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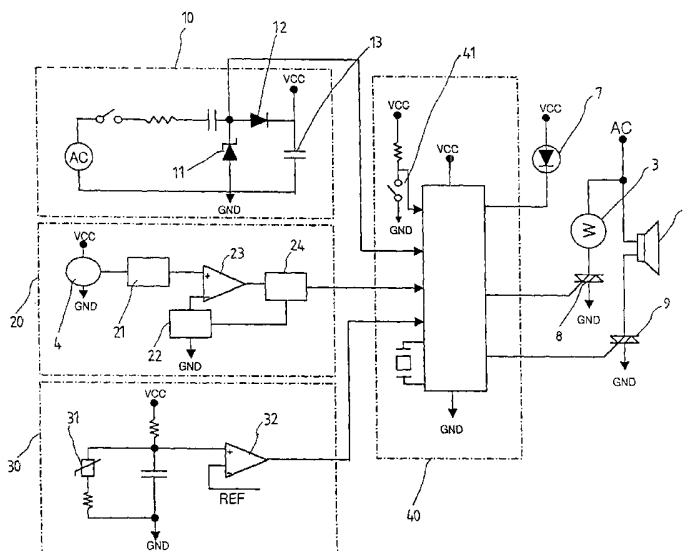
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(54) Title: SENSOR ALARM LIGHT USED AS ELECTRIC LAMP



(57) **Abstract:** A sensor alarm light used as an electric lamp is provided, which replaces a conventional electric lamp without placing additional electric wires to be used as an electric lamp or a burglar alarm. The sensor alarm light used as an electric lamp includes a power on/off detection unit for generating on/off detection signals according to on/off of a power switch, a human body detecting unit for detecting access of the human body with a pyroelectric sensor, a light sensing unit for generating detection signals according to the daytime and nighttime through a CDS device sending lights, and a controller for recognizing the detection signals of the power on/off detecting unit, light sensing unit and human body detection unit to control the operations of the electric lamp, a buzzer, and an indicating element.

**SENSOR ALARM LIGHT USED AS ELECTRIC LAMP****Technical Field**

5       The present invention relates to a sensor alarm light used as an electric lamp and, more particularly, to a sensor alarm light used as an electric lamp, which replaces a conventional electric lamp without placing additional electric wires to be used as an electric lamp or a burglar alarm.

10   **Background Art**

To prevent a trespasser such as a burglar from intruding into a house through the entrance or porch, we should bolt our doors fast or leave burglary prevention to a professional security company. However, it is not possible to fasten the door securely  
15 unless an air-conditioner is operated in the summertime. Even if the door is secured, intrusion of burglar cannot be prevented perfectly.

Furthermore, to leave the burglary prevention to a professional security company is not effective, because it takes time for the security company to arrive upon the scene after detecting intrusion. The most effective way to prevent a burglar  
20 from intruding a house is to warn neighbors of the burglar's intrusion by generating an alarm sound and turning on and off an electric lamp when the intrusion is detected. Actually, most of burglars give up intrusion if an alarm sound sounds or light turns on.

**Disclosure of Invention**

An object of the present invention is to provide a sensor alarm light used as an electric lamp, which sounds an alarm sound and turns on and off a lamp when burglar's intrusion is detected, to warn the burglar and neighbors of the intrusion and allow the burglar to give up the intrusion.

The sensor alarm light used as an electric lamp of the present invention is fit up at the position of an electric lamp in a place where burglar's intrusion is expected without placing additional electric wires, to serve as an electric lamp and carry out burglar prevention function.

To accomplish the object of the present invention, there is provided a sensor alarm light used as an electric lamp of the invention includes a power on/off detection unit for detecting on/off of a power switch, a human body detection unit for detecting access of the human body with a pyroelectric sensor, a light sensing unit for outputting detection signals according to day and night using a CDS device sensing lights, and a controller for judging electric lamp and burglar prevention functions with detection signals from the power on/off detector, human body detector and light detector to control the operations of an electric lamp, a buzzer and an indicating element.

It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

### **Brief Description of the Drawings**

Further objects and advantages of the invention can be more fully understood  
5 from the following detailed description taken in conjunction with the accompanying  
drawing in which:

FIG.1 illustrates wiring of a conventional sensor lamp;

FIG. 2 illustrates wiring of a sensor alarm light used as an electric lamp  
according to the present invention;

10 FIG. 3 is a schematic diagram of the sensor alarm light used as an electric  
lamp according to the present invention; and

FIG. 4 is a timing chart of the operation of the sensor alarm light used as an  
electric lamp according to the present invention.

### **15 Best Mode for Carrying Out the Invention**

Reference will now be made in detail to the preferred embodiments of the  
present invention, examples of which are illustrated in the accompanying drawings.

The sensor alarm light used as an electric lamp of the invention includes a  
20 power on/off detection unit 10 for detecting on/off of a power switch 1 and supplying  
driving power of a set 6, a human body detection unit 20 for detecting access of the  
human body with a pyroelectric sensor 4, a light sensing unit 30 for sensing  
brightness of light with a CDS device 31, and a controller 40 for recognizing the  
outputs of the power on/off detector 10, human body detector 20 and light detector 30  
25 to control the operations of an electric lamp 3, a buzzer 5 and an indicating element 7.

In the power on/off detection unit 10, a square wave is generated by a zener diode 11 when the power switch 1 is turned on to supply AC power. The square wave is applied to the controller 40 and, simultaneously, rectified and smoothed by a diode 12 and a condenser 13 to be provided to the set 6 as its driving power.

5       The human body detection unit 20 is constructed in a manner that a signal detected by the pyroelectric sensor 4 is amplified by an amplifier 23 to which a high pass filter 21 and a band pass filter 22 are connected, and a window comparator 24 applies a signal sensing the human body or a signal sensing no human body to the controller 40.

10       The light sensing unit 30 is constructed in such a manner that a comparator 32 compares the voltage applied to the CDS device 31 whose resistance varies with the quantity of light with a reference voltage REF, to apply signals according to brightness and darkness, that is, day and night, to the controller 40.

15       The controller 40 turns on the electric lamp 3 when the power switch 1 is turned on to provide driving power. Then, The controller 40 operates in a normal electric lamp mode if a human body sensing signal is detected within a predetermined period of time (five seconds, approximately) but turns off the electric lamp if the human body is not detected within the predetermined period of time (about five seconds) to be converted into a burglar prevention mode. The controller 40 controls  
20       turning on/off of the indicating element 7, and controls the operations of triacs 8 and 9 so as to control the operations of the electric lamp 3 and buzzer 5 in case of the burglar prevention mode.

When the power switch 1 is turned on/off/on, the controller 40 operates in the normal sensor lamp mode in which it detects a variation in the square wave pulse

input from the power on/off detection unit 10 to turn on/off only the electric lamp 3 in the event of detecting the human body.

The set of the present invention is constructed in a separation type or integration type and replaces a conventional electric lamp without placing additional  
5 electric wires.

A conventional sensor lamp 2, which is fit up at the entrance or stairway of an apartment house and automatically turned on when a person comes close thereto, includes the pyroelectric sensor 4 and electric lamp 3, as shown in FIG. 1. When the pyroelectric sensor 4 detects access of the human body, the sensor lamp turns on the  
10 electric lamp 3 for a predetermined period of time, and when the period of time is finished, turns off the lamp 3. This kind of sensor light 2 is a generalized technique.

The present invention replaces a convention electric lamp with the set 6 including the indicating element 7, pyroelectric sensor 4, electric lamp 3 and buzzer 5, as shown in FIG. 2, without placing additional electric wires. FIG. 3 illustrates the  
15 detailed configuration of the set 6. The operation principle of the present invention is explained with reference to the attached drawings.

The human body detection unit 10 employs the human body sensing technique used by the conventional sensor light 2. When the pyroelectric sensor 4 senses the human body, the human body detection unit 10 applies a detection signal to the  
20 controller 40.

In the light sensing unit 30 for discriminating day and night from each other, the comparator 32 compares the voltage applied to the CDS device 31 whose resistance varies with the quantity of light with the reference voltage REF and applies logic levels corresponding to external lights of below and above a predetermined

quantity of light, respectively, to the controller 40. Accordingly, day and night can be discriminated from each other by the detection signals of the light sensing unit 30.

In the power on/off detection unit 10, when the power switch 1 is turned on, the zener diode 11 applies a square wave of 1/60sec, represented as (1) of FIG. 4, to the controller 40 and, simultaneously, the condenser 13 attains DC voltage, represented as (3) of FIG. 4, to use it as the operation voltage of the controller 40.

When the power switch 1 is turned off, while the zener diode 11 maintains 0V, as shown as (2) in FIG. 4, the condenser 13 holds the operation voltage ((5) of FIG. 4) of the controller 40 for a predetermined period of time (1~1.5 seconds) as shown as (4) in FIG. 4.

As described above, waveforms are different from each other in the cases where the power switch 1 is turned on ((1) of FIG. 4) and off ((2) of FIG. 4). Accordingly, the controller 40 can detect the number of times of turning on/off of the power switch using the different waveforms and a user can select an operation mode using it.

Specifically, in case where the power switch 1 is turned on, the controller 40 operates in the normal lamp mode when a person is detected within a predetermined period of time and it operates in the alarm function mode when a person is not detected within the predetermined period of time. When the power switch 1 is turned off, the electric lamp 3 and the alarm function are turned off.

When the power switch 1 is turned on/off/on, the controller 40 detects a variation in the square wave pulse input from the power on/off detection unit 10 to operate in the normal sensor lamp mode in which only the electric lamp 3 is turned on/off when the human body is detected.

The power switch 1 of the invention is a switch that turns on/off the conventional electric lamp so that it is used for the set of the invention without having additional wiring because the set of the invention replaces the conventional lamp.

In case that the power switch 1 is turned on, the controller drives the traic 8 to  
5 turn on the electric lamp 3 and, when a person is detected within a predetermined period of time (five seconds, approximately), it operates in the normal lamp mode to maintain the electric lamp 3 turned on until the power switch 1 is turned off.

When a person is not detected within the period of time (about five seconds) after the power switch 1 is turned on, the electric lamp 3 is turned off and the  
10 controller 40 is converted into the alarm function mode. Here, the controller 40 performs a preliminary alarm operation by flickering the indicating element 7 for about ten seconds to inform a user of conversion into the alarm function mode. From this point of time, the controller 40 drives the buzzer 5 when the human body detecting unit 20 detects the human body, to generate an alarm sound. In addition, the  
15 controller turns on and off the electric lamp 3 to warn a burglar of detection of his intrusion to make him give up intrusion.

After the controller 40 is set to the alarm function mode, it flickers the indication element 7 once a minute to indicate that the alarm function is in operation state.

20 When the automatic selection switch 41 is turned on, the controller 40 recognizes it to execute an alarm clearing function in the daytime and perform an automatic alarm function in the nighttime when it operates in the alarm function mode. Here, the day and night are discriminated from each other by the light sensing unit 30.



In a night alarm function mode, the alarm function does not operate even when the human body detection unit 20 detects the human body in the daytime. The alarm function operates when the light sensing unit 30 recognizes the nighttime.

While the controller 40 performs the normal sensor lamp mode, the automatic  
5 selection switch 41 is turned on so that the electric lamp 3 is not turned on even if a person is detected in the daytime. The electric lamp 3 is turned on when a person is detected in case that the light sensing unit 30 recognizes the nighttime.

In the present invention, the alarm is cleared by turning off the power switch 1. If the alarm is not cleared, alarm is automatically cancelled after the lapse of one  
10 minute, approximately, and the burglary prevention mode is carried out again.

The set of the present invention can be constructed in a separation type or integration type. The set can be realized in one chip in case of mass production.

The set of the invention can be configured in a manner that it is provided with power all the time by turning on the power switch 1 so that its user can control the set  
15 remotely. In this case, a receiver for receiving a remote control signal is attached to the set.

### **Industrial Applicability**

20 The set of the present invention is fit up at a place where a burglar is expected to intrude, to generate an alarm sound and turn on and off the electric lamp in the event of intrusion of the burglar. This prevents intrusion of the burglar to protect human and material properties. Furthermore, the set of the invention can be easily fit up without having additional wiring because it replaces the conventional electric  
25 lamp. The set of the invention can be used in a desired function mode selected from

the normal electric lamp mode, alarm function mode, normal sensor lamp mode only by operating the power switch.

The set of the present invention can be fit up at the entrance or porch of a house or apartment house to automatically warn of intrusion of a burglar.

5 Accordingly, its user can live with the door open without having an air-conditioner in the summertime. This can save energy and promote the user's health.

Moreover, the automatic selection switch operates to cancel the alarm in the daytime and execute the automatic alarm mode in the nighttime in case of the alarm function mode. In the normal sensor lamp mode, the electric lamp is not turned on in  
10 the daytime even when a person is detected but it is turned on when a person is detected in the nighttime. This eliminates unnecessary energy consumption.

The forgoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The present teachings can be readily applied to other types of apparatuses. The description of the present invention is intended to be  
15 illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

**What is claimed is:**

1. A sensor alarm light (2) used as an electric lamp, which has a human body detecting unit (20) for detecting the human body with a pyroelectric sensor (4) to turn on an electric lamp (3) for a predetermined period of time, comprising:

a power on/off detection unit (10) for generating on/off detection signals according to on/off of a power switch (1);

a light sensing unit (30) for generating detection signals according to the daytime and nighttime through a CDS device sending lights; and

a controller for recognizing the detection signals of the power on/off detecting unit (10), light sensing unit (30) and human body detection unit (20), to control the operations of the electric lamp (3), a buzzer (5), and an indicating element (7).

2. The sensor alarm light used as an electric lamp as claimed in claim 1, wherein the controller (40) operates in a normal electric lamp mode when the power switch (1) is turned on and a person is detected within a predetermined period of time, whereas the controller operates in a burglary prevention mode when a person is not detected within the predetermined period of time to execute an alarm function mode that drives the electric lamp (3) and buzzer (5) in the event of detection of intrusion.

3. The sensor alarm light used as an electric lamp as claimed in claim 1, wherein the controller (40) operates in a normal sensor lamp mode that turns on/off only the electric lamp (3) when a person is detected according to on/off/on of the power switch (1).

4. The sensor alarm light used as an electric lamp as claimed in claim 2, wherein, in the alarm function mode, an automatic selection switch (41) is turned on to allow the controller (40) to operate in an alarm clearing mode in the daytime but in an automatic alarm function mode in the nighttime.

5

5. The sensor alarm light used as an electric lamp as claimed in claim 3, wherein the controller (40) turns off the electric lamp (3) in the daytime but turns on the electric lamp (3) only when a person is detected in the nighttime in case where the controller operates in the normal sensor lamp mode.

10

6. The sensor alarm light used as an electric lamp as claimed in claim 1, wherein the power on/off detection unit (10), human body detection unit (20), light sensing unit (30), controller (40), indicating element (7), buzzer (5), and electric lamp (3) are constructed in a separation manner, being fit up at a place where a conventional lamp is set without having additional wiring.

15

7. The sensor alarm light used as an electric lamp as claimed in claim 1, wherein the power on/off detection unit (10), human body detection unit (20), light sensing unit (30), controller (40), indicating element (7), buzzer (5) and electric lamp (3) are constructed in an integration manner, being fit up at a place where a conventional lamp is set without having additional wiring.

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FIG. 1

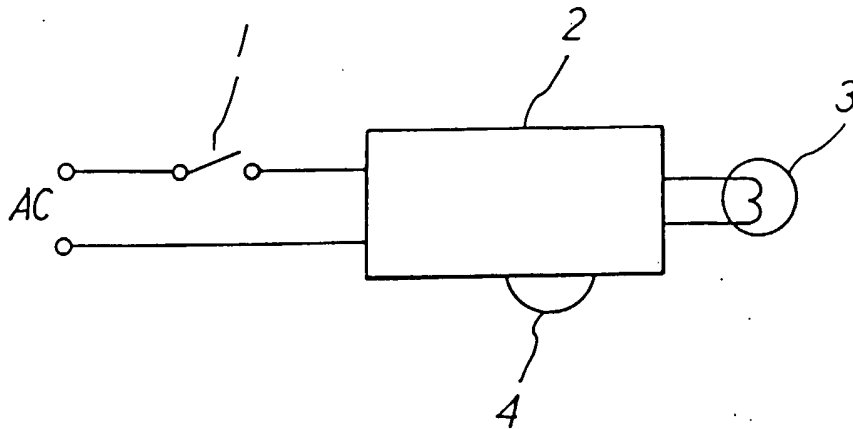


FIG. 2

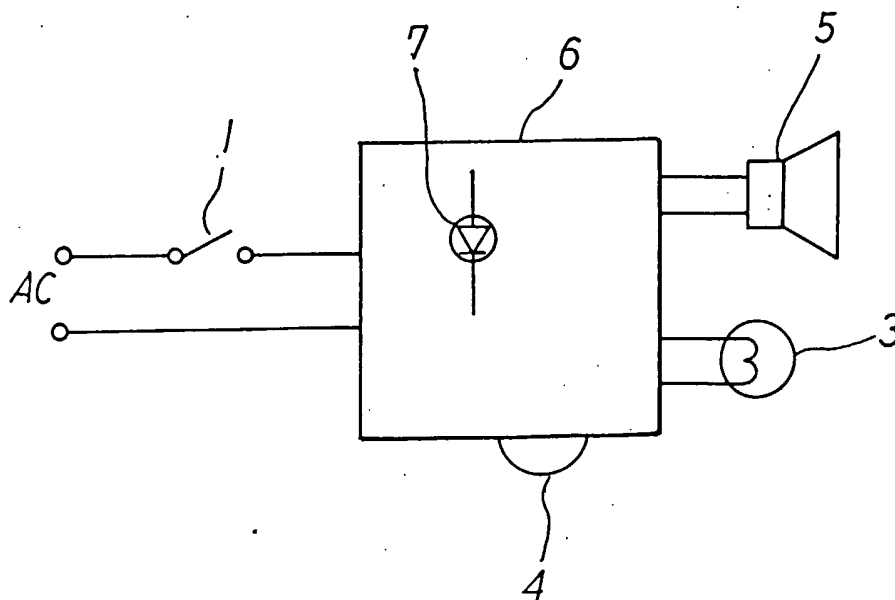


FIG. 3

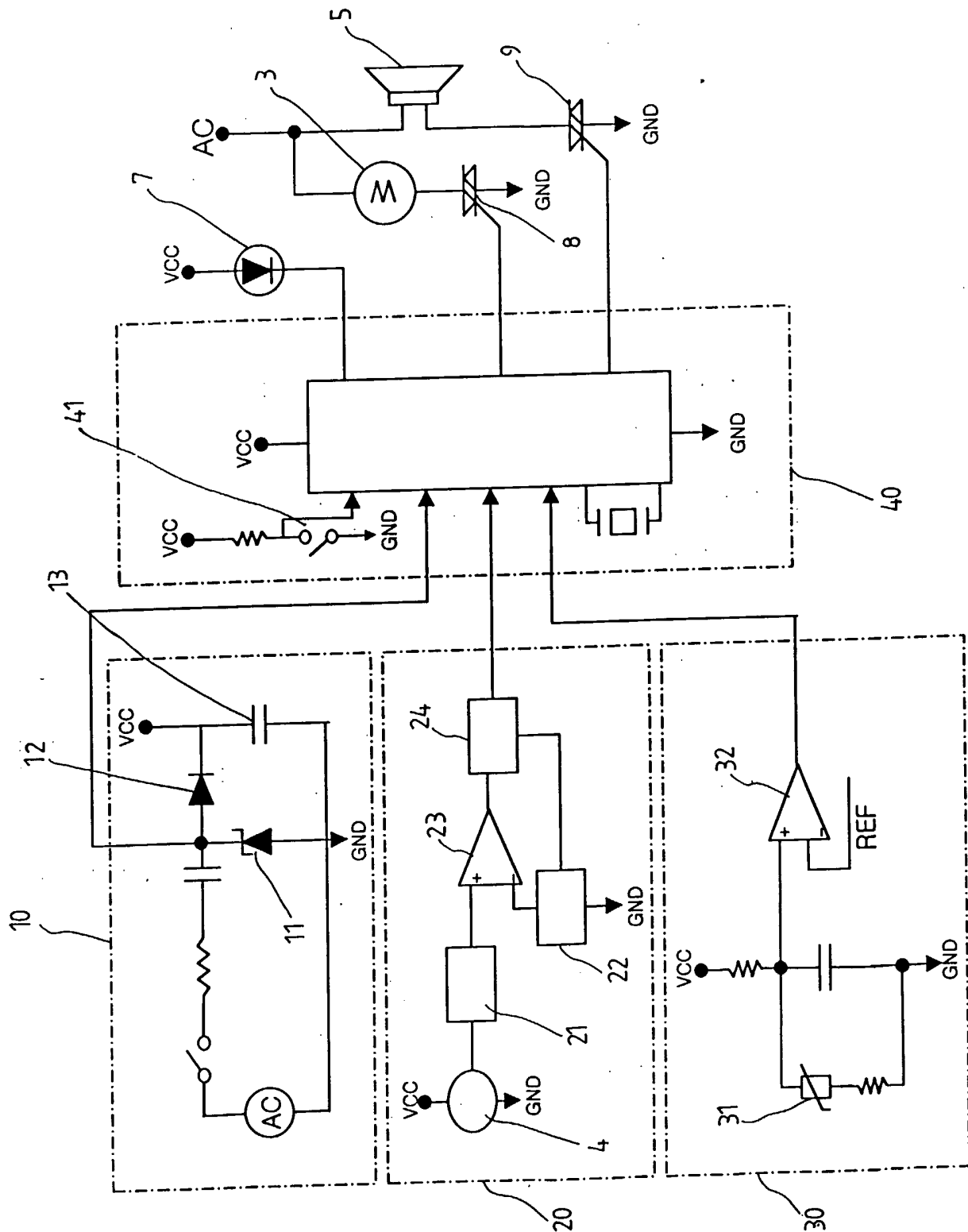
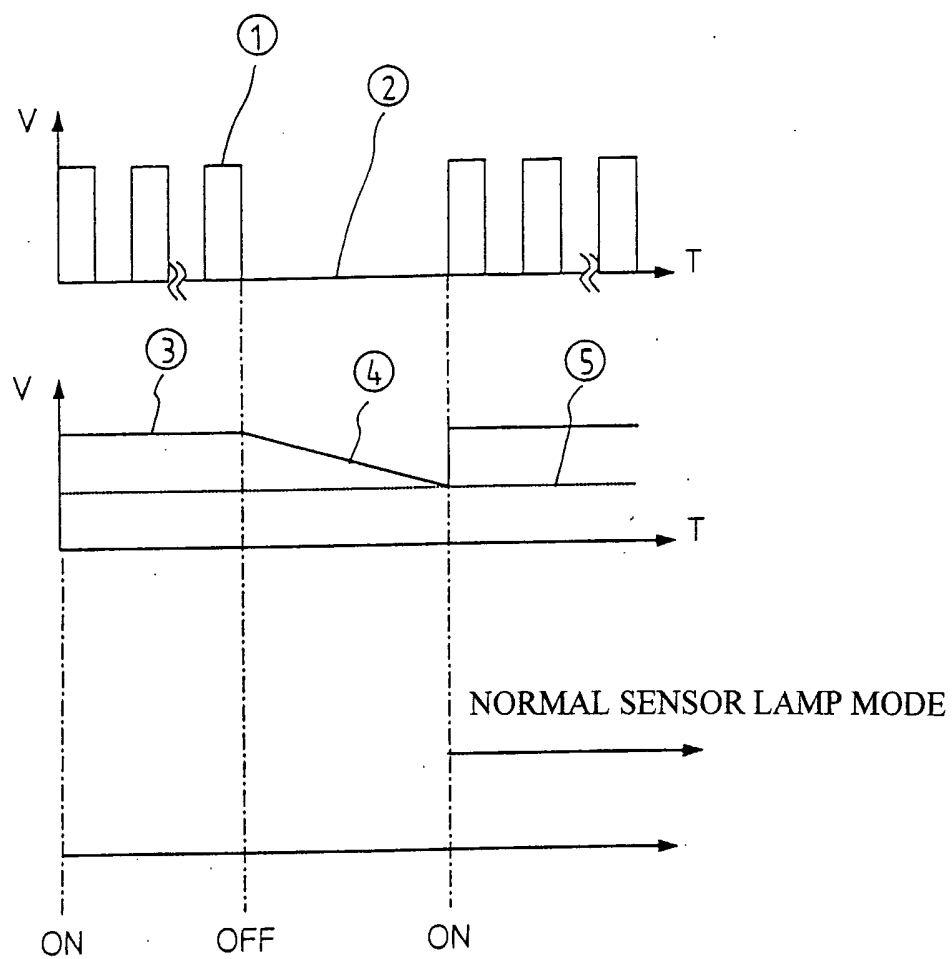


FIG. 4



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR02/00993

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7 G08B 13/191**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G08B13\*, H05B35\*

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KOREAN PATENTS AND APPLICATIONS FOR INVENTIONS SINCE 1975

KOREAN UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NPS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR20-0258735 Y (CHOI, YOUNG SIK) 29. Dec. 2001(29.12.2001) See the whole document	1-7
X	KR20-0195366 Y ((KIM, KI TAE) 01. Sep.2000(01.09.2000) See the whole document	1-3, 5-6
Y	"	4,7
Y	US 4,982,176 A (Frank Schwarz) 01.Jan.1991(01.01.1991) See the abstracts, fig1-2	1
Y	US 6,137,047 A (Nikon Corp.) 24.Oct.2000(24.10.2000) See the abstracts, fig1	1
A	US 5,128,654 A (Lightolier Incorporated)07.Jul.1992(07.07.1992) See the abstracts, fig3	1
A	KR 20-0176539 Y (SON, JONG HYUN) 15.Apr.2000(15.04.2000) See the whole document	1

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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