ABSTRACT

A mobile phone app is utilised, the app being loaded into a mobile device of each of a nominated set of responsible persons and which turns on and loads when the mobile device is turned on. Thus the app is continually running in the background. A conventional alarm system 10 has its alarm panel 11 connected to an alarm sensor 13. The alarm sensor 13 is able to communicate in any one of three possible fashions. The first of these is by means of a hard wired local area network LAN 15. The second is via the means of a WiFi connection 16, which is used if no hard wired telephone connection is available. The third possibility is a 3G/4G modem 17, which is used if the local internet connection is down or is otherwise not available.

Figure 3

TITLE OF INVENTION

Monitoring Conventional Alarm Systems

TECHNICAL FIELD

The present invention relates to the monitoring of conventional alarm systems such as are used in businesses and residential homes.

BACKGROUND

The following references to and descriptions of prior proposals or products are not intended to be, and are not to be construed as, statements or admissions of common general knowledge in the art. In particular, the following prior art discussion does not relate to what is commonly or well known by the person skilled in the art, but assists in the understanding of the inventive step of the present invention of which the identification of pertinent prior art proposals is but one part.

A typical prior art method of alarm monitoring is schematically illustrated in Figure 1 in which a customer site is monitored by a security alarm control room in which one or more persons viewing computer screens are able to observe alarm notifications. In the event that the operator is of the view that the alarm notification is a genuine alarm, the operator then telephones one or more of the responsible persons on the list of responsible persons and these persons are advised either by landline or mobile phone that an alarm has been triggered at the monitored premises.

A responsible person is a person nominated by an owner, being an individual or organisation, for which the premises is protected by a security alarm system, and may include directors, employees, contractors or consultants of the owner.

This arrangement enables such premises to be serviced by specialised service providers who not only install the alarm system but monitor it 24 hours a day, 7 days a week and alert the responsible person when the alarm system generates an alarm notification. The users are charged for the staffing of the service provider maintained control room and thus this system is relatively expensive. This service does incur ongoing Weekly/Monthly/Quarterly or Annual charges depending on the agreement with the Monitoring Service Provider.

An alarm may be communicated from an alarm system using a variety of communication methods, including public switched telephone network (PSTN) or plain old telephone service (POTS), direct line (point to point subscriber), global system for mobile (GSM), including 3G, 4G, general packet radio service (GPRS) and transmission control protocol/ internet protocol (TCP/IP).

An object of the present invention is to ameliorate the aforementioned disadvantages of the prior art or to at least provide a useful alternative thereto.

SUMMARY OF INVENTION

The genesis of the present invention is originates in part from a desire to reduce the cost of alarm monitoring and, in particular to utilise the functionality available in that nearly all of the responsible persons are equipped with a mobile communication device capable of receiving digital data via a wireless telephone communication system. Such devices include mobile phones with “smart phone” capabilities. Current suppliers or brands of “smart phones” include iPhone, Samsung and other so-called Androids, Blackberry and Windows Phone. Most smart phones are connected to the internet by, for example a 3G/4G network or by local Wi-Fi. Responsible persons nominated to be on-call for instructions regarding alarm alerts are generally contactable via their mobile phones by voice, text (SMS) or email. The invention utilises the accessibility of responsible persons by establishing connectivity directly from the alarm system to the responsible person or persons instead of to a remote third party control room.

In accordance with a first aspect of the present invention there is disclosed

a method of monitoring a conventional alarm system to alert at least two responsible persons equipped with a mobile phone device, said method comprising the steps of:

connecting an alarm sensor to said alarm system to generate electric alarm data of an alarm event;

providing each of the mobile phone devices with a software program which permanently runs in the background whilst the device is operational;

sending a message derived from the electric alarm data alerting the responsible persons of the alarm event to each device;

the software program converting said alarm data to a graphic and/or audible alarm;

connecting a wireless communications information board (WCIB) to the alarm system via a telephone connection; and

connecting the WCIB to an external network by a wired or wireless network connection adapted to be able to connect with the devices to send the message,

wherein the WCIB provides an intermediate link between the alarm system and the devices that utilises a telephone connection with the alarm system.

In another aspect of the invention, there is provided a method of monitoring a conventional alarm system to alert recipients equipped with a mobile phone having "smart phone" capabilities, said method comprising the steps of connecting an alarm sensor to said alarm system to receive electric alarm data therefrom in the event of presumed detection of an intruder by said alarm system, providing each of the mobile phones of said recipients with a mobile phone app which runs in the background, sending said electric alarm data to said preselected mobile phones and converting said alarm data to a graphic and/or audible alarm.

In accordance with another aspect of the present invention there is disclosed an alarm monitoring system for responsible persons equipped with a mobile phone device having a software program loaded thereon to enable interaction with a WCIB of a security alarm system, said alarm system comprising an alarm sensor arranged to be activated by a conventional alarm system on presumed detection of an alarm even such as a fire or unauthorised entry, the WCIB adapted to receive electric alarm data and transmit a corresponding intelligible message to the devices, the WCIB when activated connecting to an external network and sending the message to the preselected mobile phones devices, each of which has running in the background the software program to convert said alarm data to a graphic and/or audible alarm message or display,

wherein the WCIB is connected to the alarm system via a telephone connection.

In accordance with another aspect of the present invention there is disclosed an alarm monitoring system for recipients equipped with a mobile phone having "smart phone" capabilities, said system comprising an alarm sensor arranged to be activated by a conventional alarm system on presumed detection of an intruder, to thereby receive electric alarm data, said sensor when activated connecting to the internet and sending said alarm data to preselected mobile phones, each of which has running in the background an app to convert said alarm data to a graphic and/or audible alarm.

The invention utilises an onsite module in the form of a wireless communications information board (WCIB). The WCIB is preferably installed at the location (at or on the premises of the owner) of the alarm system. The WCIB is installed on the premises to be monitored by the alarm system and provides the intermediary between an existing alarm panel (in the case of retrofitting) or a new alarm panel, and the responsible persons' mobile phones using WiFi, wired Ethernet, 3G-4G (or subsequent communication generations), or other remote wireless network communication means.

The WCIB of the invention is adapted to connect to a global communication network, such as the internet. This may be achieved by wired or wireless means, including by WiFi or a wired network connection. Should the orthodox network connection become unavailable through some technical failure, climatic conditions, an infrastructure failure or temporary cessation of services, or other reason, for redundancy purposes a modem and SIM card is preferably provided to enable wireless connection to a telephone network, for example a 3G or 4G network.

In a retrofit of an existing alarm system, the WCIB is preferably connected directly to the already installed system. This is preferably through the system's dialer output port. The dialer output port is normally where a PSTN line would be connected. Accordingly, the WCIB is preferably placed between the existing system and the outgoing telephone line. The advantage of this facility is more significant with the advent of the national broadband network (NBN) in Australia and the introduction of equivalent non-copper based telephone networks and connections in other jurisdictions. With such new networks, onld alarm systems reliant on a telephone-out

connection will become redundant and require replacement. However, the current invention permits their retention and furthermore enhances the usability to the owner, as well as reduce security costs.

The WCIB is preferably programmed to interpret information from an alarm signal. A retrofitted WCIB is preferably adapted to send a message via the telephone connection and the global network (internet) to one or more telephones. The telephones are preferably capable of receiving a short message service (SMS) text message, although this is primarily a redundancy feature in case the network connection fails. The app software on the mobile telephone devices is configured to read the WCIB message transmissions that are custom made based on an app customer written protocol. However, if the default network connection fails, the WCIB is preferably adapted to house a SIM card to enable wireless external connection by 3G/4G connection.

The telephones of the invention are preferably smart phones. Preferably, the message is sent to at least five smart phones, each one held by a responsible person.

In relation to redundancy and fall-back utilisation of SMS messaging, the primary means of messaging from the WCIB to the mobile devices is peer to peer (P2P) in which the app software loaded on the mobile device is configured to interact with the WCIB using the same or complementary communication protocols.

The message is preferably sent in real time as a consequence of the WCIB receiving an alarm signal from the system. The message is sent to the responsible persons' smart phones to act upon an alarm event, just as they would if a security company called them.

Each smart phone has an app, made according to an aspect of the invention, installed on the smart phone. The app preferably stays live and runs in the background of the smart phone's operation at all times that the smart phone is on. Provided that the smart phone has internet access, it will receive a message of an alarm event wherever the smart phone is, i.e. any where in the world.

A preferred embodiment includes a wireless information communications board (WCIB) that is controlled by a microprocessor. The WCIB has its own real time clock

(RTC). The WCIB preferably has a Wi-Fi module. The WCIB preferably has a local area network (LAN) module. The WCIB preferably has an on-board modem. The modem is preferably adapted to connect via 3G or 4G, or a subsequent telephone network generation.

Advantageously, the WCIB uses the owner's internet connection on the premises to send and receive information or messages to one or more smart phones. The message preferably comprises live alarm information from the alarmed site of the premises. As a redundancy safety measure, the WCIB may utilise an installed SIM card and 3G/4G connection to connect directly to the smart phones.

Preferably, the WCIB will provide a dial tone and will answer or receive calls made by the alarm panel of the installed alarm system. The WCIB preferably includes a telephone receiver protocol to connect to and receive data from the alarm panel. The WCIB preferably sends that data to its internal processing unit (CPU). The CPU preferably has a built in database. The database may be used by the WCIB to read and convert the data and to store it. The data may be stored on a memory disc, drive or solid state device. The data may be stored in a flash memory. The storage device may be housed on or associated with the WCIB. The data or a corresponding alert message may then be sent directly to the one or more responsible persons' smart phones. With a suitable software package or program, such as an app, installed and paired on each of the responsible persons' communication devices, the devices are each able to display an intelligible message to the responsible person on the device.

The program preferably communicates via the device to the responsible by a display and/or audio alert that an alarm signal has been generated by the alarm system. This may include the display of a red icon and/or an audible tone. The program may provide for an acknowledgement icon or button on the device's screen. For example, the device may have a touch-sensitive screen to enable user input. Once the acknowledgement is activated on one device ("the acknowledging device"), for example by one of the responsible persons pressing the button or icon on the acknowledging device, all other responsible persons may be notified by the return of a signal from the acknowledging device to the WCIB, and then a message may be

relayed, on-sent, re-sent, or freshly generated and sent to the remaining devices informing the remaining responsible persons that another of the responsible persons ("the primary responsible person") has taken responsibility for the alarm event. This may entail the primary responsible person attending the premises or otherwise dealing with the alarm event, such as by notifying another person or organisation, such as security personal or a consultant, or law enforcement, as determined by the nature of the alarm event and the level of capability of the primary responsible person.

In a preferred arrangement according to one aspect of the invention, the app will alert each of the responsible persons of the fact of the alarm event. If one responsible person presses or touches the acknowledgement button, that person is thereby is nominated as the primary responsible person. The remaining responsible persons are notified by a message or other display informing them that someone else has taken responsibility for the alarm event.

The WCIB preferably has one or more outputs, and preferably two outputs, that are adapted to controllable by the communications device of the primary responsible person.The outputs may be the arming or disarming of the alarm system, the locking or unlocking of an electronically controlled door lock, or any other suitable action on or in relation to the premises.

Preferably, the WCIB has a data storage facility. The data storage facility may be adapted to store data in relation to an alarm event for a limited period of time, such as in the range of 2 - 360 days or 2 - 30 days, or up to and no less than 30 days, or indefinitely.

The WCIB may have security protection to isolate it from hacking risks or other unauthorised tampering or interference. Preferably, the WCIB can only be setup, programmed, re-set and/or have its settings modified, by access directly if it has input and display facilities, or by access through a LAN connection. Preferably, the WCIB cannot be modified by access through Wi-Fi or 3G/4G connections. In this way, user data such as responsible person contact information (e.g. telephone numbers), contact indentification (ID) conversion tables are isolated from access via an external network. Preferably, setting up of Wi-Fi or 3G/4G connections, including password

information, can only be performed directly with the WCIB or via a wired internal network connection.

The software program or "app" may be installed on the responsible person's mobile communications device, such as a smart phone. The app may have set-up parameters, such as internet protocol (IP) settings, default port, username and password, etc., that are nominated by the responsible person (the user of the device) or a technical support person.

The app on a particular mobile device may be able to lock onto one or more, and preferably as many as five, separate WCIB modules. The WCIB is preferably adapted to send live alarm events to the one or more mobile devices nominated for that WCIB simultaneously.

The mobile device is adapted to receive live alarm events from a converted contact ID table stored on the WCIB. The live alarm event messages preferably convey informative messages to the one or more mobile devices. For example: Zone 1 – PIR Lounge room; or Zone 77 – fore alarm kitchen. The app may list the information, messages and data associated with each alarm event (called an "event block" that commences with the activation of an alarm received and issued by the WCIB and concludes when the alarm system is disarmed) and this may be displayed on its screen or other display or other information output. The event block may be a new event stream sent after the alarm system has been disarmed to conclude a previous alarm event and re-armed.

The app preferably provides an array of button inputs to enable outputs or commands to be sent to the WCIB connected to the alarm system. The buttons preferably activate outputs from the mobile device. The app also has the facility to tag or name the outputs. For example, outputs may be tagged as Disarm and Arm. There may be two (2) active outputs (disarm or unlock door, etc.) on the WCIB that may be controlled by the app.

The app may display on the mobile device display a button to seek and receive an indication of the "Current Status" of the alarm system by recalling the last arm and/or disarm signals sent. These signals may be sent to the app by the WCIB. However,

such information may only be displayed in the background as they may be rated as a low priority event that is not required to alert the user. The app preferably recognises a signal from the WCIB and interprets the signal as corresponding to an Armed or Disarmed status from that signal. The display system may include a "traffic light" system, using for example a green light for disarmed, a red light for armed and an amber light for alarm condition uncertain.

The app may require an acknowledge alarm button on the app screen to be used for the acknowledgement of the alarm event.

When the alarm event is acknowledged by the primary responsible person, preferably the WCIB will stop sending alarm messages to the remaining mobile devices and only send them to the primary responsible person who acknowledged the alarm event. The WCIB module may then be able to send a message to the remaining responsible persons so that their app screen indicates that some one else has taken responsibility for the alarm event, for example by changing to a green symbol display.

The app may have an ARM/DISARM (toggle) button to enable the user to disarm the site's alarm system. The ARM/DISARM button may require a password or user code to be entered to ensure that the responsible person is a valid user authorised to disarm the system. It may be noted that not all existing or installed alarm panels will have a key switch input to allow ARM/DISARM. Such issues can be noted in product information sheets and setup sheets.

Another app button may bring up a Call List (that may also be set up in a Parameters facility of the app). This may allow a simple touch or press of the button to dial to call Emergency or Police, or other users or services. The call list may have storage for multiple telephone numbers or contacts (e.g. phone numbers or email addresses). The call list may have capacity for up to 10 numbers, with the Police number as the primary number (for example in Australia the emergency number is 000 and in the US it is 911).

The App preferably loads and sits in the background when the mobile device is switched on and may use the least amount of resources as possible when idle.

It may be important for some sites to have time monitoring. If the alarm system has not been armed by a predetermined time, the app may alert a user who can then arm the system (if it has been set up to do so from the app). Alternatively, the user may go to the site and arm the system directly. This function can also alert users if the site has been disarmed during predetermined times. This is an advantageous feature.

Another feature of the app is a user-selectable audible alarm alert tone. The alert tone preferably has a siren sound set as the default.

The app may have a "do not disturb" feature which is easy to switch on/off. The app may use a mobile device's silent function so that only a "Vibrate" or "visual only" signal is activated to avoid noise signals being generated at inconvenient times.

Advantageous Effects of Invention

1. Removes dependence upon human surveillance for reporting.

2. Copes with some power supply failures.

BRIEF DESCRIPTION OF DRAWINGS

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a schematic representation of a prior art method of alarm monitoring.

Figure 2 is a schematic representation of alarm monitoring in accordance with the preferred embodiment of the present invention.

Figure 3 is a more detailed block diagram representation of the system of Figure 2.

Figure 4 is a detailed block diagram of the alarm sensor of the preferred embodiment.

Figure 5 is a schematic representation of the communication protocol used to communicate between the conventional alarm system and the alarm sensor.

Figure 6 is a schematic representation of the display of two mobile phones illustrating a graphical alarm.

Figure 7 is a view similar to Figure 6 but illustrating a reset situation.

Fig. 8 is a schematic representation of the relationship between a board of WCIB, alarm panel and network connection.

Fig. 9 is a representation of the circuit board of the WCIB shown in Fig. 8.

DESCRIPTION OF EMBODIMENTS

Preferred features of the present invention will now be described with particular reference to the accompanying drawings. However, it is to be understood that the features illustrated in and described with reference to the drawings are not to be construed as limiting on the scope of the invention.

Figure 1 illustrates the typical prior art method of alarm monitoring and, as explained above, utilises an expensive alarm control room which must be paid for by the owner, or tenant, of the premises known as the customer site where the conventional alarm system is installed.

As schematically illustrated in Figure 2, the preferred embodiment of the present invention does away with the need for a control room and utilises a mobile phone app which is loaded into the mobile phone of each of the responsible persons and which turns on and loads when the mobile phone is turned on. Thus the mobile phone app is continually running in the background.

As seen in Figure 3, a conventional alarm system 10 has its alarm panel 11 connected to an alarm sensor 13. The alarm sensor 13 is able to communicate in any one of three possible fashions. The first of these is by means of a hard wired local area network LAN 15. The second is via the means of a WiFi connection 16 which is used if no hard wired telephone connection is available. The third possibility is a 3G/4G modem 17 which is used if the local internet connection is down or is otherwise not available. This is also an alternative if the Local Area Network or WiFi is disabled. 3G/4G is optional by use of a valid SIM card.

The abovementioned communications capability enables the alarm sensor 13 to communicate with local monitoring users via the communications path labelled 1 in Figure 3. In addition, communications are possible with proximity monitoring users as indicated by communications path labelled 2. Furthermore, as indicated by

communications path 3, communications are possible with remote monitoring users and a security service provider server, if desired.

The internal components of the alarm sensor 13 are illustrated in more detail in Figure 4.

The operation of the alarm sensor 13 is best understood in relation to the signal protocol as illustrated in Figure 5. In the event that an alarm event is triggered, the conventional alarm system 10 causes the alarm panel 11 to activate its telephone interface. This is equivalent to picking up the phone or taking the phone off the hook.

The telephone interface waits for a dial tone which is generated by the alarm sensor 13. When the alarm panel 11 receives the dial tone, the alarm panel 11 dials a number which was originally intended to be the telephone number of the security alarm control room of Figure 1. However, this is modified to be a telephone number which is associated with the alarm sensor 13. Only this predefined number is captured by the alarm sensor 13. Any other telephone number will not trigger a response from the alarm sensor 13.

The alarm sensor 13 waits for one second to enable any fluctuating voltages to settle, after which it sends a contact handshake. As illustrated in Figure 5, the contact handshake is made up of 100mSec of 1400Hz pure tone followed by 100mSec of silence, and then followed by a further 100mSec of pure tone but this time of frequency of 2300Hz.

The receipt of this handshake signalled by the alarm panel 11 causes the alarm panel within 250mSec to generate the contact message. This message takes the form of 16 dial tone modulated frequency (DTMF) digits. Each digit is 50mSec in duration separated by 50mSec of silence. The last digit is a check sum digit that enables the alarm sensor 13 to verify the integrity of the message received from the alarm panel 11. The contact message includes data such as a number identifying the premises, the number of the sensor which has been triggered (for example, a back door or a side window), and the like.

After successful reception by the alarm sensor 13 of the contact message, the alarm sensor 13 sends a "kiss-off" signal. The kiss-off signal is made up from 800mSec of 1400Hz pure tone. If the alarm panel 11 does not receive the kiss-off tone in time, it is programmed to re-transmit the contact message. Following receipt of the kiss-off signal, the alarm panel 11 completes the alarm notification by restoring the telephone interface to its initial "on hook" status.

Following receipt of the contact message, the alarm sensor 13 then communicates with the preselected mobile phones, the numbers of which are stored within the alarm sensor 13. Contact ID is a useful protocol for the above operations. This is also known as Ademco Contact ID and is available from Ademco (Far East) Pte Ltd.

As indicated in Figure 6, a mobile phone with "smart phone" capabilities is carried by the responsible persons. Two possible such phones, namely an APPLE iPhone and a SAMSUNG Galaxy are illustrated. The preferred alarm indication is to turn the screen red, to thereby provide a graphic as well as an audio alarm, and to provide a graphical display of the data contained in the electrical signals sent in the contact message.

The app stored within the phones enables the alarm to be acknowledged. In addition, the alarm sensor 13 is able to be disarmed or re-armed. Furthermore, the mobile phones can poll the alarm sensor 13 so as to obtain the current status of its data.

Preferably when the first of the mobile phone users presses the acknowledge "button" on his mobile phone screen, all other users will be notified of this action by their phone's screen turning green instead of red. That is to say, the user who first acknowledges the alarm thereby takes responsibility for the alarm and the follow-up action which is required.

Turning to Figs. 8 and 9 and with reference to Fig. 4, the preferred embodiment includes a wireless information communications board (WCIB) 20 that is controlled by a microprocessor 22. The WCIB 20 has its own real time clock 24. The WCIB 20 also includes a Wi-Fi module 21, a local area network (LAN) module 25 and an on-board modem 27. The on-board modem 17 is adapted to connect via 3G or 4G, or a subsequent telephone network generation, eg. 5G.

The WCIB 20 preferably uses the owner's internet connection on the premises to send and receive information or messages to one or more smart phones correspondingly held by responsible persons. The message preferably comprises live alarm information from the alarmed site of the premises. As a redundancy safety measure, the WCIB 20 ideally utilises an installed SIM card and 3G/4G connection to connect directly to the smart phones using SMS messaging. However, the preferred default form of messaging is a P2P customer written protocol that renders the WCIB 20 compatible with the app 50 for exchange of data and messages.

The WCIB 20 provides a dial tone and will answer or receive calls made by the alarm panel 11 of the installed alarm system 10. The WCIB 20 includes a telephone receiver protocol to connect to and receive data from the alarm panel 11. The WCIB 20 sends that data to its internal processing unit (CPU) 22. The CPU 22 has a built in database stored permanently on a ROM drive 26. The database is used by the WCIB 20 to read and convert the data and to store it on the permanent memory 26. The data may be stored on a memory disc, drive or solid state device. The data may be stored in a flash memory 28. The storage device 26,28 is housed on or associated with the WCIB 20. The data or a corresponding alert message may then be sent directly to the one or more responsible persons' smart phones. With a suitable software package or program, such as an app 50, installed and paired on each of the responsible persons' communication devices 40, the devices 40 are each able to display an intelligible message 52 to the responsible person on the device 40, such as "Zone 2 – Study PIR" as shown in Fig. 6, or "Area 1 Access – User 2 – Peter" as shown in Fig. 7.

The program 50 can communicate via the device 40 to the responsible person by a display 54 and/or audio alert that an alarm signal 56 has been generated by the alarm system 10. This preferably includes the display of a red icon 56 and/or an audible tone. The program 50 provides for an acknowledgement icon or button 62 on the device's screen 54. The device 40 has a touch-sensitive screen 54 to enable user input via the four buttons, Acknowledge 62, Disarm 63, Current Status 64 and Arm 65. Once the acknowledgement button 62 is activated on one device ("the acknowledging device") 40a by one of the responsible persons pressing the button or icon 62 on the

acknowledging device 40a, all other responsible persons may be notified by the return of a signal from the acknowledging device 40a to the WCIB 20, and then a message may be relayed, on-sent, re-sent, or freshly generated and sent to the remaining devices 40 informing the remaining responsible persons that another of the responsible persons ("the primary responsible person") has taken responsibility for the alarm event. This may entail the primary responsible person attending the premises or otherwise dealing with the alarm event, such as by notifying another person or organisation, such as security personal or a consultant, or law enforcement, as determined by the nature of the alarm event and the level of capability and/or authority of the primary responsible person.

The app 50 will alert each of the responsible persons of the fact of the alarm event. If one responsible person presses or touches the acknowledgement button 62, that person is thereby is nominated as the primary responsible person. The remaining responsible persons are notified by a message or other display 52 informing them that someone else (the primary responsible person) has taken responsibility for the alarm event.

The WCIB 20 has one or more outputs, and preferably two outputs, that are adapted to controllable by the communications device of the primary responsible person. The outputs may be the arming or disarming of the alarm system, the locking or unlocking of an electronically controlled door lock, or any other suitable action on or in relation to the premises.

As mentioned, the WCIB 20 has data storage facilities 26,28. The data storage facility 26,28 may be adapted to store data in relation to an alarm event for a limited period of time, such as in the range of 2 - 360 days or 2 - 30 days, or up to and no less than 30 days, or indefinitely. Typically, a period of 2 days is elected to optimise storage and performance of the WCIB 20.

The WCIB 20 may have security protection to isolate it from hacking risks or other unauthorised tampering or interference. In the preferred embodiment, the WCIB 20 can only be setup, programmed, re-set and/or have its settings modified, by access directly if it has input and display facilities, or by access through the LAN connection 25. The WCIB 20 cannot be modified by access through Wi-Fi or 3G/4G connections.

In this way, user data such as responsible person contact information (e.g. telephone numbers), contact identification (ID) conversion tables are isolated from access via an external network. Preferably, setting up of Wi-Fi or 3G/4G connections, including password information, can only be performed directly with the WCIB or via a wired internal network connection.

The software program or "app" 50 is adapted to be installed on the responsible person's mobile communications device 40, such as a smart phone. The app 50 has set-up parameters, such as internet protocol (IP) settings, default port, username and password, etc., that are nominated by the responsible person (the user of the device 40) or a technical support person.

The app 50 on a particular mobile device 40 may be able to lock onto one or more, and preferably as many as five, separate WCIB modules 20. The WCIB 20 is adapted to send messages 52vin relation to live alarm events to the one or more mobile devices 40 nominated for that WCIB 20 simultaneously.

The mobile device 40 is adapted to receive live alarm events from a converted contact ID table stored on the data storage 26,28 of the WCIB 20. The live alarm event messages 52 preferably convey informative messages to the one or more mobile devices 40. For example: Zone 1 – PIR Lounge room; or Zone 77 – alarm kitchen. The app 50 may list the information, messages and data 52 associated with each alarm event (called an "event block" that commences with the activation of an alarm received and issued by the WCIB 20 and concludes when the alarm system 10 is disarmed) and this may be displayed on its screen 54 or other display or other information output. The event block may be a new event stream sent after the alarm system 10 has been disarmed to conclude a previous alarm event and re-armed.

The app 50 provides an array of button inputs 60 to enable outputs or commands to be sent to the WCIB 20 connected to the alarm system 10. The buttons 60-65 activate outputs from the mobile device 40. The app 50 also has the facility to tag or name the outputs. For example, outputs may be tagged as Disarm 63 and Arm 65. There may be two (2) active outputs (disarm or unlock door, etc.) on the WCIB 20 that may be controlled by the app 50.

The app 50 may display on the mobile device display 54 a button 62 to seek and receive an indication of the "Current Status" of the alarm system 10 by recalling the last arm and/or disarm signals sent. These signals are sent to the app 50 by the WCIB 20. However, such information is only displayed in the background of the device 40 as they may be rated as a low priority event that is not required to alert the user. The app 50 recognises a signal from the WCIB 20 and interprets the signal as corresponding to an Armed or Disarmed status from that signal. The display system may include a "traffic light" system, using for example a green light for disarmed, a red light for armed and an amber light for alarm condition uncertain.

The app 50 includes an acknowledge alarm button 62 on the app screen 54 to be used for the acknowledgement of the alarm event.

When the alarm event is acknowledged by the primary responsible person, preferably the WCIB 20 will stop sending alarm messages 52 to the remaining mobile devices 40 and only send them to the primary responsible person's device 40a which acknowledged the alarm event. The WCIB module 20 is then able to send a message 52 to the remaining responsible persons so that their app screen 54 indicates that some one else has taken responsibility for the alarm event, for example by changing to a green symbol display as shown in Fig. 7.

The app 50 may have an ARM/DISARM (toggle) button to enable the user to respectively arm or disarm the site's alarm system 10. The ARM/DISARM button may require a password or user code to be entered to ensure that the responsible person is a valid user authorised to disarm the system 10. It may be noted that not all existing or installed alarm panels 11 will have a key switch input to allow ARM/DISARM. Such issues can be noted in product information sheets and setup sheets.

Another app 50 button may bring up a Call List (that may also be set up in a Parameters facility of the app 50). This may allow a simple touch or press of a button to dial to call Emergency or Police, or other users or services. The call list may have storage for multiple telephone numbers or contacts (e.g. phone numbers or email addresses). The call list may have capacity for up to 10 numbers, with the Police

number as the primary number (for example in Australia the emergency number is 000 and in the US it is 911).

The app 50 preferably loads and sits in the background when the mobile device 40 is switched on and optimally uses the least amount of resources as possible when idle.

It may be important for some sites to have time monitoring. If the alarm system 10 has not been armed by a predetermined time, the app 50 may alert a user who can then arm the system 10 (if it has been set up to do so from the app 50). Alternatively, the user may go to the site and arm the system 10 directly. This function can also alert users if the site has been disarmed during predetermined times.

Another feature of the app 50 is the provision of the option of a user-selectable audible alarm alert tone. The alert tone preferably has a siren sound set as the default.

The app 50 may have a "do not disturb" feature which is easy to switch on/off. The app 50 may use the mobile device's 40 silent function so that only a "Vibrate" or "visual only" signal is activated to avoid noise signals being generated at inconvenient times.

In Fig. 9, there is shown a board for the WCIB 20 in which at least the following functionality is provided:

A telephone line connection J16 being tip/ring connection in which the WCIB mimicks the parameters and properties of a telephone line to enable the alarm system to operate as previously configured using a telephone connection outlet;

A 12V input J1 to power up the WCIB;

Output relays L2-4 for two inputs J3 and two outputs J2. The inputs J3 may include anything that may be triggered on the premises, such as sprinkler or door locks. The outputs J2 are controlled by the mobile device 40 and may include arming and disarming the alarm system 10 and/or turning lights on/off at the premises. The exchanges between the WCIB 20 and the mobile device app 50 use a Honeywell protocol;

A SIM card holder U12;

A 3G/4G modem U11 (also designated 27 in Fig. 4);

A Wi-Fi modem U8 (also designated 21 in Fig. 4);

A USB connection J4 (also designated 18 in Fig. 4) for upgrades, etc.;

A LAN connection J10 (also designated 25 in Fig. 4); and/or

A microprocessor U4 (also designated 22 in Fig. 4).

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the security alarm arts, can be made thereto without departing from the scope of the present invention.

The term "comprising" (and its grammatical variations) as used herein is used in the inclusive sense of "including" or "having" and not in the exclusive sense of "consisting only of".

In the present specification, terms such as "apparatus", "means", "device" and "member" may refer to singular or plural items and are terms intended to refer to a set of properties, functions or characteristics performed by one or more items or components having one or more parts. It is envisaged that where an "apparatus", "means", "device" or "member" or similar term is described as being a unitary object, then a functionally equivalent object having multiple components is considered to fall within the scope of the term, and similarly, where an "apparatus", "assembly", "means", "device" or "member" is described as having multiple components, a functionally equivalent but unitary object is also considered to fall within the scope of the term, unless the contrary is expressly stated or the context requires otherwise.

Orientational terms used in the specification and claims such as vertical, horizontal, top, bottom, upper and lower are to be interpreted as relational and are based on the premise that the component, item, article, apparatus, device or instrument will usually be considered in a particular orientation that will be apparent in the context.

The claims defining the invention are as follows:

1. A method of monitoring a conventional alarm system to alert at least two responsible persons equipped with a mobile phone device, said method comprising the steps of:

connecting an alarm sensor to said alarm system to generate electric alarm data of an alarm event;

providing each of the mobile phone devices with a software program which permanently runs in the background whilst the device is operational;

sending a message derived from the electric alarm data alerting the responsible persons of the alarm event to each device;

the software program converting said alarm data to a graphic and/or audible alarm;

connecting a wireless communications information board (WCIB) to the alarm system via a telephone connection; and

connecting the WCIB to an external network by a wired or wireless network connection adapted to be able to connect with the devices to send the message,

wherein the WCIB provides an intermediate link between the alarm system and the devices that utilises a telephone connection with the alarm system.

2. The method as defined in Claim 1, including a further step of transmitting to said alarm system electric re-setting data from the software program which is in the form of an app that is adapted to enable the preselected mobile phone to interact with the WCIB on receipt of said alarm data.

3. The method as defined in Claim 2, including the further step of using said app enabled the preselected mobile phone devices to change the mobile phone device preselection stored in said alarm sensor.

4. The method as defined in any one of Claims 1-3, including the further step of displaying on said mobile phone devices, location information contained in said electric alarm data or the message.

5. An alarm monitoring system for responsible persons equipped with a mobile phone device having a software program loaded thereon to enable interaction with a WCIB of a security alarm system, said alarm system comprising an alarm sensor arranged to be activated by a conventional alarm system on presumed detection of an alarm even such as a fire or unauthorised entry, the WCIB adapted to receive electric alarm data and transmit a corresponding intelligible message to the devices, the WCIB when activated connecting to an external network and sending the message to the preselected mobile phones devices, each of which has running in the background the software program to convert said alarm data to a graphic and/or audible alarm message or display,

wherein the WCIB is connected to the alarm system via a telephone connection.

6. The system as defined in Claim 5, wherein said software program is an app and the app-enabled preselected mobile phone device, on receipt of said alarm data, is able to transmit electric re-setting data to said alarm system via the WCIB.

7. The system as defined in Claim 6, wherein said app-enabled preselected mobile phones are able to change the mobile phone device pre-selection stored in said alarm system.

8. The system as defined in any one of Claims 5-7, wherein location information contained in said electric alarm data is displayed on said mobile phone devices.

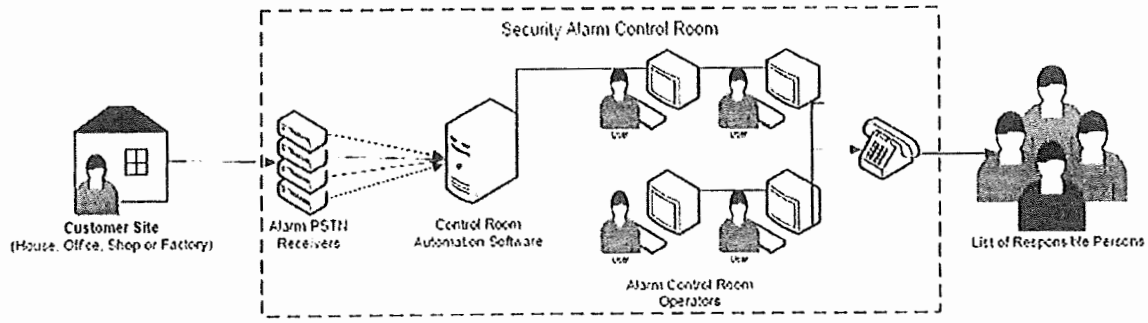

FIG. 1

PRIOR ART

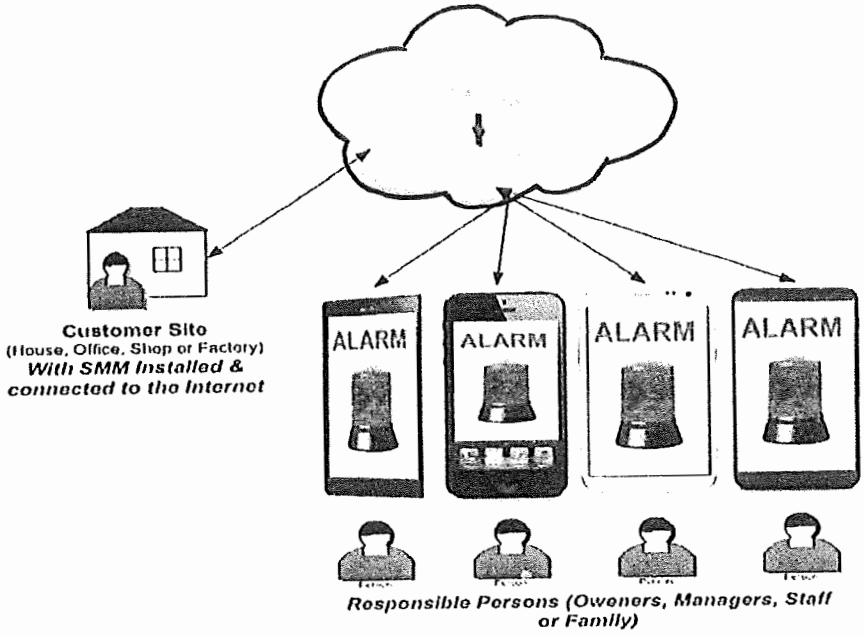

FIG. 2

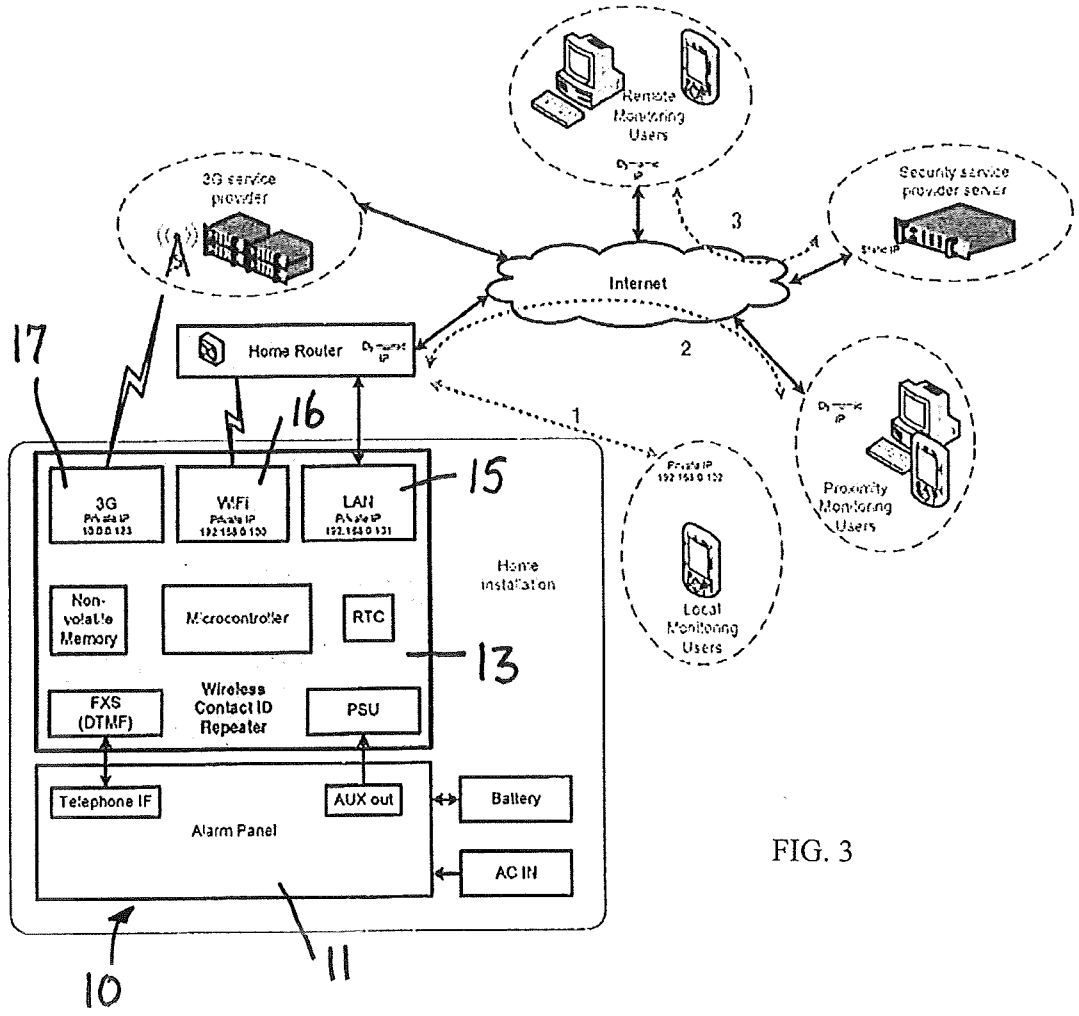
Remote Monitoring Users
3G service provider
Security service provider server
Internet
3
2
1
Home Router
17
16
15
13
3G
WiFi
LAN
Home installation
Non-volatile Memory
Microcontroller
RTC
FXS (DTMF)
Wireless Contact ID Repeater
PSU
Telephone IF
AUX out
Battery
Alarm Panel
AC IN
Proximity Monitoring Users
Local Monitoring Users
10
11

FIG. 3

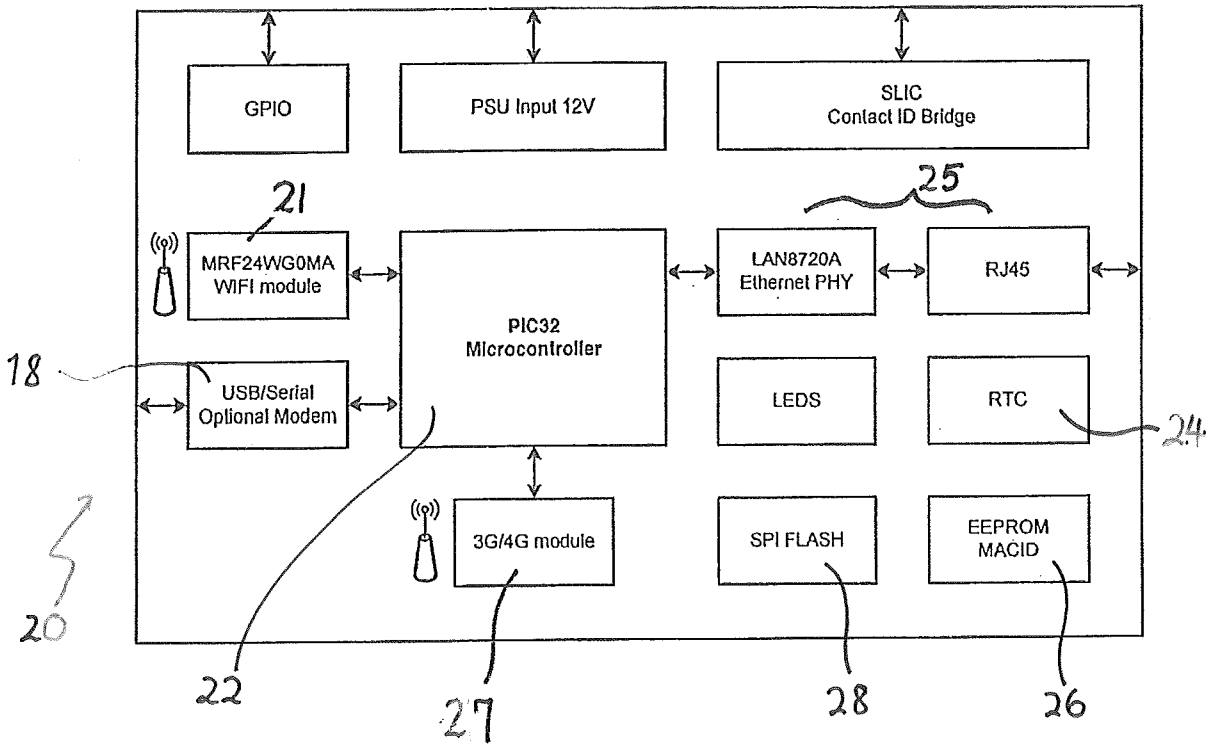
GPIO
PSU Input 12V
SLIC Contact ID Bridge
21
25
MRF24WG0MA WIFI module
PIC32 Microcontroller
LAN8720A Ethernet PHY
RJ45
18
USB/Serial Optional Modem
LEDS
RTC
24
20
3G/4G module
SPI FLASH
EEPROM MACID
22
27
28
26

FIG. 4

Contact-ID protocol time-line

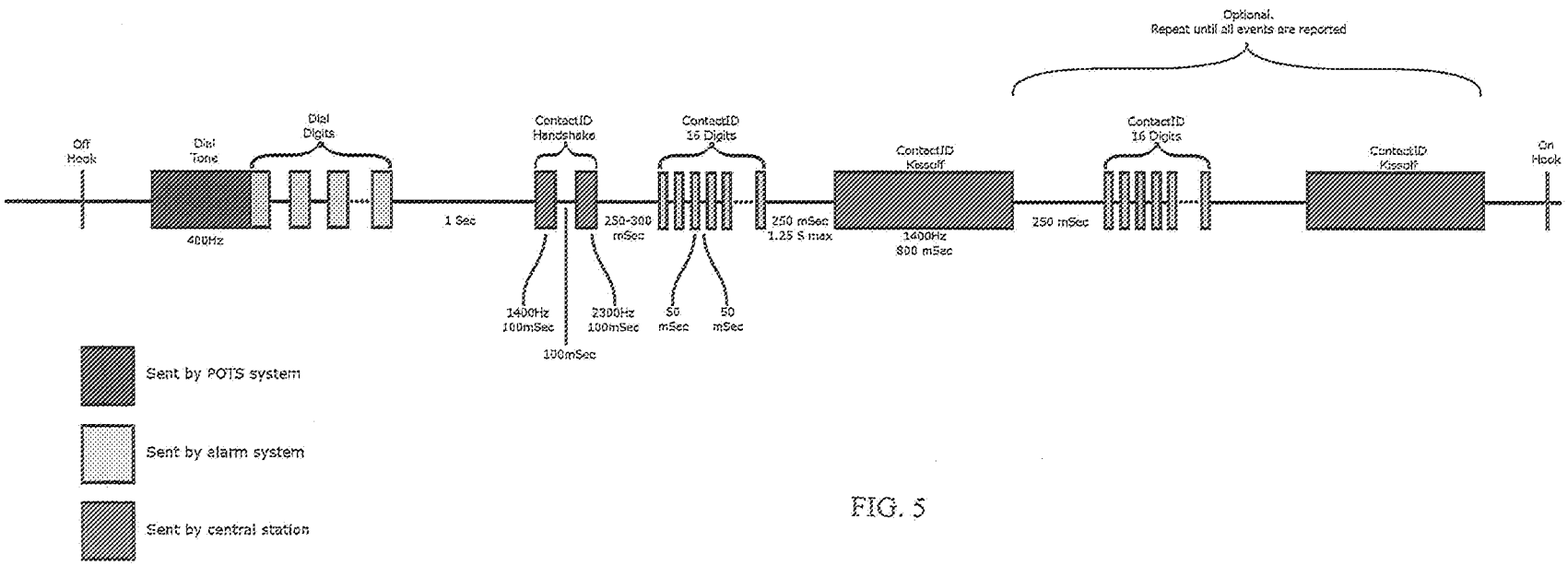

FIG. 5

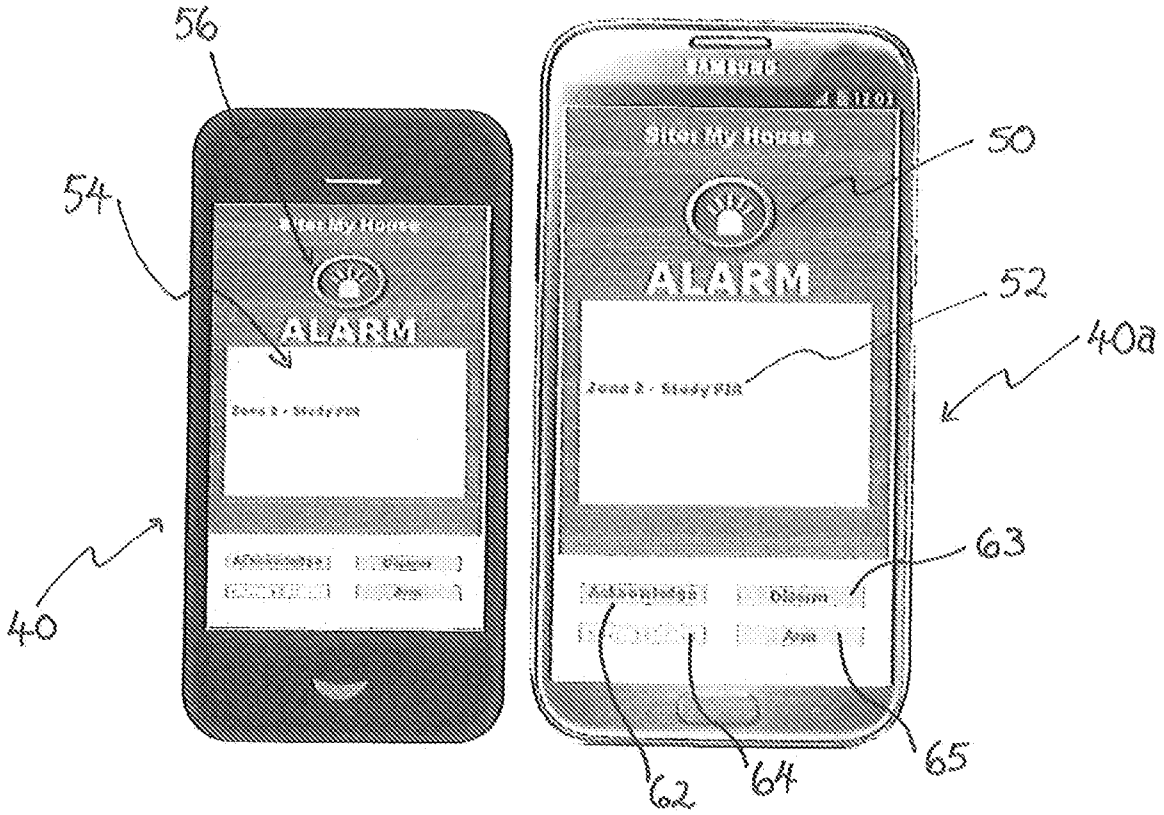

FIG. 6

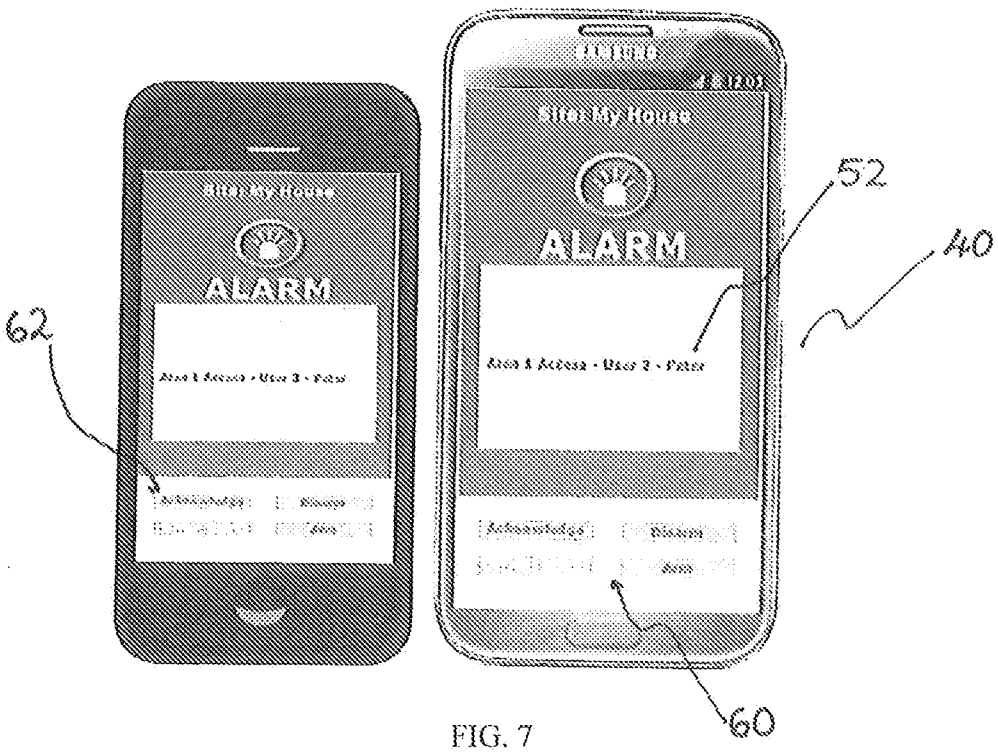

FIG. 7

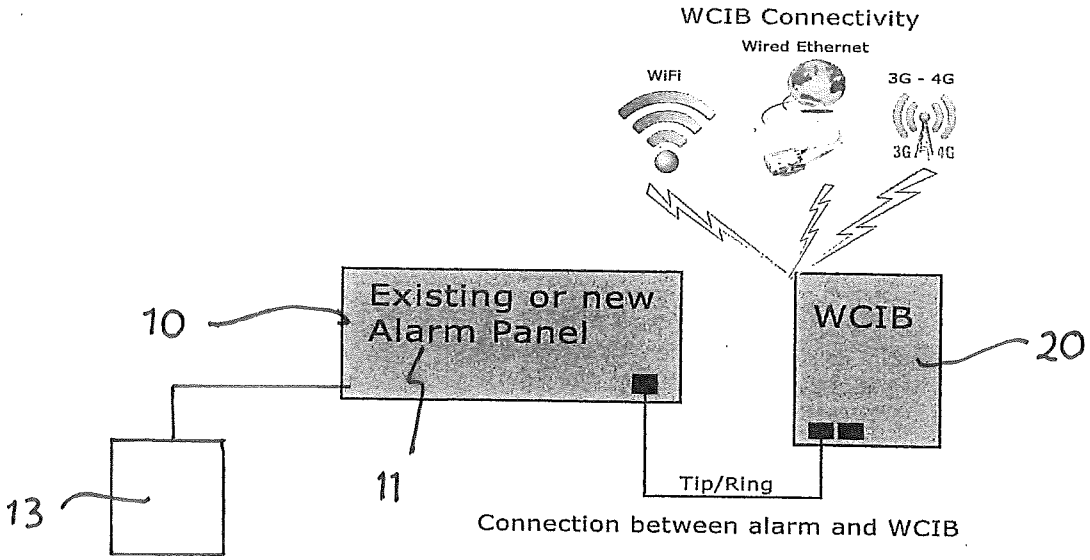
WCIB Connectivity
Wired Ethernet
WiFi
3G - 4G
3G / 4G
Existing or new
Alarm Panel
WCIB
10
20
11
13
Tip/Ring
Connection between alarm and WCIB

FIG. 8

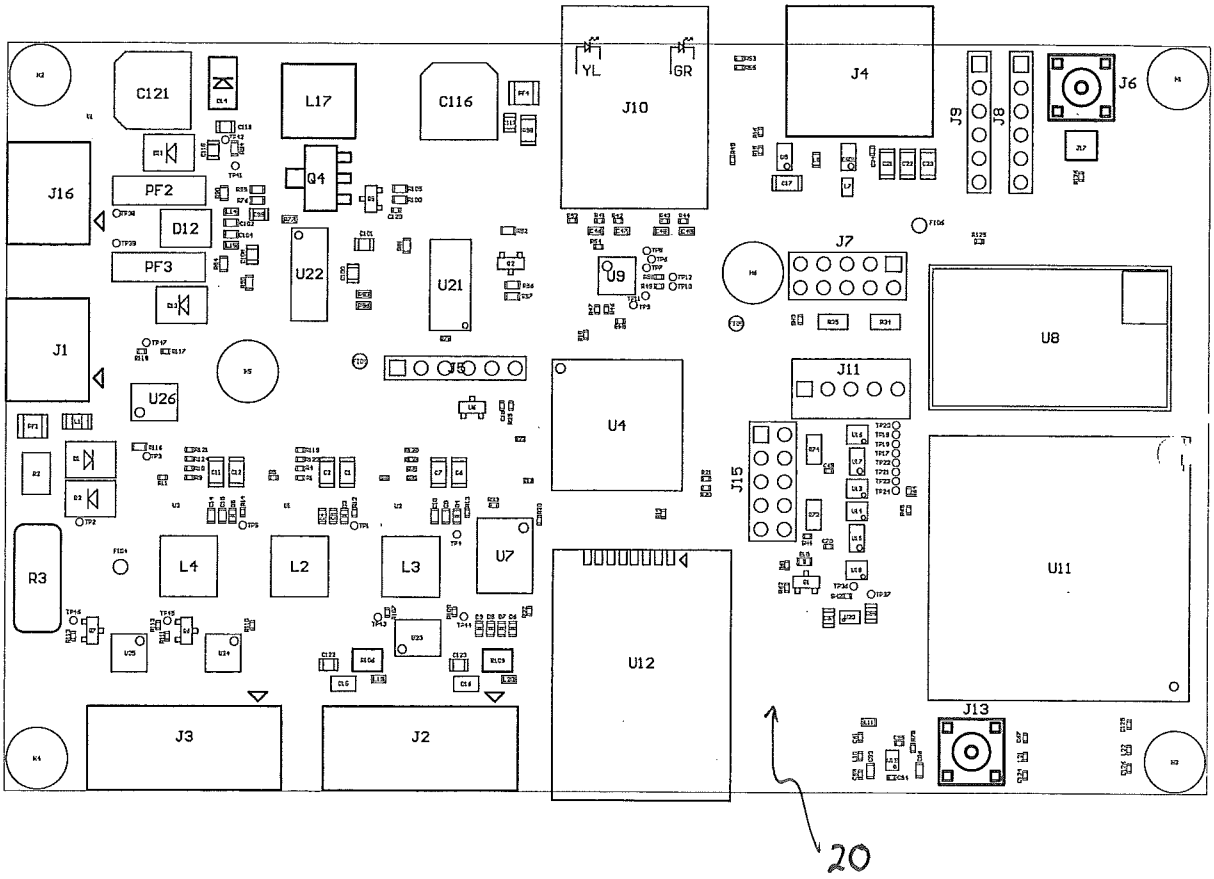
C121
L17
C116
YL
GR
J10
J4
J9
J8
J6
J16
PF2
D12
PF3
Q4
U22
U21
U9
J7
J1
U26
U8
J11
U4
J15
R3
L4
L2
L3
U7
U11
U12
J13
J3
J2
20

FIG. 9