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(54) **REMOTE RECORDING AND DATA REPORTING SYSTEMS AND METHODS**

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(52) **U.S. Cl.**

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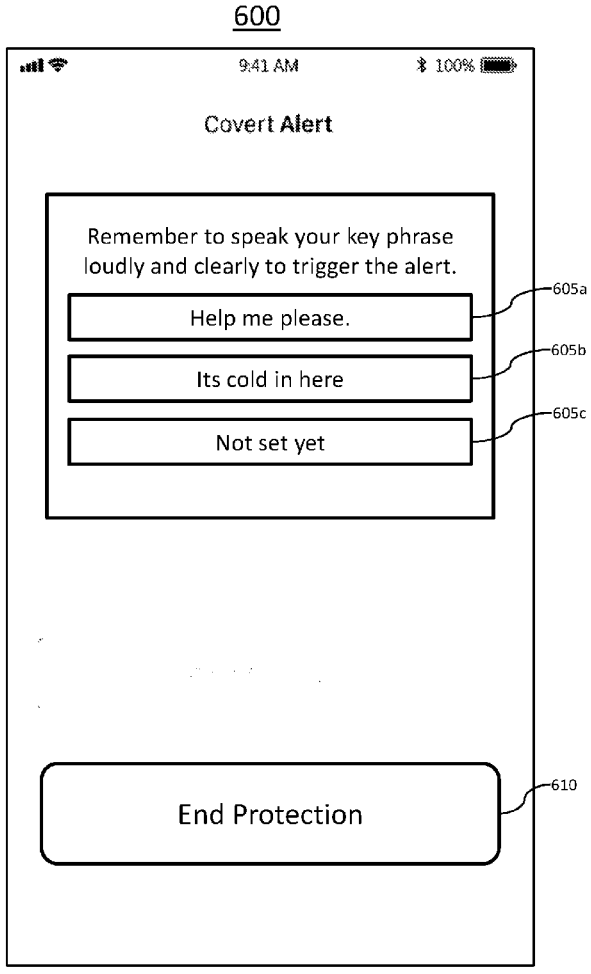
(57) **ABSTRACT**

Remote recording and data reporting apparatuses and methods, such as for enhancing personal security, are disclosed. Embodiments include a data processor, a microphone configured to detect audio signals and provide the audio signals to the data processor, a memory module configured to store one or more personal security response operations, and a communications module configured to transmit a personal security alert. A personal security procedure includes receiving an initiation signal, enabling the microphone in response to the receiving of the initiation signal, and detecting a spoken keyword which initiates one of the one or more personal security response operations and initiates recording of subsequent audio signals. Embodiments further include transmitting the personal security alert to a remote device.



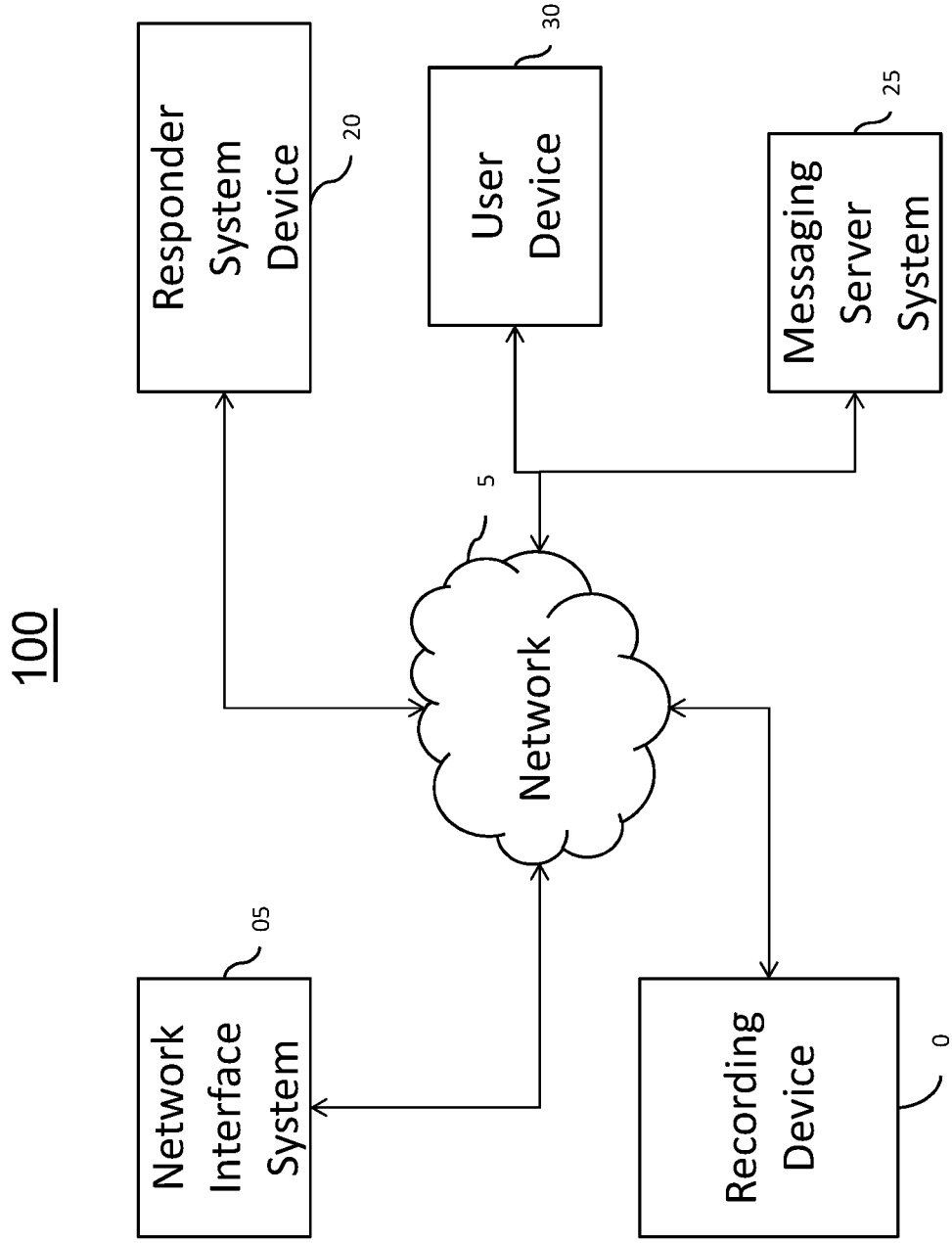

100
Responder System Device
20
User Device
30
Messaging Server System
25
5
Network
Network Interface System
05
Recording Device
0

FIG. 1

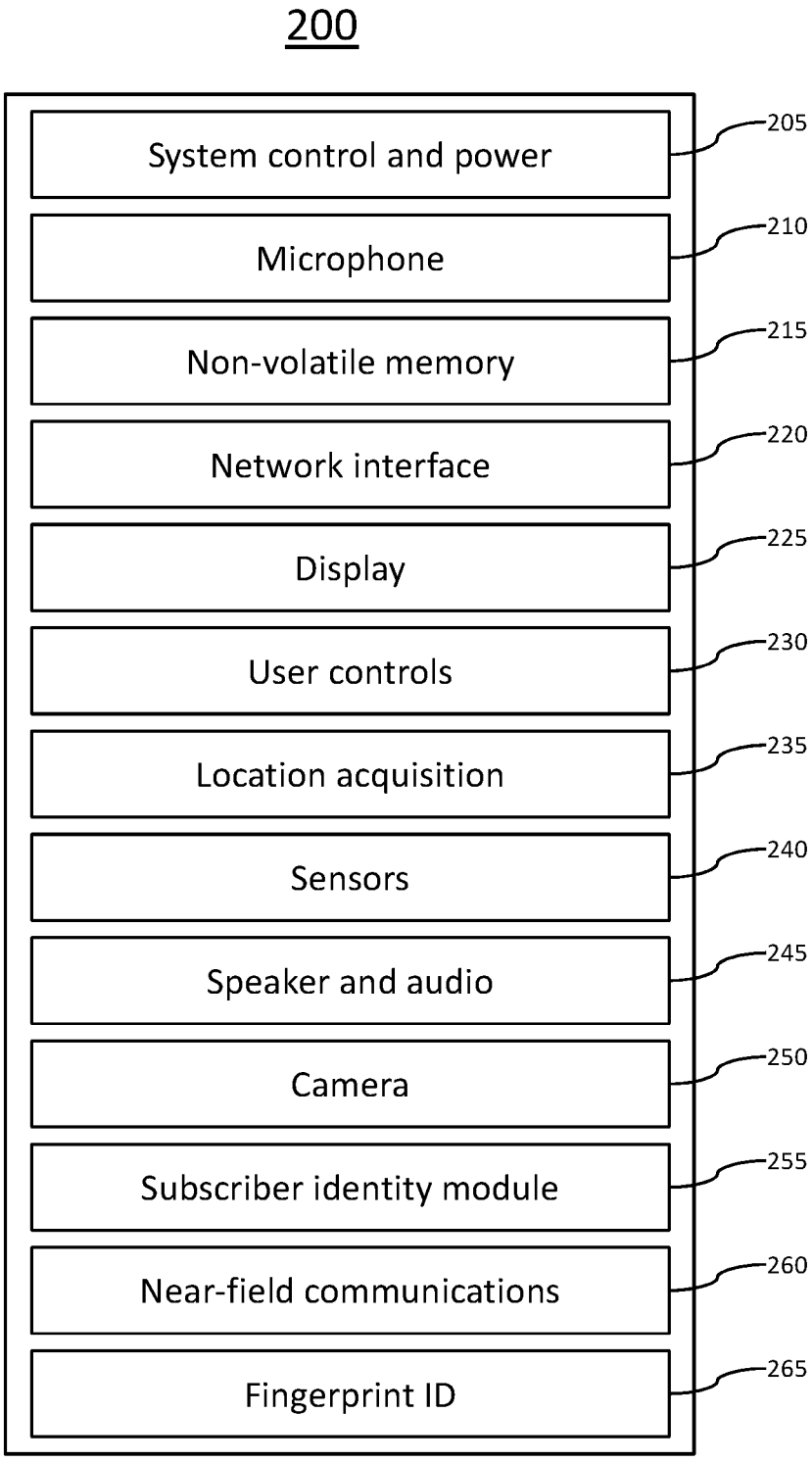

200
System control and power
205
Microphone
210
Non-volatile memory
215
Network interface
220
Display
225
User controls
230
Location acquisition
235
Sensors
240
Speaker and audio
245
Camera
250
Subscriber identity module
255
Near-field communications
260
Fingerprint ID
265

FIG. 2

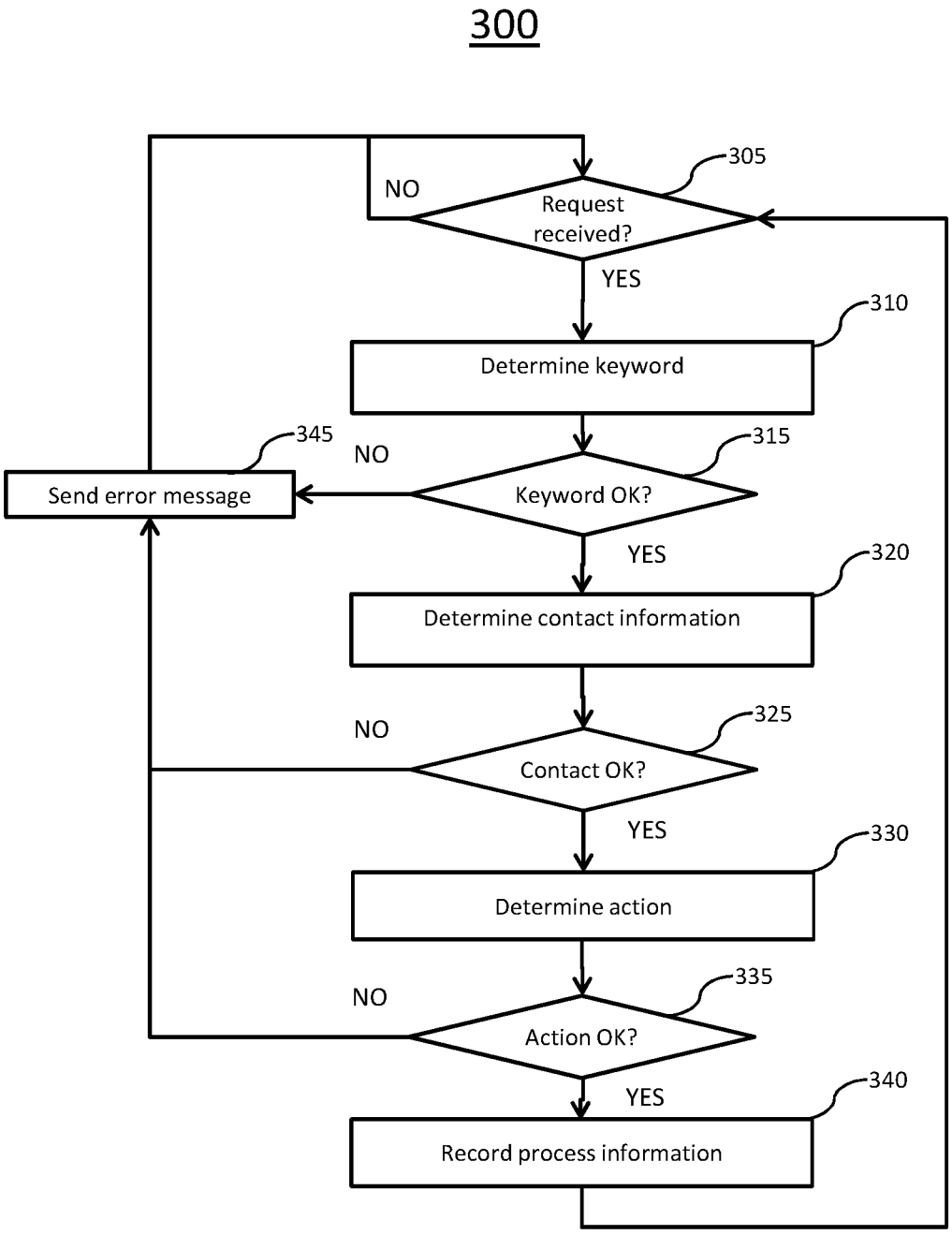

300
305
Request received?
NO
YES
310
Determine keyword
315
Keyword OK?
NO
345
Send error message
YES
320
Determine contact information
325
Contact OK?
NO
YES
330
Determine action
335
Action OK?
NO
YES
340
Record process information

FIG. 3

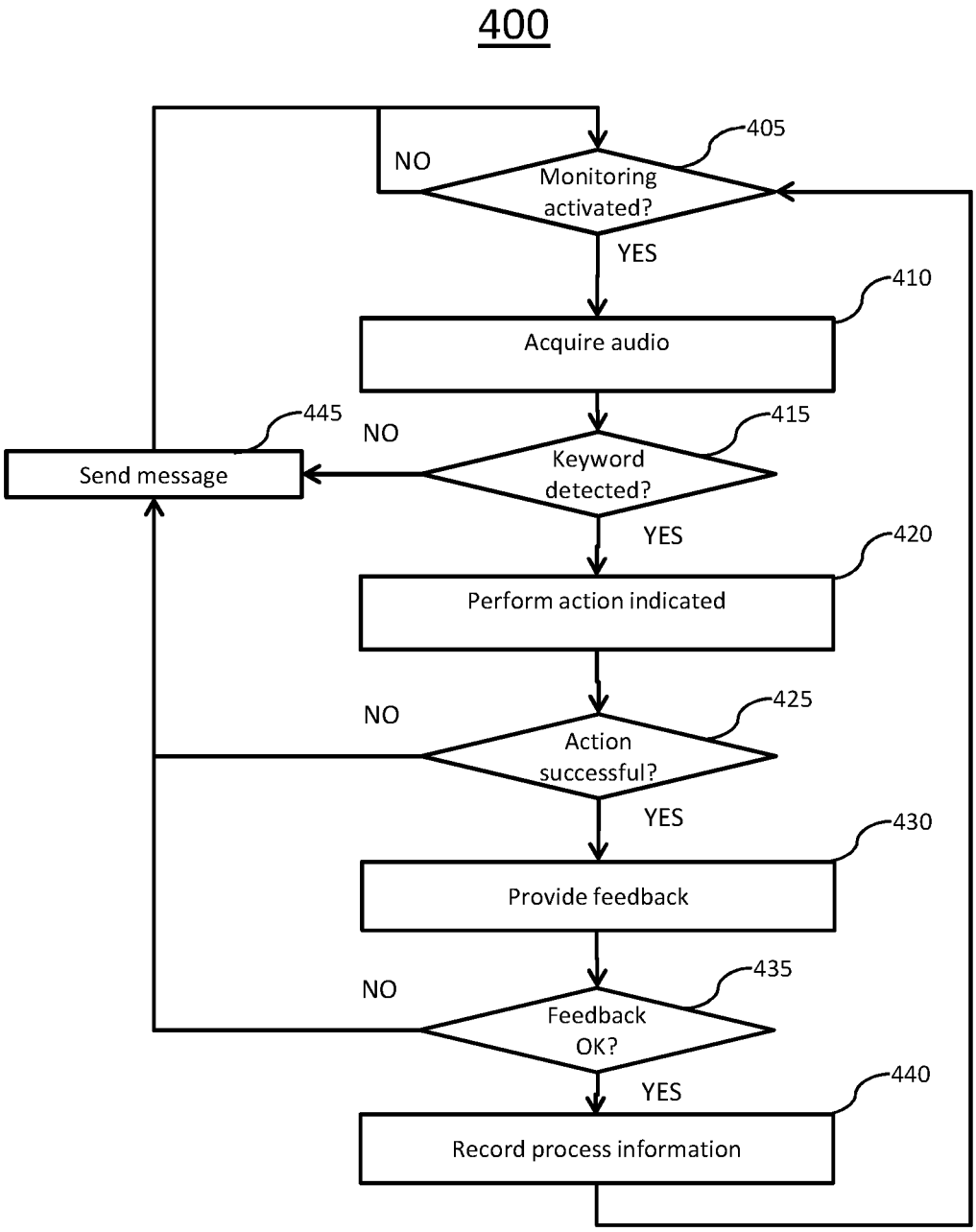

400
405
NO
Monitoring activated?
YES
410
Acquire audio
445
NO
415
Send message
Keyword detected?
YES
420
Perform action indicated
NO
425
Action successful?
YES
430
Provide feedback
NO
435
Feedback OK?
YES
440
Record process information

FIG. 4

500

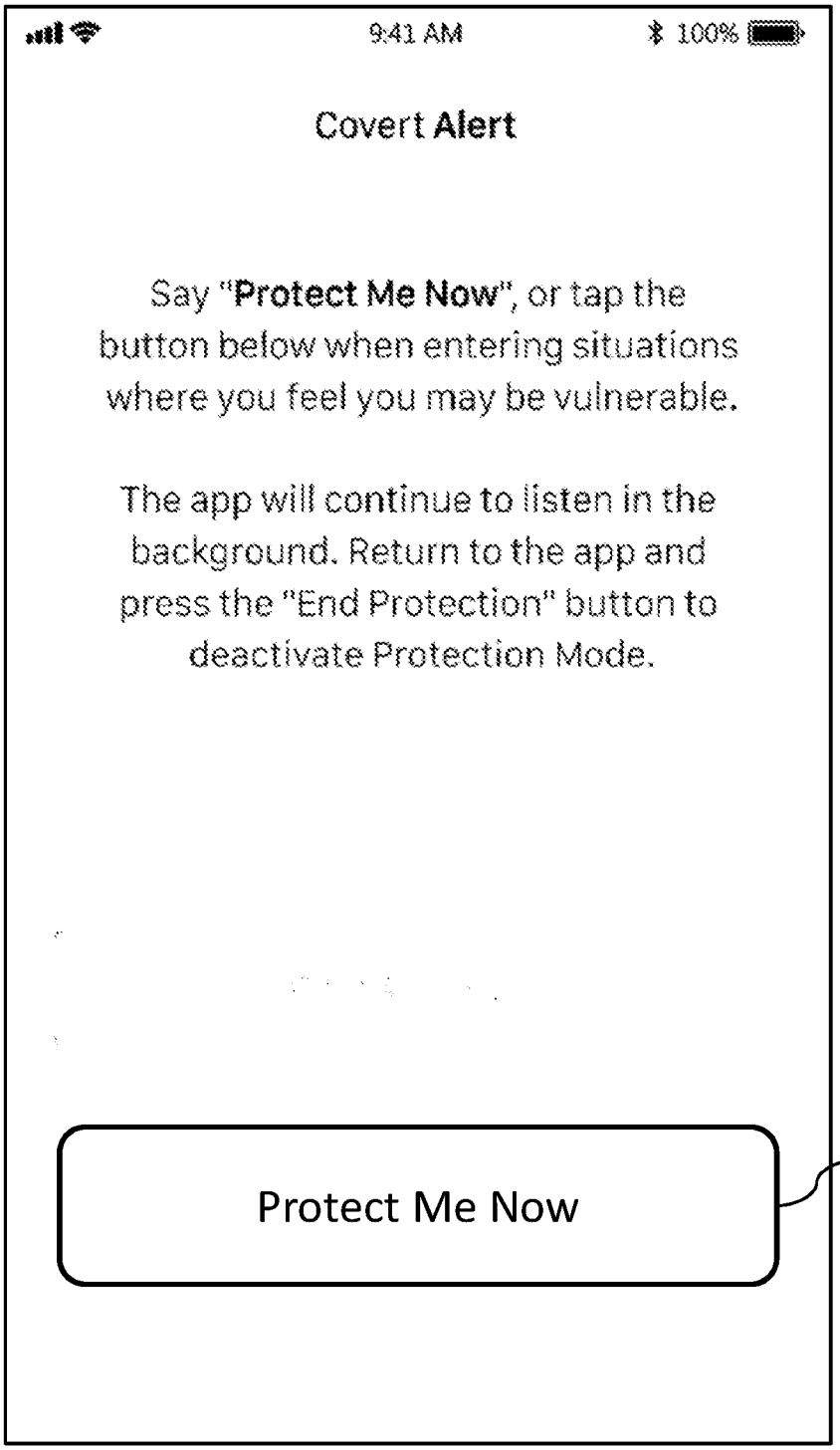

9:41 AM
100%
Covert Alert
Say "Protect Me Now", or tap the button below when entering situations where you feel you may be vulnerable.
The app will continue to listen in the background. Return to the app and press the "End Protection" button to deactivate Protection Mode.
Protect Me Now
505

FIG. 5

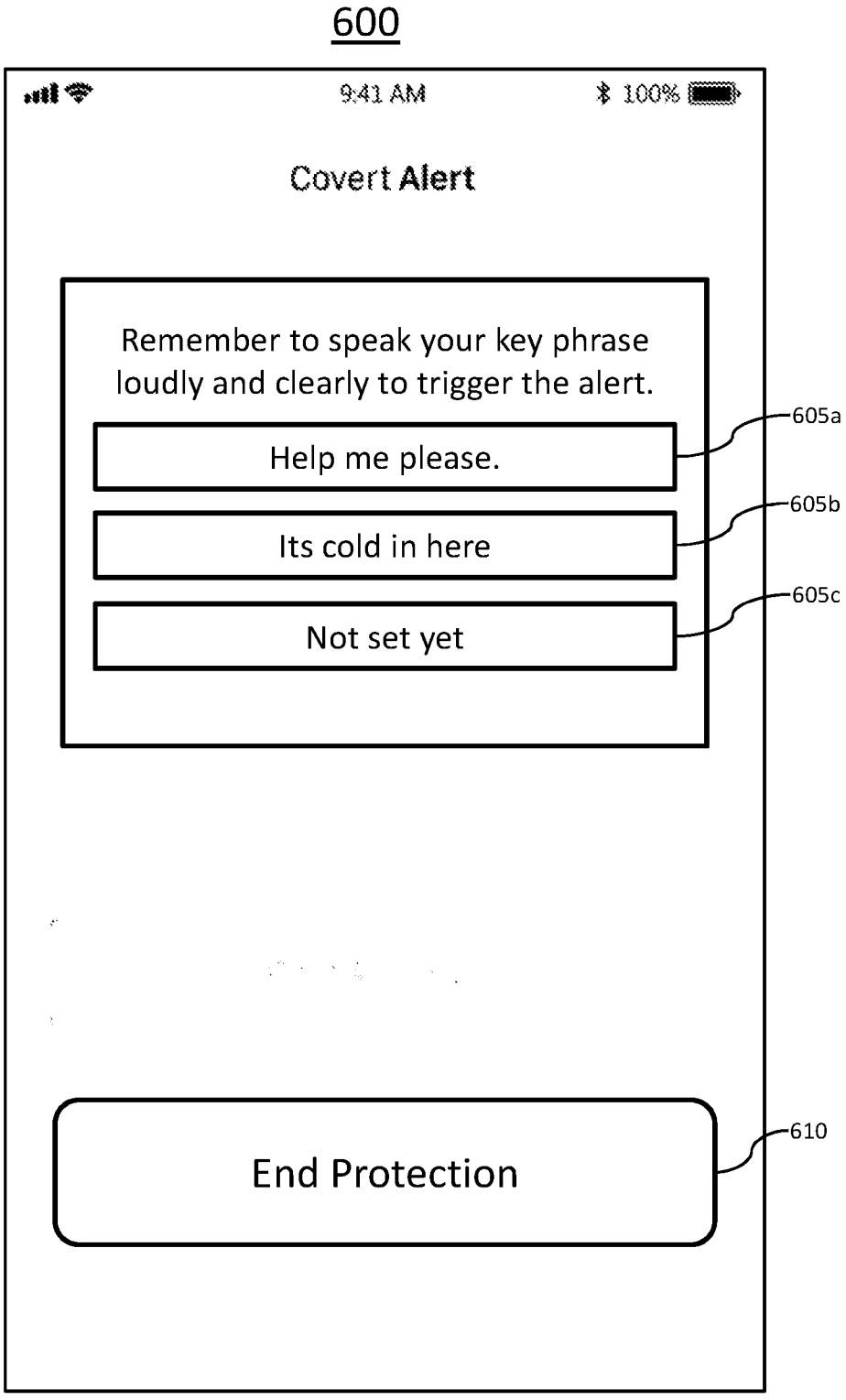

600
9:41 AM
100%
Covert Alert
Remember to speak your key phrase loudly and clearly to trigger the alert.
Help me please.
Its cold in here
Not set yet
605a
605b
605c
End Protection
610

FIG. 6

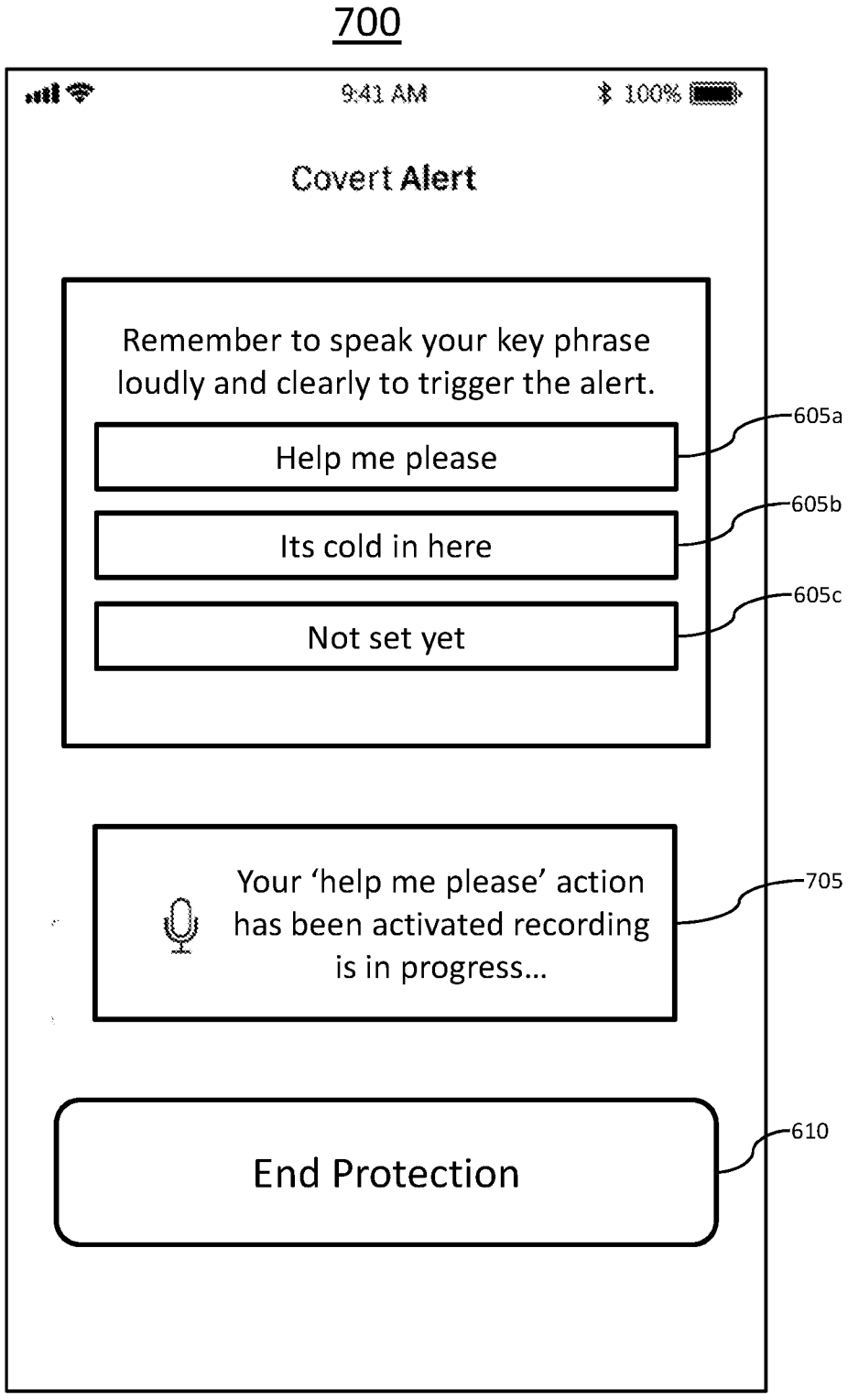

700
9:41 AM
100%
Covert Alert
Remember to speak your key phrase loudly and clearly to trigger the alert.
Help me please
Its cold in here
Not set yet
605a
605b
605c
Your 'help me please' action has been activated recording is in progress...
705
End Protection
610

FIG. 7

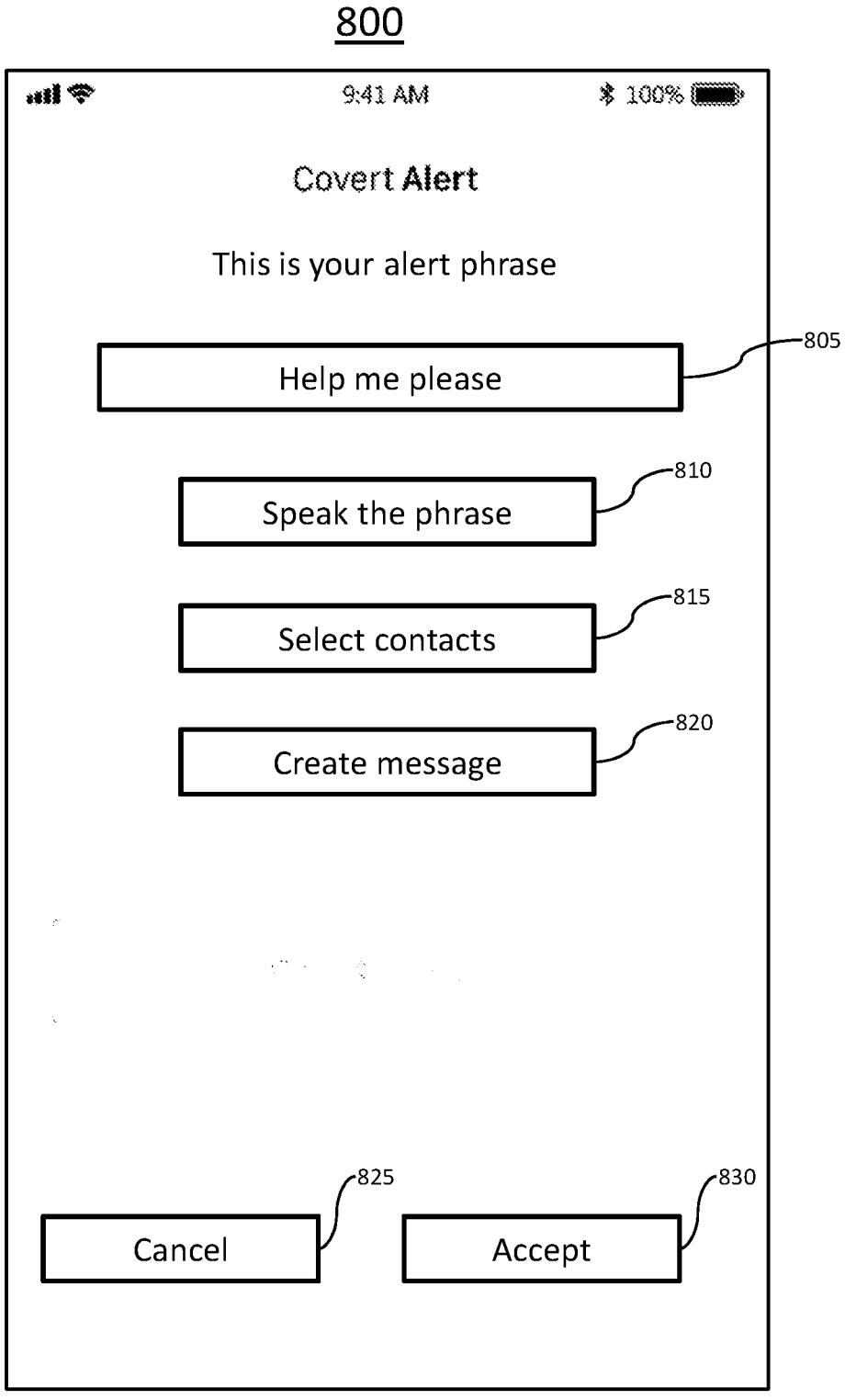

800
9:41 AM
100%
Covert Alert
This is your alert phrase
Help me please
805
Speak the phrase
810
Select contacts
815
Create message
820
Cancel
825
Accept
830

FIG. 8

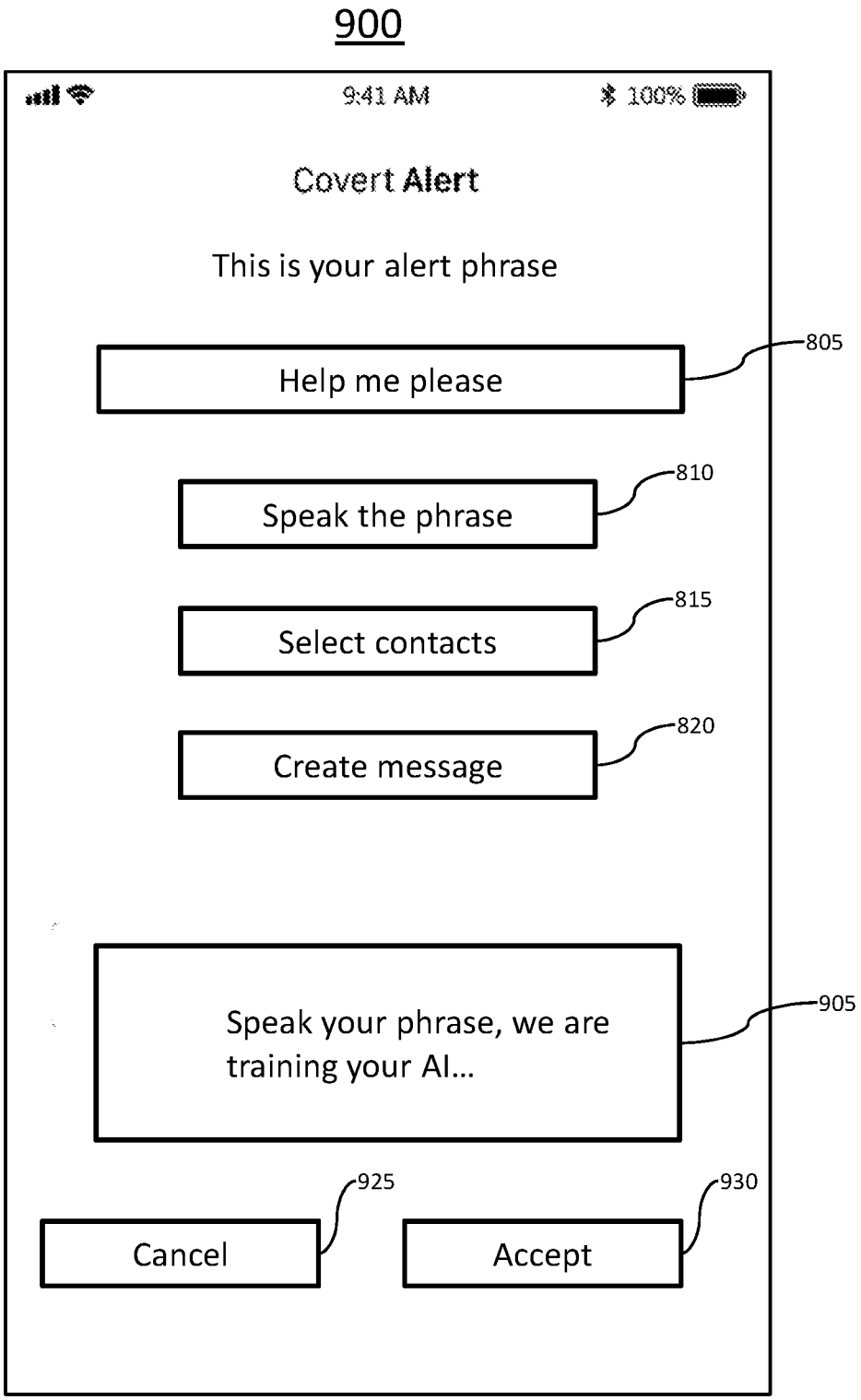

900
9:41 AM
100%
Covert Alert
This is your alert phrase
Help me please
805
Speak the phrase
810
Select contacts
815
Create message
820
Speak your phrase, we are training your AI...
905
Cancel
925
Accept
930

FIG. 9A

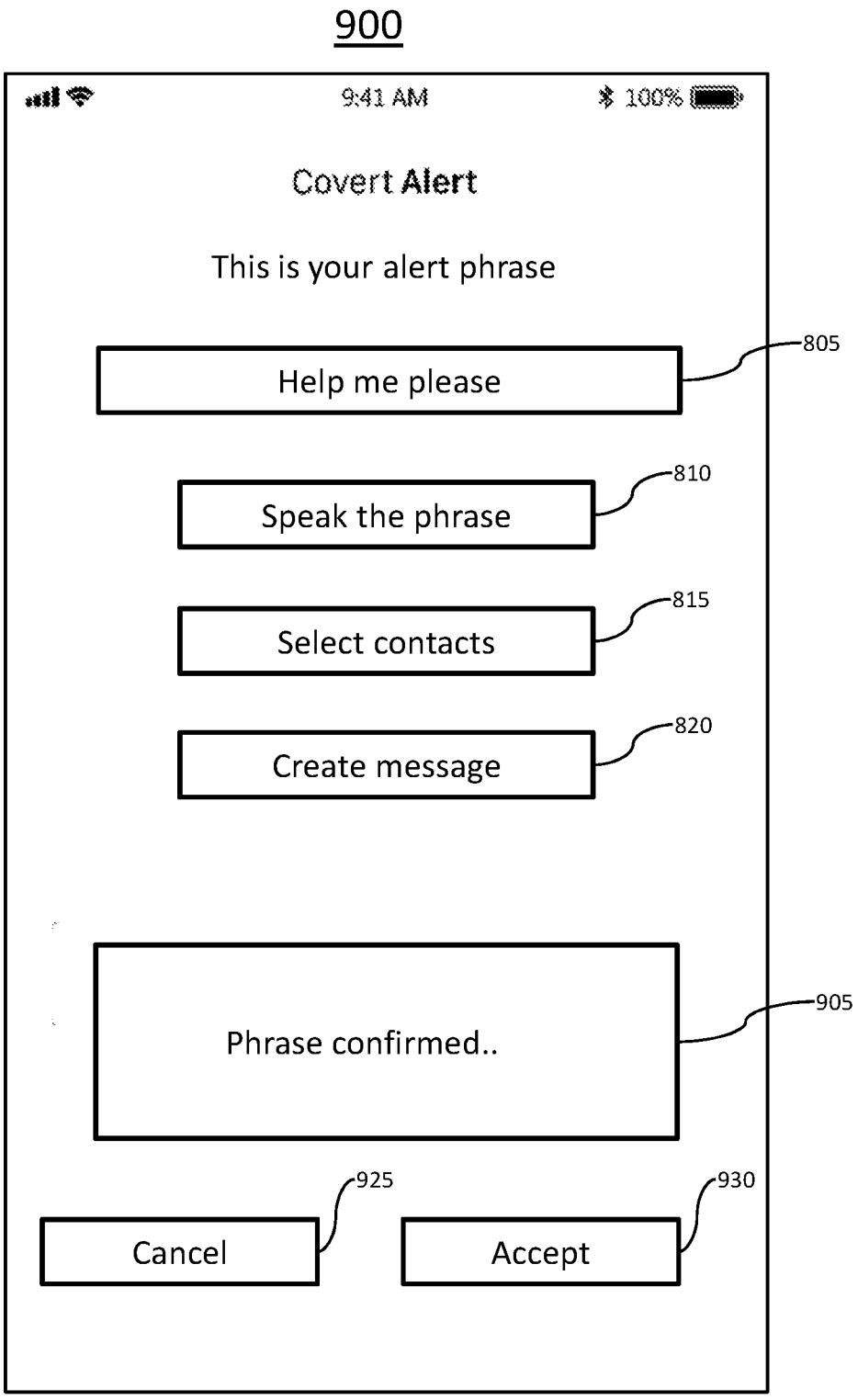

900
9:41 AM
100%
Covert Alert
This is your alert phrase
Help me please
805
Speak the phrase
810
Select contacts
815
Create message
820
Phrase confirmed..
905
Cancel
925
Accept
930

FIG. 9B

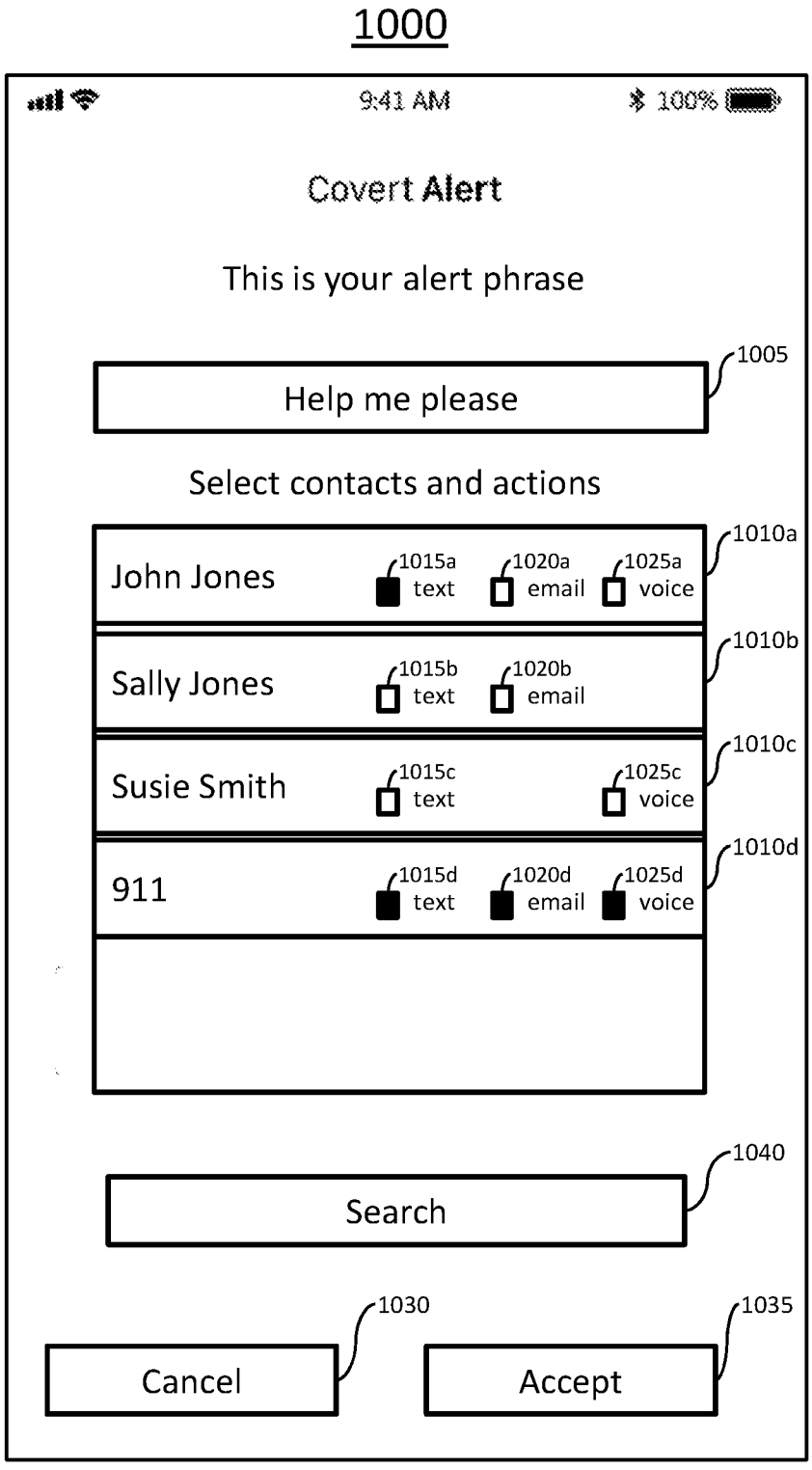

1000
9:41 AM
100%
Covert Alert
This is your alert phrase
1005
Help me please
Select contacts and actions
1010a
John Jones
1015a text
1020a email
1025a voice
1010b
Sally Jones
1015b text
1020b email
1010c
Susie Smith
1015c text
1025c voice
1010d
911
1015d text
1020d email
1025d voice
1040
Search
1030
Cancel
1035
Accept

FIG. 10

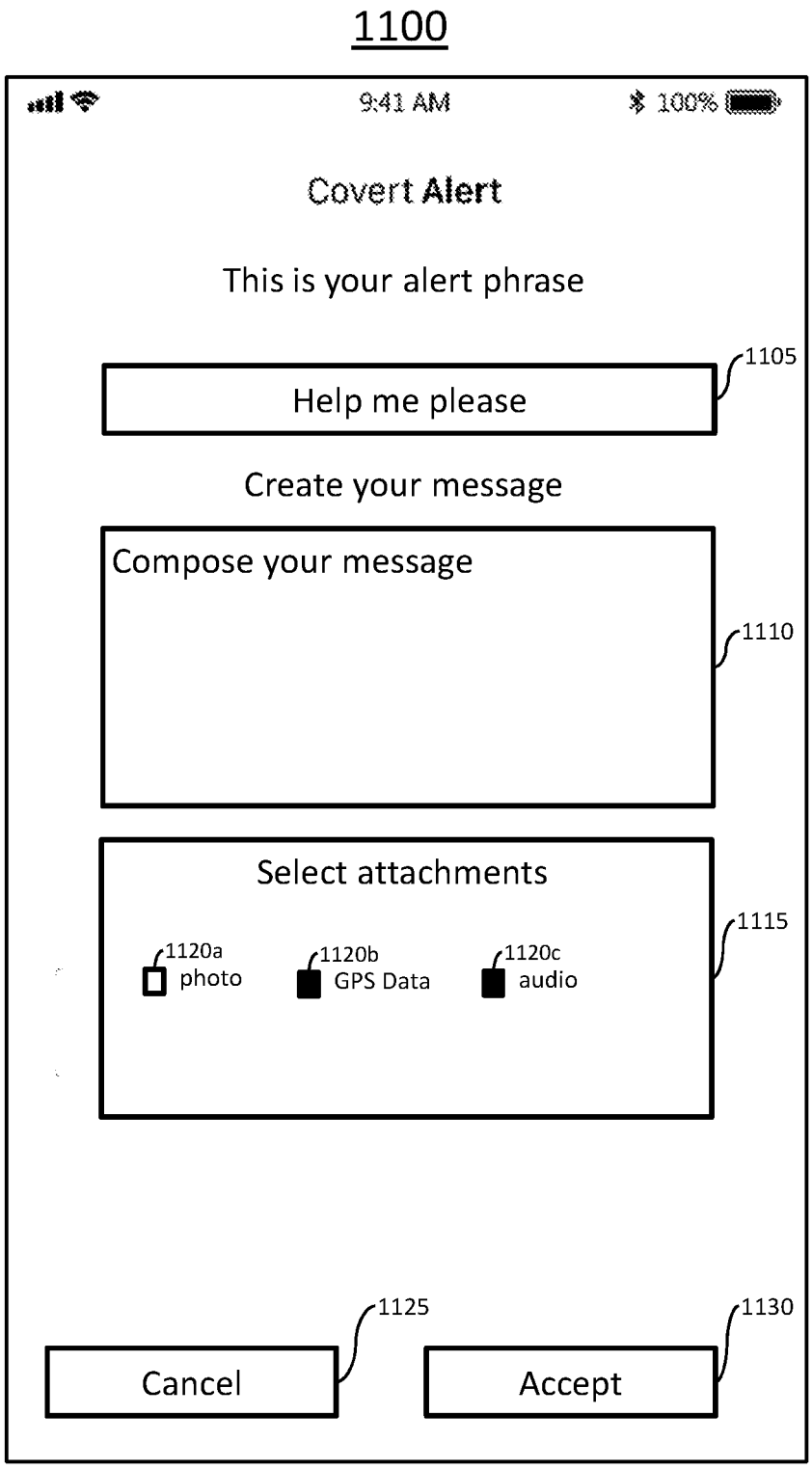

1100
9:41 AM
100%
Covert Alert
This is your alert phrase
1105
Help me please
Create your message
Compose your message
1110
Select attachments
1115
1120a
photo
1120b
GPS Data
1120c
audio
1125
Cancel
1130
Accept

FIG. 11

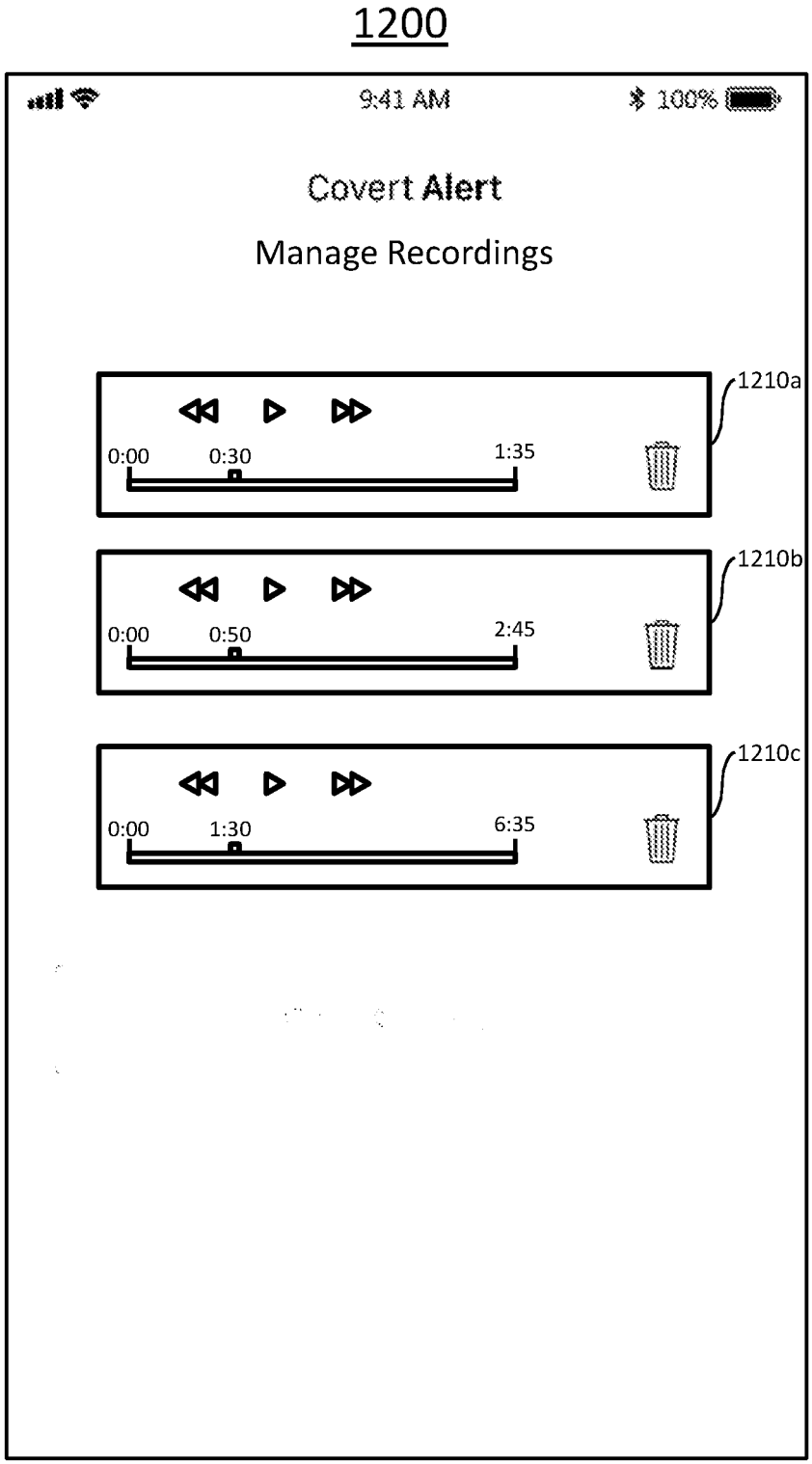

1200
9:41 AM
100%
Covert Alert
Manage Recordings
0:00
0:30
1:35
1210a
0:00
0:50
2:45
1210b
0:00
1:30
6:35
1210c

FIG. 12

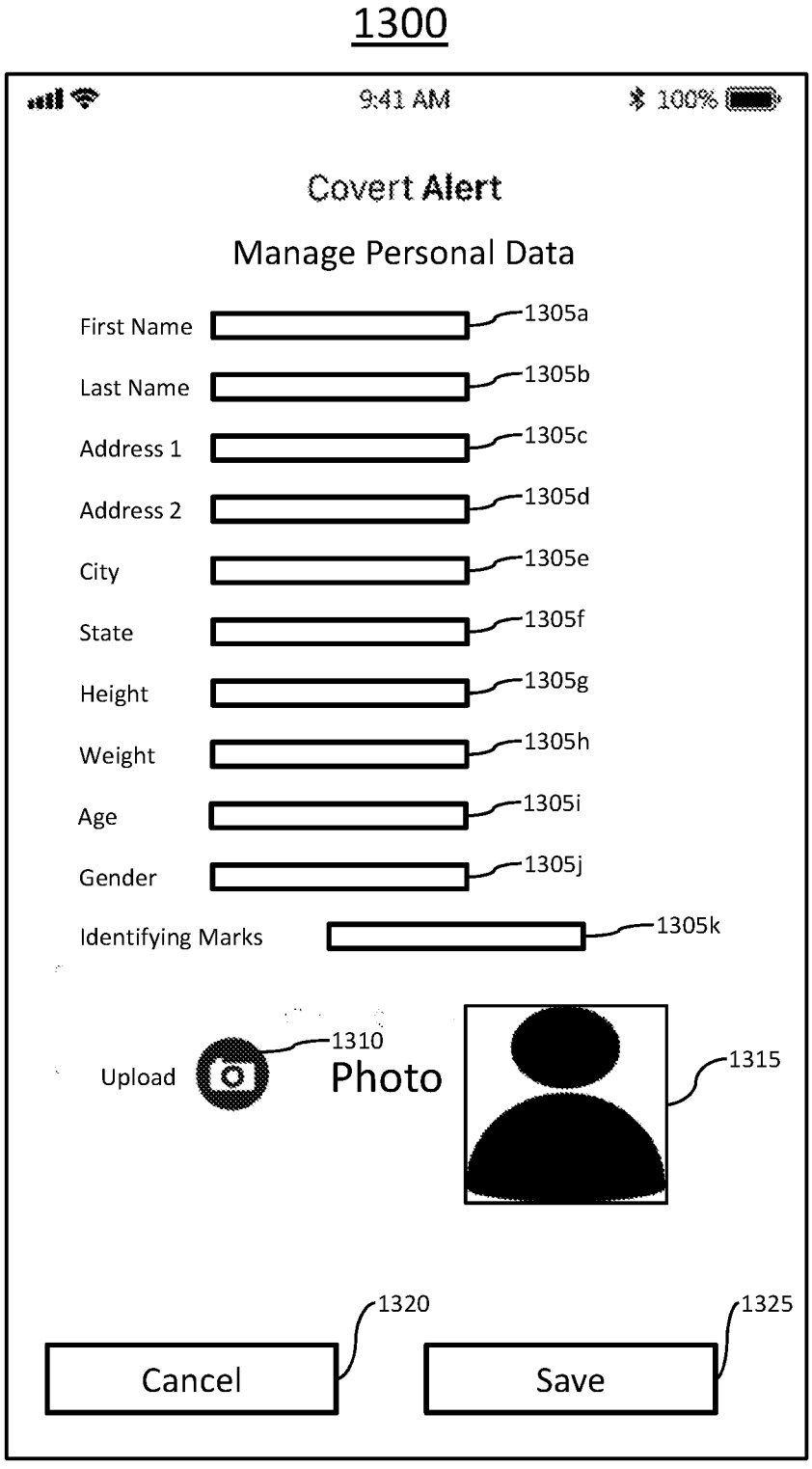

1300
9:41 AM
100%
Covert Alert
Manage Personal Data
First Name
1305a
Last Name
1305b
Address 1
1305c
Address 2
1305d
City
1305e
State
1305f
Height
1305g
Weight
1305h
Age
1305i
Gender
1305j
Identifying Marks
1305k
Upload
1310
Photo
1315
Cancel
1320
Save
1325

FIG. 13

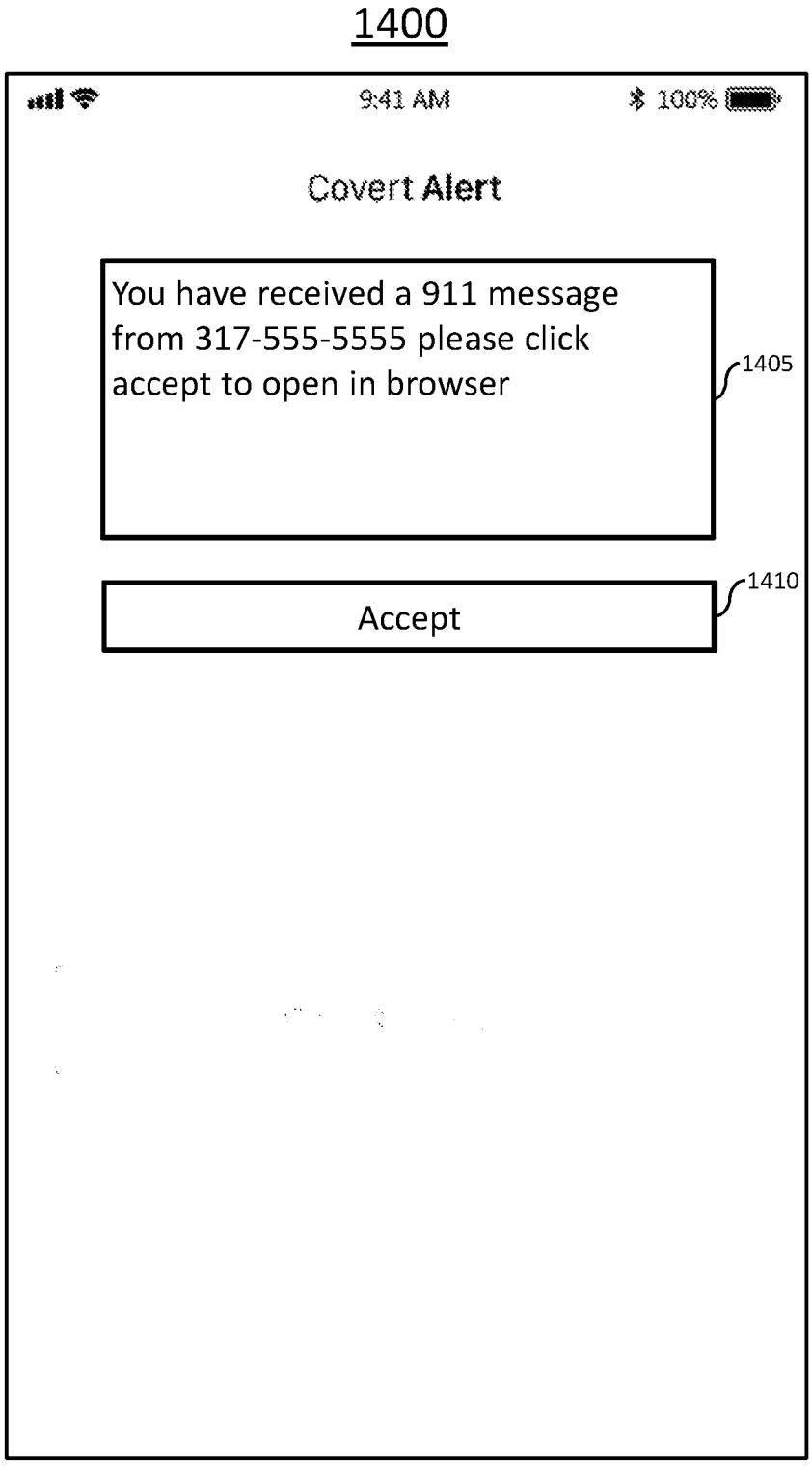

1400
9:41 AM
100%
Covert Alert
You have received a 911 message from 317-555-5555 please click accept to open in browser
1405
Accept
1410

FIG. 14

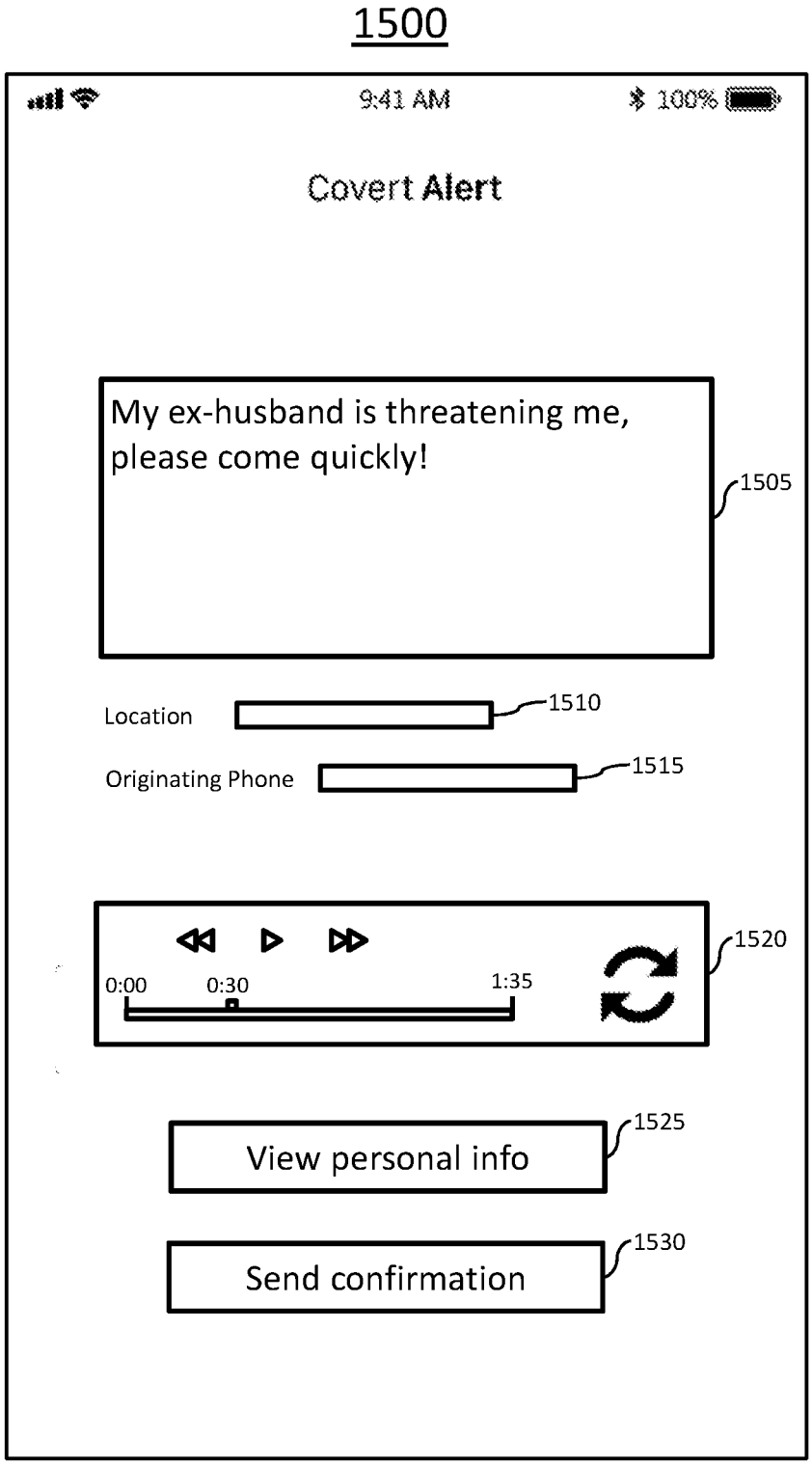

1500
9:41 AM
100%
Covert Alert
My ex-husband is threatening me, please come quickly!
1505
Location
1510
Originating Phone
1515
0:00
0:30
1:35
1520
View personal info
1525
Send confirmation
1530

FIG. 15

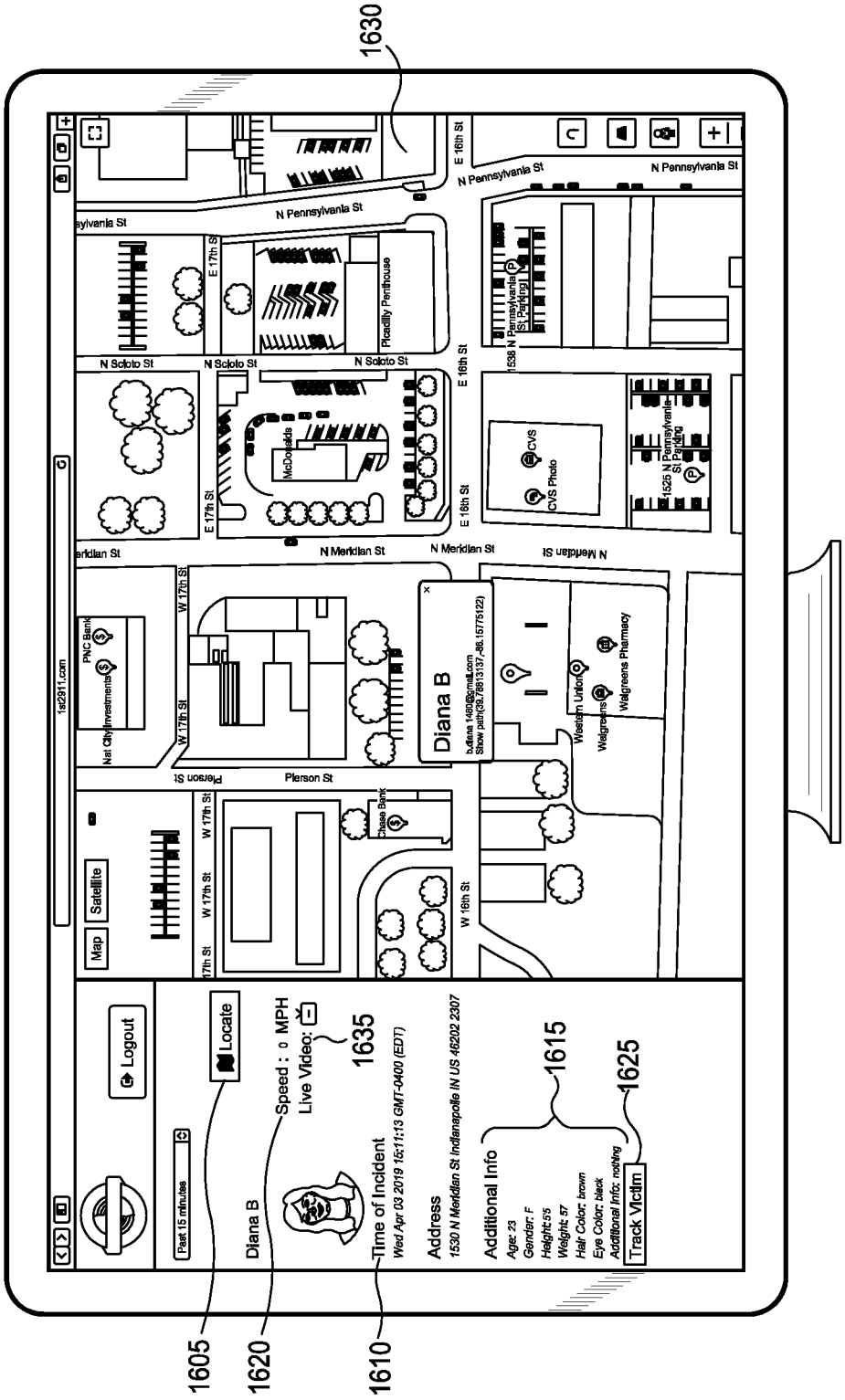

1600
1630
1605
1620
1610
1635
1615
1625
Logout
Locate
Past 15 minutes
Speed : 0 MPH
Live Video:
Diana B
Time of Incident
Wed Apr 03 2019 16:11:13 GMT-0400 (EDT)
Address
1530 N Meridian St Indianapolis IN US 46202 2307
Additional Info
Age: 23
Gender: F
Height: 5'5
Weight: 57
Hair Color: brown
Eye Color: black
Additional Info: nothing
Track Victim
Map
Satellite
N Pennsylvania St
N Meridian St
E 16th St
E 17th St
W 17th St
W 16th St
N Scioto St
Pierson St
Diana B
Piccadilly Penthouse
McDonald's
CVS
CVS Photo
PNC Bank
Chase Bank
Western Union
Walgreens
Walgreens Pharmacy

FIG 16

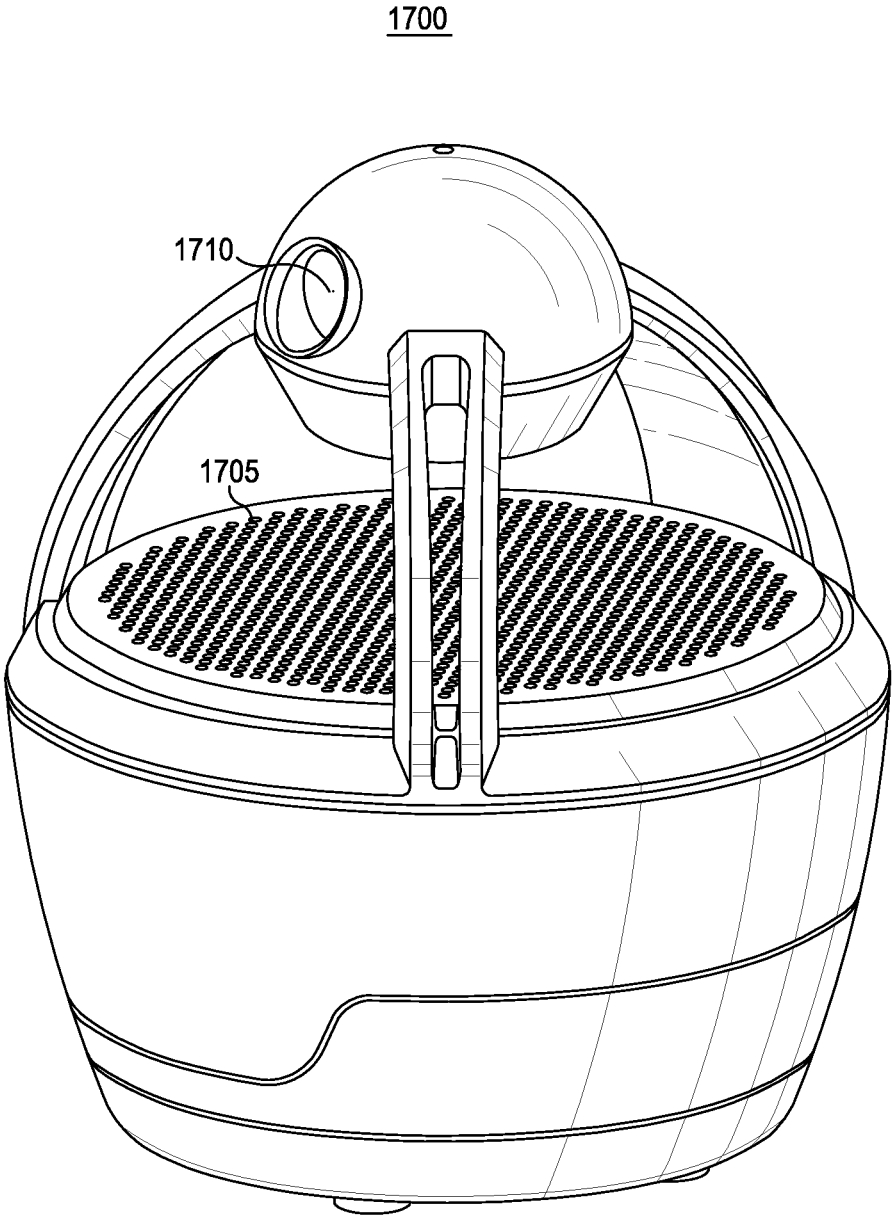


FIG. 17

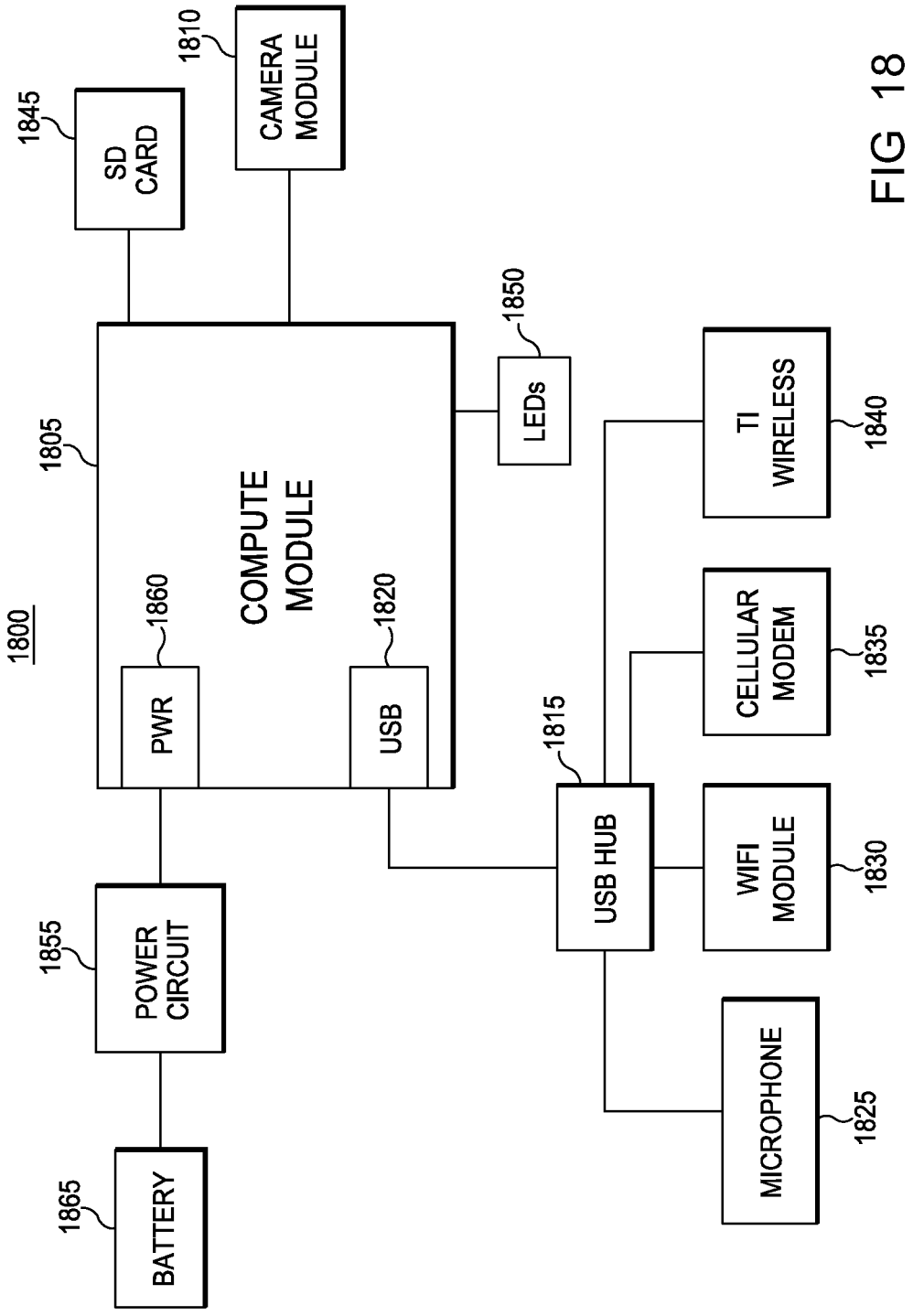

1800
1805
COMPUTE MODULE
PWR
1860
USB
1820
1810
CAMERA MODULE
1845
SD CARD
1850
LEDs
1815
USB HUB
TI WIRELESS
1840
CELLULAR MODEM
1835
WIFI MODULE
1830
MICROPHONE
1825
1855
POWER CIRCUIT
1865
BATTERY

FIG 18

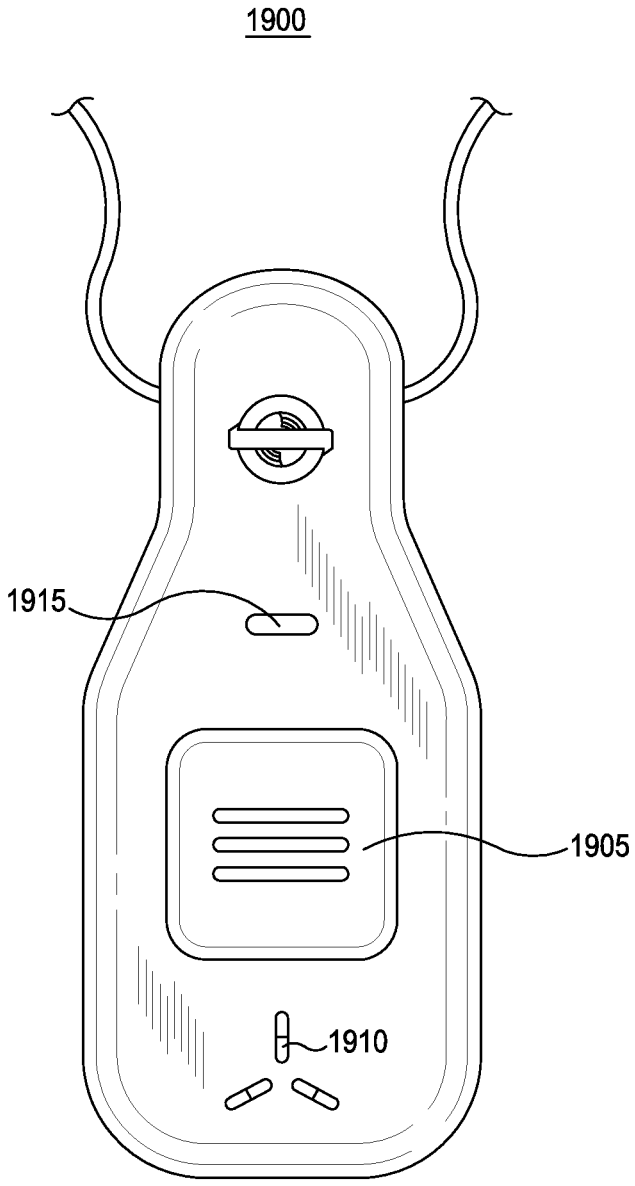


FIG. 19

REMOTE RECORDING AND DATA REPORTING SYSTEMS AND METHODS

FIELD

[0001] Embodiments of this disclosure relate generally to methods and systems for providing recordings of information, and more specifically to methods and systems for providing remote recording and data reporting as related to personal security.

BACKGROUND

[0002] There are various devices on the market aimed at providing greater personal safety protection. For example, mobile applications such as Red Panic Button allow a user to send an emergency message via email or mobile text messaging. These emergency messages may include location information associated with the user device, and/or may include a pre-recorded audio message. The emergency message in this example is activated by the user actuating a button provided on a user interface within the mobile application. Similarly, portable GSM-enabled personal security devices may permit a user to send a position signal that can be traced using a web-based application. These personal security devices may include an "SOS" emergency button which may initiate a phone call to a pre-designated person or group of people.

[0003] However, the personal security solutions noted above include intrinsic shortcomings. In particular, a physical action by the user (e.g., a button press) is required to activate the device to execute an action responsive to a threat. Additionally, the amount and type of information provided by the device may be insufficient for emergency responders to adequately or appropriately assess the reported threat. Absent more detailed information from the emergency message, and without the active participation of the user who is under threat, the emergency responders may not be able to respond in an adequate and/or timely manner.

SUMMARY

[0004] Methods and systems are described which can permit a user to activate a recording device which will respond to a spoken word, phrase, or "keyword." Detection of a spoken keyword can be configured to trigger a variety of responses to the activation. For example, when detection of a spoken keyword occurs, a word or phrase recognized by the system can determine an action which is taken. Detection of a spoken keyword can cause a recording device to record audio information received by the recording device. Similarly, GPS or other location data can be recorded responsive to detection of a spoken keyword.

[0005] A facility can be provided to a user via a user device which can allow a user to establish a set of contacts which may be associated with a spoken keyword. Contacts can include any type of communication identifier that may be used to deliver a message to a device associated with a contact. For example, an email address, a phone number, a messaging identifier (e.g., FACEBOOK Messenger ID), and/or other type of communication system identifier can be associated with a contact. A contact can also include an emergency responder such as a 911 service which can be configured using the 911 mapping system described herein.

[0006] A listening mode can be activated on a recording device which can cause a recording device to begin continuous monitoring of received audio for items in a list of a plurality of keywords. A listening mode can remain active until it is canceled by an action. For example, a user action can cancel a listening mode. A listening mode can be activated by a spoken command. A listening mode can also be activated by an action control in a user interface provided by a user device.

[0007] A server can be provided to perform communications between a plurality of recording devices and other devices which can be associated with target recipients of messages generated in response to a detection of a spoken keyword. A server can be connected to a recording device using a communications network, such as the internet. A server device can receive information from a recording device, and that information may be stored in hardware associated with a server device.

[0008] A web interface can be provided which can allow a user and/or authorized personnel to access information associated with a user. For example, a recording, contact information, images, physical description, etc. associated with a user can be accessed using a web browser interface provided by a server device which can access information of a user.

[0009] A recording device can be a general-use device such as a smartphone, laptop, or tablet computing device. A recording device can also be a purpose-built device that might be optimized for speech recognition and recording. Optionally, a recording device can be a device such as the AMAZON ECHO or GOOGLE HOME device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Some of the figures shown herein may include dimensions or may have been created from scaled drawings. However, such dimensions, or the relative scaling within a figure, are merely presented by way of example and are not to be construed as limiting.

[0011] FIG. **1** is a block diagram of a system architecture of one embodiment of a remote recording and data reporting system.

[0012] FIG. **2** is a block diagram of a recording device of one embodiment of a remote recording and data reporting system.

[0013] FIG. **3** is a flowchart illustrative of the preparation of a recording device according to one embodiment of a remote recording and data reporting system.

[0014] FIG. **4** is a flowchart illustrative of the monitoring and response process according to one embodiment of a remote recording and data reporting system.

[0015] FIG. **5** is an exemplary user interface for activating a recording device according to one embodiment of a remote recording and data reporting system.

[0016] FIG. **6** is an exemplary user interface for selecting a keyword according to one embodiment of a remote recording and data reporting system.

[0017] FIG. **7** is an exemplary user interface for an active recording device according to one embodiment of a remote recording and data reporting system.

[0018] FIG. **8** is an exemplary user interface for setting up a recording device according to one embodiment of a remote recording and data reporting system.

[0019] FIG. **9**A is an exemplary user interface for training for a keyword according to one embodiment of a remote recording and data reporting system, showing the user interface awaiting a user input.

[0020] FIG. **9**B is an exemplary user interface for training for a keyword according to one embodiment of a remote recording and data reporting system, showing the user interface confirming a received user input.

[0021] FIG. **10** is an exemplary user interface for selecting a contact associated with a keyword according to one embodiment of a remote recording and data reporting system.

[0022] FIG. **11** is an exemplary user interface for composing a message associated with a keyword according to one embodiment of a remote recording and data reporting system.

[0023] FIG. **12** is an exemplary user interface for managing recordings according to one embodiment of a remote recording and data reporting system.

[0024] FIG. **13** is an exemplary user interface for creating profile information according to one embodiment of a remote recording and data reporting system.

[0025] FIG. **14** is an exemplary user interface for responding to a message according to one embodiment of a remote recording and data reporting system.

[0026] FIG. **15** is an exemplary user interface for viewing information associated with a message according to one embodiment of a remote recording and data reporting system.

[0027] FIG. **16** is an exemplary user interface for an emergency responder viewing information associated with an emergency alert according to one embodiment of a remote recording and data reporting system.

[0028] FIG. **17** is one embodiment of a personal security base device for use with a remote recording and data reporting system.

[0029] FIG. **18** is a block diagram of the personal security base device of FIG. **16**.

[0030] FIG. **19** is an exemplary personal security pendant device which may be configured to communicate with the personal security base device and provide one or more functions according to some embodiments of the remote recording and data reporting system.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0031] Reference will now be made in detail to the present embodiments discussed herein. Examples are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to explain the disclosed system and method by referring to the figures. It will nevertheless be understood that no limitation of the scope is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles as illustrated therein being contemplated as would normally occur to one skilled in the art to which the embodiments relate. As used herein, words importing the singular shall include the plural and vice versa unless specifically contraindicated.

[0032] A system is described which allows a voice-activated response to a spoken keyword. An action may be required to activate monitoring for a spoken keyword. For example, a user may be required to activate an application and may be required to take a specific action in order that monitoring for a spoken keyword is active, or enabled. If an activation action is not taken, a spoken keyword may not activate a response by a recording device.

[0033] In one embodiment, a recording device is a smartphone, while in other embodiments the recording device may be the Personal Security Base Device and/or the Personal Security Pendant Device described herein. An application, or "app," installed on a smartphone may be used to provide a user interface which may be used to set up and activate monitoring for spoken keywords. For example, a user may be required to speak a predetermined phrase which may initiate monitoring. Monitoring may be implemented as a background process or "service" which may be operative on a recording device. Thus, continuous monitoring for detection of a spoken keyword may be accomplished regardless of whether an application, which could be used to activate monitoring, is active. A user may be able to select an action that enables a monitoring function. For example, a screen touch action, a key press, and/or a spoken phrase may be selected to activate monitoring. A time delay may be inserted between activation and a start of monitoring so a user is informed that monitoring is active.

[0034] In one example, wherein the recording device is a smartphone, a voice or touch-activated trigger event, such as speaking the phrase "protect me now," enables audio monitoring, or a combination of audio monitoring and video recording, by the smartphone. The smartphone will then provide an indication that listening has begun, such as by outputting a sound or a vibration. Thereafter, the smartphone will continuously listen to the received audio for additional triggers, such as pre-defined keywords or phrases, which activate pre-defined actions. For example, a user may predefine the key phrase "meatball sandwich," when detected by the continuously recording smartphone to have been spoken by the user, to initiate a text message to a particular friend or emergency responder, wherein the text message content is pre-defined to read "please help me." The text message may also include additional information, such geographic location tracking data representative of the location of the person in danger via the smartphone. At this point, the smartphone will begin recording the audio and/or video discreetly until stopped by the smartphone user, during and/or after which the recording(s) will be saved. In some embodiments, the smartphone, may automatically transmit the recording(s) to a remote server for storage. It should be understood that this represents only one example configuration of the systems and methods described herein and should not be considered limiting.

[0035] A recording device may record any information which is available to be recorded by the recording device, such as any information capable of being sensed by sensors equipped by the recording device. For example, many smartphones may include GPS modules, accelerometers, video capabilities, audio capabilities, pressure sensors, temperature sensors, and/or other sensory capabilities.

[0036] An interface is provided whereby a user may create a list of a plurality of spoken keywords. A voice recognition facility may be resident on a recording device, and the voice recognition facility may be trained to recognize and capture data from one or more particular users. For example, a user may "train" a voice recognition system to recognize a spoken keyword by the user speaking the keyword multiple times while the voice recognition system is enabled in a training mode.

[0037] An interface is provided whereby a user may identify actions which are to be taken responsive to detection of a spoken keyword. For example, a user may be able

to select a keyword, and may provide a list of contacts which are associated with the keyword. Likewise, actions associated with a contact and a keyword may be defined by a user. For example, a contact might be sent a voice message, a Universal Resource Locator (URL), an audio file, an image, a video, text, and/or any other available information associated with a particular spoken keyword.

[0038] A system is provided which includes a server device. A server device may allow for communication between a recording device and a plurality of responder systems. A server device may obtain information from a recording device and/or other devices associated with a user. For example, a server may obtain audio information from a recording device when a spoken keyword is detected by a recording device. A server may route messages between a recording device and a responder system. For example, a server may direct a text message comprising a URL to a responder system, receive a message from a responder system which may cause a message to be delivered to a recording device, and/or create a message responsive to system conditions.

[0039] A network is provided which may connect components of the system. A network may comprise wired and/or wireless networks and may connect a recording device with other components of a system.

[0040] An exemplary system block diagram is provided in FIG. **1**. The system **100** may comprise a network interface system **105**, a recording device **110**, a network **115**, a responder system device **120**, a messaging server system **125**, and a user device **130**. While a single responder system device **120**, recording device **110**, and user device **130** are depicted in FIG. **1**, a plurality of such devices may be utilized.

[0041] The network interface system **105** allows any system which may access the network **115** to communicate with the messaging server system **125** (FIG. **1**), for example, when the accessing system has been properly authenticated. The network interface **105** may comprise an Application Programming Interface (API) which may allow a network connected device to send a standard protocol request using for example a representational state transfer (REST) web service. For example, Hypertext Transfer Protocol (HTTP) request such as GET, PUT, POST, and DELETE may be used to send commands to and receive information from components of the system **100** (FIG. **1**).

[0042] The recording device **110** allows for detection of audio and recording of information such as audio, GPS, and/or other data available to the recording device as further described herein with respect to FIG. **2**. The recording device **110** may be implemented using any suitable computing device. For example, a microcontroller implementing the ARDUINO protocols might be used to implement the recording device **110**, or a typical smartphone device might be used to implement the recording device **110**. The recording device **110** includes a network interface which may or may not be accessible to elements of the system **100** such as the user device **130** and the network interface system **105**. The recording device **110** may include various recording and detection functionalities as further described herein. For example, the recording system device **110** may implement a user interface, audio acquisition, location acquisition, speech and phrase detection, magnetic and gyroscopic sensing, temperature and pressure sensing, and local data storage. The recording device **110** may incorporate non-volatile memory which may be used to store unique identifiers associated with a recording device. A wired and/or wireless network protocol may be implemented to communicate between a plurality of elements of the system **100** and the recording device **110**.

[0043] The network **115** may be a global public network of networks (e.g., the Internet) and/or may consist in whole or in part of one or more private networks and communicatively couples the network interface system **105**, the recording device **110**, the responder system device **120**, the messaging server system **125**, and the user device **130** with each other. The network **110** may include one or more wireless networks which may enable wireless communication between various elements of the system **100**.

[0044] A remote server, such as messaging server system **125**, may perform coordination between the network interface system **105**, the recording device **110**, the responder system device **120**, and/or the user device **130**. For example, the messaging server system **125** may route messages received from the recording device to a responder system device. The messaging server system **125** may receive a command from the network interface system **105**, which may be sent responsively to a request from the user device **130**. The messaging server system may determine commands and/or messages to be issued to a plurality of responder system devices, user devices, and recording devices based on a result of a message. The messaging server system **125** may provide a report and/or a notification to a user device regarding status of the system **100**.

[0045] The messaging server system **125** may comprise a database which may be used to manage and route messages in the system **100** (FIG. **1**). For example, the messaging server system **125** may maintain a database record associated with a plurality of responder system devices. For example, the messaging server system **125** may determine factors such as proximity, capabilities, and/or availability associated with a responder system device. The messaging server system **125** may provide a notification to a responder system device based on location information obtained from a recording device. The messaging server system **125** may also include memory for storing audio and/or video files recorded and transmitted to it by one or more recording devices **110**.

[0046] The user device **130** may allow a user of the system **200** to access information and/or make requests of the system **200**. For example, the network interface system **105** may provide a web interface which may allow a user of the user device **130** to select, create, and/or modify a message, a recording, a keyword, and/or other information associated with a recording device. The user device **130** may permit a user with sufficient access rights to view system status, responder systems available, historical information, system logs, etc., which may be used for systems administration.

[0047] A network interface system, a recording device, a responder system, a messaging server system, and/or a user device may be a desktop, portable, or tablet PC or MAC, a mobile phone, a smartphone, a PDA, a server system, a specialized communication terminal, a terminal connected to a mainframe, and/or any suitable communication hardware and/or system. For example, servers such as the POWEREDGE 2900 by DELL, or the BLADECENTERJS22 by IBM, or equivalent systems which might use an operating system such as Linux, WINDOWS XP, etc. might be used as a network interface system, messaging server

system, or responder system. After being presented with the disclosure herein, one of ordinary skill in the relevant art will immediately realize that any viable computer systems or communication devices known in the art may be used as a network interface system, a responder system device, a recording device, a messaging server system, and/or a user device. Any suitable hardware and software components which are able to implement the required functionalities which are well known in the art may be used to implement as a network interface system, a recording device, a responder system device, a messaging server system, and/or a user device.

[0048] In an embodiment, a recording device may request and/or receive an application, or "app," from a server such as the iPhone AppStore or Google Play Store, which may be operative on a recording device. Similarly, the network interface system **105** may provide content which may implement a "web app" which may operate in a browser functionality of a user device, a responder system, and/or a recording device.

[0049] As illustrated in FIG. **2**, a recording device **200** may comprise a plurality of functionalities which may be implemented using hardware and/or software systems. A system control and power module **205** may serve to provide power to the other subsystems of the recording device **200**. For example, battery power, charging, availability, connection management, system operations management, as well as speech detection and phrase recognition may be performed by the system control and power module **205**. A microphone module **210** may consist of a plurality of transducers which may convert pressure waves (i.e., sound) to signals which may be processed and stored by the recording device **200**. An exemplary standalone microphone module is the RESPEAKER **4** microphone array for RASPBERRY PI. A plurality of microphone devices may be used in order to perform functions such as ambient noise cancellation and direction sensing. A non-volatile memory module **215** may include flash memory which may be used for local storage and recoding of information. For example, NAND flash devices may be used as non-volatile memory.

[0050] A network interface **220** may provide for wired and wireless communications. For example, USB data connectivity may be implemented in the network interface **220**. Similarly, Wi-Fi, 3G/4G phone connection, BLUETOOTH, and FM radio communications may be implemented in the network interface module **220**. An exemplary standalone GPRS and WI-FI module is the LE910NAG, 4G+GPS shield for ARDUINO and RASPBERRY PI. A display module **225** may comprise a visual display and user interface component (e.g., touch screen). A visual display may be, for example, LCD, OLED, LED, etc. The display module **225** may comprise controls for back-lighting, and display management. In an embodiment, the display module **225** may comprise a plurality of indicator lights. A user control module **230** may comprise mechanical and/or optical transducers which may be used to obtain actions of a user. A location acquisition module **235** may comprise location functionality such as GPS, as incorporated in the LE910NAG previously described. A sensors module **240** may include sensors for humidity, temperature, gravity, gyroscopes, etc. as is well known in the art. A speaker and audio module **245** may comprise power amplifiers, speakers, and/or other audio output components. A camera module **250** may comprise a plurality of cameras. For example, the camera module **250** may incorporate a user-facing camera and one or more non user-facing cameras as per, for example, the IPHONE **7**. A subscriber identity module (SIM) module **255** may include the hardware and software functionalities to identify a device and permit the recording device **200** to access a wireless phone network. A near-field communications (NFC) module **260** may permit the recording device **200** to communicate via near-field RF communications protocols. A fingerprint ID module **265** may allow the recording device **200** to perform biometric verification of a fingerprint.

[0051] Any suitable hardware as is well known in the art may be used to implement the various modules of the recording device **200**. Any of the modules of the recording device **200** may be omitted as determined suitable for its intended purpose.

[0052] As illustrated in FIG. **3**, a process **300** for commissioning a recording device is provided. The process **300** may be performed in whole or in part by any suitable element of the system **100** (FIG. **1**). In at least one embodiment, the process **300** is operative on the recording device **110**. In an embodiment, the process **300** is operative on the user device **130**. A request to set up a recording device may originate from any device in the system **200**. A request to set up a recording device may be originated by an action detected by a recording device.

[0053] In operation **305** (FIG. **3**) a determination is made as to whether a request to set up a recording device is received. If it is determined in operation **305** that a request to set up a recording device is not received, control remains at operation **305**, and process **300** continues. If it is determined in operation **305** that a request to set up a recording device is received, control is passed to operation **310**, and process **300** continues.

[0054] The determination in operation **305** may be made using various criteria. In at least one embodiment, if a user activates a control of the recording device **110** (FIG. **1**), it may be determined that a request to set up a recording device is received. For example, if a request is received at an address associated with the network interface system **105** from the user device **130** it may be determined that a request to set up a recording device is received. In an embodiment, a web browser functionality of the user device **130** may be used to access a web-based application provided by the network interface system **105**, which may be used to perform any or all of the process **300**. An authorization and/or verification process including security data may be required as part of a determination that a request to set up a recording device is received.

[0055] In operation **310** a keyword is determined. For example, a user interface (UI) such as that depicted in FIG. **8** may be provided to a user of a recording device or a user device. A keyword or key phrase may consist of any number of words and/or phonemes. In an embodiment, at least three utterances are required to establish a keyword. In some embodiments, a keyword may be required to be selected from a list of keywords. Control is passed to operation **315**, and process **300** continues.

[0056] In operation **315**, a determination is made as to whether a keyword is acceptable. If it is determined in operation **315** that a keyword is not acceptable, control is passed to operation **345**, and process **300** continues. If it is determined in operation **305** a keyword is acceptable, control is passed to operation **320**, and process **300** continues.

[0057] The determination in operation **320** may be made using various criteria. In at least one embodiment, a keyword length may be verified to determine whether a keyword is "OK," or acceptable. A speech recognition process may be applied to determine if a keyword is acceptable. For example, a user may be required to speak a keyword a plurality of times, which may be measured by a speech recognition system, which may require that the keyword is correctly recognized a predetermined number of times to determine if a keyword is acceptable. Temporal and spectral analysis of a spoken keyword may be performed, recorded, and may be compared to a reference to determine if a keyword is acceptable. A keyword may be converted to text and may be compared to a dictionary of keywords which may be used to determine whether a keyword is acceptable. For example, if a keyword is in a list of blocked keywords due to factors such as ambiguity, frequency of use, etc., it may be determined that a keyword is not acceptable. In an embodiment, no verification of a keyword may be performed, and it may always be determined that a keyword is acceptable.

[0058] In operation **320**, contact information is determined. For example, a UI such as that depicted in FIG. **10** may be provided to a user. A selection of contacts from a dictionary, such as a contacts dictionary typically accessible in a mobile phone, or email client contacts list may be provided to a user to determine contact information based on a selection by a user. A type of messaging which may be associated with a contact may be used to determine contact information. A generic emergency contact (e.g., 911) may be identified and may route a message to an emergency responder selected based on criteria such as geographic location of a recording device. Any suitable criteria may be used to determine contact information. Contact information may include any available communications system, such as email, instant messaging, voice communication, etc., as may be found in contact information of a person or entity. Control is passed to operation **325**, and process **300** continues.

[0059] In operation **325** a determination is made as to whether a contact is "OK," or acceptable. If it is determined in operation **325** that a contact is not acceptable, control is passed to operation **345** and process **300** continues. If it is determined in operation **325** that a contact is acceptable, control is passed to operation **330** and process **300** continues.

[0060] The determination in operation **325** may be made using various criteria. In at least one embodiment, if a test message is sent to a destination associated with a contact, and a response is received which indicates invalid contact information (e.g., email address not deliverable, etc.), it may be determined that a contact is not acceptable. In one embodiment, no verification of a contact is performed, and it may always be determined that a contact is acceptable. In another embodiment, if a contact is determined to be unacceptable, an error message **345** is provided, and control is passed back to operation **320** to, for example, permit a user to re-enter contact information.

[0061] In operation **330**, an action is determined. For example, a type of communication which is to be delivered to a contact may be determined, or content which is to be delivered to a contact may be determined. A UI, such as that depicted in FIG. **11**, may be provided to a user in order to determine an action based on a user action. An action associated with a contact may be predetermined based on a type of contact. For example, if a contact is only associated with text messaging, an action associated with the contact may be required to be a text message, which may comprise a predetermined message. Similarly, if a contact is an emergency responder, a predetermined set of information may be provided to the contact. A user may customize an action based on a contact and/or a keyword. For example, a different keyword may cause a different action to be taken using the same contact as a first keyword. An action may comprise continuous recording of information acquired by a recording device. For example, audio, video, GPS, location, gyroscopic, and/or magnetic data available to a recording device may be recorded as part of an action. Control is passed to operation **335**, and process **300** continues.

[0062] In operation **335**, a determination is made as to whether an action is "OK," or acceptable. If it is determined in operation **335** that an action is acceptable, control is passed to operation **340**, and process **300** continues. If it is determined in operation **335** that an action is not acceptable, control is passed to operation **345**, and process **300** continues. Alternatively, in some embodiments the control may be passed back to operation **330** if the action is deemed unacceptable so the user may re-enter a new action and again proceed to operation **335**.

[0063] The determination in operation **335** may be made using various criteria. For example, if a contact is associated with a browser device and an action includes delivering a URL to the contact it may be determined that the action is acceptable. Similarly, if an action is associated with delivering an image and an image has not been selected by a user, it may be determined that an action is not acceptable. Any suitable criteria may be used to determine whether an action is acceptable.

[0064] In operation **340**, process information is recorded. For example, a keyword, contacts, and actions associated with a keyword may be stored in memory of a recording device. Likewise, information of a user, a user device, a keyword, an action, a contact, and/or a recording device may be recorded in persistent storage associated with the messaging server system **125** (FIG. **1**), the responder system device **120**, and/or any suitable elements of the system **100**. Control is passed to operation **305**, and process **300** continues.

[0065] In operation **345**, an error message is sent. An error message may be based on historical information of an error detected in the process **300**. For example, if a keyword error is detected, a suitable message indicating the nature of the error may be provided in a UI to permit a user to correct the error. Likewise, if a contact error and/or an action error is detected, a message may be provided to a user to indicate a type of error and/or to suggest a corrective action. Information obtained via the process **300** may be recorded in persistent storage of any suitable element of the system **100** (FIG. **1**). Control is passed to operation **305**, and process **300** continues.

[0066] As illustrated in FIG. **4**, a process **400** for activating a recording device is provided. The process **400** may be performed in whole or in part by any suitable element of the system **100** (FIG. **1**). In at least one embodiment, the process **400** is operative on the recording device **110**. A request to activate a recording device may originate from any suitable component of the system **100**. A request to activate a recording device may be initiated by user action detected by a recording device.

[0067] In operation **405** (FIG. **4**), a determination is made as to whether monitoring is activated. If it is determined in operation **405** that monitoring is not activated, control remains at operation **405**, and process **400** continues. If it is determined in operation **405** that monitoring is activated, control is passed to operation **410**, and process **400** continues.

[0068] The determination in operation **405** may be made using various criteria. In an embodiment it may be determined that monitoring is activated based on audio information received by a recording device. For example, if a keyword is detected by a recording device, it may be determined that monitoring is activated. If a user action, such as a key press or "swipe" gesture is detected, it may be determined that monitoring is activated.

[0069] In operation **410**, audio may be acquired. Audio may be acquired using any suitable facility of a device of the system **100** (FIG. **1**). In an embodiment, audio is acquired by the recording device **110** (FIG. **1**). In an embodiment, audio may be acquired by a device associated with the recording device, such as an external microphone, wearable device, wirelessly connected device, etc., which can be connected via BLUETOOTH, WI-FI, or the like. Control is passed to operation **415**, and process **400** continues.

[0070] In operation **415**, a determination is made as to whether a keyword is detected. If it is determined in operation **415** that a keyword is detected, control is passed to operation **420**, and process **400** continues. If it is determined in operation **415** that a keyword is not detected, control is passed to operation **445**, and process **400** continues.

[0071] The determination in operation **415** may be made using various criteria. For example, real-time speech recognition software operative on the recording device **110** (FIG. **1**) might compare received and decoded audio converted to text to a list of key phrases associated with the recording device. If a match is found in the list of key phrases to the text, it may be determined that a keyword is detected, or that a triggering event has occurred. A voiceprint of a received utterance may be compared to a stored voiceprint, and if a match is not detected, it may be determined that a keyword is not detected. Any suitable criteria may be used to determine whether a keyword is detected.

[0072] In operation **420**, an indicated action is performed. For example, a message associated with a keyword may be delivered to an address indicated by a contact associated with a keyword. A recording process may be initiated by a recording device responsive to detection of a keyword. Any action which may be associated with a keyword may be performed. Control is passed to operation **425**, and process **400** continues.

[0073] In operation **425**, a determination is made as to whether an action is successful. If it is determined in operation **425** that an action is successful, control is passed to operation **430**, and process **400** continues. If it is determined in operation **425** that an action is not successful, control is passed to operation **445**, and process **400** continues. In some embodiments, an unsuccessful action passes control back to operation **420**, wherein the process **400** continues by performing the action again. The system may be configured to retry performance of unsuccessful actions any particular number of times before control is passed to operation **445**.

[0074] The determination in operation **425** may be made based on various criteria. For example, if a network error occurs, it may be determined that an action is not successful. If a message is successfully delivered to a contact associated with an action, it may be determined that an action was successful. If a confirmation message is received from a contact indicated by an action, it may be determined that an action was successful. If a recording device acknowledges that a recording has started, it may be determined that an action was successful. In an embodiment, it may always be determined that an action is successful.

[0075] In operation **430**, feedback can be provided. Responsive to detection of a keyword, an audio message, a visual indicator, and/or a haptic signal may be generated. For example, if a keyword is detected an audio message selected by a user to be associated with a keyword may be played. A "push" notification message may be provided to a recording device. If an action succeeds or fails, a feedback response indicating success or failure may be provided. A status message may be provided to indicate that a recording is in progress. Control is passed to operation **435**, and process **400** continues.

[0076] In operation **435**, a determination is made as to whether feedback is "OK," or acceptable. If it is determined in operation **435** that feedback is acceptable, control is passed to operation **440**, and process **400** continues. If it is determined in operation **435** that feedback is not acceptable, control is passed to operation **445**, and process **400** continues. In some embodiments, an unacceptable or unsuccessful feedback passes control back to operation **430**, wherein the process **400** continues by providing the feedback again. The system may be configured to retry providing feedback any particular number of times before control is passed to operation **445**.

[0077] The determination in operation **435** may be made based on various criteria. If a user acknowledges a feedback indicator, it may be determined that feedback is acceptable. For example, a user may acknowledge a feedback message with a spoken response, a key press, a "swipe" or "shake" gesture, etc. Likewise, a user may take an action which indicates that monitoring is to be cancelled. For example, a spoken keyword, a key press, etc. may be used to indicate that a false detection has occurred. Any suitable criteria may be used to determine that feedback is acceptable. In an embodiment, it may always be determined that feedback is acceptable.

[0078] In operation **440**, process information is recorded. Detection of a keyword, actions, contacts, responses to an action, user actions, device status, and/or any information acquired via the process **400** may be recorded using any suitable persistent storage of any element of the system **100**. Control is passed to operation **405**, and process **400** continues.

[0079] In operation **445** a message is sent. For example, a status message may be delivered based on historical information of the process **400**. A detection of a keyword may be indicated to a user device, a failure of an action may be indicated to the messaging server system **125** (FIG. **1**), a cancellation of monitoring may be indicated to a recording device. A message may be sent to any element of the system **100** based on information acquired via the process **400**. Information of the process **400** may be recorded. Control is passed to operation **405**, and process **400** continues.

[0080] One embodiment of an exemplary UI **500** for activation of monitoring by a recording device is illustrated in FIG. **5**. The UI **500** may be provided using a device such

as the recording device **110** (FIG. **1**). A monitoring activation control **505** is provided. The monitoring activation control **505** may cause monitoring of audio to be initiated when activated. Activation of the monitoring activation control **505** may cause a UI such as that depicted in FIG. **6** to be provided. An instruction provided in the UI **500** may indicate a spoken phrase which may be used to activate monitoring.

[0081] One embodiment of an exemplary UI **600** for managing keywords is illustrated in FIG. **6**. The keyword management UI **600** may include keyword indicators **605***a*-**605***c* and a monitoring cancellation control **610**. The keyword indicators **605***a*-**605***c* may be used to indicate a plurality of phrases associated with an action. An uninitialized keyword may be indicated as greyed out and/or as indicated by "Not set yet," as shown by example keyword indicator **605***c*. Activation of a keyword indicator may cause a UI such as that depicted in FIG. **8** to be provided. Detection of a phrase indicated in the keyword indicator **605***a* may cause a UI such as that depicted in FIG. **7** to be provided. Activation of the monitoring cancellation control **610** may cancel keyword monitoring and may cause the UI **500** (FIG. **5**) to be provided.

[0082] One embodiment of an exemplary UI **700** for indicating recording activation is illustrated in FIG. **7**. The recording activation UI **600** may include the keyword indicators **605***a*-**605***c*, the monitoring cancellation control **610**, and action indicator **705**. The functionality of the keyword indicators and monitoring cancellation control **610** has been previously described with respect to FIG. **6**. The action indicator **705** may indicate a keyword which has been detected and a status of an action taken responsive to the keyword. Activation of the monitoring cancellation control **610** may cancel an action indicated in the action indicator **705**.

[0083] One embodiment of an exemplary UI **800** for managing a key phrase is illustrated in FIG. **8**. The key phrase management UI **800** may include a keyword indicator **805**, a phrase verification control **810**, a contact selection control **815**, a message composition control **820**, a cancel control **825** and an accept control **830**. The keyword indicator **805** may indicate a phrase which is to be detected in monitoring mode. Activation of the keyword indicator **805** may allow a user to edit content of a phrase and/or to speak a phrase which is to be converted to text. Activation of the phrase verification control **810** may cause a UI such as that depicted in FIG. **9**A to be provided. Activation of the contact selection control **815** may cause a UI such as that depicted in FIG. **10** to be provided. Activation of the create message control **820** may cause a UI such as that depicted in FIG. **11** to be provided. Activation of the cancel control **825** may cause information obtained using the UI **800** to be discarded and cause the UI **600** (FIG. **6**) to be provided. Activation of the accept control **830** may cause information obtained using the UI **800** to be recorded and cause the UI **600** (FIG. **6**) to be provided.

[0084] One embodiment of an exemplary UI **900** for verifying a key phrase is illustrated in FIG. **9**A. The key phrase verification UI **900** may include the keyword indicator **805**, the phrase verification control **810**, the contact selection control **815**, the message composition control **820**, a phrase detection indicator **905**, a cancel control **925**, and an accept control **930**. The phrase detection indicator **905** may be used to indicate whether a phrase has been recorded. For example, if a user activates the phrase detection indicator **905**, the UI **900** may change to show a message indicating that a recording device is verifying a spoken phrase in the phrase detection indicator **905** as shown in FIG. **9**B. If a user does not speak a phrase, or if a phrase is not correctly detected, an indication may be provided in the phrase detection indicator **905**. Activation of the cancel control **925** may cause information obtained using the UI **900** to be discarded and cause the UI **800** (FIG. **8**) to be provided. Activation of the accept control **930** may cause information obtained using the UI **900** to be recorded and cause the UI **800** (FIG. **8**) to be provided.

[0085] One embodiment of an exemplary UI **1000** for associating contacts with a key phrase is illustrated in FIG. **10**. The contact management UI **1000** may include a keyword indicator **1005**, contact information indicators **1010***a*-**1010***d*, contact message selectors **1015**, contact email selectors **1020**, contact voice selectors **1025**, contact search controls **1040**, a cancel control **1030**, and an accept control **1035**. The keyword indicator **1005** may be used to indicate a keyword that is to be associated with a contact.

[0086] The contact information indicators **1010***a*-**1010***d* may indicate information of a user contact associated with a keyword. For example, the contact indicator **1010***a* indicates the contact "John Jones." The contact information indicators **1010** may include a plurality of selection controls, such as checkboxes or radio buttons. For example, the contact message selectors **1015***a*-**1015***d* may be used to indicate that a text message is to be sent to the contact indicated by the respective contact information indicators **1010***a*-**1010***d*. Absence of a contact message selector in a contact information indicator may indicate that a communication service indicated by the contact message selector is not associated with a contact indicated by a contact information indicator. The contact email selectors **1020***a*, **1020***b*, **1020***d* may be used to indicate that an email message is to be sent to a contact indicated by the respective contact information indicator. For example, selection of the contact email selector **1020***b* might cause an email to be sent to "Sally Jones" when the keyword indicated in the keyword indicator **1005** is detected. Likewise, the contact voice message indicators **1025***a*, **1025***c*, **1025***d* may be used to indicate that a voice message is to be delivered to a contact indicated in the respective contact information indicator when the keyword indicated in the keyword indicator **1005** is detected.

[0087] Activation of the cancel control **1030** may cause information acquired using the UI **1000** to be discarded and may cause the UI **800** (FIG. **8**) to be provided. Activation of the accept control **1035** may cause information acquired using the UI **1000** to be stored and may cause the UI **800** (FIG. **8**) to be provided. Activation of the search control **1040** may permit a user to enter search text in the search control **1040** and may cause a list of contacts matching the search text to be provided for selection. In an embodiment, a contact information indicator may be a generic contact such as "911," which may utilize the 911 mapping system described below, as illustrated in the contact information indicator **1010***d*. A generic contact may cause a message to be directed to a destination selected by the messaging server system **125** based on information obtained from the recording device **110**. For example, GPS coordinates associated with a recording device might be used to select an emergency responder, rather than area code associated with a user device or a cell phone tower "ping." A contact indicator may

not allow a user to modify any or all message indicators indicated in a contact indicator. For example, an emergency responder might have a fixed set of contact services which may not be modified by a user.

[0088] One embodiment of an exemplary UI **1100** for composing a message associated with a key phrase is illustrated in FIG. **11**. The message management UI **1100** may include a keyword indicator **1105**, message text indicator **1110**, message attachment window **1115**, attachment selection indicators **1120**, a cancel control **1125**, and an accept control **1130**. The keyword indicator **1105** may be used to indicate a keyword that is to be associated with a message. The message text indicator **1110** may be used to provide text of a message which is to be provided when a keyword indicated by the keyword indicator **1105** is detected. The message attachment window **1115** may be used to indicate a plurality of attachments which are to be delivered to a contact when a message is delivered responsive to detection of a keyword indicated in the keyword indicator **1105**. Attachment selection indicators **1120** may be used to select additional information which is to be provided to a contact associated with a keyword. The number and description of attachment indicators may depend on various factors. For example, if a recording device can acquire GPS data, or geomagnetic data, or if a profile picture has been selected by a user, an attachment selector indicating that such data may be provided may be indicated in the message attachment window **1115**. As illustrated in the example of FIG. **11**, the attachment selection indicator **1115***a*-**1115***c* may be used to indicate that a photo, GPS data, audio recordings, and/or video recordings may be delivered as an attachment with a message when the key phrase "Help me please" is detected. Any number of attachment selection indicators may be provided in the message attachment window based on capabilities of devices found in the system **100** (FIG. **1**).

[0089] Activation of the cancel control **1125** may cause information acquired using the UI **1100** to be discarded and may cause the UI **800** (FIG. **8**) to be provided. Activation of the accept control **1130** may cause information acquired using the UI **1100** to be stored and may cause the UI **800** (FIG. **8**) to be provided.

[0090] One embodiment of an exemplary UI **1200** for managing audio recordings is illustrated in FIG. **12**. An action of a user may cause the UI **1200** to be provided. For example, a right-to-left or left-to-right "swipe" gesture in the UI **600** (FIG. **6**) may cause the UI **1200** to be provided. The recording management UI **1200** may be provided using any suitable device such as the user device **130** (FIG. **1**). The recording management UI **1200** may include recording indicators **1210***a*-**1210***c*. The recording indicators **1210***a*-**1210***c* may be used to control playback and deletion of stored recordings.

[0091] One embodiment of an exemplary UI **1300** for managing user information is illustrated in FIG. **13**. The user information management UI **1300** may include user information indicator **1305***a*-**1305***k*, photo upload control **1310**, a photo window **1315**, a cancel control **1320** and a save control **1325**. The user information indicators **1305***a*-**1305***k* may be used to provide information of a user. For example, first and last name, address, gender, and/or other descriptive information of a user may be provided using the user information controls **1305***a*-**1305***k*. Activation of the photo upload control **1310** may cause a "pick list" to be provided whereby a user may select a photo that is to be uploaded. The photo window **1315** may indicate a current photo which has been uploaded using the photo upload control **1310**. The cancel control **1320** may be used to discard any information obtained using the UI **1300**. The save control **1325** may be used to store information obtained using the UI **1300**. The UI **1300** may be provided using any suitable device of the system **100** (FIG. **1**). For example, the UI **1300** may be provided using the user device **130** and/or the recording device **110**.

[0092] One embodiment of an exemplary UI **1400** for receiving a message is illustrated in FIG. **14**. The responder message UI **1400** may include a user message window **1405** and a message acceptance control **1410**. The responder message UI **1400** may be provided to any suitable element of the system **100** (FIG. **1**). For example, the responder message UI **1400** may be provided to a browser functionality of the responder system device **120**. The user message window **1405** may include information of a message composed by a user which is provided responsive to detection of a keyword. The message acceptance control **1410** may be used to indicate that a message has been accepted. Activation of the message acceptance control **1410** may cause a UI such as that depicted in FIG. **15** to be provided. Activation of the message acceptance control may cause a message to be delivered to the recording device **110** (FIG. **1**).

[0093] One embodiment of an exemplary UI **1500** for retrieving information associated with a message is illustrated in FIG. **15**. The responder information retrieval UI **1500** may include a user message window **1505**, a location indicator **1510**, a source indicator **1515**, audio recording controls **1520**, profile retrieval control **1525**, and a confirmation message control **1530**. The responder information retrieval UI **1500** may be provided to any suitable element of the system **100** (FIG. **1**). For example, the responder information retrieval UI **1500** may be provided to a browser functionality of the responder system device **120**. The user message window **1505** may include information of a message composed by a user which is provided responsive to detection of a keyword.

[0094] The location indicator **1510** may be used to indicate a location associated with a message. For example, a most recent GPS location acquired from a recording device may be indicated as an address and/or map location in the location indicator **1510**. In an embodiment, the location indicator may comprise a map which indicates a sequence of location information acquired by a recording device. For example, if a substantial change (e.g., more than 20 meters in a one-minute interval) in location information is detected by a recording device, the location indicator **1510** might be presented as a map. A refresh control may be provided as a part of the location indicator **1510**, which may retrieve additional location information from a recording device.

[0095] The originating phone indicator **1515** may be used to indicate information of a recording device which has initiated a message in response to a detected keyword. For example, a phone number, device ID, or other indicator of a source of a message may be provided in the originating phone number indicator **1515**. If a recording device is not a mobile phone, an indicator of the device, such as "classroom 205, Marksburg, Elementary School" may be indicated in the originating phone indicator **1515**.

[0096] The audio recording controls **1520** may allow play, pause, and scan capability for an audio recording associated with a message. A "refresh" control as indicated by the

circular arrows may permit a recording to be refreshed from a source of the recording using the audio recording controls **1520**. Activation of the profile retrieval control **1525** may cause information of a user such as that provided using the user information management UI **1300** (FIG. **13**) to be provided. Activation of the confirmation message control **1530** may cause a message to be delivered to a suitable element of the system **100** which indicates that responder is taking an action in response to a message indicated by the user message indicator **1505**.

[0097] 911 Mapping System

[0098] The 911 mapping system is a mobile or web-based application which can be configured to quickly connect victims with first responders. The 911 mapping system can include, for example, a remote server configured to host the mobile or web-based application and configured to communicate with personal security devices, such as smartphones and purpose-built personal security devices, to send and receive personal security alerts and the associated user data. If a user of the exemplary system, such as a victim of a threat or violence, actuates an alert through the exemplary system, first responders may be directly notified through the 911 mapping system. Depicted in FIG. **16** is an exemplary user interface **1600** which can be viewed by a first responder. In embodiments, a visual marker, which may include a flashing beacon and audio alert, is shown on the user interface **1600**. When the police or first responding officer views the marker, such as by actuating a button via a user interface, the officer gains access to one or more of the location of the victim **1605**, time of the incident **1610**, and/or personal information **1615** of the victim such as age, gender, height, weight, hair color, eye color, a photo, and/or any additional information. If the victim is moving, the officer can view the speed **1620** in which the victim is moving. In some embodiments, the option is provided to track the victim via a tracking button **1625**, and a tracking service interface **1630** is provided to the officer instructing the officer of the shortest available path to reach the victim. The directional service can be updated continuously based on the movement of victim. If the recording device associated with the victim provides live audio and/or video, the live audio and/or video can be viewed by the officer. The 911 mapping system can determine whether these audio and video features are being offered by the recording device and, if so, include links for the officer to view the content. In the illustrated example, the "live video" button **1635** may be actuated by the officer to view the live video.

[0099] Purpose-Built Personal Security Devices

[0100] Depicted in FIG. **17** is a personal security base device **1700** which can be deployed within the remote recording and data reporting methods and systems described herein. The base device **1700** is a purpose-built device which can be optimized for speech recognition and recording, functioning within the personal security system as a recording device **110**. The base device **1700** is a voice-activated security unit for enterprise applications which can capture audio and/or video during emergency situations taking place in the enterprise, such as a school, office, home, or the like. The base device **1700** can include a microphone **1705** enabled to listen for a particular spoken key phrase, and the base device **1700** can include a video camera **1710** which can be actuated to record by the microphone's **1705** detection of a spoken key phrase. The base device **1700** can then provide a live audio and/or video feed to emergency response personnel. The base device **1700** can be a desktop device powered by an external wall outlet and may include a battery backup.

[0101] Depicted in FIG. **18** is a block diagram illustrating a base device **1800** having various components which can be incorporated into base device **1700**. It should be understood that each and every component described herein may not be required for the base device **1800** to perform as a recording device **110**, and certain components may be optional or may be substituted with one or more components which may provide the same or similar functionality.

[0102] An exemplary base device **1800** can include a compute module **1805**. One example of a compute module **1805** is a RASPBERRY PI Compute Module **3**, which may contain various sub-components such as a data processor, memory module, eMMC Flash, and supporting power circuitry. Base device **1800** may include a unique identification serial number to support multiple-device registration with the security system, for example, via the network interface system **105**. Base device **1800** may also include stored credentials for authenticating the device for communications with the network interface system **105**.

[0103] The base device **1800** may also include a video camera module **1810** capable of providing a live-stream video to a user across a wireless network. The camera module **1810** may connect to the compute module **1805**, for example, using the standard camera interface provided by the RASPBERRY PI Compute Module **3**. In some embodiments, the compute module **1805** interfaces with a USB hub **1815** connectable to the compute module **1805** via a USB port **1820**. The USB hub **1815** can accept various inputs, such as a microphone **1825**, a Wi-Fi module **1830**, a cellular modem **1835**, and/or a TI wireless module **1840**. The microphone **1825**, for example, includes the ability to receive audio to provide to the compute module **1805** for data processing and/or to store to a removable memory device, such as an SD card **1845** and/or for streaming as described herein. Video captured by the camera module **1810** may also be stored on the SD card **1845** and/or streamed. The microphone may be able to use the HLS communications protocol for streaming audio, and/or Dynamic Adaptive Streaming over HTTP (DASH). The Wi-Fi module **1830** may provide the ability for the base device **1800** to connect to a Wi-Fi access point or to connect directly to a client device, such as a smartphone, computer, or the like, via a Wi-Fi connection. The cellular modem **1835**, for example, may provide the ability for the base device **1800** to connect to a cellular network. In this embodiment, the base device **1800** may also accept a SIM card for storing the network data required for connecting to a cellular network. The cellular modem **1835** may be utilized in place of, or as a backup to, the Wi-Fi module **1830** during base device **1800** operation. Further, base device **1800** may include a TI wireless module **1840** to support additional forms of wireless communications, such as BLUETOOTH, BLUETOOTH Low-Energy, RF, and the like.

[0104] The base device **1800** may include one or more status-indication LEDs **1850** which visually indicate a status of base device **1800**, such as (1) "ready, AC powered," (2) "ready, battery powered," (3) "active streaming," and/or (4) "alerting-secondary device." The base device **1800** may include additional inputs, such as a USB interface (not shown) which is configured to connect to other devices or

systems, such as a computer, if a wired connection facilitates initial commissioning of the base device **1800** into the security system.

[0105] Additionally, base device **1800** may include power circuitry **1855** for powering the base device **1800** through the power port **1860**. In some embodiments, a battery backup **1865** is included to ensure the base device **1800** remains powered and enabled in the event of a power outage.

[0106] If the situation warrants, the base device **1700**, **1800** can connect with a personal security pendant device that is wirelessly linked with the base device. Depicted in FIG. **19** is one exemplary pendant device **1900**. The pendant device **1900** can include a small form factor permitting it to be carried with a user by hand, in a pocket, or worn around a user's neck via a lanyard. The pendant device **1900** activates the base device **1700**, **1800** in the event the ambient noise level is too high to pick up or recognize a user's voice, or in situations that the user is positioned away from the device but may need emergency assistance.

[0107] The pendant device **1900** may include various components for connecting with a base device **1700**, **1800**, listening for spoken key phrases, and for transmitting audio and/or video streams to the base device **1700**, **1800**. In some embodiments, the pendant device **1900** may directly communicate with the network interface system **105** via a Wi-Fi or cellular connection or may do so through a wireless connection with a mobile device (e.g., a smartphone or tablet) or a computer system. Accordingly, the pendant device **1900** may at least include, for example, an audio and/or video transceiver, a microphone **1910**, and a battery. Other components, such as a Wi-Fi or cellular module, may be included to support further wireless connectivity.

[0108] The pendant device **1900** may include one or more buttons to assist with activation of audio and/or video recording or commissioning/pairing of the pendant device **1900**. For example, to pair the device, a user may press and hold the button **1905** until an audio or visual indication is received by a user, such as from status indicator LED **1915**, indicating that a pairing mode has been activated. The user may then activate a pairing mode on the base device **1700**, **1800** to initiate scanning for pendant devices. Once pairing has been completed, the LED indicator **1915** may output a light pattern indicating pairing has been completed.

[0109] To initiate recording, such as audio recording using the microphone **1910**, pressing and holding the button **1905** can act to power on the pendant device **1900**, establish or re-establish a wireless connection to the base device **1700**, **1800**, enable the microphone **1910**, and stream audio data to the base device **1700**, **1800**. Thereafter, releasing the button can terminate audio streaming, disable the microphone, or terminate the wireless connection, respectively. In some embodiments, various functions are triggered by various numbers and/or durations of presses.

[0110] The base device, with or without connectivity to the pendant device, can communicate with the 911 mapping system. Specifically, the base device can be used to send emergency alerts to the 911 mapping system. When an alert is sent from the base device, it will appear on the 911 mapping system and permit the responding officer to view one or more of the device code, company name, room number in which the device is located, time of the incident, address, live streaming of audio and video, or other pertinent information provided by the personal security base device. Further, officers will be able to track the location of device if it is moving.

[0111] Using the methods and systems and apparatus described herein, a method and system for providing a message to a predetermined destination based on detection of a spoken keyword is described. A system in which functionality may be triggered by an activation action, followed by a monitoring and detection process is described. Activation of continuous monitoring may be accomplished using a user action such as a key press, or a spoken word and/or phrase. An acknowledgement may be delivered to a user when a monitoring function is activated. A monitoring function may be deactivated by a user action. For example, a "stop" word, phrase, gesture, and/or a UI actuation may cause a monitoring function to be terminated.

[0112] A plurality of keywords, which may consist of one or more utterances, can be identified. A corresponding destination for a message associated with a keyword can be defined. A spoken keyword may be verified based on utterances of a user. An action associated with a keyword may be verified by the system. An action associated with a keyword may be determined based on a destination associated with a keyword. A destination of a message associated with a keyword may be determined based on a type associated the destination and information acquired by a recording device which has detected a keyword.

[0113] A recording device is provided which may comprise sensors including audio, location, magnetic, RF, gyroscopic, temperature, pressure, and video data acquisition. When a monitoring function is activated, local storage may be used to record any or all available data. A speech detection and recognition capability may be resident on a recording device and/or may be obtained via a network. A recording device may have at least one network connection.

[0114] A network interface is provided which may permit a device with sufficient authorization to access information of any device connected to a network. A network, which may consist of one or more public and/or private networks, allows messages to be passed between devices using messaging protocols such as TCP/IP and HTTP and SMTP. A messaging server is provided which may allow messages to be routed from a recording device to user devices and/or responder devices.

[0115] If a keyword is detected, a message is originated by a recording device. A message may include prior recordings of audio, video, location, and/or other information acquired by a recording device while the recording device is actively monitoring. If a message is received by a responder system, information associated with a user may be provided. Information recorded by a recording device may be requested by a responder system. A responder system may receive continuous and/or on-demand updates of information which is recorded by a recording device.

[0116] The systems and methods described herein have been described using specific user interface components and methods which are well known in the art. However, no limitation is implied thereby. Any suitable components which may accomplish the functionality described herein and which are well known in the art may be used within the scope and spirit of the embodiments herein.

[0117] Any or all operations described herein may be implemented via one or more hardware components. However, the present invention is not limited to any specific

implementation of an operation. For example, one or more operations discussed herein may be implemented via software executed on a device while others may be executed via a specific hardware device.

[0118] Further, according to an aspect of the embodiments, any combinations of the described features, functions, and/or operations can be provided.

[0119] The many features and advantages of the claimed invention are apparent from the detailed specification. Thus, it is intended by the appended claims to cover all such features and advantages of the claimed invention that fall within the true spirit and scope of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described for the disclosed embodiments, and accordingly all suitable modifications and equivalents may be resorted to while still falling within the scope of the claimed invention. It will further be understood that the phrase "at least one of A, B, and C" may be used herein as an alternative expression that means "one or more of A, B, and C." What is claimed is:

1. An apparatus for performing a personal security procedure, comprising:

(a) a data processor;

(b) a microphone operatively coupled to the data processor, wherein the microphone is configured to detect audio signals and provide the audio signals to the data processor;

(c) a memory module operatively coupled to the data processor, wherein the memory module is configured to store one or more personal security response operations, wherein at least one personal security response operation is defined by a user;

(d) a communications module operatively coupled to the data processor, wherein the communications module is configured to transmit a personal security alert defined by one of the personal security response operations;

wherein the personal security procedure includes:

(i) receiving an initiation signal,

(ii) enabling the microphone in response to the receiving of the initiation signal,

(iii) detecting a spoken keyword from the audio signals, wherein the spoken keyword initiates one of the one or more personal security response operations, and wherein the spoken keyword initiates recording of subsequent audio signals, and

(iv) transmitting the personal security alert defined by the one of the one or more personal security response operations to a remote device.

2. The apparatus of claim **1**, wherein the initiation signal is provided by a tactile control when activated by the user.

3. The apparatus of claim **1**, wherein the initiation signal is the detection by the microphone of a spoken audio cue.

4. The apparatus of claim **1**, wherein the subsequent audio signals are stored in an audio file is stored in the memory module.

5. The apparatus of claim **1**, further comprising:

a video camera operatively coupled to the data processor and configured to capture video signals;

wherein the initiation of the one of the one or more personal security response operations of the personal security procedure initiates recording of subsequent video signals.

6. The apparatus of claim **1**, wherein the communications module is capable of at least one of Wi-Fi communications and cellular data communications.

7. The apparatus of claim **1**, wherein the personal security procedure further includes, in response to receiving a termination signal, terminating the recording of the subsequent audio signals.

8. The apparatus of claim **7**, wherein the personal security procedure further includes transmitting the recorded subsequent audio signals to a remote server for storage subsequent to the terminating of the recording of the subsequent audio signals.

9. The apparatus of claim **1**, further comprising a GPS module, wherein the personal security alert includes geographic location data about the apparatus collected via the GPS module.

10. The apparatus of claim **1**, wherein the recording of the subsequent audio signals is provided to the remote device in continuous real time.

11. A system, comprising:

(a) a personal security device, including

(i) a data processor having a memory storing a personal security response procedure, wherein the personal security response procedure defines an alert message and a trigger event,

(ii) a microphone operatively coupled to the data processor and configured to receive audio signals, wherein the microphone is configured to detect the trigger event from the audio signals, wherein the microphone records the subsequent audio upon detection of the trigger event,

(iii) a wireless transmitter operatively coupled to the data processor, wherein the wireless transmitter is configured to transmit the alert message upon detection of the trigger event, wherein the alert message includes a geographic location associated with the personal security device, and

(b) a remote server hosting a security monitoring application, wherein the remote server is configured to communicate with the wireless transmitter and is configured to receive the alert message, and wherein the security monitoring application is configured to display the alert message to a user through a graphical user interface.

12. The system of claim **11**, wherein the personal security response procedure further defines a plurality of contact users, wherein at least one of the plurality of contact users is correlated with the alert message and the trigger event, wherein the wireless transmitter transmits the alert message to the correlated contact user upon detecting the trigger event.

13. The system of claim **11**, wherein a portion of the subsequent audio is compiled into an audio file and is stored in the memory.

14. The system of claim **11**, wherein a portion of the subsequent audio is compiled into an audio file and transmitted to and stored within a remote database.

15. The system of claim **11**, wherein the personal security device further includes a video camera operatively coupled to the data processor and configured to capture video signals, wherein the video camera records the subsequent video upon detection of the trigger event.

16. The system of claim **15**, wherein a portion of the subsequent video is compiled into a video file and is stored in the memory.

17. The system of claim **15**, wherein the subsequent audio recorded by the microphone is streamed by the wireless transmitter to the remote server for real-time viewing via the security monitoring application.

18. A method of providing a personal security alert, comprising the steps of:

(a) receiving an initiation signal;

(b) in response to the receiving of the initiation signal enabling a microphone and receiving audio signals from the microphone;

(c) detecting a triggering event from the audio signals;

(d) upon detecting the triggering event, initiating a personal security response operation, wherein the personal security response operation defines event data pertaining to

(i) the triggering event,

(ii) an alert message to transmit in response to detecting the triggering event, and

(iii) one or more contacts to transmit the alert to in response to detecting the triggering event;

(e) signals upon detecting the triggering event, initiating a recording of the subsequent audio;

(f) composing the alert message defined by the event data; and

(g) transmitting the alert message to the one or more contacts defined by the event data.

19. The method of claim **18**, further comprising:

(h) providing upon detecting of the triggering event a real-time audio feed of the recording of the subsequent audio to the one or more contacts defined by the event data.

20. The method of claim **18**, further comprising:

(h) terminating the recording of the subsequent audio upon detecting of a second triggering event and compiling the subsequent audio into an audio file; and

(i) transmitting the audio file to a remote server for storage.

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