

(21) Application No 8814717  
(22) Date of filing 21 Jun 1988  
(30) Priority data  
(31) 62/161136 (32) 30 Jun 1987 (33) JP

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(51) INT Cl<sup>4</sup>  
G08B 23/00

(52) Domestic classification (Edition J):  
G4N 2V1 6D5 7A AAX  
G4H 13D 14A 14B 14D NLA  
U1S 2186 G4H G4N

(56) Documents cited  
GB A 2090970 GB A 2013876 EP A1 0148949  
EP A1 0101231

(58) Field of search  
G4N  
G1A  
Selected US specifications from IPC sub-class  
G08B

(54) Environmental abnormality alarm apparatus

(57) The apparatus includes a sensor S for detecting a fire, gas leakage, a burglar, or the like, and a signal processor 10 for receiving an output from the sensor and evaluating the output against an alarm determination reference and generating an alarm. A detecting unit D is provided in a monitoring area A1... An of the sensor to detect a change in environmental condition other than that to be detected by the sensor, and the alarm determination reference is changed in accordance with the output state of the detecting unit during signal processing.

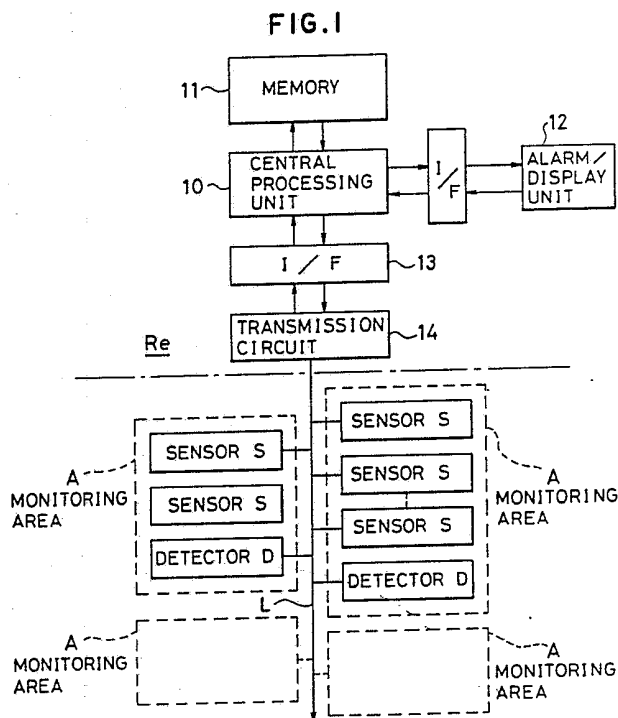


FIG. 1

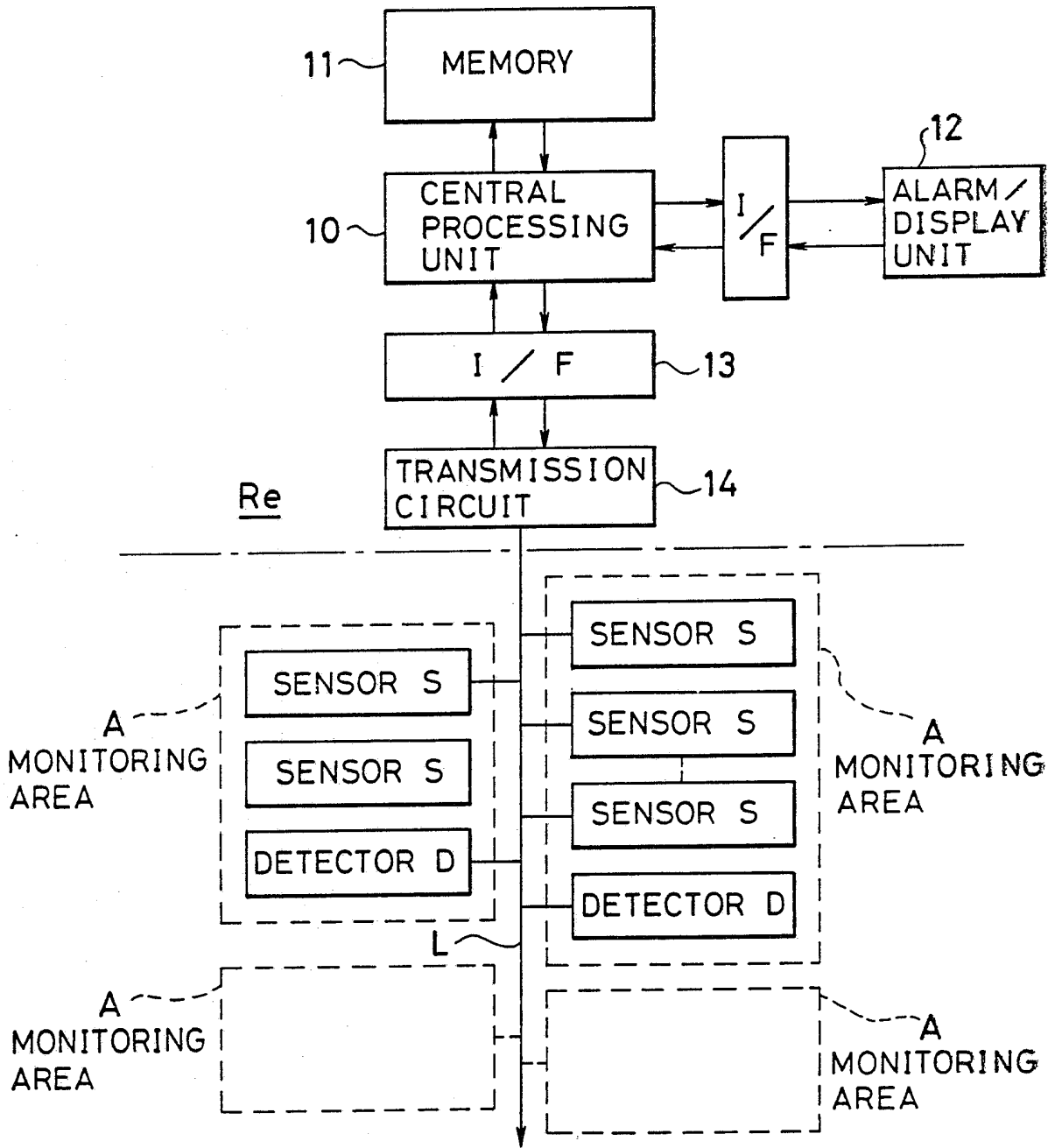


FIG. 2

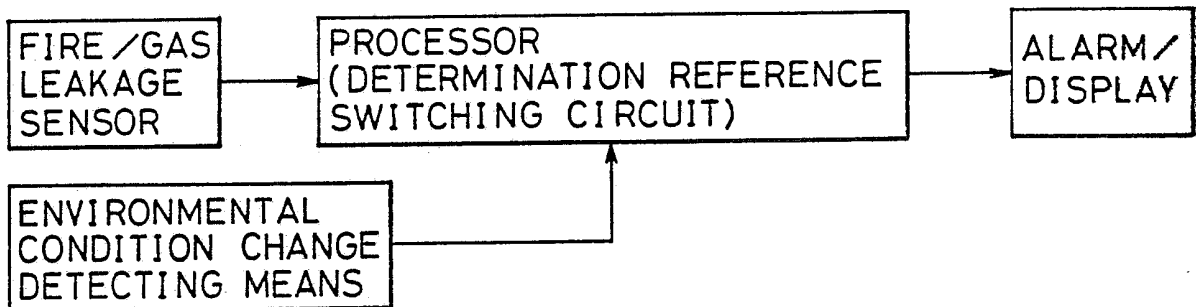
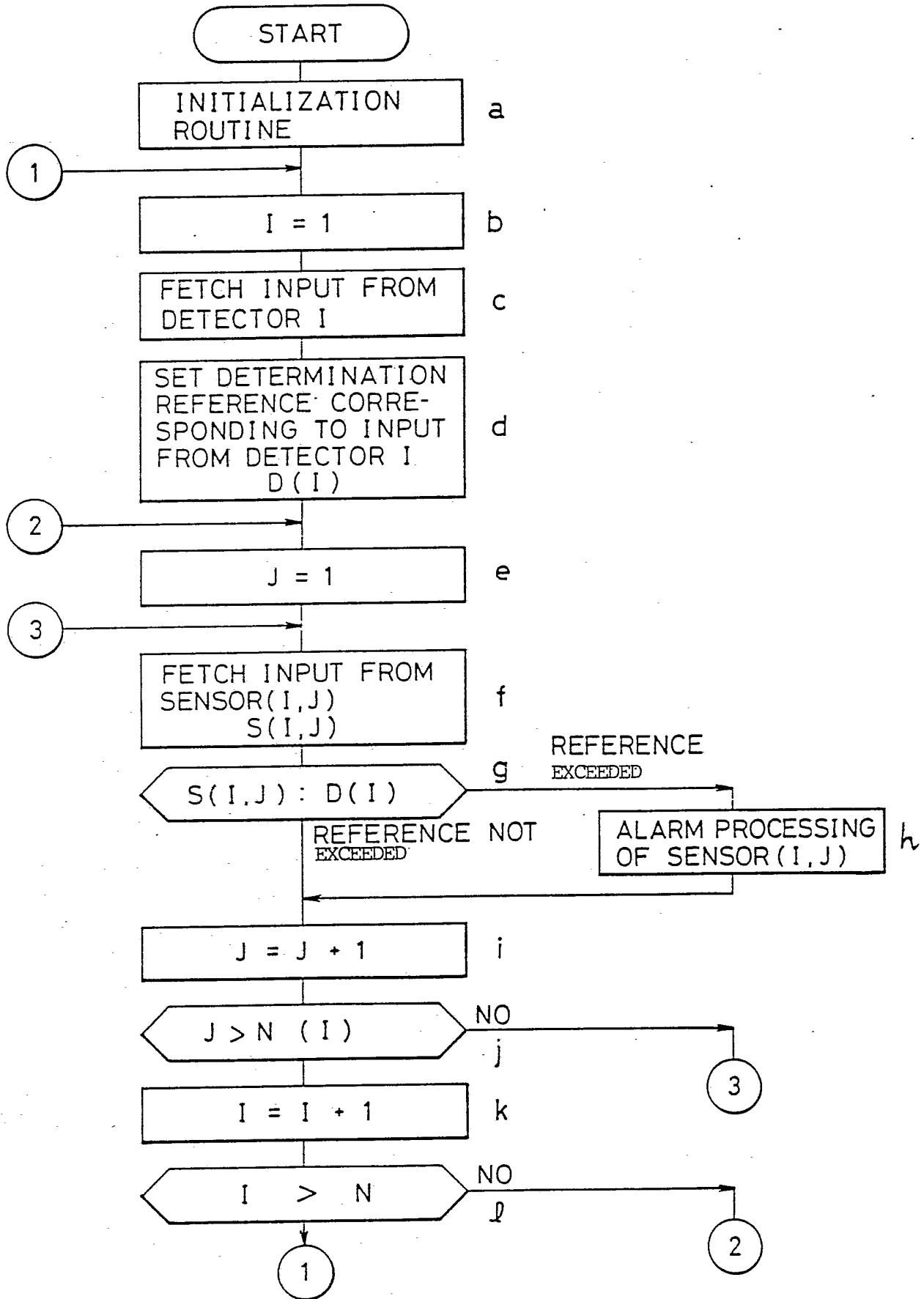


FIG.3



ENVIRONMENTAL ABNORMALITY ALARM APPARATUS

This invention relates to environmental abnormality alarm apparatus in which the abnormality determination reference of a sensor for e.g. a fire, gas leakage, a burglar, or the like may be changed in accordance with the environmental conditions of the monitoring area of the sensor, such as, for example, the presence or absence of a person or the power consumption in that area.

In some conventional types of abnormality alarm apparatus which detect a fire or gas leakage and generate an alarm, a determination reference value (i.e. an alarm level value) is changed in accordance with the presence or absence of combustibles in a monitoring area, or a time zone, i.e. day or night, thereby improving reliability.

However, in the above types of conventional apparatus, the conditions are set such that each sensor is weighted by a predetermined coefficient in accordance with a predetermined statistical tendency, and this is inflexible. Therefore, these types of apparatus cannot completely cope with a variety of objects to be monitored such as a state of a building and hence may often generate a false alarm.

Embodiments of the present invention provide an environmental abnormality alarm apparatus which can perform an alarm display function with high reliability in correspondence with an environmental condition and which rarely generates a false alarm.

According to this invention there is provided an environmental abnormality alarm apparatus comprising:

a sensor for detecting an environmental abnormality such as e.g. a fire, gas leakage, a burglar, or the like; and

a signal processor for receiving an output from said sensor and evaluating said output against an alarm determination reference and generating an alarm;

detecting means provided in the area to be monitored by said sensor for detecting changes in an environmental condition other than that or those to be detected by said sensor, and means for changing said

alarm determination reference in accordance with the output state of said detecting means during signal processing.

By way of example only an embodiment of an environmental abnormality alarm apparatus according to the present invention will be described in detail with reference to the accompanying drawings, in which:-

Figure 1 is a block diagram of a basic arrangement of an environmental abnormality alarm apparatus according to an embodiment of the present invention;

Figure 2 is a block diagram of main part of the apparatus shown in Figure 1; and

Figure 3 is a flow chart for explaining the operation of Figure 1.

In Figure 1, a common transmission line L for monitoring areas A1, A2, ..., An, extends from a central monitoring panel Re. Each of the monitoring areas A1 to An has one or more sensors S for detecting an environmental abnormality and a detector D for detecting an environmental condition of the monitoring area A. The detector D detects one or a plurality of artificial environmental change parameters such as the presence or absence of a person, the ON/OFF state of an illumination, the locked or unlocked state of a lock, the power consumption, the noise level and selects an optimal parameter corresponding to the particular state of the monitoring area A.

The central monitoring panel Re includes a central processing unit 10 (to be referred to hereinafter as a CPU) which is connected to the transmission line L through an interface 13 and a transmission circuit 14. The CPU 10 is also connected to a memory 11 for storing abnormality determination references, operation programs, or the like and to an alarm/display unit 12.

In normal operation, the central monitoring panel Re sequentially and circularly accesses the sensors S and detectors D through

the common transmission line L by address polling and fetches environmental information such as a fire, gas leakage, or the presence or absence of a person therefrom by multiplex transmission or the like. This information is processed by the CPU 10 as shown in Figure 3.

Figure 3 is an operation processing flow diagram of the CPU 10. In steps (b), (c), and (d) of Figure 3, detection data of the detector D in a predetermined monitoring area A is sequentially fetched, and a determination reference corresponding to an output from the detector D is set. For example, in fire alarm equipment, the monitoring areas A1 to An may correspond to floors of an office building. In this case, if the detector D is provided to detect the presence or absence of a person, the determination reference value is set higher, i.e., the sensitivity is set lower when people are present in a room and the determination reference value is set lower when no one is in the room.

A detector for detecting an ON/OFF state of an illumination lamp may be provided as the detector D in addition to that for detecting the presence/absence of a person so that the determination reference is set in accordance also with the output from the additional detector.

After the detection data of the detector D has been fetched, output data from one of the sensors S in the monitoring area is fetched in steps (e) and (f), and an abnormality is determined in step (g) on the basis of a determination reference value corresponding to the environmental information of that area. If the output from the sensor S exceeds the abnormality reference value, an alarm display for the sensor S is actuated in step (h).

If the output from the sensor S is below the abnormality reference value, the flow advances to step (i) and then returns to step (f) to fetch an output from the next sensor S in the particular monitoring area, and the above determination is performed again. This processing is repeated a number of times corresponding to the number of the sensors S installed in the particular monitoring area. After the processing is

completed, in steps (k) and (l), the next monitoring area is subjected to the same processing.

According to the environmental abnormality alarm apparatus described above, an environmental condition is detected in units of monitoring areas, and an abnormality determination reference value is changed in accordance with the environmental condition. Therefore, the alarm display function can be accurately performed in accordance with the environmental condition with high reliability, and a false alarm is rarely generated.

It will be understood that the present invention is not limited to the environmental abnormality alarm apparatus described above. For example, the present invention can be similarly applied to an apparatus in which a sensor for detecting a fire, gas leakage, a burglar, or the like is provided and detecting means for detecting a change in the environmental conditions other than that of those detected by the sensor so that the alarm determination processing of the sensor may be changed in accordance with the detection result of the detecting means.

CLAIMS

1. An environmental abnormality alarm apparatus comprising:  
a sensor for detecting an environmental abnormality such as e.g. a fire, gas leakage, a burglar, or the like; and  
a signal processor for receiving an output from said sensor and evaluating said output against an alarm determination reference and generating an alarm;  
detecting means provided in the area to be monitored by said sensor for detecting changes in an environmental condition other than that or those to be detected by said sensor, and means for changing said alarm determination reference in accordance with the output state of said detecting means during signal processing.
2. An environmental abnormality apparatus as claimed in claim 1, wherein the detecting means is operable to detect at least two environmental conditions in the area monitored by said sensor.
3. An environmental abnormality alarm apparatus according to claims 1 or 2, wherein a plurality of sensors are provided in a given sensing area and a single value or set of values for the alarm determination reference for all the sensors is detected by detecting means in said sensing area.
4. An environmental abnormality alarm apparatus according to any preceding claim, wherein the sensors are sequentially and circularly accessed by said signal processor and the respective values are evaluated against said alarm determination reference value or values.
5. An environmental abnormality alarm apparatus substantially as hereinbefore described, with reference to, and as illustrated in, any of



the accompanying drawings.

6. Any and all novel features and combinations and subcombinations thereof substantially as herein disclosed.