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Applicant: **PAYRISE LIMITED**
459, Princess Road
Withington, Manchester M20 8BH(GB)

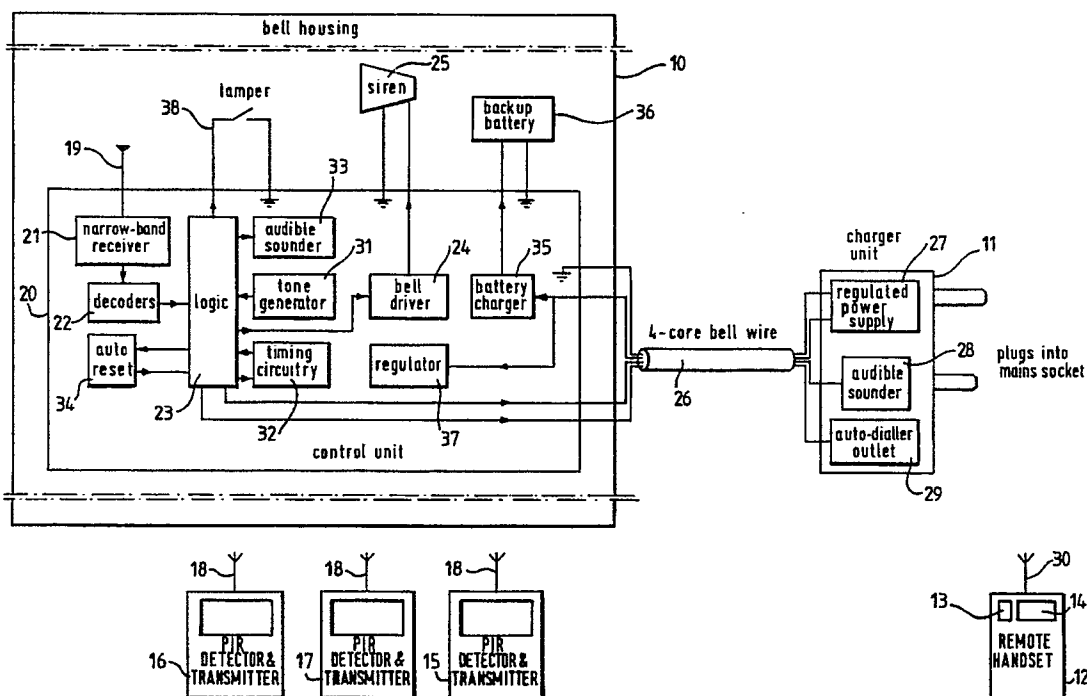
Inventor: **Jalali, Kambiz**
115, Irlam Road, Flixton
Manchester, M31 3ND(GB)
Inventor: **Riazi, Nader**
9, Lumb Lane, Little Moss
Ashton-Under-Lyne, OL7 8LY(GB)

Representative: **Neill, Alastair William et al**
Appleyard Lees & Co. 15 Clare Road
Halifax West Yorkshire HX1 2HY(GB)

Alarm systems.

An alarm system comprising at least one audible alarm (25), at least one detector (15), at least one control unit (12) which communicates with the alarm (25) in a remote, wireless manner, and is arranged to be hand held. There is at least one power connection device (11) for supplying power to the alarm

(25) the power connection device (11) including a step down transformer (27) which enables the alarm and the power connection device to be interconnected by wiring (26) which carries low voltage and can therefore be installed safely by an unskilled person.



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The invention relates to alarm systems.

A large number of known alarm systems are presently on the market. Broadly speaking, there are two different types available.

The first type is the old fashioned type which has a simple control panel, and a number of detectors and door and window contacts, all connected together by wires. Although such systems are relatively cheap, an extensive amount of wiring has to be carried out, which is a messy and time consuming job, requiring a skilled operator, not just to produce a neat, finished job, but from the safety point of view, because of the high power levels involved.

The second known general type is the wireless system, which does not require as much wiring, but tends to fall in the top price category, putting it outside the reach of many household budgets. Although these known wireless systems reduce the amount of wiring involved, a certain amount of sophisticated, high power, wiring is nevertheless required, and a skilled operator is still required to neatly and safely install the system.

The invention solves the problem of providing an alarm system which can be quickly, neatly and safely installed, using an unskilled operator.

According to a first aspect of the invention, an alarm system comprises at least one audible alarm, at least one detector, at least one control unit which communicates with the alarm in a remote, wireless manner, and is arranged to be hand held, and at least one power connection device for supplying power to the alarm, the power connection device including a step down transformer which enables the alarm and the power connection device to be interconnected by wiring which carries low voltage and can therefore be installed safely by an unskilled person.

The alarm preferably comprises a siren, but any other audible alarm, such as a bell may be used.

Preferably the audible alarm is arranged in a housing, for example, for mounting on the outside of a building, the housing also enclosing control circuitry for the system.

The control circuitry preferably includes logic circuitry.

The control circuitry preferably includes a battery charger for charging a back-up battery unit for use in the event of mains failure.

Preferably the back-up battery unit is also positioned within the housing.

The control circuitry preferably includes a secondary audible sounder to give a user of this system audible signals relating to the status of the system.

There may for example be a first audible signal to indicate when the system has been switched on,

and a second, different audible signal to indicate when the system has been switched off.

The control circuitry may include a tone generator for generating tones used by the secondary audible sounder.

The control circuitry may include timing circuitry to control the pattern of sounds produced by the secondary audible sounder.

The control circuitry preferably includes at least one tamper switch which sets off the alarm if the housing is tampered with.

The control circuitry preferably includes a re-setting circuit which re-sets the alarm after it has been sounding for a pre-determined time, for example ten to twenty minutes.

The control circuitry preferably includes receiving means to receive signals from the detector and control unit.

Preferably the signals are radio wave signals.

The detector may comprise a passive infra-red volumetric detector sensitive to body heat and movement.

There may be more than one passive infra-red volumetric detector and each detector may be arranged to communicate with the alarm in a remote, wireless manner.

Alternatively, or in addition, other detectors may be used, such as door switches, window switches and pressure pads.

The control unit may have an on/off push button arranged so that pushing the button once activates the alarm system and pushing the button a second time then de-activates the system.

The on/off switch may be such that if the alarm is sounding, pressing the button switches the alarm off.

There may be a second, panic, button which, whenever it is depressed, sets off the alarm.

The power connection device may comprise a three pin plug for plugging into a conventional three pin socket, the step down transformer being incorporated in the plug.

Preferably, the plug includes a second secondary audible sounder to give an audible indication as to the status of the system, to a user positioned within a building.

The plug may also have an outlet for sending a signal to an auto-dialler telephone unit.

According to a second aspect of the invention, an alarm system comprises at least one audible alarm, at least one detector, and at least one control unit which communicates with the alarm in a remote, wireless manner, and is arranged to be hand held, thus avoiding the need for a wall mounted control panel.

According to a third aspect of the invention, an alarm system comprises at least one audible alarm for mounting at one location (e.g. outside a build-

ing) and at least one power connection device for positioning at a second location (e.g. at a mains supply socket inside the building), the power connection device including a step down transformer which enables the alarm and power connection device to be interconnected by wiring which carries low voltage and can therefore be installed safely by an unskilled person.

According to a fourth aspect of the invention, an alarm system comprises at least one audible alarm arranged in a housing, and at least one device for sending an actuation signal to the alarm in a remote, wireless manner, the control circuitry for the alarm system being arranged in the alarm housing.

By way of example, a specific embodiment of an alarm system will now be described, with reference to the single accompanying figure, which is a diagrammatic block diagram of the embodiment of alarm system according to the invention.

The alarm system which is the subject of this embodiment is astonishingly simple and easy to instal.

The system simply comprises an alarm housing 10, a three pin plug unit 11, a compact remote hand set 12 with just two control buttons 13 and 14, and any desired number of remote operating detectors, three of these detectors, 15, 16 and 17, being shown in the figure.

Each of the passive, infra-red volumetric detectors comprises a conventional unit, known in itself, but arranged, when it senses body heat and movement, to send an actuation signal, in the form of a radio signal, from an aerial 18 on the detector, to a receiving aerial 19 on control circuitry 20 housed within the housing 10.

Signals received by the aerial 19 are picked up by a narrow band receiver 21, and the resultant signal is de-coded by de-coders 22 and passed to a logic circuit 23.

The logic circuit 23 is connected via a driver unit 24 to a siren 25.

It can be seen that all the necessary control circuitry is contained within the housing 10, which also houses the siren 25. The housing 10 is simply connected by four core bell wire 26 to the plug unit 11.

Built into the plug unit 11 is a device 27 for providing a regulated power supply, and this device 27 includes a step down transformer so that the power carried by the wire 26 is of low, safe levels.

The plug unit 11 also contains an audible sounder 28 and an auto-dialler outlet 29, which will be described in more detail later.

The alarm system requires minimal wiring to instal the system. The only hard-wired connection is between the housing 10 and the plug unit 11,

and this wiring is simple, low power, bell wiring. There is no need to make special tapping connections into the electrical supply system of a house or of a building. All that is necessary is to plug the unit 11 into a conventional three pin electrical power socket.

The housing 10 is mounted on the outside of the building and it is only necessary to drill a single hole through the wall of the building to take the wiring 26. This wiring is inobtrusive and can be easily clipped or otherwise secured in position in a neat manner, even by an unskilled person. Even if the wiring is accidentally damaged, it is unlikely that an accident will result, because of the low power carried by the wiring.

The detectors such as 15, 16 and 17 are simply screwed onto wall locations in any desired area which is to be monitored for intruders. There is no need to interconnect the detectors with the rest of the alarm system by means of wires, and there is no need to instal a special, wall mounted control panel.

Once the housing 10 has been mounted on the outside of the building, the plug unit 11 has been inserted into a socket, and the detectors 15, 16 and 17 have been secured to the appropriate walls, the compact hand set 12 can be then carried around freely by a user of the system, and this hand set is all that is necessary to control the system.

Once the system has been installed, a single push of the button 13 will set the system, ready for use. The hand set 12 can be used either inside the building, for example to set the system at night, or outside the building, when leaving the building unoccupied. The hand set 12 transmits control signals, in the form of radio signals, from an aerial 30 to the receiving aerial 19 of the control circuitry 20 positioned within the housing 10.

When the button 13 is depressed in this manner, the audible sounder 28 emits a special pattern of audible tones to let the user know that this system has been set.

This pattern of tones is created by a tone generator 31 and timing circuitry 32 associated with the logic circuitry 23.

The housing 10 includes a second audible sounder 33 which repeats the tones of the audible sounder 28, so that a user of the system hears the pattern of tones, regardless of whether the user is inside or outside the building at the time.

Once the system has been set, any unauthorised movement within any of the monitored areas causes a signal to be transmitted from one of the aerals 18 to the aerial 19. This causes the logic circuitry to set off the siren 25.

To avoid excessive disturbance to neighbours, and to comply with regulations, the logic circuitry 23 is connected to an automatic re-setting circuit

34, which re-sets the system after the siren has been sounding for from 10 to 20 minutes.

Once the system has been activated, it can be deactivated by pressing the button 13 a second time. This causes the audible sounders 28 and 33 to produce a different pattern of tones to indicate to the user that the system has been deactivated.

While the siren 25 is sounding, a single press on the button 13 will switch the siren off, and deactivate the system.

The control circuitry includes a battery charger 35 and the back-up battery 36, to provide power for the system in the event of mains failure. A regulator unit 37 within the control circuitry provides a stable DC output, free from fluctuations of the mains supply, to be used by the internal circuitry, and also to trickle charge the back-up battery 36, via the charger 35, when mains supply is available.

The second button 14 on the hand set 12 is a "panic" button. If this button is pressed at any time, for example in the event of an accident or a sudden intrusion, the siren 25 will sound for the full period of 10 to 20 minutes, unless the button 13 is subsequently depressed.

The control circuitry 20 is also provided with at least one tamper switch 38, for example in the form of a trembler switch, this switch being arranged to close if the housing 10 is tampered with, thus setting off the siren 25.

The auto-dialler outlet 29 in the plug unit 11 provides an output signal to an optional extra in the form of a telephone auto-dialler unit (not shown). If this optional extra is connected to the outlet 29 and a telephone, then if the siren 25 is set off, the unit will automatically dial a selected telephone number, for example 999.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of

the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

10 Claims

1. An alarm system comprising at least one audible alarm (25), at least one detector (15), at least one control unit (12) which communicates with the alarm, and at least one power connection device (11) for supplying power to the alarm, characterised in that the control unit (12) communicates with the alarm (25) in a remote, wireless manner and is arranged to be hand held, and the power connection device (11) includes a step down transformer (27) which enables the alarm (25) and the power connection device (11) to be interconnected by wiring (26) which carries a low voltage and can therefore be installed safely by an unskilled person.

2. An alarm system as claimed in Claim 1, in which the audible alarm (25) is arranged in a housing (10), the housing (10) also enclosing control circuitry (20) for the system.

3. An alarm system as claimed in Claim 2, including a battery charger (35) for charging a back-up battery (36) for use in the event of mains failure.

4. An alarm system as claimed in Claim 2 or Claim 3, including a secondary audible sounder (33) to give a user of the system audible signals relating to the status of the system.

5. An alarm system as claimed in any one of the preceding Claims, including a plurality of passive infra-red volumetric detectors (15, 16, 17) each arranged to communicate with the alarm (25) in a remote, wireless manner.

6. An alarm system as claimed in any one of the preceding Claims, in which the control unit (12) has an on/off button (13) arranged so that pushing the button once activates the alarm system and pushing the button a second time de-activates the system.

7. An alarm system as claimed in any one of the preceding Claims, in which the control unit (12) has panic button (14) which, whenever it is depressed, sets off the alarm.

8. An alarm system as claimed in any one of the preceding Claims, in which the power connection device (11) comprises an electric plug for plugging into a conventional socket, the step down transformer (27) being incorporated in the plug.

9. An alarm system comprising at least one

audible alarm (25), at least one detector (15), and at least one control unit (12) which communicates with the alarm (25) in a remote, wireless manner.

10. An alarm system comprising at least one audible alarm (25) for mounting at one location (e.g. outside a building) and at least one power connection device (11) for positioning at a second location (e.g. at a mains supply socket inside the building), the power connection device (11) including a step down transformer (27) which enables the alarm and power connection device to be interconnected by wiring (26) which carries low voltage and can therefore be installed safely by an unskilled person.

11. An alarm system comprising at least one audible alarm (25) arranged in a housing (10), and at least one device (15) for sending an actuation signal to the alarm in a remote wireless manner, the control circuitry (20) for the alarm system being arranged in the alarm housing (10).

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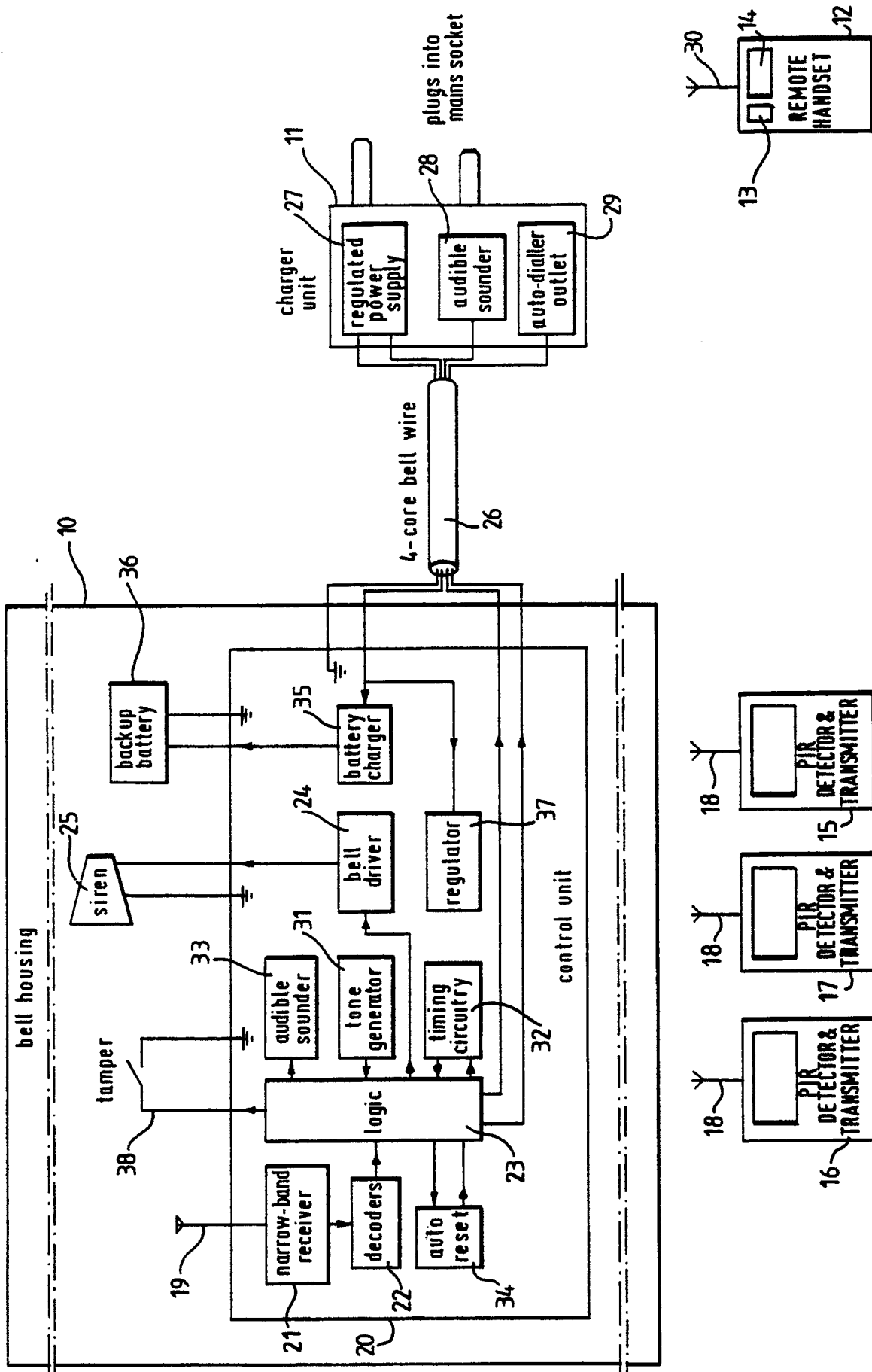
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European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 2919

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-2 913 266 (ECOTRON) * figure 1; page 5, lines 4-10; page 6, line 23 - page 7, line 5 *	1,9,11	G 08 B 25/10
A	US-A-4 737 770 (R. E. BRUNIUS et al.) * figure 1; column 1, lines 22-36; column 4, lines 1-15 *	1	
A	US-A-4 772 876 (T. G. LAUD) * figure 1; column 5, lines 35-50 *	1,6	
A	FUNKSCHAU no. 11, May 1982, page 45, München, DE; G. GERSTENBERG: "Funkalarmsysteme" * page 45; column 2, line 26 - column 3, line 1; page 45; column 3, lines 4-21 *	3,5	
A	GB-A-2 186 404 (NOTIFIER COMPANY) * figure 1; page 2, lines 40-59 *	7	
P,A	US-A-4 825 457 (M.M. LEBOWITZ) * figure 1; column 1, lines 31-48; column 8, lines 8-25 *		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	US-A-4 581 606 (J. MALLORY) * figure 1, abstract *		G 08 B
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 14-06-1990	Examiner BREUSING J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			