second call count in memory when the second caller identification does not match one or more of the plurality of stored caller identifications;

retrieving the second call count associated with the second call source from the memory;

comparing the second call count with each call quantity range associated with each of the plurality of call quantity categories to identify a second call quantity category;

alerting using a second alert associated with the second call quantity category; and

10. A method as recited in claim 9 further comprising the step of:

incrementing the second call count.

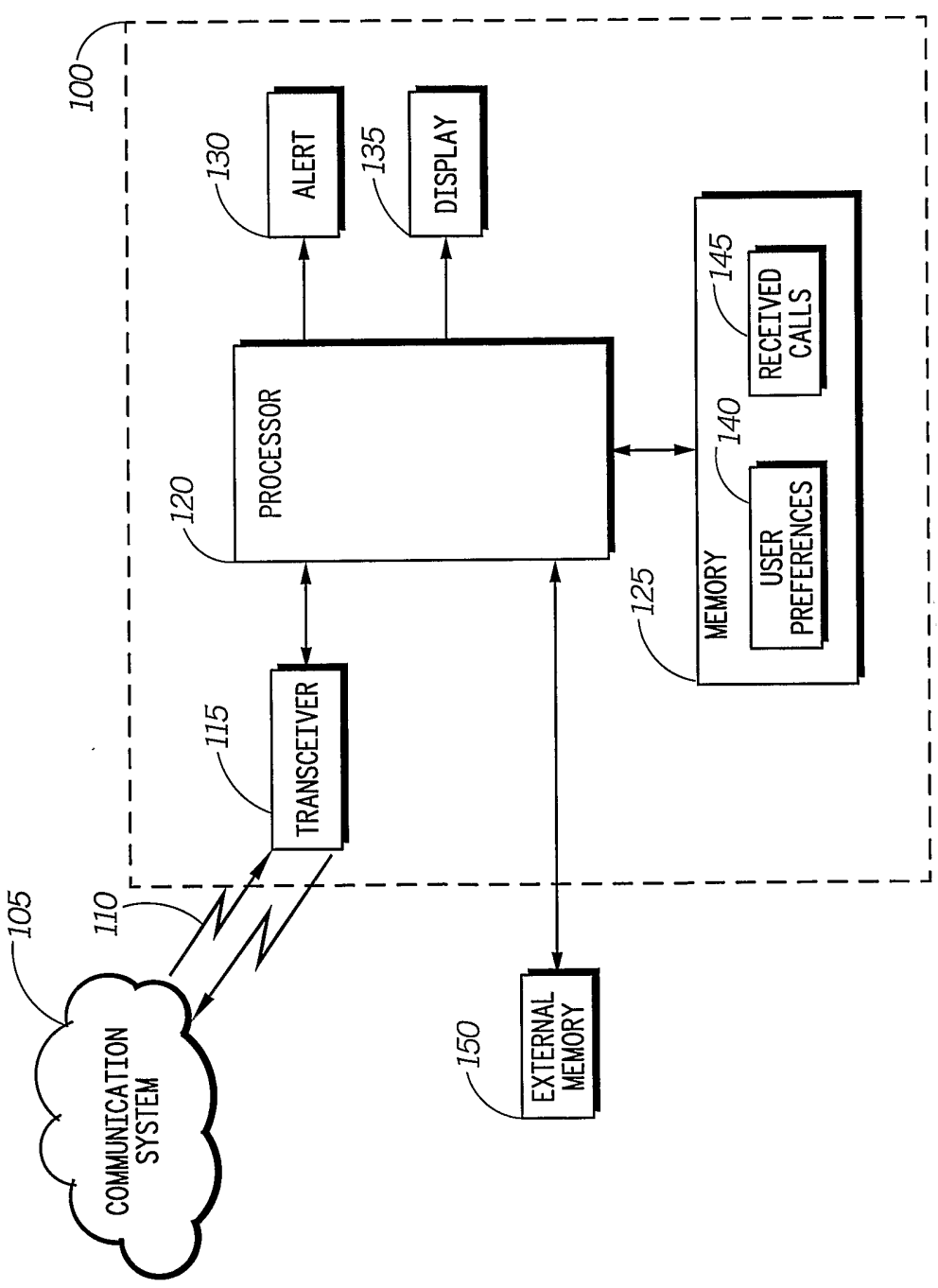

100
130
ALERT
135
DISPLAY
145
RECEIVED CALLS
140
USER PREFERENCES
MEMORY
125
120
PROCESSOR
115
TRANSCEIVER
105
110
COMMUNICATION SYSTEM
150
EXTERNAL MEMORY

FIG. 1

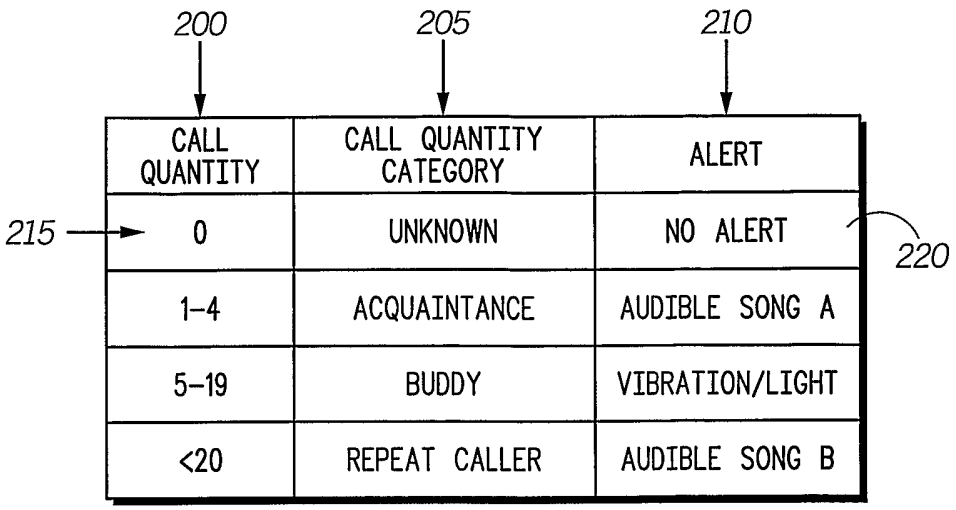


FIG. 2

140

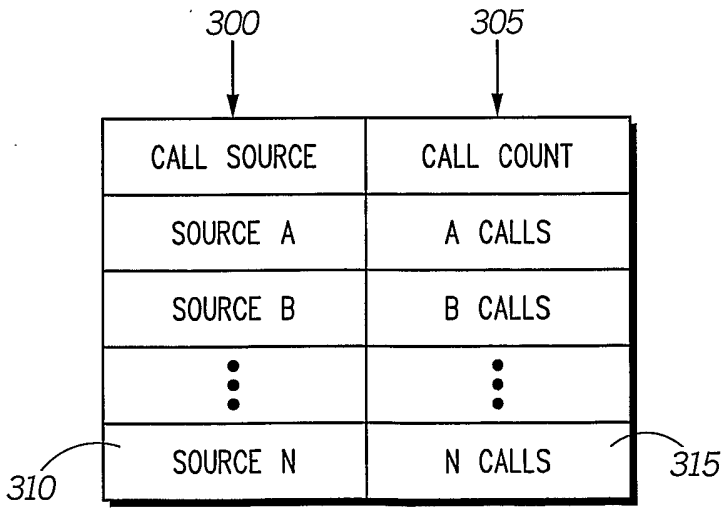


FIG. 3

145

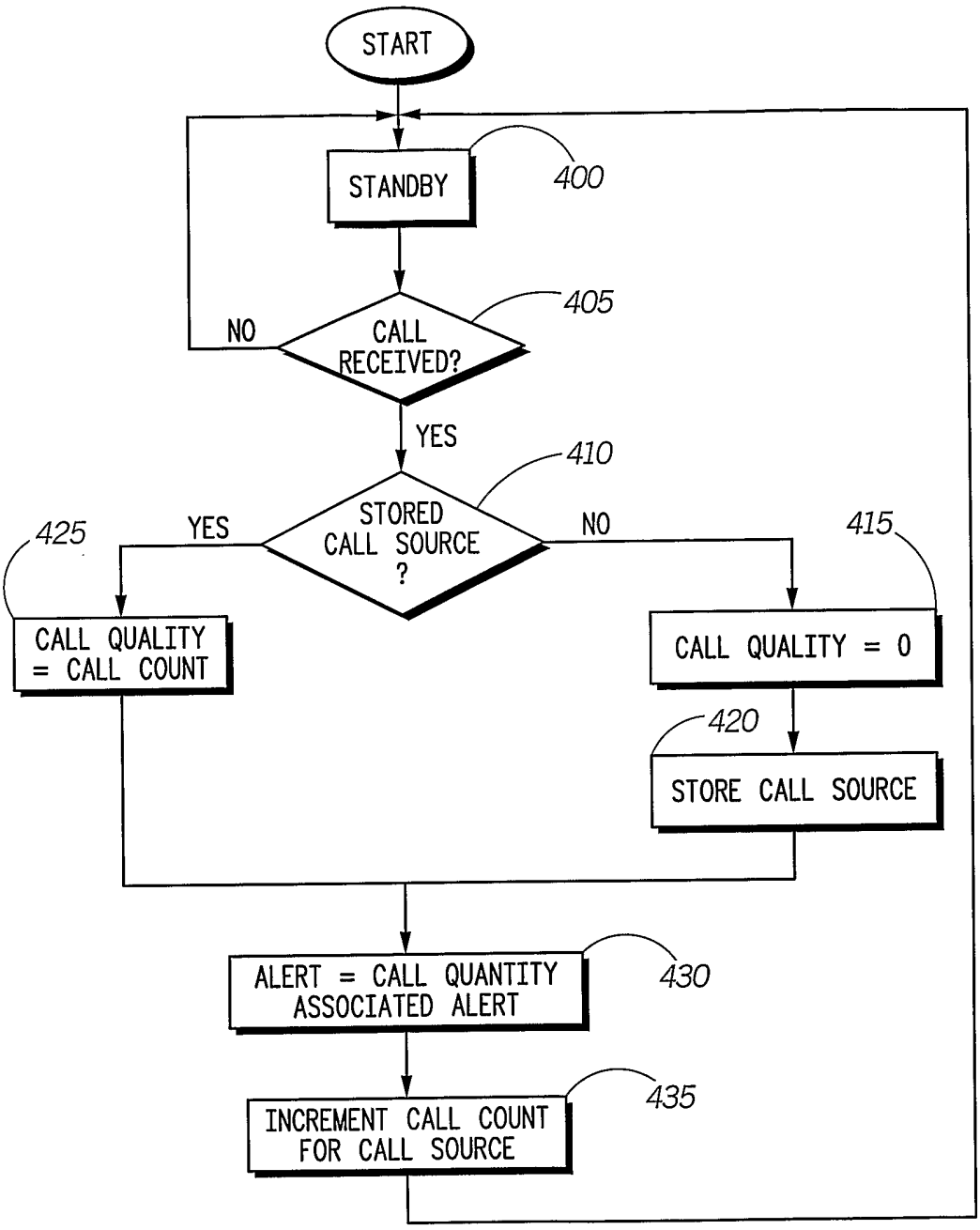

START
STANDBY
400
CALL RECEIVED?
405
NO
YES
STORED CALL SOURCE ?
410
YES
NO
425
415
CALL QUALITY = CALL COUNT
CALL QUALITY = 0
420
STORE CALL SOURCE
ALERT = CALL QUANTITY ASSOCIATED ALERT
430
INCREMENT CALL COUNT FOR CALL SOURCE
435

FIG. 4