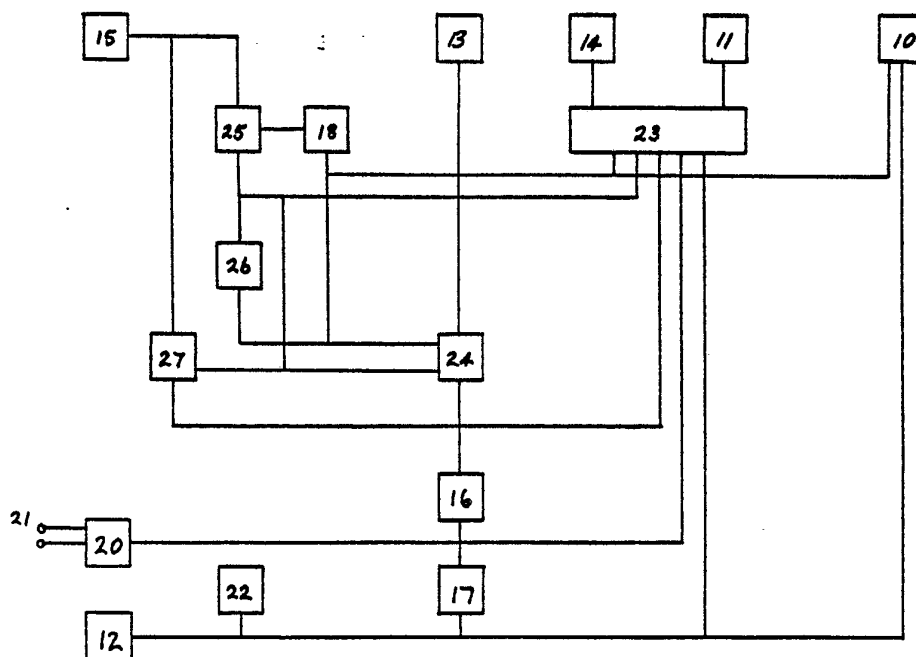




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(54) Title: PERSONAL ALARM TRANSMITTER



(57) Abstract

A personal device incorporates radio transmitter (10), audible and visual alarms (11, 14), a manually operated alarm button (12) and an attitude-sensitive device (13). Operation of the manual alarm button on actuation of the attitude-sensitive device for a preset time causes transmission of a coded alarm signal. The audible and visual alarms operate during a predetermined time interval (17) after actuation of the attitude-sensitive device, during which time the attitude-sensitive device may be deactivated before an alarm signal is transmitted.

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PERSONAL ALARM TRANSMITTER

FIELD OF THE INVENTION

This invention relates to personal alarm devices which function to sound and transmit an alarm in emergency situations.

BACKGROUND ART

Alarm devices are known in which actuation of an alarm button will activate the transmission of a signal to a central receiver, so that assistance may be sent to the location of the actuated device. The known devices have not provided sufficient flexibility in their operation, and have not satisfactorily responded to conditions in which the user may be unable to actuate the alarm condition.

SUMMARY OF THE INVENTION

The alarm device of the present invention incorporates both manual activation means and attitude-sensitive alarm activation means, and in the preferred embodiment, provides also for activation by external sensors.

In the preferred form of the invention, a battery operated radio transmitter is enclosed with the remaining componentry, in a small plastics case which is capable of being worn by means of a clip on the belt or pocket of a user. When activated, the transmitter radiates a signal which is coded to identify the particular alarm device. An audible alarm is also incorporated in the device, and this may suitably be a piezo-electric transducer. The alarm activation may occur instantly in the case of manual

action, or in timed stages in the case of attitude-sensitive actuation, and the audible alarm operates either in a continuous or a beeping mode for the purpose of distinguishing the alarm condition of the device.

5 The device is also provided with a visual warning device such as an LED warning light, which may be coupled with the alarm driving circuitry.

 For manual triggering of the device, a large and readily accessible alarm button is provided, and actuation
10 of this button immediately activates the audible alarm in its continuous mode, and activates the transmitter, these being deactivated by being reset upon a subsequent operation of the alarm button.

 As indicated above, the unit also incorporates an
15 attitude-sensitive switch. Preferably this switch may selectively be operated either in a mode where the attitude-sensitive switch is operative, or in a mode where an alarm condition will only be produced by actuation of the alarm button. Time delay circuitry is incorporated
20 to control the operation of the device when in its attitude-sensitive mode, as described below.

BRIEF DESCRIPTION OF THE DRAWINGS

 To facilitate an understanding of the construction and operation of the invention, reference will now be made
25 to a proposed embodiment thereof, the operation of which is illustrated in the block diagram comprising the accompanying drawing.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

 As illustrated, the components of the alarm device

comprise an RF transmitter 10 which is provided with a transmitting antenna (not shown), a piezo-electric audible alarm device 11, a visible alarm device in the form of a light-emitting diode (LED) 14, a manual alarm button 12, and an attitude-sensitive switch 13 which may, for example, be a mercury switch. The alarm devices 11 and 14 are controlled by driving circuitry 23.

The manual alarm button 12 is coupled with the alarm device 11 and the transmitter 10. In the normal mode of operation of the device, actuation of the button 12 results in the immediate operation of both the transmitter and the audible alarm. The audible alarm is maintained in a state of continuous operation by driver 23, and to facilitate location of the device and therefore of the person requiring assistance, this continues until the alarm condition is reset by a reset function 22 in response to a second operation of the alarm button 12. This condition is true also where the transmitter is activated in response to the attitude-sensitive or remote sensor activation of the device described below.

The LED indicator 14 provides an alternative local indication of the relevant alarm condition, and facilitates the observation of an alarm condition in conditions of high background noise.

The attitude-sensitive switch 13 is operated when the device is horizontal or at a predetermined angle from the vertical, and is therefore actuated should the wearer collapse or should the device be left unattended in a horizontal position while in the attitude-sensitive

actuation mode. So that the attitude-sensitive mode may be selected and either temporarily or permanently turned off, the attitude-sensitive switch 13 is coupled with the alarm circuitry via logic circuitry responsive to an on-
5 off switch 15.

In the schematic form of the device illustrated, a 'tilt enable' function 24 is controlled by counting and delay functions 25, 26 and 27 in response to operation of the on-off switch 15. A single operation and release of
10 the switch 15, detected by counting function 25, actuates a battery-checking function 18, and if this reveals that the battery is in acceptable condition, the device is turned on with the tilt switch enabled, while at the same time the transmitter is actuated to transmit a signal
15 indicative of the ON condition of the device in question, and the devices 11 and 14 are driven in a single "beep".

With the attitude-sensitive switch 13 enabled, activation of the attitude-sensitive switch 13 commences a first five second timing period by means of timing circuit
20 16. If the switch is returned to an unactivated position within that five second period, then no alarm condition is activated. If the attitude-sensitive switch 13 remains in its activated condition at the end of the five second delay provided by the timing circuit 16, then the audible
25 alarm 11 is activated in a fast beeping mode, the LED 14 also being activated at that time. A further five second delay 17 is then commenced, and if during this period the switch 13 is deactivated, for example by the user, on becoming aware that he or she has accidentally caused the

alarm condition, returning the unit to its upright position, then the unit returns to its quiescent state.

If the attitude-sensitive switch 13 remains in its activated condition at the end of the second five second
5 delay, then the audible alarm 11 and the LED 14 are placed in a continuous alarm mode and the transmitter 10 is activated. Preferably, to conserve power, the transmitter operates for only a short period after actuation, and for example may transmit a cycle of five
10 repetitions of the identifying code of the particular device in question. The audible and visual alarms will then only be deactivated by a resetting operation of the manual alarm button 12.

Should the user need to leave the unit unattended for
15 a short time, the attitude-sensitive function may be disabled by a double actuation of the on-off switch 15, detected by counting function 25 and signalled by two "beeps" of the devices 11 and 14. This disables the switch 13 for a period (suitably 60 seconds) determined by
20 a time delay function 26, at the end of which the switch 13 is again enabled, this condition being signalled by a single beep operation of the devices 11 and 14.

Should it be desired to disable the attitude-sensitive function for an indefinite period, the on-off
25 switch 15 is held down for a period of three seconds, detected by timing function 27 which disables the switch 13 and causes the driver 23 to operate the alarm devices 11 and 14 with three beeps.

In order that the alarm device may be coupled with

external alarm circuitry such as fire or smoke detectors, or intrusion warning devices, a sensor input circuit 20 is provided, with a pair of normally closed inputs 21. The sensor input circuitry 20 may be coupled with the alarm
5 devices 11 and 14 and the transmitter 10, through one or more of the time delay circuits, in this embodiment the five second time delay circuit 17.

It will be appreciated that the present invention is not limited in its scope to the specific arrangement of
10 the embodiment described, and that in its various forms the functions may be achieved by hardware or software.

CLAIMS :

1. A personal alarm device comprising a radio transmitter actuatable to transmit an alarm signal indicative of an alarm condition, indicator means observable at the device and indicating an alarm condition thereof, an actuator manually operable to actuate said transmitter and said indicator means, characterised in that the device comprises attitude-sensitive means responsive to the attitude of the device relative to vertical orientation, first timing means responsive to the actuation of said attitude-sensitive means for a first period to actuate said indicator means, and second timing means responsive to the continued actuation of said attitude-sensitive means for a second period following said first period to actuate said transmitter.

2. A personal alarm device according to claim 1 further characterised in that said indicator means are operable in two modes, and are operated in a first mode during said second period and in a second mode upon actuation of said transmitter.

3. A personal alarm device according to claim 2 further characterised in that said indicator means continues in said second mode until reset by operation of said actuator.

4. A personal alarm device according to claim 3 further

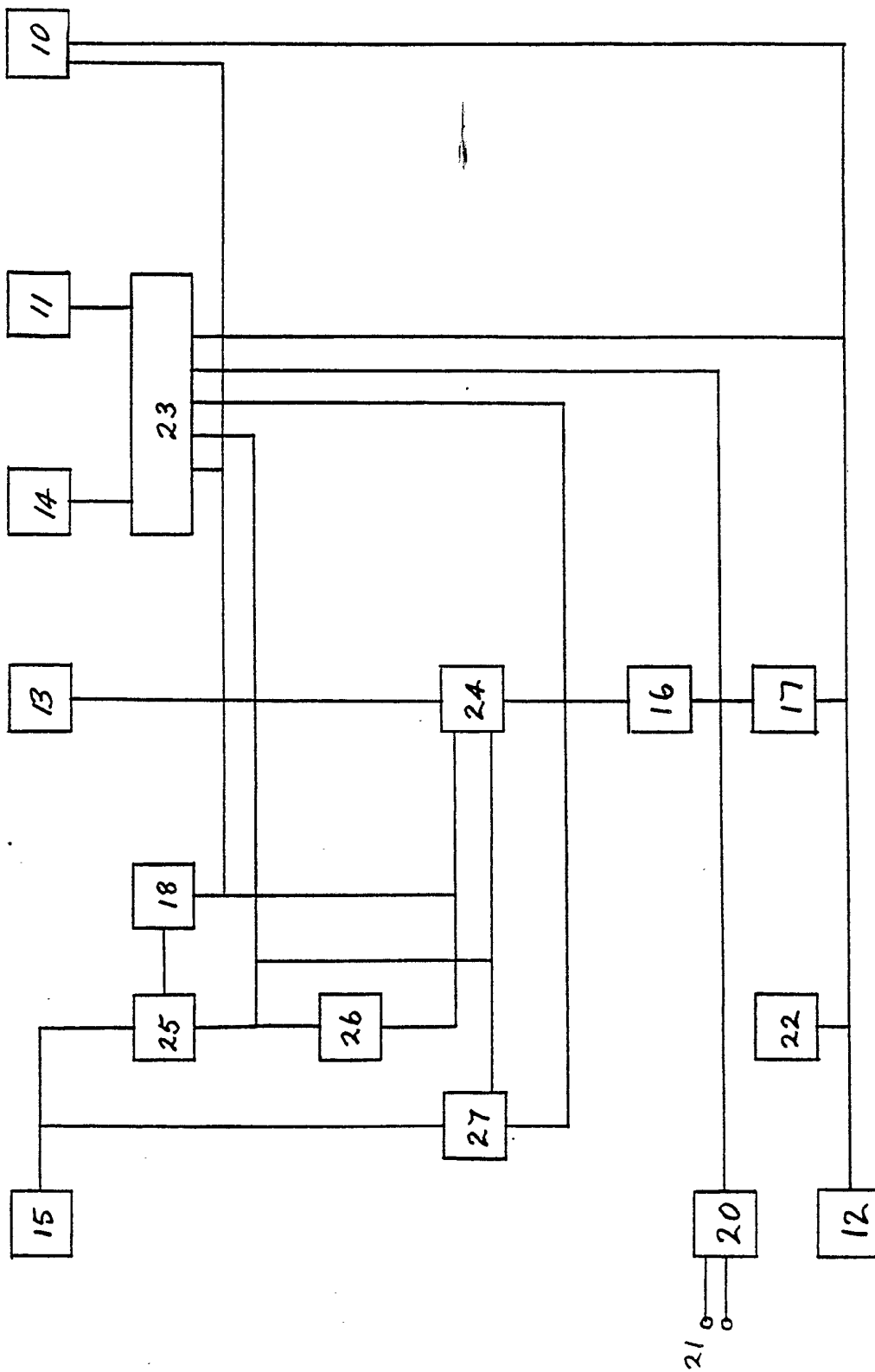
characterised in that said indicator means comprises an audible alarm device and a visible alarm device.

5. A personal alarm device according to claim 1 further characterised in that said device further comprises an on-off switch, power supply means, means responsive to operation of said switch in a first mode to test the condition of said power supply means, and means responsive to said test to cause said transmitter to transmit a signal indicative of the actuated state of the device.

6. A personal alarm device according to claim 1 further characterised in that said device further comprises an on-off switch means responsive to a second mode of operation of said switch to disable said attitude-sensitive means and to initiate a timing period, and means enabling said attitude-sensitive means at the end of said period.

7. A personal alarm device according to claim 6 further comprising means responsive to the disabling and enabling of said attitude-sensitive means to cause said indicator means to provide an indication of those events.

8. A personal alarm device according to claim 1 further characterised in that the device further comprises an on-off switch, and means responsive to the operation of said switch in a third mode to disable said attitude-sensitive means.



INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 87/00040

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *				
According to International Patent Classification (IPC) or to both National Classification and IPC				
Int. Cl. ⁴ G08B 19/00, 21/00				
II. FIELDS SEARCHED				
Minimum Documentation Searched ⁷				
Classification System	Classification Symbols			
IPC	G08B 19/00, 21/00			
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸				
AU : IPC as above				
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹				
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³		
X,Y	GB,A, 1595788 (BARLOW) 19 August 1981 (19.08.81)	(1-4,6-8)		
X,Y	GB,A, 1547364 (BARLOW) 13 June 1979 (13.06.79)	(1-8)		
X,Y	GB,A, 2067051 (ANSTALT) 15 July 1981 (15.07.81)	(1-8)		
A	US,A, 4314240 (SCHNÜG) 2 February 1982 (02.02.82)			
A	US,A, 4284986 (AMORTEGUI) 18 August 1981 (18.08.81)			
A	US,A, 4536755 (HOLZGANG & OTHERS) 20 August 1985 (20.08.85)			
A	US,A, 4520351 (ALTMAN and KASHA) 28 May 1985 (28.05.85)			
A	AU,B, 33734/84 (553715) (ROMAGNOLI) 11 July 1985 (11.07.85)			
X	DE,A, 2922542 (SIEMENS AG) 4 December 1980 (04.12.80)	(1-4)		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; border: none; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Δ" document member of the same patent family</p> </td> </tr> </table>			<p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Δ" document member of the same patent family</p>
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IV. CERTIFICATION				
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report			
2 June 1987 (02.06.87)	(09.06.87) 9 JUNE 1987			
International Searching Authority	Signature of Authorized Officer			
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Members			
GB 2067051	DE 3047231	ES 498073	FR 2475259	
	JP 56153848	NO 803844	SE 8008623	
US 4314240	CA 1145833	EP 13421		

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