

(19)



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(11)

EP 0 901 113 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.03.1999 Bulletin 1999/10

(51) Int Cl.⁶: **G08B 29/18, G08B 17/10**

(21) Application number: **98306527.7**

(22) Date of filing: **17.08.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **03.09.1997 GB 9718547**

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(54) **Insect repulsion**

(57) A fire alarm system comprising a plurality of remote alarm transducers 11, each incorporating a smoke and/or heat sensor 20 and a sounder 22. The sounders 22 emit a high frequency sound that deters insects from

entering the transducers 11 and from causing false alarms or faults. In a preferred embodiment, the sounders 22 are also arranged to emit an alarm signal in the event that smoke or heat is detected.

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Description

[0001] This invention relates to a insect repulsion.

[0002] Alarm transducers generally comprise a sensor and/or a warning device mounted inside a housing. One such alarm transducer comprises a smoke detector having a housing, a sensing chamber mounted inside the housing and provided with an opening through which smoke can enter. A sensor inside the chamber senses the smoke either by optical or by ionisation methods.

[0003] A disadvantage of known transducers, such as the above-mentioned smoke detector, is that insects can enter the sensing chamber through the an opening in the housing and cause a fault or a false alarm.

[0004] Electronic insect repellent apparatus are known. However, such apparatus are relatively expensive, and thus it is extremely costly to provide one such apparatus in each room of a hotel or office etc.. Another disadvantage of such apparatus is that they are generally regarded as a luxury item and accordingly they are rarely purchased.

[0005] We have now devised an alarm transducer, which alleviates the above-mentioned problems.

[0006] In accordance with this invention, there is provided an alarm transducer comprising a housing and sound generating means disposed inside the housing and arranged to emit high frequency audio sound.

[0007] The high frequency audio sound, say in the range of 7-20kHz deters insects from entering the alarm housing but is inaudible to the human ear. Thus, the transducer is less susceptible to false alarms and faults caused by insects.

[0008] The high frequency sound also deters insects from entering the room in which the alarm transducer is mounted and thus additional insect repulsion apparatus do not need to be provided. The invention thus provides a convenient way of deterring insects at cost which is negligible over the cost of a conventional alarm transducer.

[0009] In one embodiment, the alarm transducer comprises a smoke detector having a smoke sensing chamber or device.

[0010] Preferably the smoke detector comprises an audible warning transducer which emits an audible alarm signal when smoke or heat is detected.

[0011] In an alternative embodiment, the alarm transducer comprises an audible warning transducer. This type of transducer will also deter insects from entering a conventional smoke detector mounted in the same room or nearby.

[0012] Preferably the audible warning transducer is also arranged to emit said audible alarm signal, thereby saving on component costs and size.

[0013] Preferably the transducer comprises terminals for connecting to a control panel, which supplies power to the transducer, so that there are no batteries to replace.

[0014] In the event of a mains power failure, power is supplied to the transducer from a battery, so that the

transducer remains operable. However, in order to preserve battery power, the transducer preferably comprises means for inhibiting said high frequency audio sound, say in the event of a mains power failure.

5 [0015] An embodiment of this invention will now be described by way of example only and with reference to the accompanying drawing, the single figure of which is a block diagram of an alarm system in accordance with this invention.

10 [0016] Referring to the drawing, there is shown an alarm system comprising a control panel 10 and a plurality of remote transducers 11 connected to a cable 12, which extends from the control panel 10.

15 [0017] The cable 12 carries data and control signals between the control panel 10 and the transducers 11, as well as carrying power to the transducers 11 from a mains power supply unit 13 in the control panel 10. The power supply unit 13 also applies power to a monitoring circuit 14 in the control panel 10. The power supply unit 20 13 is connected to a rechargeable battery 15, which provides standby power to the monitoring circuit 14 and remote transducers 11, in the event of a mains power failure.

[0018] Each transducer 11 comprises an optical smoke sensor 20 having a chamber provided with a smoke inlet. A conventional optical sensing arrangement (not shown) is disposed in the chamber for sensing the presence of smoke therein. The sensing arrangement is connected to a control circuit 21 in the device 11. A rocking armature loudspeaker 22 is disposed in the device 11 and is connected to the control circuit 21.

30 [0019] In use, the control panel 10 applies power to the transducers 11 and the control circuits 21 therein monitor the output of their smoke sensor 20 for an alarm condition. The control circuit 21 in each transducer 11 also generates a high-frequency audio signal and applies it to a loudspeaker or other sounder 22, as long as control pulses are received from the control panel 10. The high-frequency sound output by the loudspeaker 22 acts as a deterrent to insects and thus the transducers 11 are less susceptible to faults and false alarms than conventional alarm transducers. The sound that it is emitted is inaudible to humans and thus does not cause a nuisance.

45 [0020] When smoke enters the sensor 20 of a transducer 11, the control circuit 21 thereof senses a change in output signal and applies an alarm signal to the control panel 10. The control panel 10 then outputs a control signal which activates each of the transducers 11, such that their control circuits 21 apply a high intensity pulsed audible warning signal to their respective loudspeakers 22.

50 [0021] In the event of a power failure, the rechargeable battery 15 continues to apply power to the monitoring circuit 14 of the control panel 10 and to the remote transducers 11, so that the alarm system remains operable. However, the monitoring circuit 14 in the panel 10 senses the loss of mains power and ceases to apply the

above-mentioned signal to the cable 12, thereby preventing the transducers 11 from generating the insect repellent sound.

[0022] Thus, the transducers 11 do not emit an insect repellent sound whilst there is a mains power failure and in this manner the life of the rechargeable battery is extended. 5

Claims

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1. An alarm transducer comprising a housing and sound generating means disposed inside the housing and arranged to emit high frequency audio sound. 15
2. An alarm transducer as claimed in claim 1, in which the alarm transducer comprises a smoke detector having a smoke sensing chamber or device. 20
3. An alarm transducer as claimed in claims 1 or 2, comprising an audible warning transducer which is arranged to emit an audible alarm signal when an alarm condition is detected. 25
4. An alarm transducer as claimed in claim 3, in which the audible warning transducer is also arranged to emit said high frequency audio sound.
5. An alarm transducer as claimed in any preceding claim, in which the transducer comprises terminals for connecting to a control panel, which supplies power to the transducer. 30
6. An alarm transducer as claimed in any preceding claim, comprising control means for inhibiting said high frequency audio sound. 35

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