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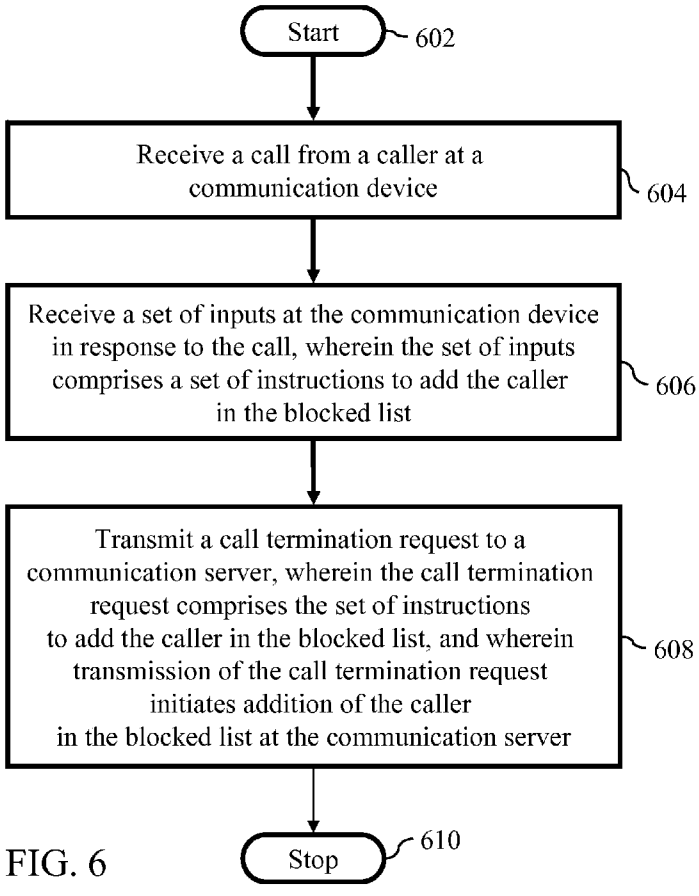


FIG. 6

(57) Abstract: A method and system for adding a caller (102) in a blocked list is provided. The blocked list is stored at a communication server (104). The method includes receiving (604) a call from the caller (102) at a communication device (108). Further, the method includes receiving (606) a set of inputs at the communication device (108) in response to the call. The set of inputs includes a set of instructions to add the caller (102) in the blocked list. Furthermore, the method includes transmitting (608) a call termination request to the communication server (104). The call termination request includes the set of instructions to add the caller (102) in the blocked list. Transmission of the call termination request initiates addition of the caller (102) in the blocked list at the communication server (104).

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METHOD AND SYSTEM FOR ADDING A CALLER IN A BLOCKED LIST

FIELD OF THE INVENTION

[0001] This invention relates in general to communication devices, and more specifically, to a method and system for adding a caller in a blocked list.

BACKGROUND OF THE INVENTION

[0002] With an increase in the penetration of communication devices in our lives, such as mobile phones, fixed lines in office, and a wireless in local loop phone at home, the number of incoming calls at the communication device have increased disproportionately. Some of these incoming calls are more nuisance than utility for a user of a communication device. Depending on the timing and occasion of the call, a nuisance call can be a call from a persistent telemarketer, a missed call, a wrong number call, an intimidating call, an irksome call, or even an obscene call. Incoming calls of such nature can affect the peace and harmony in the life of the user using the communication device.

[0003] There exist various methods that enable the user to avoid such nuisance calls. In one such method, the user can switch-off the communication device for a definite period of time. However, resorting to such a method ensures that all the incoming calls are blocked, even desired and important incoming calls. This decreases the overall utility of the communication device. Another method to avoid the nuisance calls is use of calling number identification (CNID). CNID ensures that the phone number of the caller is displayed on a display screen of the user's communication device. This enables the user to accept the incoming call only from a caller that the user wants to communicate with. This method is only partially effective as the user might have to cancel or consciously avoid a recurring incoming call. This requires a manual effort and a consistent shift in attention from the ongoing business at hand. Moreover, in case the caller uses different lines to call the user, the user will have to keep track of various phone numbers that the user wants to avoid. This makes the method very cumbersome and unfriendly.

[0004] In yet another method, a blocked list is maintained at a communication server. The communication server is part of a communication network providing service to the user. The communication server screens and blocks the incoming calls as per the entries listed in the blocked list. For example, the blocked list may contain a number of a notorious telemarketer and if a call is received at the communication server from the same number, the call will be blocked. However, this method would fail in the event that the notorious telemarketer changes lines for making calls until the blocked list is manually updated.

[0005] In still another method, a white list is maintained at the communication server. In this case, the communication server allows only incoming calls from entries listed in the white list. For example, the white list will contain the phone numbers approved by the user and whenever a call is received at the communication server from one of those numbers, it will be allowed. However, this method has a disadvantage that it allows only those incoming calls from entries that are listed in the white list and blocks all other incoming calls. Further, even if a combination of the blocked list and the white list is used, it still requires the user to manually update both the blocked list and the white list to ensure accuracy.

[0006] None of the above mentioned methods are automated and all involve human intervention. Furthermore, the user is not notified about rejection of a call from a caller in any of these methods.

BRIEF DESCRIPTION OF DRAWINGS

[0007] 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 explain various principles and advantages, all in accordance with the present invention.

[0008] FIG. 1 illustrates an exemplary environment, where various embodiments of the present invention can be practiced;

[0009] FIG. 2 illustrates a call flow diagram according to an embodiment of the present invention;

[0010] FIG. 3 illustrates a call flow diagram according to another embodiment of the present invention;

[0011] FIG. 4 illustrates a call flow diagram according to yet another embodiment of the present invention;

[0012] FIG. 5 illustrates a call flow diagram according to still another embodiment of the present invention;

[0013] FIG. 6 is a flow diagram illustrating a method for adding a caller in a blocked list in accordance with some embodiments of the present invention;

[0014] FIG. 7 is a flow diagram illustrating a method for adding a caller in a blocked list in accordance with various embodiments of the present invention;

[0015] FIG. 8 illustrates a flow diagram for a method for generating one or more notification alerts for a communication identifier based on rejection of one or more call set-up requests for the communication identifier in accordance with various embodiments of the present invention; and

[0016] FIG. 9 is a block diagram of a communication network device in accordance with an embodiment of the present invention.

[0017] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated, relative to other elements, to help in improving an understanding of the embodiments of the present invention.

DETAILED DESCRIPTION

[0018] For one embodiment, a method for adding a caller in a blocked list is provided. The blocked list is stored at a communication server. The method includes receiving a call from the caller. Further, the method includes receiving a set of inputs

at the communication device in response to the call. The set of inputs includes a set of instructions to add the caller in the blocked list. Furthermore, the method includes transmitting a call termination request to the communication server. The call termination request includes the set of instructions to add the caller in the blocked list. Transmission of the call termination request initiates addition of the caller in the blocked list at the communication server.

[0019] For another embodiment, a method for adding a caller in a blocked list is provided. The method includes receiving a voice signal from the caller. Further, the method includes comparing a data associated with the voice signal received from the caller with a predefined data. Furthermore, the method includes, based on the comparison, adding the caller in the blocked list when the data associated with the voice signal is comparable to the predefined data.

[0020] For yet another embodiment, a method for generating one or more notification alerts for a communication identifier based on rejection of one or more call set-up requests for the communication identifier is provided. The communication identifier is associated with a communication device. The method at a notification server includes receiving a set of instructions from the communication device. Further, the method includes receiving an indication of rejection of the one or more call set-up requests for the communication identifier. Furthermore, the method includes generating the one or more notification alerts based on the set of instructions received from the communication device.

[0021] For yet another embodiment, a communication network device is provided. The communication network device includes a receiver configured to receive a voice signal from a caller. Further, the communication network device includes a processor configured to compare a data associated with the voice signal received from the caller with a predefined data. The .processor is also configured to add the caller in a blocked list based on the comparison between data associated with the voice signal received from the caller with a predefined data, and when the data associated with the voice signal is comparable to the predefined data

[0022] Before describing in detail the particular method and system for adding a caller in a blocked list, in accordance with various embodiments of the present invention, it should be observed that the present invention utilizes a combination of method steps and apparatus components that are related to the method and system for adding a caller in a blocked list. Accordingly, the apparatus components and method steps have been represented, where appropriate, by conventional symbols in the drawings, showing only those specific details that are pertinent for an understanding of the present invention, so as not to obscure the disclosure with details that will be readily apparent to those with ordinary skill in the art, having the benefit of the description herein.

[0023] In this document, the terms 'comprises,' 'comprising,' 'includes,' 'including,' or any other variation thereof, are intended to cover a non-exclusive inclusion, such that a process, article, system or apparatus that comprises a list of elements does not include only those elements but may include other elements not expressly listed or inherent to such process, article or apparatus. An element preceded by 'comprises ... a' does not, without more constraints, preclude the existence of additional identical elements in the process, article, system or apparatus that comprises the element. The terms 'includes' and/or 'having', as used herein, are defined as comprising. The term 'another,' as used in this document, is defined as at least a second or more. The term 'includes,' as used herein, is defined as comprising.

[0024] **FIG. 1** illustrates an exemplary communication network **100**, where various embodiments of the present invention can be practiced. The communication network **100** can be used for exchange of information and data between different communication devices in the communication network **100**. Examples of the communication network **100** can include, but are not limited to, Internet Protocol Multimedia Subsystem (IMS) networks, IEEE 802.16-based broadband wireless access networks, Advanced Mobile Phone Systems (AMPS) networks, Global System for Mobile Communications (GSM) networks, Digital Cellular Systems (DCS) networks, Code Division Multiple Access (CDMA) networks, Integrated Digital Enhanced Network (iDEN), and Universal Mobile Telecommunication Systems (UMTS) networks.

[0025] The communication network **100** includes entities such as a caller **102**, a communication server **104**, a notification server **106**, and communication devices **108** and **110**. The caller **102** can communicate with a user of any communication device, for example, a user of communication device **108**, in the communication network **100** through the communication device **110**. In order to communicate with the user of the communication device **108**, the caller **102** requests the communication server **104** to establish a call between the communication device **110** and the communication device **108**. The communication server **104** enables the communication device **110** and the communication device **108** to communicate between themselves and has capabilities of establishing and handling various types of calls, such as voice calls, data calls and the like. Further, the communication server **104** can host and execute other services such as Voice Call Continuity (VCC) service, Short Message Service (SMS), Multimedia Message Service (MMS), location-based service, voice mail service, and Push-To-Talk (PTT) service among others. The examples of the communication server **104** can be a radio network controller (RNC), servers used for packet termination and routing, and the like.

[0026] In a usual scenario, upon receiving the request to establish the call between communication device **110** and the communication device **108**, the communication server **104** establishes the call between the communication device **110** and the communication device **108**. As a result, the caller **102** and the user of the communication device **108** can communicate with each other. However, in many scenarios the caller **102** can be a telemarketer, a harasser, a malicious caller or any other unwanted caller. In such scenarios, the user of the communication device **108** can terminate the call by pressing a key on the communication device **108** for terminating the call at the communication device **108**. As soon as the user presses the key, a call termination request is sent to the communication server **104**. In one embodiment, the call termination request can also include a set of instructions to block the caller **102**. Based on the set of instructions, the caller **102** is added to a blocked list. The blocked list contains a list of communication identifiers associated with the callers blocked by the user of the communication device **108**. For example, the blocked list can contain contact numbers or contact URI (Universal Resource Identifier) associated with the blocked callers.

[0027] After the caller **102** has been added to the blocked list, when the caller **102** tries to contact the user of the communication device **110** again, then the communication server **104** can reject the call set-up request from the caller **102** based on the set of instructions. Further, a notification alert regarding rejection of the call set-up request is also sent to the communication device **108**. The notification alert is generated by the notification server **106**, which works in tandem with the communication server **104** to generate the notification alert for the communication device **108**. The notification alert can be in form of a text message, a voice recording, an automated response system, or a Session Initiation Protocol (SIP) NOTIFY message and the like. For example, a text message containing the phone number of the caller **102** may be sent to the user of the communication device **108** when a call set-up request from the caller **102** for the communication device **108** is rejected.

[0028] Further, **FIG. 1** shows only the caller **102**, the communication server **104**, the notification server **106**, the communication device **108**, and the communication device **110**; however, in practical scenarios the communication network could include multiple callers, communication servers, notification servers and communication devices.

[0029] **FIG. 2** illustrates a call flow diagram according to an embodiment of the present invention. The call flow diagram shows messages exchanged between the caller **102**, the communication server **104**, the notification server **106**, and the communication device **108** in order to add the caller **102** to a blocked list. To describe the call flow, reference will be made to the **FIG. 1**, although it is understood that the call flow can be implemented in any other suitable environment or network.

[0030] The caller **102** requests the communication server **104** to set-up a call with communication device **108** by sending a call set-up request **210** to the communication server **104**. The call set-up request **210** can include an identifier associated with the communication device **108**. The identifier helps to uniquely identify the communication device **108** within the communication network **100**. The identifier can be a phone number, a private address used within the communication network **100**, a SIP URI, an Internet protocol (IP) address and the like. Based on the call set-

up request **210**, the communication server **104** sends a call set-up request message **212** to the communication device **108**. The message **212** can include the call set-up request **210** and is intended to set-up the call between the caller **102** and the communication device **108**. A user of the communication device **108** is alerted of the incoming call from the caller **102** based on the message **212.** The user of the communication device **108** accepts the incoming call from the caller **102** by pressing a designated button on the communication device **108**. In response to the pressing of the button, the communication device **108** sends a message **214** to the communication server **104** acknowledging answering of the incoming call from the caller **102**. Thereafter, the communication server **104** forwards the acknowledgement received from the communication device **108** to the caller **102** by sending a message **216**.

[0031] After the message **216** has been sent to the caller **102** by the communication server **104**, the call is established. The caller **102** then can exchange data, such as voice data, with the user of the communication device **108** by sending a message **218**. However, in some scenarios, the caller **102** may be a telemarketer, a harasser, a malicious caller or any other unwanted caller and the user of the communication device **108** would like not to receive any further calls from the caller **102**. Further, the user of the communication device **108** would like to block the caller **102**. For one embodiment, the user of the communication device **108** can transmit a call termination request **220** to the communication server **104** and the notification server **106** by pressing a designated key on the key pad of the communication device **108**. In this embodiment, a set of instructions to block the caller **102** is transmitted along with the call termination request **220**. The set of instructions can include a request for receiving notification alerts based on further call set-up requests received from the caller **102**, a time period for blocking the caller **102**, a condition for blocking the caller **102**, and a reason for blocking the caller **102**. For example, George (user of the communication device **108**) after receiving a call from a telemarketer, John (caller **102**), presses a key on the communication device **108** to block John and to terminate the call. In response to the pressing of the key, a call termination request can be transmitted to the communication server **104** and the notification server **106**. In addition, in response to the pressing of the key, the communication device **108** may display on a display screen of the communication device text that prompts George for,

or may display a form via which George can input, instructions to block John. When George further inputs instructions to block John, these instructions are transmitted to the communication server **104** along with, and preferably are included in, the call termination request. Based on the set of instructions received with the call termination request **220**, the communication server **104** can add the caller **102** (John) in a blocked list. As a result of addition of the caller **102** to the blocked list, future calls from the caller **102** can be rejected. The blocked list can be stored and updated at the communication server **104**.

[0032] For another embodiment, the call termination request **220** can include a set of instructions to store the voice of the caller **102**. In this embodiment, voice of the caller **102** is pre-recorded at the communication server **104** after the media exchange is initiated by the message **218**. The communication server **104** then may store the pre-recorded voice of the caller **102** in a particular format in a memory of the communication server **104** as per the set of instructions contained in the call termination request **220**. For example, communication server **104** may convert John's voice sample to one of the various available formats such as Windows Wave (WAV), Moving Picture Experts Group Layer-3 Audio (MP3), Advanced Audio Coding (AAC), Audio Compression – 3 (AC3), Apple Lossless Audio Codec (ALAC), Adaptive Multi-Rate AMR, Windows Media Audio (WMA) and the like. Further the communication server **104** may convert the recorded voice of the caller **102** into text by a voice-to-text conversion system included in, or coupled to, the communication server **104**. Hence, the data associated with the voice of the caller can also be stored as a string of words or a piece of text.

[0033] After adding the caller **102** in the blocked list and/or recording the voice of the caller **102**, the communication server **104** terminates the call by sending a termination message **222** to the caller **102**. After terminating the call, the communication server **104** sends an acknowledgement message **224** to the communication device **108**. The acknowledgement message **224** acknowledges blocking of the caller **102** or recording and storing of voice of the caller **102** to the user of the communication device **108**. For example, George can receive a text message from the communication server **104**, informing George about successfully blocking John.

[0034] **FIG. 3** illustrates a call flow diagram according to another embodiment of the present invention. The call flow diagram shows messages exchanged between the caller **102**, the communication server **104**, the notification server **106**, and the communication device **108** in order to terminate the call from the caller **102**. To describe the call flow, reference will be made to the **FIG. 1** and **FIG. 2**, although it is understood that the call flow can be implemented in any other suitable environment or network.

[0035] The call flow diagram depicted in **FIG. 3** begins when the caller **102** requests the communication server **104** to set-up a call with communication device **108** by sending a call set-up request **302** to the communication server **104**. In a usual scenario, the caller **102** is checked against a white list maintained at the communication server **104**. The white list contains a set of callers authorized by the communication device **108**. In the event that the caller **102** is present in the white list, the call setup request **302** is forwarded to the communication device **108** for the purpose of establishing the call between the caller **102** and the communication device **108**. However, in the current embodiment, if the caller **102** is, not present in the white list the call is established at the communication server **104** without forwarding the call set-up request **302** to the communication device **108**. This is done in order to receive a voice signal **304** from the caller **102**. The voice signal **304** is recorded at the communication server **104** after it is received from the caller **102**. The communication server **104** then may convert the recorded voice signal **304** to a particular format in order to compare the voice signal **304** with a predefined data maintained in the memory of the server **104**. The predefined data can be the data associated with another voice signal recorded and stored at an instance when a call was blocked. Further, the communication server **104** also may convert the voice signal **304** into text by the voice-to-text conversion system.

[0036] In one embodiment, the predefined data can be a text converted from the voice of the caller **102** that has been previously recorded at the communication server **104**. For example, suppose that John calls George for the first time and introduces himself to George by saying a specific line such as "Hi, I am calling from Exotic Sellers." George, being not interested in the offer, presses a key on the communication device

108 to terminate the call and to record John's voice for blocking all such future calls. John's voice, which has been recorded and then converted into text, can serve as the predefined data in this case. For another embodiment, the predefined data can be a voice message recorded by the user of the communication device **108** or a text message provided by the user of the communication device **108** to the communication server **104**. For example, George can record "Hi, I am calling from Exotic Sellers" in his own voice. This voice recording can serve as the predefined data. Another example of the predefined data can be George entering the string of words "Exotic" and/or "Sellers" in a text message and sending it to the communication server **104**.

[0037] After the voice-to-text conversion system of communication server **104** converts the data associated with the voice signal **304** to the particular format or to text, the communication server **104** compares the converted voice signal to the predefined data. If the data associated with the voice signal **304** received from the caller **102** is found comparable to the predefined data, that is, a match is determined in at least a limited way, for example, when a match is determined with respect to one or more key words of the converted voice signal and the predefined data, then a pre-recorded message **306** is transmitted to the caller **102**. The pre-recorded message **306** is a message recorded by the user of the communication device **108** and that informs the caller **102** that the call is blocked. Further, a call termination message **308** is transmitted to the caller **102** after transmission of the pre-recorded message **306**. For example, George can record a message at the communication server **104** saying "I have added your number to a blocked list and please don't bother calling again." This message will be replayed to every caller blocked by the communication server **104**. As a result, when John calls George for a second time and introduces himself by using the same line, "Hi, I am calling from Exotic Sellers," the communication server **104** compares John's voice sample with the previously recorded voice sample and terminates the call. As another embodiment, the communication server could compare the text of what John spoke with the predefined text data. However, before terminating the call the communication server **104** will replay the message recorded by George to John.

[0038] After the call is terminated/rejected by the communication server **104**, a message **310** is sent to the notification server **106**. The message **310** includes an indication of rejection of the call/call set-up request by the communication server **104** and other information corresponding to the caller **102**. The other information can be a phone number of the caller **102**, identity/name of the caller **102** and the like. The indication of rejection of the call/call set-up request serves as a trigger for notification server **106** to generate a notification alert **312** for the communication device **108**. The notification server **106** can utilize the other information contained in the message **310** to generate the notification alert **312**. The notification alert **312** informs user of the communication device **108** regarding the termination of call by the communication server **104**. For example, after John's call is blocked at the communication server **104**, a text message may be sent to George from the notification server **106**. The text message can include data such as a phone number of John, a time when the call was blocked, and a reason for blocking John. This text message can help George in keeping a log of calls blocked by him.

[0039] **FIG. 4** illustrates a call flow diagram according to yet another embodiment of the present invention. The call flow diagram shows messages exchanged between the caller **102**, the communication server **104**, the notification server **106**, and the communication device **108** in order to terminate the call from the caller **102**. To describe the call flow, reference will be made to the **FIG. 1** and **FIG. 2** although it is understood that the call flow can be implemented in any other suitable environment or network.

[0040] The call flow diagram depicted in **FIG. 4** begins when the caller **102** requests the communication server **104** to set-up a call with communication device **108** by sending a call set-up request **402** to the communication server **104**. The caller **102** is checked against a white list maintained at the communication server **104**. The white list contains a set of callers authorized by the communication device **108**. If the caller **102** is present in the white list, the call setup request **302** is forwarded by the communication server **104** to the communication device **108** for the purpose of establishing the call. However, in the current embodiment, if the caller **102** is not present in the white list, the call set-up request **402** is forwarded by the

communication server **104** to the notification server **106** by sending a message **404**. In response to receiving the message **404** at the notification server **106**, the call is established at the notification server without forwarding the call set-up request **402** to the communication device **108**. This is done in order to receive a voice signal **406** from the caller **102**. The voice signal **406** is recorded in a memory at the notification server **106** after it is received from the caller **102**. The notification server **106** converts the voice signal **406** to a particular format and compares the converted voice signal with a predefined data. The particular format can be text, as the data associated with the voice signal **406** can be converted into text by the voice-to-text conversion system included in, or coupled to, the notification server **106**.

[0041] In case the data associated with the voice signal **406** received from the caller **102** is found comparable to, that is, matches in at least a limited way, the predefined data, then the notification server **106** conveys a pre-recorded message **408** to the caller **102**. The pre-recorded message **408** can be a message recorded by the user of the communication device **108** and informs the caller **102** that the call is being blocked. Further, the notification server **106** conveys a call termination message **410** to the caller **102** after transmission of the pre-recorded message **408**. However, in case the data associated with the voice signal **406** is not comparable to the predefined data, the call between the caller **102** and the communication device **108** can be established.

[0042] After the termination/rejection of the call is indicated to the notification server **106**, a notification alert **412** is generated by the notification server **106**. The notification alert **412** can include information related to the phone number of the caller **102**, identity/name of the caller **102**, and the like. The notification alert **412** is transmitted to the communication device **108**. The notification alert **412** informs the user of the communication device **108** regarding the call terminated by the notification server **106**.

[0043] **FIG. 5** illustrates a call flow diagram according to yet another embodiment of the present invention. The call flow diagram shows messages exchanged between the caller **102**, the communication server **104**, the notification server **106**, and the communication device **108** in order to terminate the call from the caller **102**. To

describe the call flow, reference will be made to the **FIG. 1** and **FIG. 2** although it is understood that the call flow can be implemented in any other suitable environment or network.

[0044] The call flow diagram depicted in **FIG. 5** begins when the caller **102** requests the communication server **104** to set-up a call with communication device **108** by sending a call set-up request **502** to the communication server **104**. In this embodiment, the call set-up request **502** is forwarded **504** by the communication server **104** to the communication device **108** for the purpose of establishing the call. Prior to the ringing of the communication device **108**, the caller **102** is checked against a white list maintained at the communication device **108**. The white list contains a set of callers authorized by the communication device **108**. For example, a contact list of a mobile phone, in this case the communication device **108**, can serve as the white list. If the caller **102** is present in the white list, the communication device **108** is rung to inform the user of the incoming call. The incoming call is established at the communication device **108** and a recording of a voice signal **506** is not initiated.

[0045] If the caller **102** is not present in the white list, the call is established at the communication device **108** and a pre-recorded voice message, such as "hello," is retrieved from a memory of the communication device **108**. The communication device **108** then conveys the retrieved voice message to communication device **110**, where the pre-recorded "hello" is replayed to the caller **102** to convince the caller that the call has been established with the user of communication device **108**. The pre-recorded "hello" is replayed for the caller **102** without alerting the user of the communication device **108**. In response to the establishment of the call and the playing of the pre-recorded voice message, a voice signal **506** is received by the communication device **108** from the caller **102**. Communication device 108 then records the received voice signal **506** and stores it in the memory of communication device **108**. The communication device **108** further converts the voice signal **506** to a particular format at the communication device **108** and compares the converted voice signal with a predefined data. The particular format can be text as the data associated

with the voice signal **406** can be converted into text by a voice-to-text conversion system included in the communication device **108**.

[0046] If the data associated with the voice signal **506** received from the caller **102** is found comparable to, that is, matches in at least a limited way, the predefined data, then the communication device **108** conveys a pre-recorded message **508** to the caller **102**. The pre-recorded message **508** can be a message recorded by the user of the communication device **108** and informs that the caller **102** is being blocked. Further, the communication device **108** conveys a call termination message **510** to the caller **102** after transmission of the pre-recorded message **508**. However, in case the data associated with the voice signal **506** is not comparable to the predefined data, the communication device **108** alerts the user of the communication device **108** to the call and the call between the caller **102** and the communication device **108** then can be established after the user of communication device **108** answers the call. The data associated with the voice signal **506** can be used as a predefined data for call setup requests at a later point of time.

[0047] After the call is terminated/rejected by the communication device **108**, the communication device **108** conveys a message **512** to the notification server **106**. The message **512** includes an indication of rejection of the call/call set-up request by the communication server **104** and other information corresponding to the caller **102**. The other information can be a phone number of the caller **102**, identity/name of the caller **102**, and the like. The indication of rejection of the call/call set-up request serves as a trigger for notification server **106** to generate a notification alert **514** for the communication device **108**. The notification server **106** can utilize the other information contained in the message **512** to generate the notification alert **514**. In other embodiments of the present invention, the notification alert **514** can be sent by the notification server **106**, or by the communication device **108**, to another communication device as selected by the user of the communication device **108**. This is advantageous in case the user of the communication device **108** wants to process the notification alert **514** or maintain a log of notification alerts at another communication device. The notification alert **514** informs the user of the communication device **108** regarding the termination of call by the communication

device **108**. For example, after the call is blocked at the communication device **108**, a text message may be sent from the notification server **106**. The text message can contain data such as the phone number of caller **102**, a time when the call was blocked, and/or a reason for blocking the call. This text message helps a user in keeping a log of calls blocked by him or her.

[0048] FIG. 6 is a flow diagram illustrating a method for adding the caller **102** to a blocked list in accordance with various embodiments of the present invention. To describe the method, reference will be made to **FIG. 1**, although it is understood that the method can be implemented in any other suitable environment or network. Moreover, the invention is not limited to the order in which the steps are listed in the method.

[0049] The method for adding the caller **102** to a blocked list initiates at step **602**. At step **604**, a communication device, such as the communication device **108**, receives a call from an unwanted caller, such as the caller **102**, for example, a telemarketer. In case the caller **102** is an unwanted caller, the user of the communication device **108** responds by inputting to the communication device **108**, for example, by pressing one or more buttons of the communication device **108,** and the communication device receiving **606** from the user, a set of instructions. The set of instructions includes instructions to add the caller **102** to the blocked list. Further, at step **608**, the user of the communication device **108** can transmit a call termination request to the communication server **104** in order to terminate the first call and to block future calls from the caller **102**. The communication device **108** can also transmit the call termination request to the notification server **106**. The call termination request includes the instructions to add the caller **102** to the blocked list. In response to receiving the call termination request, the communication server **104** initiates the addition of the caller **102** to the blocked list.

[0050] In one embodiment of the present invention, the call termination request is transmitted to the communication server **104** based on an input received at the communication device **108**. The input can be a pressing of a key on a key pad of the communication device **108** by the user of the communication device **108**. For

example, George can push a pre-designated key on the communication device **108** after receiving a call from John and with an intention of terminating the call from John and further blocking any calls from John that are received within a predefined time period. In this embodiment, the time period for blocking the caller **102** can be a default period or a time period predefined by the user of the communication device **108**.

[0051] In another embodiment of the present invention, the user of the communication device **108** can provide a set of inputs at the communication device **108** in order to terminate the call and to provide a set of instructions to block the caller **102**. In this embodiment, the user of the communication device **108** can select options for receiving notification alerts from the notification server **106** every time a call from the caller **102** is rejected/terminated. Further, the user of the communication device **108** can select a time period for which the user wants the caller **102** to be blocked, a condition for blocking the caller **102**, and a reason for blocking the caller **102**. All these options selected by the user of the communication device **108** can be transmitted by the communication device **108** to the communication server **104** and the notification server **106** in form of the set of instructions included in the call termination message.

[0052] Based on the set of instructions included in the call termination message, communication server **104** adds the caller **102** to the blocked list at step **608**. The communication server **104** updates the blocked list and stores the set of instructions in the memory of the communication server. For example, after receiving a call from an unwanted caller, George can punch a key on the communication device **108** to block the unwanted caller. As a result, a database on the communication server **104** can dynamically store the phone number and other details associated with the unwanted caller. After the caller **102** is added to the blocked list, the call is terminated by the communication server **104**. Further, based on addition of the caller **102** to the blocked list, an acknowledgement message can be transmitted to the communication device **108**.

[0053] When the communication server **104** receives another call set-up request from the caller **102** after the caller **102** has been added to the blocked list, the communication server **104** rejects the call set-up request. In addition, the notification server **106**, working in conjunction with the communication server **104**, may transmit a notification alert to the communication device **108**. Thereafter, the method terminates at step **610**.

[0054] **FIG. 7** is a flow diagram illustrating a method for adding the caller **102** in a blocked list in accordance with various embodiments of the present invention. To describe the method, reference will be made to **FIG. 1**, although it is understood that the method can be implemented in any other suitable environment or network. For example, the method as described below can be implemented at the communication server **104** or at the communication device **108.** Moreover, the invention is not limited to the order in which the steps are listed in the method.

[0055] The method for adding the caller **102** in a blocked list initiates at step **702**. At step **704**, a voice signal is received from the caller **102**. The voice signal can be received at the communication server **104**. At step **706**, the communication server **104** compares a data associated with the voice signal from the caller **102** with a predefined data. In one embodiment, the predefined data can be the voice of the caller **102** previously recorded at the communication server **104**. The predefined data in this case is recorded based on an input received at the communication device **108**. For example, when the caller **102**, for example, John, calls a user of the communication device **108**, for example, George, for the first time, John may introduce himself to George by saying a specific line such as "Hi, I am calling from Exotic Sellers." George, being not interested in the offer, presses a key on the communication device **108**. The pressing of the key terminates the call and also initiates a storing of John's voice at one or both of the communication server **104** and the communication device **108**. John's stored voice then may server as the predefined data. In another embodiment, the predefined data can be the recorded voice of the caller **102** converted into text by a voice-to-text conversion system included in, or associated with, one or more of the communication server **104** and the communication

device **108** and stored in the memory of the communication server and/or the communication device as a string of words or a piece of text.

[0056] When the predefined data is stored at the communication server **104**, the predefined data may be stored at the communication server **104** by the user of the communication device **108**. In such an embodiment, the user can record a voice message on the communication server **104** or can store a text file at the communication server **104**. The voice message recorded by the user or the text file stored by the user then may become the predefined data. In the event that the data associated with the voice signal received from the caller **102** is not similar to the format of the predefined data, then the data associated with the received voice signal is converted to the format of the predefined data to allow for a comparison with the predefined data. Further, the received voice signal can also be converted into text using the voice-to-text conversion system. Thus the data from the voice of a caller blocked earlier can be in form of a text. The stored voice data from an earlier blocked caller then can be compared to text that has been currently converted from the voice of a current caller. This method of converting voice signals to text ensures that any changes in voice patterns will not affect the result of comparison between the data associated with the voice of the current caller with the voice of the caller blocked earlier.

[0057] Based on the comparison between the data associated with the voice signal with the predefined data at step **706**, the communication server **104** can determine that caller **102** is an unwanted caller and can add the caller **102** to the blocked list at step **708**. In addition, based on the comparison, the communication server **104** may reject the call and, further, may convey a pre-recorded message to the caller **102** before termination of the call. After the pre-recorded message is transmitted to caller **102**, the method is terminated at step **710**.

[0058] FIG. 8 illustrates a flow diagram for a method for generating one or more notification alerts for a communication identifier based on rejection of one or more call set-up requests for the communication identifier in accordance with various embodiments of the present invention. To describe the method, reference will be

made to **FIGs. 1, 3,** and **4** although it is understood that the method can be implemented in any other suitable environment or network. Moreover, the invention is not limited to the order in which the steps are listed in the method.

[0059] The communication identifier is associated with the communication device **108** and can be a phone number, a private address used within a communication network, an Internet protocol (IP) address, and the like. The method for generating notification alerts for a communication identifier based on rejection of call set-up requests for the communication identifier initiates at step **802**. At step **804**, the notification server **106** receives a set of instructions related to the communication identifier from the communication device **108**. The set of instructions can be included in a call termination request received from the communication device **108**. The set of instruction received from the communication device **108** includes a request for receiving of notification alerts from the notification server **106**. Further, the set of instructions transmitted by the communication device **108** may be based on an input or a set of inputs received at the communication device **108** from a user of the communication device.

[0060] At step **806**, an indication of rejection of a call set-up request for the communication identifier is received. In one embodiment of the present invention, as discussed herein with respect to **FIG. 3**, the call set-up request can be rejected by the communication server **104**. The communication server **104** then may convey an indication of rejection of the call set-up request to the notification server **106**. That is, in such an embodiment, when the communication server **104** receives a call set-up request from caller **102** and wherein the callee is communication device **108**, the communication server does not forward the call set-up request and the call set-up request is rejected at the communication server. The communication server **104** then indicates, to the notification server **106,** that the call set-up request is being rejected. Based on the received indication of rejection of the call set-up request, the notification server **106** generates a notification alert at step **808**. The notification alert can be in form of a text message or a SIP NOTIFY including the details of the blocked caller **102**, the time of blocking the call, the reason for blocking the call, and other related

information. The notification server **106** then conveys the notification alert to the communication device **108**.

[0061] In another embodiment of the present invention, the call set-up request can be rejected by the notification server **106**. In such an embodiment, as discussed herein with respect to **FIG. 4**, when the communication server **104** receives a call set-up request from caller **102** wherein the callee is communication device **108**, the communication server forwards the call set-up request to the notification server **106**. The call then is established at the notification server **106** without forwarding the call set-up request to the communication device **108**. This is done in order to receive a voice signal from the caller **102** the notification server **106**. After receiving the voice signal from the caller **102**, the notification server **106** compares the data associated with the voice signal with a predefined data stored at the notification server. The notification server **106** stores the predefined data based on the set of instructions received from the communication device **108** prior to the receipt of the current call set-up request. For example, the caller **102** (John) may call the user of communication device **108** (George) for the first time and introduce himself to George by saying a specific line, such as "Hi, I am calling from Exotic Sellers." George, being not interested in the offer, presses a key on the communication device **108** to terminate the call and to record John's voice for blocking all such future calls. Thereafter, John's recorded voice would serve as predefined data. The predefined data can also be a voice message recorded by the user of the communication device **108** or a text message provided by the user of the communication device **108** to the notification server **106**.

[0062] When the data associated with the voice signal of the caller **102** and the predefined data are similar, the notification server **106** adds the caller **102** to a blocked list. In addition, the notification server **106** may convey a pre-recorded message, maintained in the memory of the notification server, to the caller **102**. The pre-recorded message can be a message previously recorded by the user of the communication device **108** and informs the caller **102** that the call is being blocked. After transmission of the pre-recorded message to the caller **102**, the call can be rejected by the notification server **106**. After the termination/rejection of the call is

indicated to the notification server **106** at step **806**, the notification server **106** generates a notification alert at step **808** and conveys the notification alert to the communication device **108**. The method then is terminated at step **810.**

[0063] FIG. 9 is a block diagram of a communication network device **902** in accordance with an embodiment of the present invention. Those skilled in the art will appreciate that the communication network device **902** may include all or even a fewer number of components than the components shown in **FIG. 9**. Further, those ordinarily skilled in the art would understand that the communication network device **902** may include additional components that are not shown here and are not germane to the operation of the communication network device **902**, in accordance with the inventive arrangements. To describe the communication network device **902**, reference will be made to **FIG. 1** and **FIG. 4**, but it should be understood that the communication network device **902** can be implemented in any other suitable environment or network. Further, in the light of the method as described in various figures above, the communication network device **902** can be represented by any one of the communication server **104**, the communication device **108**, or the notification server **106**, when part of the communication network as shown in **FIG. 1**. Moreover, the communication network device **902** represented by the notification server **106** can be a SIP notification server. Similarly, an example of the communication network device **902** represented by the communication device **108** can be a mobile phone.

[0064] The communication network device **902** includes a receiver **904**, a processor **906**, a memory **908,** a transmitter **910**, and a recorder **912**. The receiver **904** is configured to receive a voice signal from another communication device, such as the communication devices **110** and **108**. The receiver **904** further may be configured to receive a set of instructions from another communication device, for example, the communication device **108**. The set of instructions can be included in a call termination request received from the communication device **108** by the receiver **904**, which communication device **108** may transmit the set of instructions based on a set of inputs received at the communication device **108**. The communication device **108** is associated with a communication identifier. The communication identifier uniquely

identifies the communication device **108**. The communication identifier can be a phone number allocated to the communication device **108**.

[0065] The receiver **904** further may be configured to receive an indication of rejection of call set-up requests for the communication identifier, wherein the communication identifier is associated with the callee of the call set-up requests. For example, the call set-up requests may comprise a communication identifier that identifies communication device **108** as the callee and may be sent by the caller **102**. In one such embodiment, the indication of rejection can be received from the communication server **104**. In this embodiment, after the indication of rejection of the call set-up requests is received by the receiver **904**, the processor **906** can generate the notification alerts based on the set of instructions received from the communication device **108**. In another embodiment, the indication of rejection can be received from the communication device **108**. In this embodiment, after the indication of rejection of the call set-up requests is received by the receiver **904**, the processor **906** can generate the notification alerts based on the set of instructions received from the communication device **108**.

[0066] However, in yet another embodiment, the indication of rejection can be received by the receiver **904** from the processor **906**. In this embodiment, the notification server **106** acts as the communication network device **902** and the call set-up request(s) is processed at the communication network device **902** after being forwarded to the communication network device **902** by the communication server **104**. Based on processing of the call set-up request, the call with the caller **102** is established at the communication network device **902** and a voice signal from the caller **102** is received by receiver **904**. The processor **906** converts, or arranges for the conversion of, the voice signal to a particular format. Further, the processor **906** compares a data associated with the voice signal with a predefined data. The predefined data can be recorded by a recorder **912,** converted to the particular format by the processor **906**, and stored in the memory **908** based on the set of instructions received from the communication device **108** prior to the currently received call set-up request. In case the data associated with the voice signal of the caller **102** and the predefined data are similar, the caller **102** is added, by the processor **906**, to a blocked

list maintained in the memory **908**. Further, the process of adding the caller **102** to the blocked list is followed by rejection of the call by the processor **906**.

[0067] The memory **908** further may maintain one or more pre-recorded messages. One such pre-recorded message may reject a call intended for the communication identifier/callee identified in a call set-up request and may be sent to a caller, such as the caller **102**, by the transmitter **910**. The pre-recorded message is sent before the processor **906** rejects the call for the communication identifier. The pre-recorded message can be recorded at the communication network device **902** by a user of a called communication device, such as communication device **108**, using the recorder **912**. After terminating the call with the caller, that is, the caller **102**, the processor **906** generates a notification alert for the called communication device, that is, the communication device **108**. The notification alert may be sent in response to receiving, from the called communication device, a request to receive the notification alert(s). The request to receive the notification alert(s) may be included in a set of instructions received by the receiver **904** from the communication device **108**. The processor **906** then may convey the notification alert to the communication device **108** via the transmitter **910**.

[0068] Various embodiments, as described above, provide a method and system for adding a caller in a blocked list. The present invention provides the users (subscribers) with the capabilities of dynamically blocking of unwanted calls. The users can block unwanted calls either after receiving an unwanted call or before receiving an unwanted call. Also, the method and system provides a facility of notification alerts. The notification alerts are issued whenever an unwanted call is blocked at the server level. Further, the notification alerts ensure that the user can keep a track of types and number of calls being blocked by the user.

[0069] In the foregoing specification, the invention and its benefits and advantages have been described with reference to specific embodiments. However, one with ordinary skill in the art would appreciate that various modifications and changes can be made without departing from the scope of the present invention, as set forth in the claims below. Accordingly, the specification and figures are to be regarded in an

illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of the present invention. The benefits, advantages, solutions to problems, and any element(s) that may cause any benefit, advantage or solution to occur or become more pronounced are not to be construed as critical, required or essential features or elements of any or all the claims. The invention is defined solely by the appended claims, including any amendments made during the pendency of this application, and all equivalents of those claims, as issued.

[0070] It will be appreciated that embodiments of the invention described herein may be comprised of one or more conventional processors and unique stored program instructions that control the one or more processors to implement, in conjunction with certain non-processor circuits, some, most, or all of the functions of the embodiments of the invention described herein. The non-processor circuits may include, but are not limited to, a radio receiver, a radio transmitter, signal drivers, clock circuits, power source circuits, and user input devices. As such, these functions may be interpreted as steps of a method for adding a caller in a blocked list. Alternatively, some or all functions could be implemented by a state machine that has no stored program instructions, or in one or more application specific integrated circuits (ASICs), in which each function or some combinations of certain of the functions are implemented as custom logic. Of course, a combination of these approaches could be used. Thus, methods and means for these functions have been described herein. In those situations for which functions of the embodiments of the invention can be implemented using a processor and stored program instructions, it will be appreciated that one means for implementing such functions is the media that stores the stored program instructions, be it magnetic storage or a signal conveying a file. Further, it is expected that one of ordinary skill, notwithstanding possibly significant effort and many design choices motivated by, for example, available time, current technology, and economic considerations, when guided by the concepts and principles disclosed herein will be readily capable of generating such stored program instructions and ICs with minimal experimentation.

WHAT IS CLAIMED IS:

1. A method for adding a caller to a blocked list, the blocked list being stored at a communication server, the method at a communication device comprising:

receiving a call from the caller;

receiving a set of inputs at the communication device in response to the call, wherein the set of inputs comprises a set of instructions to add the caller in the blocked list; and

transmitting a call termination request to the communication server, wherein the call termination request comprises the set of instructions to add the caller in the blocked list and wherein transmission of the call termination request initiates an addition of the caller to the blocked list at the communication server.

2. The method as recited in claim 1, wherein the set of inputs initiate the transmission of the call termination request to the communication server.

3. The method as recited in claim 1, wherein the set of instructions comprises at least one of a request for receiving one or more notification alerts based on one or more call set-up requests received from the caller, a time period for blocking the caller, a condition for blocking the caller, and a reason for blocking the caller.

4. The method as recited in claim 1 further comprising receiving one or more notification alerts based on one or more call set-up requests received from the caller, wherein the one or more call set-up requests are received at the communication server.

5. A method for adding a caller to a blocked list, the method comprising:

receiving a voice signal from the caller;

comparing a data associated with the voice signal received from the caller with a predefined data; and

based on the comparison, adding the caller to the blocked list when the data associated with the voice signal is comparable to the predefined data.

6. The method as recited in claim 5, wherein comparing the data associated with the voice signal received from the caller with the predefined data comprises:

converting the data associated with the voice signal to a particular format; and

comparing the particular format of the data associated with the voice signal with the predefined data, wherein the predefined data is in the particular format.

7. A method for generating one or more notification alerts for a communication identifier based on rejection of one or more call set-up requests for the communication identifier, wherein the communication identifier is associated with a communication device, the method at a notification server comprising:

receiving a set of instructions associated with the communication identifier;

receiving an indication of rejection of the one or more call set-up requests for the communication identifier; and

generating the one or more notification alerts based on the set of instructions.

8. The method as recited in claim 7, further comprising:

receiving a voice signal from a caller;

comparing a data associated with the voice signal received from the caller with a predefined data; and

based on the comparison, adding the caller in a blocked list when the data associated with the voice signal is comparable to the predefined data.

9. A communication network device comprising:

a receiver configured to receive a voice signal from a caller;

a memory that stores predefined data; and

a processor configured to:

compare a data associated with the voice signal received from the caller with the predefined data; and

based on the comparison, add the caller in a blocked list when the data associated with the voice signal is comparable to the predefined data.

10. The communication network device as recited in claim 9, wherein the processor is further configured to:

convert the data associated with the voice signal to a particular format; and

compare the particular format of the data associated with the voice signal with the predefined data, wherein the predefined data is in the particular format.

11. The communication network device as recited in claim 9, wherein the processor is further configured to reject one or more call set-up requests from the caller.

12. The communication network device as recited in claim 9 further comprising a recorder configured to record the predefined data, wherein the predefined data is a voice data.

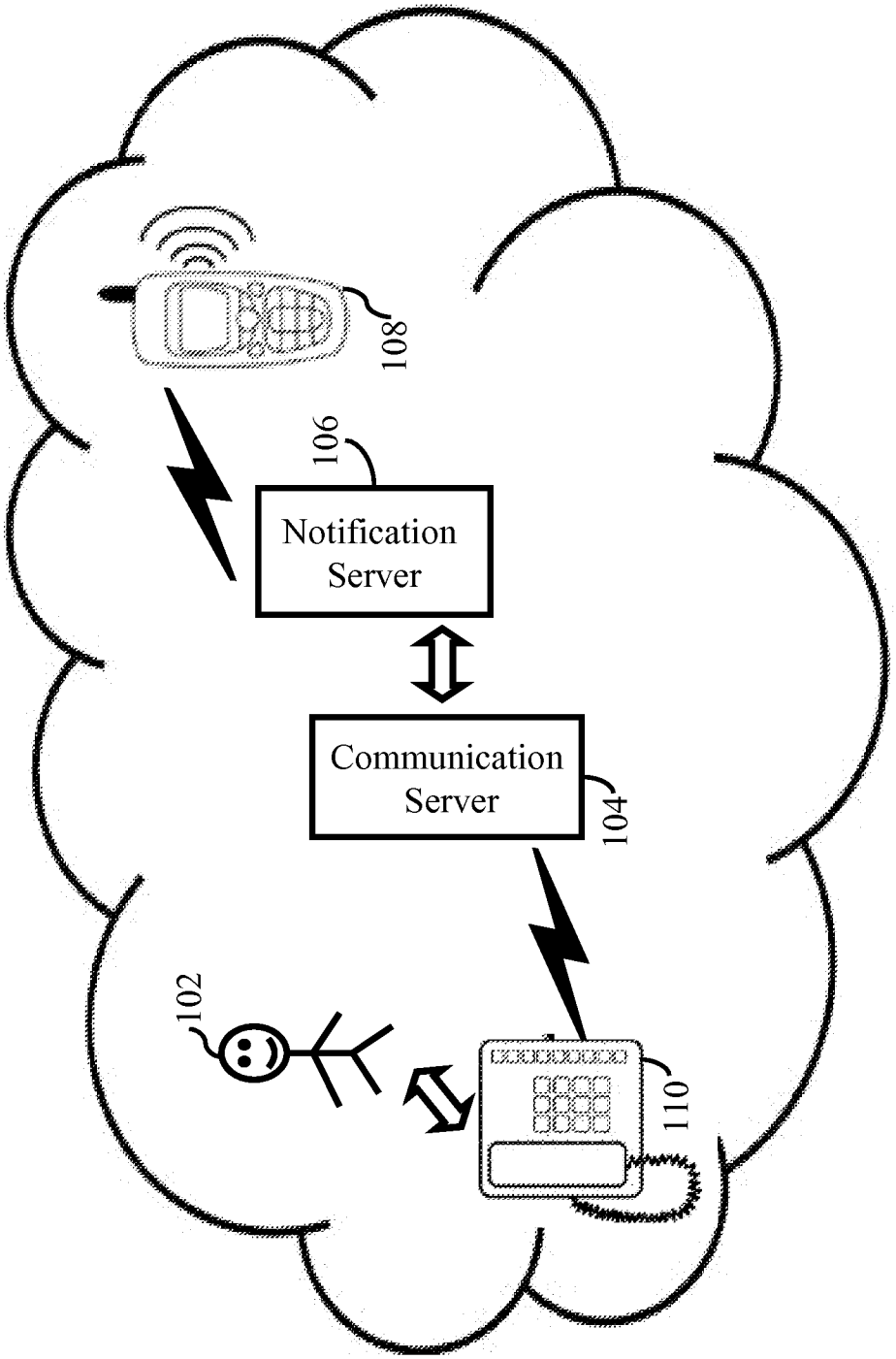

100
108
106
Notification Server
Communication Server
104
102
110

FIG. 1

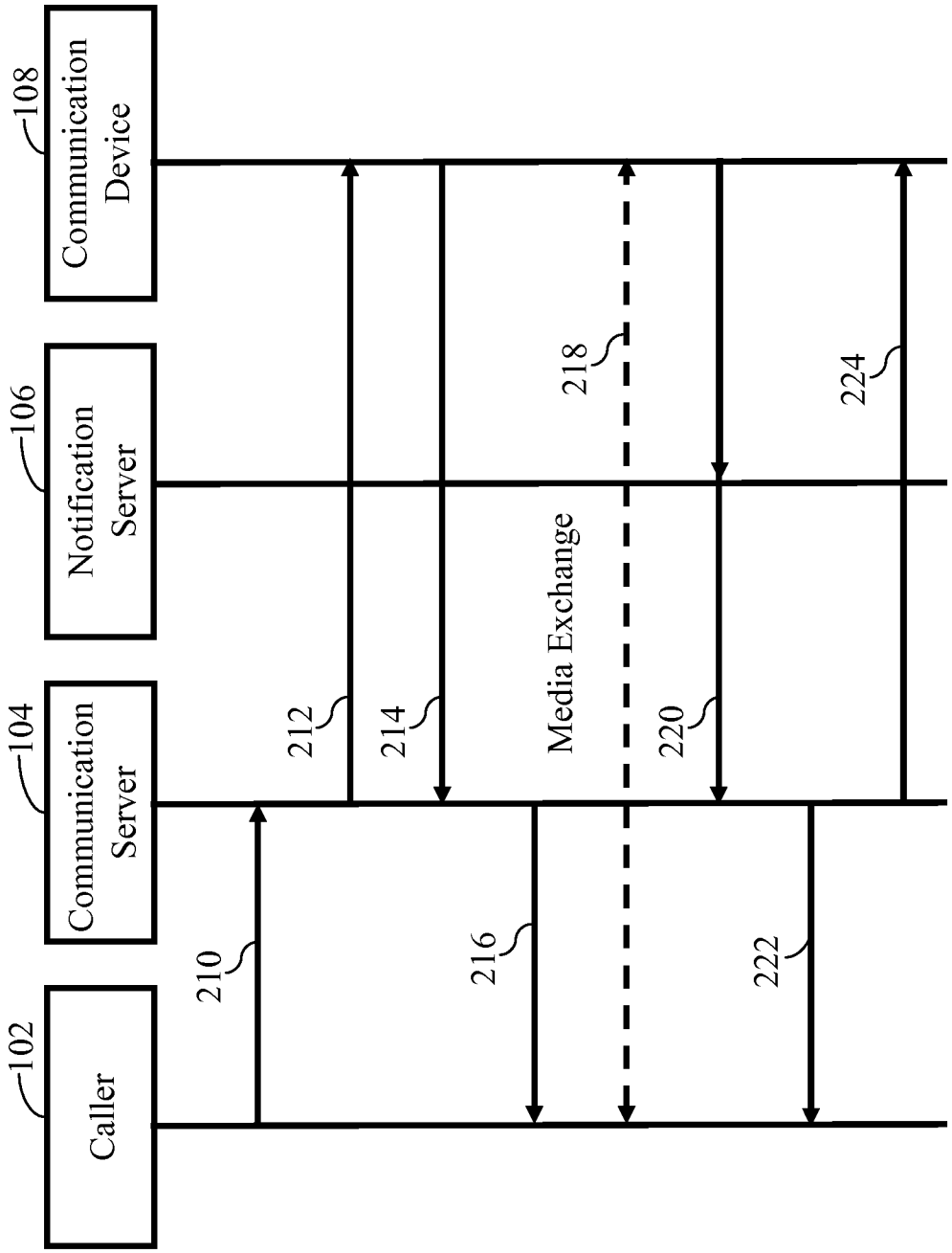

102
Caller
104
Communication Server
106
Notification Server
108
Communication Device
210
212
214
216
218
220
222
224
Media Exchange

FIG. 2

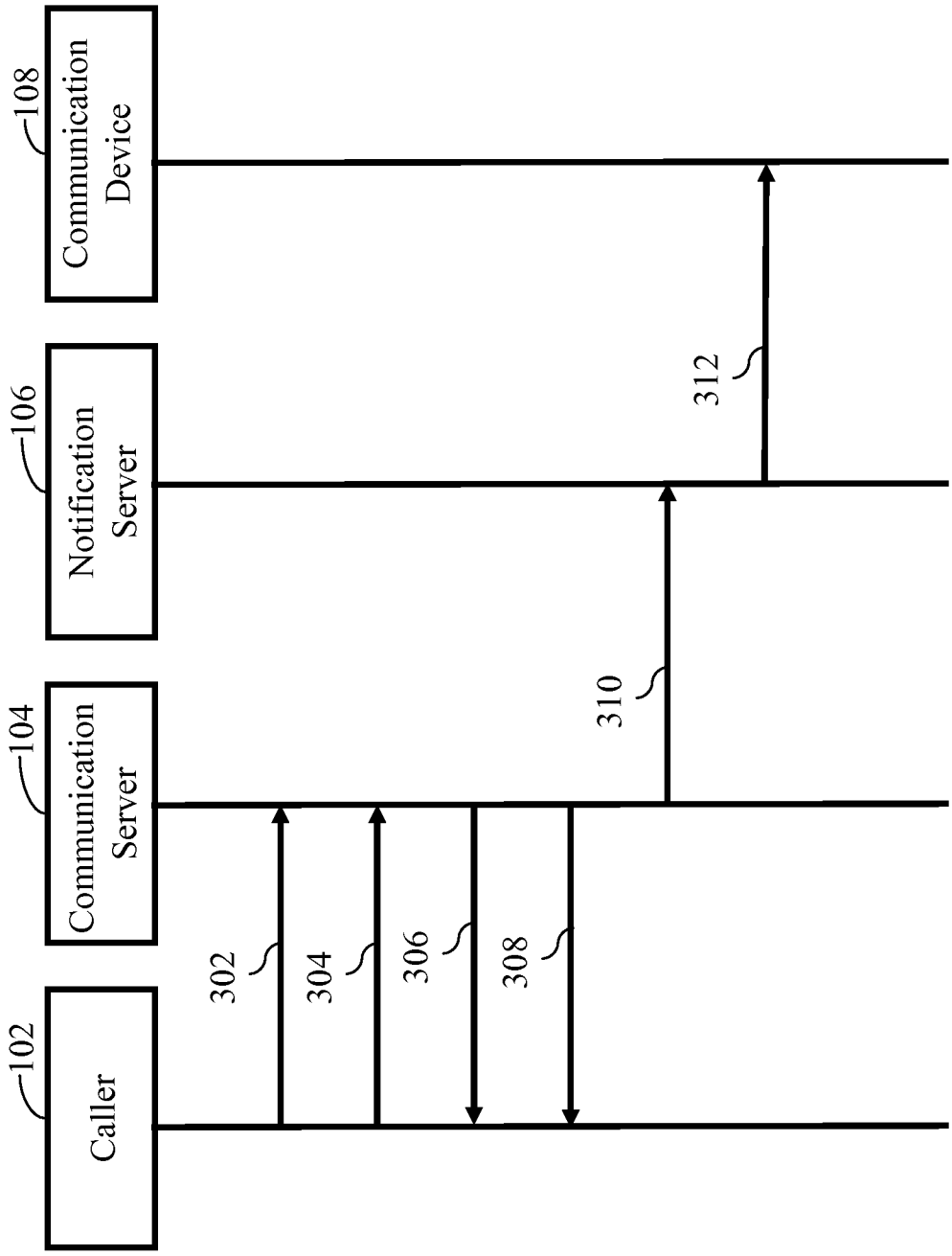

102
Caller
104
Communication Server
106
Notification Server
108
Communication Device
302
304
306
308
310
312

FIG. 3

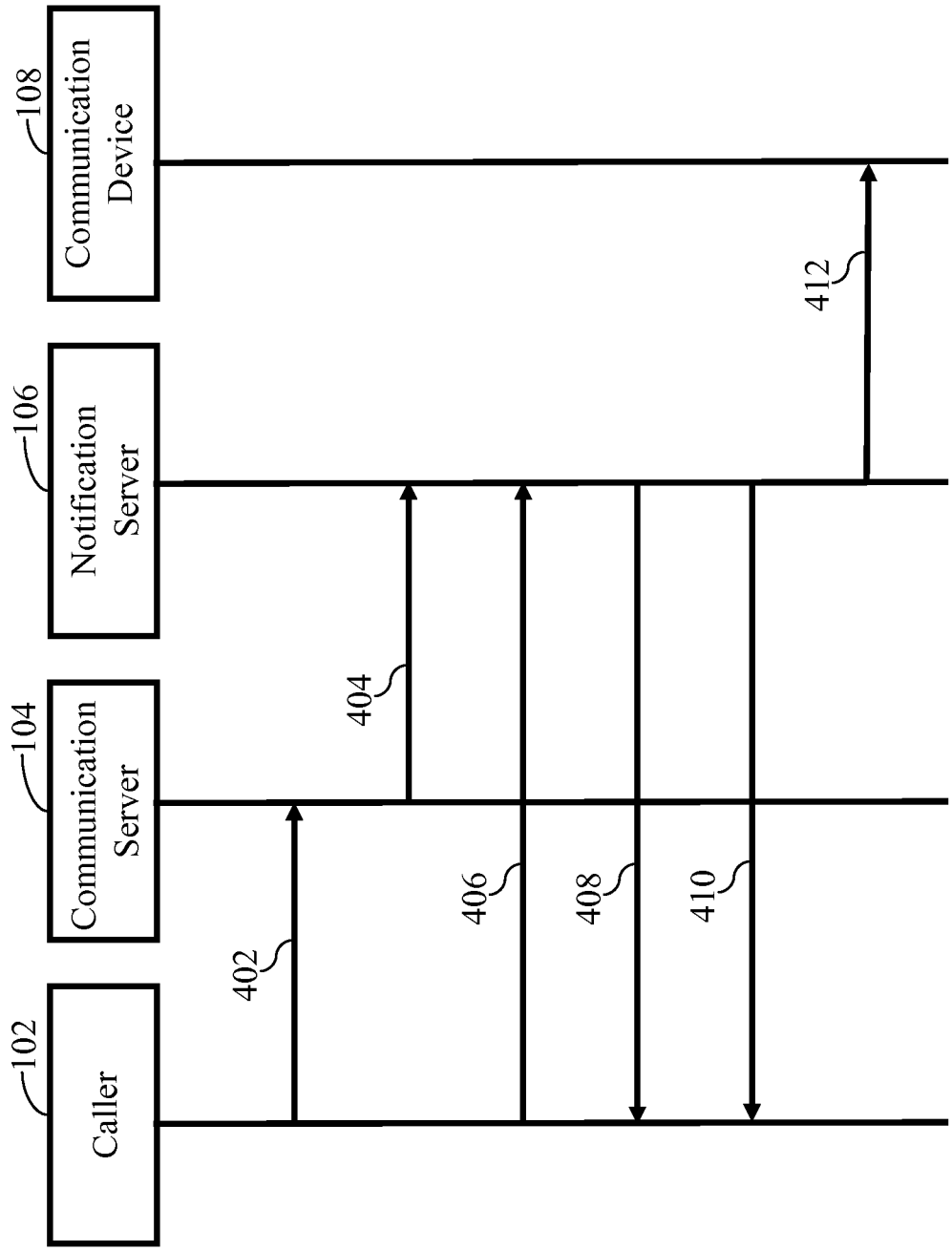

102
Caller
104
Communication Server
106
Notification Server
108
Communication Device
402
404
406
408
410
412

FIG. 4

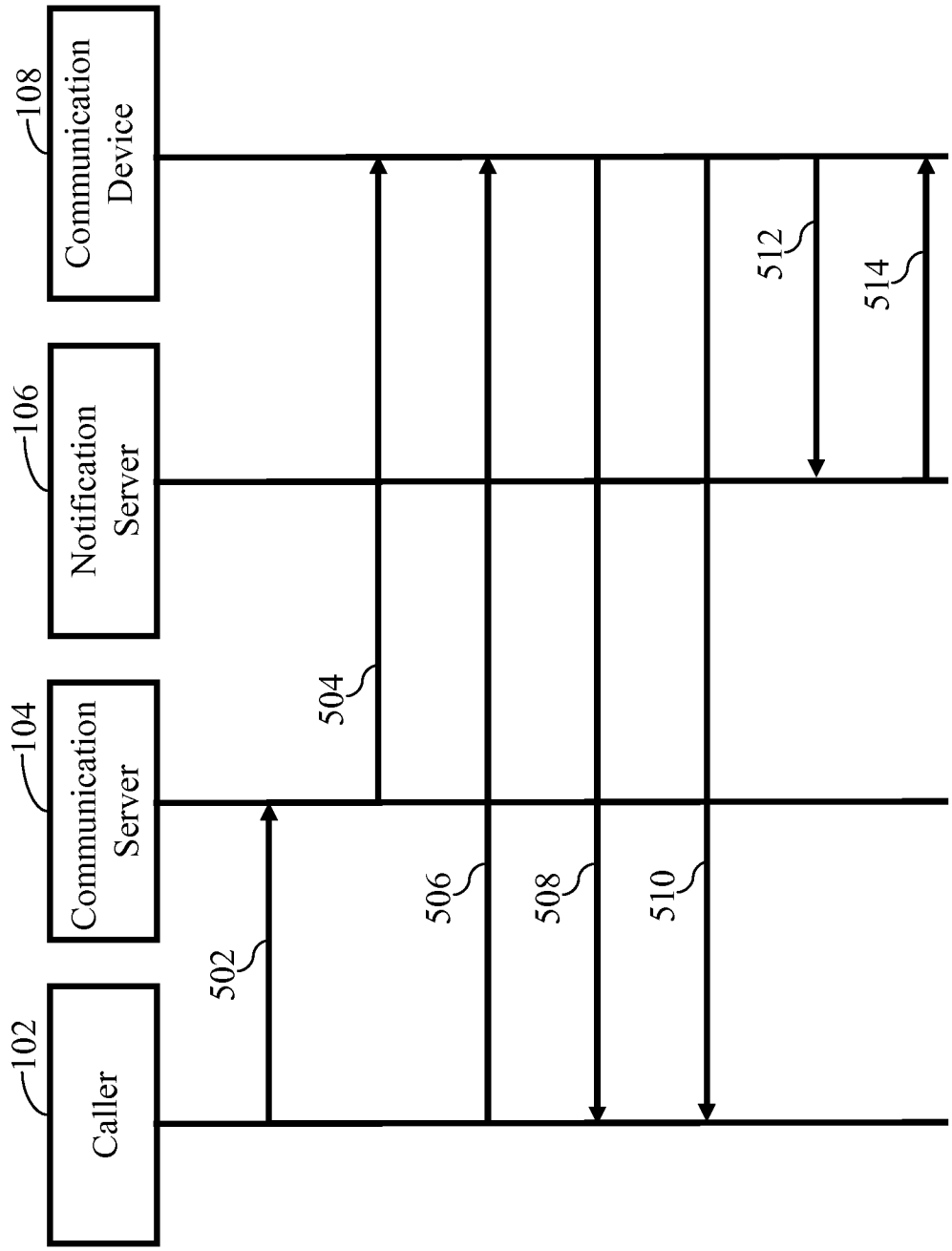

102
Caller
104
Communication Server
106
Notification Server
108
Communication Device
502
504
506
508
510
512
514

FIG. 5

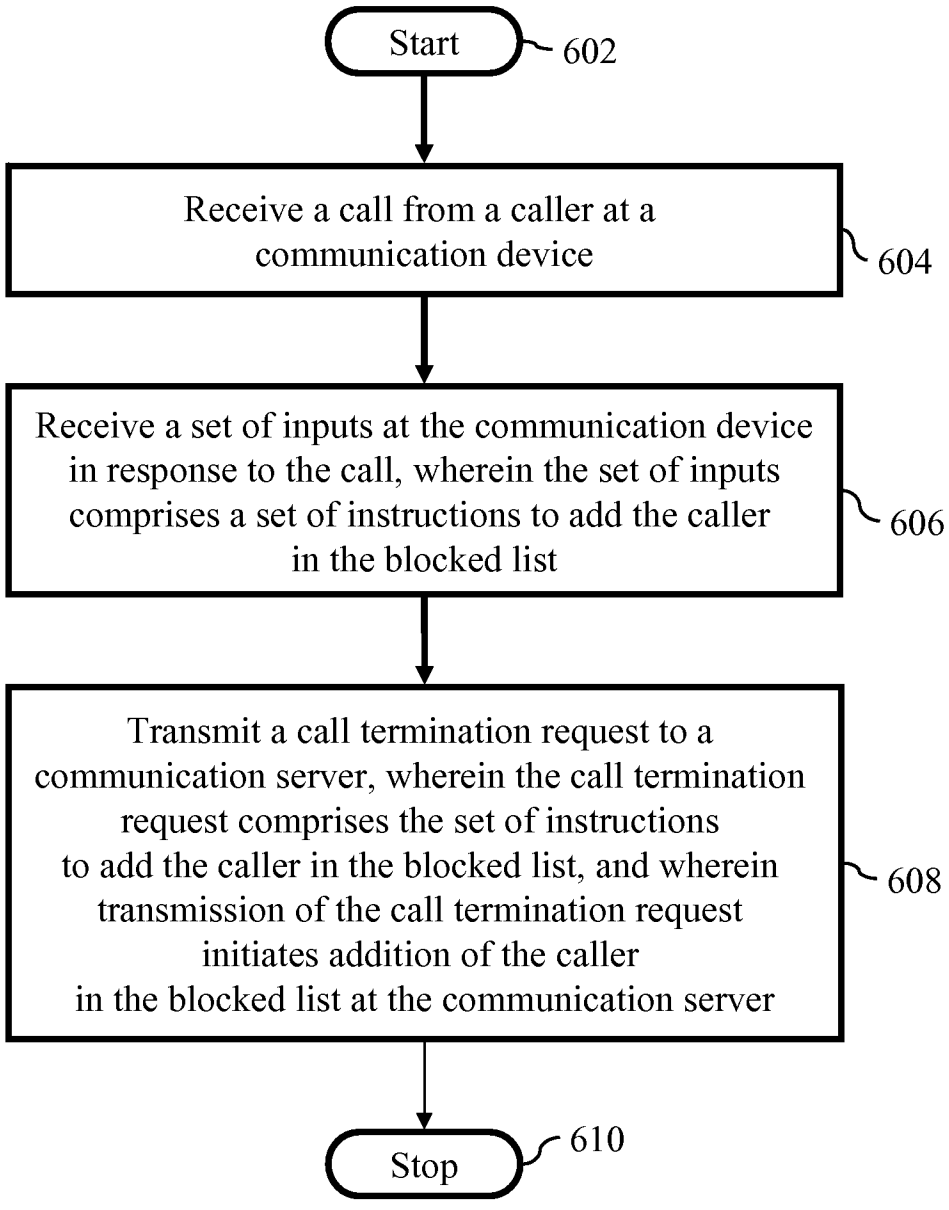

Start
602
Receive a call from a caller at a communication device
604
Receive a set of inputs at the communication device in response to the call, wherein the set of inputs comprises a set of instructions to add the caller in the blocked list
606
Transmit a call termination request to a communication server, wherein the call termination request comprises the set of instructions to add the caller in the blocked list, and wherein transmission of the call termination request initiates addition of the caller in the blocked list at the communication server
608
Stop
610

FIG. 6

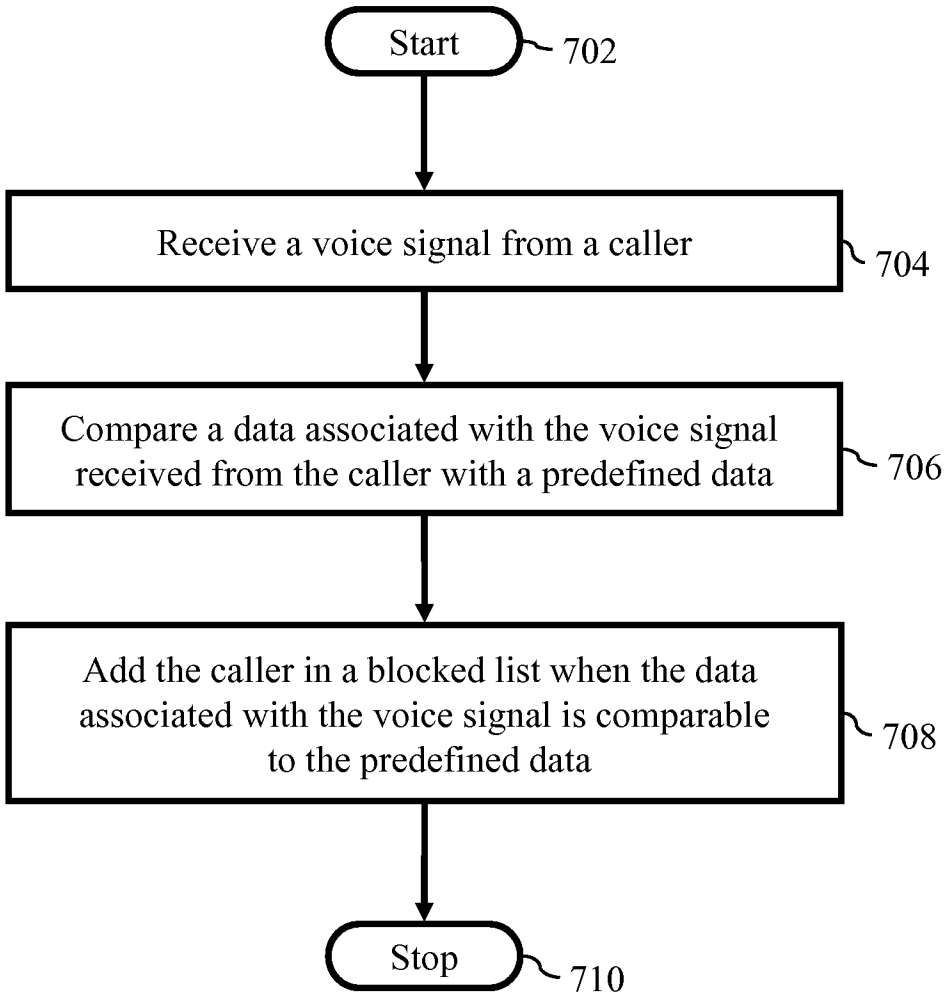

Start
702
Receive a voice signal from a caller
704
Compare a data associated with the voice signal received from the caller with a predefined data
706
Add the caller in a blocked list when the data associated with the voice signal is comparable to the predefined data
708
Stop
710

FIG. 7

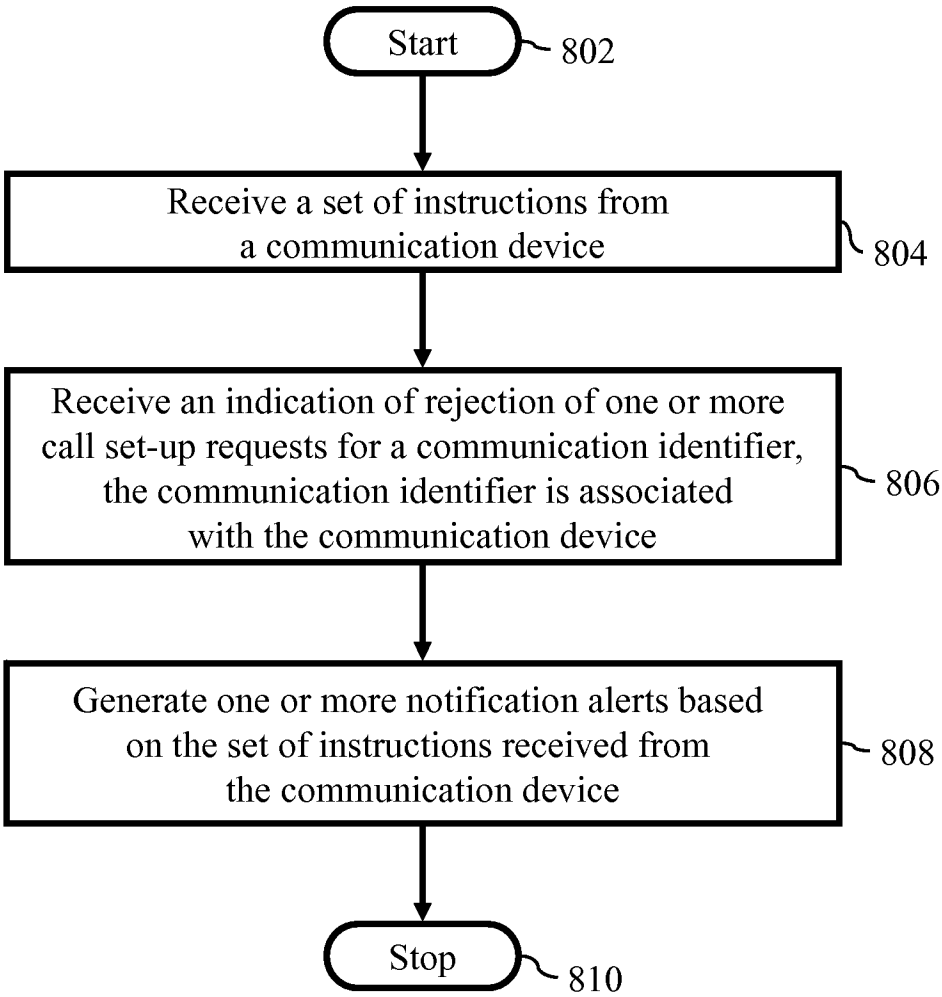

Start
802
Receive a set of instructions from a communication device
804
Receive an indication of rejection of one or more call set-up requests for a communication identifier, the communication identifier is associated with the communication device
806
Generate one or more notification alerts based on the set of instructions received from the communication device
808
Stop
810

FIG. 8

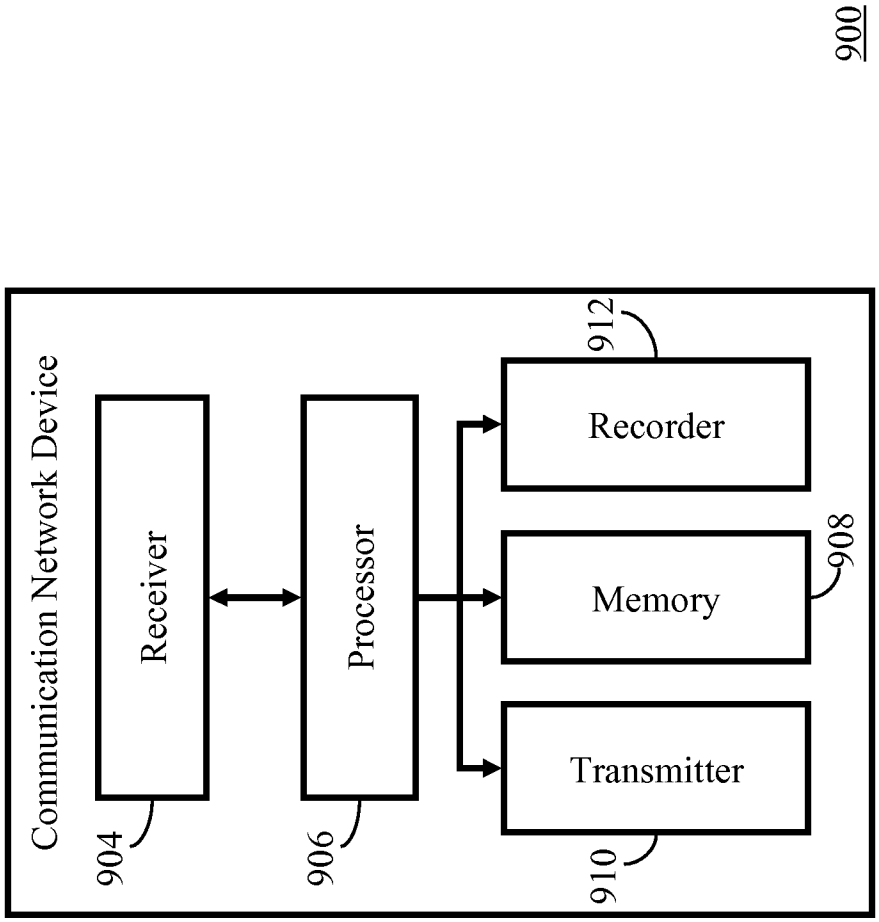

900
Communication Network Device
Receiver
Processor
Recorder
Memory
Transmitter
904
906
908
910
912

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/083095

A. CLASSIFICATION OF SUBJECT MATTER

H04M 3/436(2006.01)i, H04M 3/42(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC H04M, H04W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and Applications for Utility models since 1975.
Japanese Utility models and Applications for Utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKIPASS(KIPO Internal)
"Keywords: block, list, spam, call, reject"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	KR1020050096432 A (PANTECH CO., LTD.) 6 OCTOBER 2005 See claims 1, 5-6 and figure2	1-4, 7 5-6, 8-12
X Y	KR1020050112142 A (SK TELECOM CO., LTD.) 29 NOVEMBER 2005 See abstract and claims 1-13	1-4, 7 5-6, 8-12
Y A	KR1019990058498 A (SAMSUNG ELECTRONICS CO., LTD.) 15 JULY 1999 See pages 2-3	5-6, 8-12 1-4, 7
A	US2006/0288076 A1 (DAVID COWINGS et al.) 21 DECEMBER 2006 See abstract, claims 1-20 and figure 4	1-12

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 APRIL 2009 (28.04.2009)	**28 APRIL 2009 (28.04.2009)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/083095

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 1020050096432 A	06.10.2005	NONE	
KR 1020050112142 A	29.11.2005	KR 100646377 B1	23.11.2006
KR 1019990058498 A	15.07.1999	NONE	
US 2006/0288076 A1	21.12.2006	WO 2007-002218 A1	04.01.2007