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(71) Applicants *(for all designated States except US)*: **QEP MANUFACTURING (M) SDN BHD** [MY/MY]; No. 1, Lorong Seri Gambut 2, KJ Techno Industrial Park, Off Jalan Kebun, Klang 41100 (MY). **PINTAS PTE LTD** [SG/SG]; No. 151 Chin Swee Road, #09-11/13, Manhattan House, Singapore 169876 (SG).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **ON YOWN, Khuong** [MY/MY]; 151-1-1A, Wisma Mutiara Puchong, Jalan Puchong, Kuala Lumpur 58200 (MY).

(74) Agent: **CHOW, Weng, Weng**; No. 151, Chin Swee Road,, #09-11/13, Manhattan House, Singapore 169876 (SG).

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**Published:**
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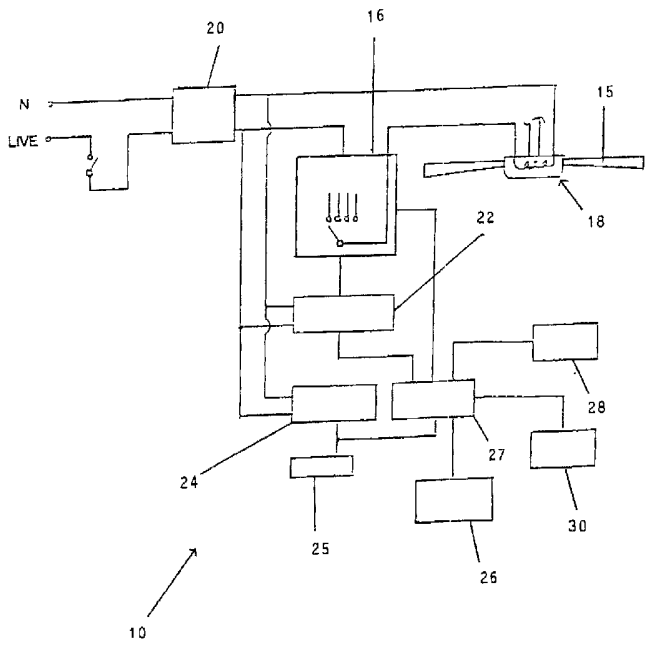
*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: IMPROVED LIGHTING MEANS CAPABLE OF BEING MOUNTED TO A FAN




(57) Abstract: The present invention relates to lighting means mounted on a fan more particularly a night light and/or emergency light that is capable of being mounted to a fan. The combination of a night light and/or an emergency light and a fan comprising; a fan installed with at least one lighting means; said lighting means lights up when in darkness and/or lighting means activates when there is power failure to said fan; wherein the lighting means de-activates once there is light and/or the power supply resumes.

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# IMPROVED LIGHTING MEANS CAPABLE OF BEING MOUNTED TO A FAN

## Field of Invention

The present invention relates to lighting means mounted on a fan more particularly a night light and/or emergency light that is capable of being mounted to a fan.

## Background of the Invention

Numerous devices for providing night lighting or emergency lighting have been provided in the prior art. For example, U.S Pat. Nos. Des. 366,127; 3,968,355; 4,546,419 and 5,443,343 all are illustrative of such prior art. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

U.S. Pat.No. Des. 366,127

Inventor: Se Kit Yuen

Issued: Jan. 9,1996

An ornamental design for an emergency power failure light including a night light is disclosed by this reference. The light is plugged into a conventional wall outlet and includes a light on its face, opposite the plug for connecting with the wall socket. A power switch appears to be on one side thereof.

U.S. Pat. No. 3,968,355

Inventor: John Smallegan

Issued: Jul. 6,1976

An automatic night light which will change its illumination in response to changes in the ambient light level. The circuit comprises an AC input with the lamp and a solid-state switch connected in series, a resistive voltage divider being connected across the solid-state switch and having series-connected fixed and light-sensitive resistors. The switch gate is connected to the voltage divider tap by a bi-directional conductor. The structure comprises a housing having circuit and lamp portions. The circuit portion has outlet prongs with bent-back ends, a circuit board being supported by notches in the housing and the prong ends. The housing also supports spring contacts which connect the circuit board to the lamp socket in a simple manner, with the light-sensitive device being easily mountable and firmly supported by the housing.

U.S. Pat. No. 4,546,419

Inventor: Kelli J. Johnson

Issued: Oct. 8,1985

A wall recessed receptacle box contained night light with a photocell light intensity dusk-dawn (or room illumination) on/off switch control equipped with manual dimming control for a darker/brighter night light atmosphere. The night light box

is insertable in a recessed box in the wall otherwise used for a normal receptacle outlet and includes at least one plug in receptacle with the light translucent or transparent cover close to flush with the wall in the recessed night light box. The night light has an internal light bulb that may be easily replaced by removing a retaining screw at the top of the cover so that the bottom hinge mounted cover may be pivoted out an down to not only expose the bulb to be replaced but also automatically simultaneously disconnect the electric supply from the bulb socket and eliminate power from the bottom of the bulb in the socket for safety.

U.S. Pat. No. 5,446,343

Inventor: Burt Shulman

Issued: Aug. 29, 1995

A capacitive element is introduced in series with the gate of a switching element in an automatic turn on/off circuit which automatically provides artificial light depending on the ambient light incident on a photo sensitive element of the circuit wherein the capacitive element holds an offset voltage which aids in turning on the switching element and provides a hysteresis in the system which counteracts a slickering effect common to automatic turn on/off circuits controlling an artificial light which employ a photo sensitive device.

**Summary of the Invention**

The present invention relates generally to night and emergency lighting devices and, more specifically, to said devices connected to an emergency power supply for detecting a power failure and providing emergency lighting upon detection of such power failure, the emergency power supply being recharged upon restoration of power or providing night light automatically whenever the vicinity surrounding the light means darkens.

A primary object of the present invention is to provide an apparatus for providing emergency and night lighting that will overcome the shortcomings of prior art devices.

Another object of the present invention is to provide an apparatus for providing emergency and night lighting which is able to detect the occurrence of a power failure.

An additional object of the present invention is to provide an apparatus for providing emergency and night lighting which is able to provide emergency lighting upon detection of a power failure or during nighttime hours.

Another object of the present invention is to provide an apparatus for providing emergency and night lighting that is simple and easy to use.

A still further object of the present invention is to provide an apparatus for providing emergency and night lighting that is economical in cost to manufacture.

Yet another object of the present invention is to provide an apparatus having additional feature of an ionizer for neutralizing electrostatic charges in the air.
Additional objects of the present invention will appear as the description proceeds.

The object of the invention is achieved by providing a combination of an emergency light and a fan comprising; a fan installed with at least one lighting means; said lighting means used as an emergency lamp which activates upon a failure of power supply to said fan; wherein the light source de-activates once the power supply resumes.

It is also preferred that the combination as mentioned above doubles as a night lamp where a manual switch means for selectively, electrically energizing said lighting means with said power supply to fan and having an ionizer to promote intermixing of positive and negative ions.

**Brief Description of the Drawings**

Figure 1 shows the block diagram of the present invention where the night light and/or emergency light is mounted to a conventional fan.

Figure 2 illustrates the cross section of the night light and/or emergency light to the fan.

Figures 3a-3c illustrates the cover for the fan hub.

**Detailed Description of the Invention**

Turning now to the drawings, in which similar reference numerals denote similar elements throughout the several views. The figures illustrate the apparatus for providing emergency and night lighting of the present invention (10).

According to figure 1, the block diagram of the invention (10) is shown. The invention can be incorporated with a fan (15) during manufacture. However, it should be noted that any conventional ceiling, stand, wall or table fan may be used together with the present invention (10). The night light and/or emergency lamp is attached to the fan (15) without the need of a skilled person to do the same. The installation may

be done by a person with limited electrical or wiring knowledge.

According to the preferred embodiment shown in figure 1, the night light and/or emergency light is connected to a ceiling fan (15). The fan (15) may be incorporated with the night light and/or the emergency light circuit during manufacture. Otherwise, the invention may be sold separately and connected to any conventional type ceiling fan (15). However, the hub (18) of the fan (15) needs to be replaced with a transparent cover (19) in order to allow light to pass through it. The hub (18) is shown in figures 3a-3c.

Figure 2 illustrates a cross section of the invention where inner parts of a typical ceiling fan (15) which includes stator, laminated iron plates, a coil and a rotor. There is an upper cover (33) at the top of the hub (18). The upper cover (33) is provided at the centre thereof with an integrally molded cylindrical portion. The cylindrical portion is rotatably supported by means of bearings (32) e.g. ball bearings at the upper portion of a cylindrically shaped vertical fixed shaft (31) press fitted through the center of the stator so as to extend above the middle of the stator. Through the fixed shaft (31) passes a lead wire comprising electrical conductive material and the like.

The method of installing the invention to conventional fans will now be explained. Basically it is divided into three steps. First step is to connect the life wire extending into a remote controller circuit board (16) for a remote controller controlled fan (15) or into a regulator (not shown) for a switch and regulator controlled fan. Step 2 is to connect the lighting means (30) within the hub (18) of the fan (15). The lighting means (30) is connected to the wires the fan (15) is connected to. The final step is to connect the control circuit concealed within the upper cover to the wiring joined to the lighting means (30).

The control circuit has two functions where one is to light the lighting means (30) when the surrounding of the photo sensor (28) is dark, in other words it functions as a night light and as an emergency light to light the lighting means (30) in case of power failure. In the event of power failure, the emergency light will only light up if the surrounding of the photo sensor (28) is dark.

The lighting means (30) mentioned may be a tungsten bulb. However, LEDs, fluorescent lamp or other conventional lighting devices may be used. The light bulb is connected to a circuit which comprises several modules.

For night light function the modules include a controller (27), voltage detector (22) and a photo sensor (28). There is also optionally provided means for reducing the supply voltage of around 240v to about 12v or suitable to light the bulb. The said voltage reducing means may preferably be a step down transformer. For the preferred embodiment the night light and/or emergency light is installed at a remote controller controlled fan (15). The fan (15) speed is controlled by a speed selector of the remote controller (16).

The night light can be switched on or off by the remote controller (16). When the night light is switched on, this will set the night light at stand by mode. During day time, the photo sensor (28) senses light and sends appropriate signal to the controller (27) not to light the lighting means (30). However, when the room gets dark the photo sensor (28) sends an opposite signal to the controller (27) to close the loop supplying voltage to the lighting means (30), thus, lighting up the lighting means (30). The lighting means (30) is lit till the photo sensor (28) senses light again, and the process repeats as long as the remote controller (16) is switched on. While for the night light to work with the switch and regulator controlled fan (15), the regulator is set to point '0' and this will set the night light at stand by mode.

An ionizer (26) may be provided to the combination apparatus of the present invention (10). The ionizer (26) is installed to the fan (15) to provide an air stream of electrically balanced with positive and negative ions. The ionizer (26) is connected to the controller (27) as shown in figure 1.

For emergency light function, the relevant modules are a controller (27), voltage detector (22), conventional rechargeable batteries (25) and a charger (24). Normal batteries may replace rechargeable batteries (25) and the charger (24) but it may be cumbersome for the user to keep changing the batteries (25) frequently. The voltage detector (22) constantly checks the voltage supplied to the lighting means (30) or alternatively the fan (15). When it detects 0 voltage where there is no supply voltage due to power failure or the like, appropriate signals are sent to the controller (27) to connect the rechargeable battery (25) to supply the voltage to the lighting means (30) instead. The lighting means (30) is lit until the building power supply resumes or the battery (25) of the temporary power supply drains out. Once the main power supply is back, the charger (24) charges the batteries (25) accordingly.

The controller (27) may have a micro processor in it or a PROM, EPROM or EEPROM programmed with source codes to turn on the lighting means (30) once the voltage detector (22)

identifies there is no voltage supply to the fan (15) and/or to turn on the lighting means (30) when dark. Voltage protector (20) may also be incorporated to avoid any surge in voltage from destroying the circuit.

Figures 3a- 3c show a hub (18) of the fan (15) that is basically a light permeable cover which is detachably fixed to the fan (15).

It is to be noted that the drawings and description herein are merely to exemplify the invention and do not represent the only and whole range of embodiments of the invention which is capable of many combinations and of various features described herein. Each of the features described may be varied, modified or adapted by a person skilled in the art without departing from the working principle or spirit of the invention which scope is defined in the following claims.

**Claims**

1. A combination of a night light and/or an emergency light and a fan comprising;
a fan installed with at least one lighting means;
said lighting means lights up when in darkness and/or lighting means activates when there is power failure to said fan;
wherein the lighting means de-activates once there is light and/or the power supply resumes.

2. A combination as claimed in claim 1, wherein said fan is installed with lighting means during manufacture.

3. A combination as claimed in claim 1, wherein said lighting means is installed to conventional fans such as a table fan, stand fan or wall fan.

4. A combination as claimed in claim 1, wherein said fan is preferably a ceiling fan.

5. A combination as claimed in claim 4, wherein said lighting means is installed within the hub of the said fan.

6. A combination as claimed in claims 4 or 5, wherein said hub is transparent to allow light to effectively brighten the vicinity.

7. A combination as claimed in any claims 1 to 6, wherein said combination may be provided with an ionizer which is installed to said fan and connected to the controller for intermixing of positive and negative ions and neutralizing electrostatic charges in the air.

8. A combination as claimed in any claims 1 to 7, wherein said fan can be a remote controller or a switch and regulator controlled fan or the like.

9. A night light for installing to a fan comprising:
a lighting means attached to said fan;
electronic circuit which includes
i) charger module to charge backup rechargable batteries;
ii) photo sensor module to detect the presence of light;
iv) controller module that turns the lighting means on or off according to the feedback signal from the said photo sensor module.

10. An emergency light for installing to a fan comprising:
a lighting means attached to said fan which;
electronic circuit which includes
i) voltage detector module to detect power failure;
ii) controller module that turns the lighting means on or off according to the feedback signal from the said voltage detector.

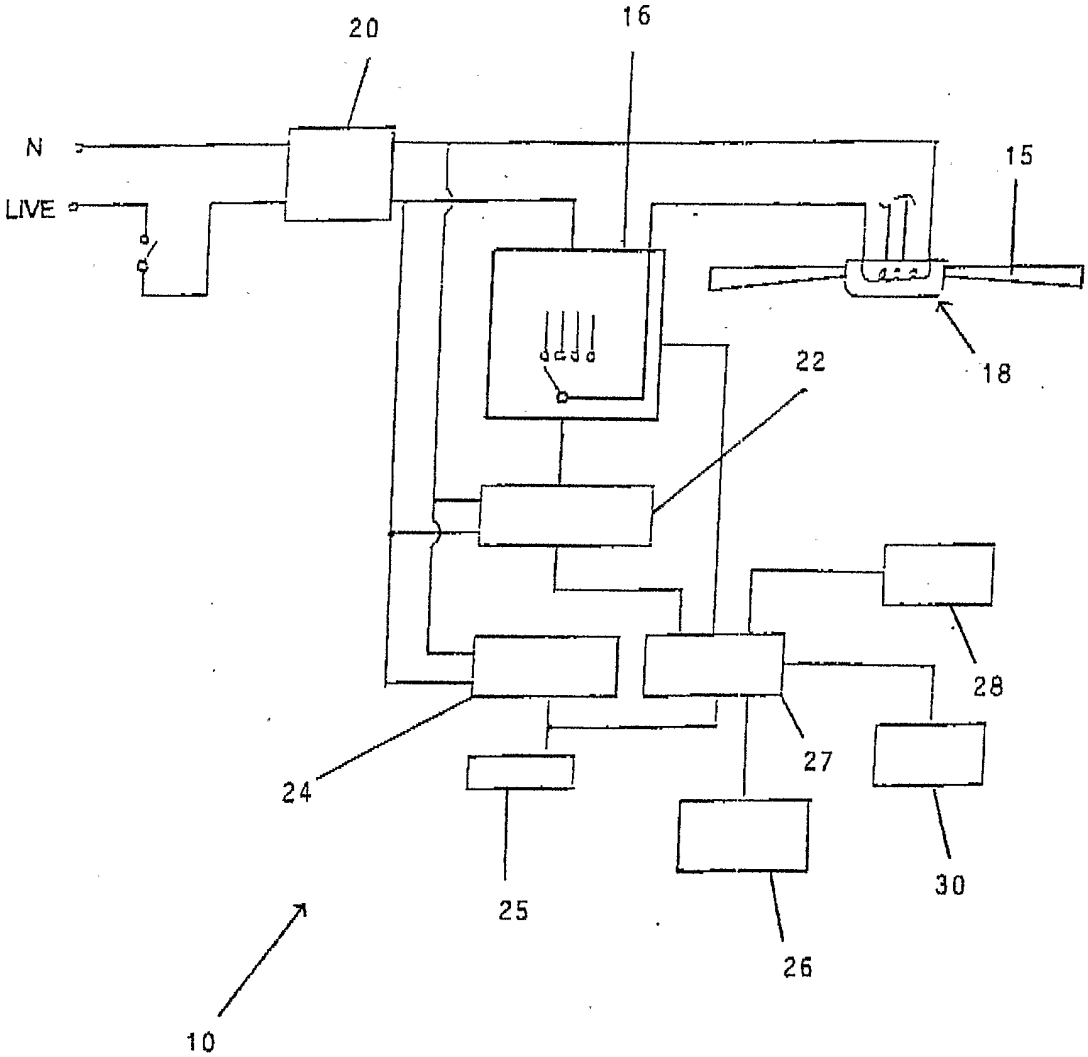


Figure 1

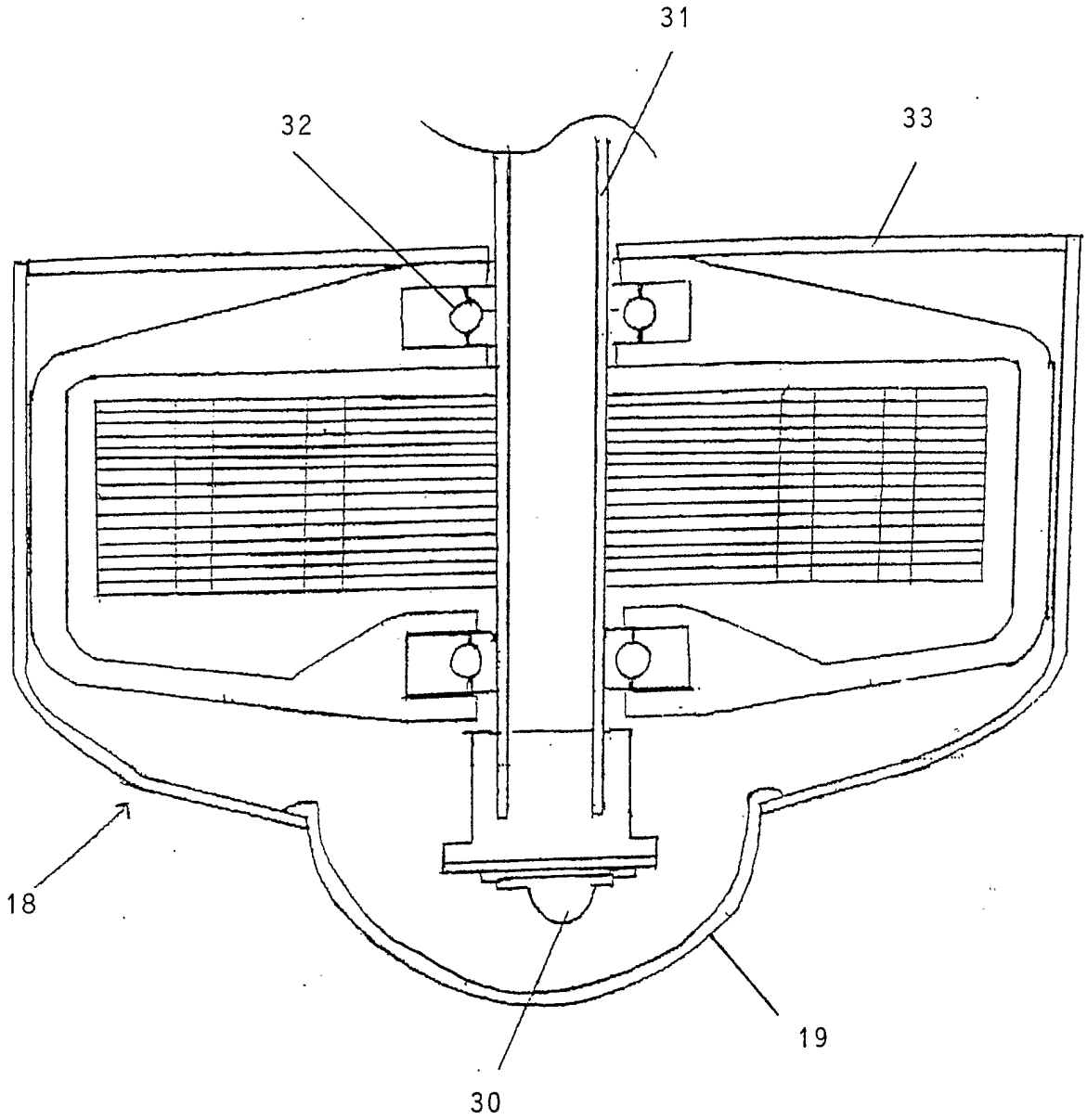


Figure 2

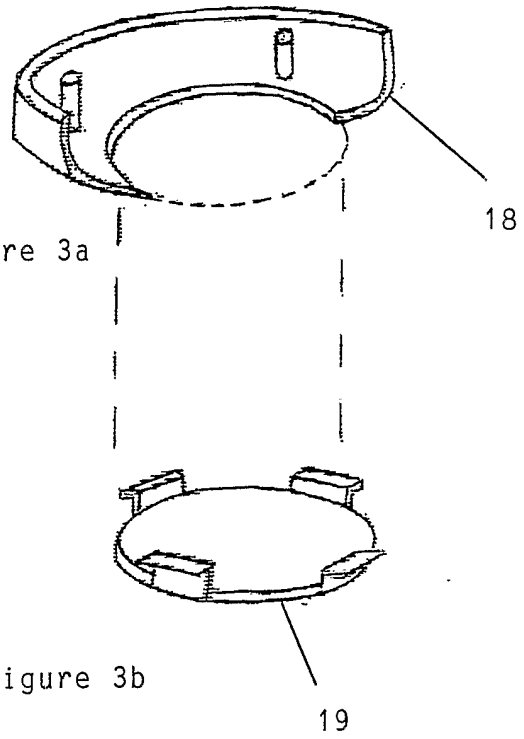


Figure 3a

Figure 3b

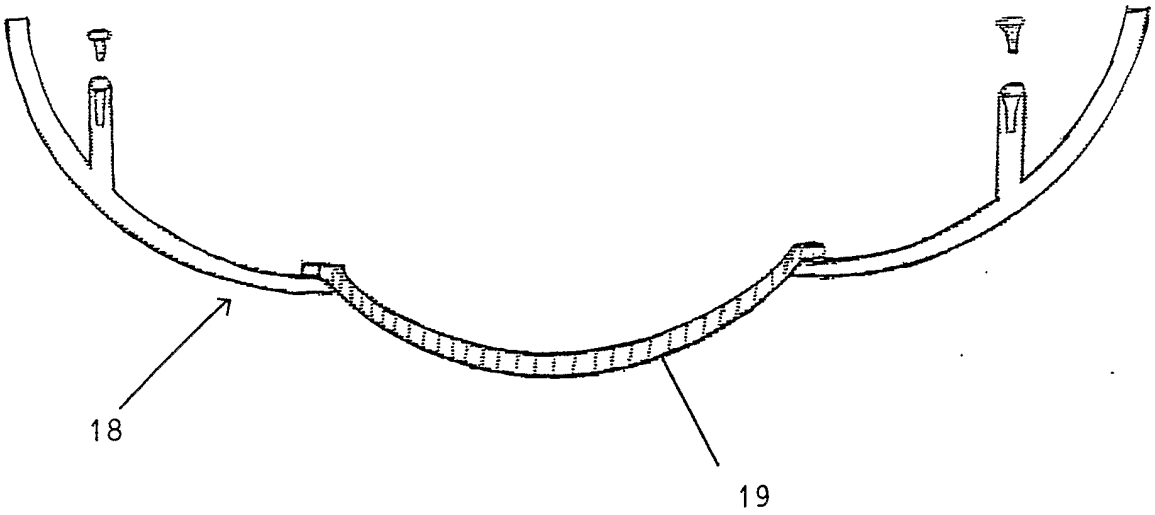


Figure 3c

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/SG03/00236**

**A. CLASSIFICATION OF SUBJECT MATTER**

Int. Cl. [7]: H05B 37/02

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)

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI, JAPIO with keywords: (ceiling (w) fan) and (light+ or lamp+ or globe or fluro+ or bulb+ or LED) and ( fan or cooler or ventil+) and (sens+ or detect+ or monitor+ or meas+) and ((light (w) sensit+) or (power(3d) fail or emerg+) or similar terms

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 6 315 431 B (GREEDY) 13 November 2001.<br>See in particular col 3 lines 8-53 and Figure 1. | 1-6, 9 |
| X | US 6 294 874 B (RUDOLPH et al) 25 September 2001.<br>See in particular col 3 line 11 - col 4 line 62, and Figures 1 and 3. | 1-6, 8, 9 |
| X | US 6 201 351 B (RUDOLPH et al) 13 March 2001.<br>See in particular col 3 line 11 - col 4 line 62, and Figures 1 and 3. | 1-6, 8, 9 |

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"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)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"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
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"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
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 21 November 2003 | 28 NOV 2003 |
| Name and mailing address of the ISA/AU<br>AUSTRALIAN PATENT OFFICE<br>PO BOX 200, WODEN ACT 2606, AUSTRALIA<br>E-mail address: pct@ipaustralia.gov.au<br>Facsimile No. (02) 6285 3929 | Authorized officer<br>**LARS KOCH**<br>Telephone No : (02) 6283 2551 |

INTERNATIONAL SEARCH REPORT

International application No.
**PCT/SG03/00236**

**C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 4 719 446 A (HART) 12 January 1988.<br>See in particular col 3 line 44 - col 5 line 3, claims 13, 14 and Figure 1 | 1-6, 8 |
| A | US 5 900 682 A ( HUNG) 4 May 1999.<br>See entire document | |
| A | US 4 831 505 A (VAN NORMAN) 16 May 1989<br>See entire document | |

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/SG03/00236**

**Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :

because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos :

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

See attached sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims

2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

**Supplemental Box**
(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: II**

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

1. Claims 1-8 are directed towards a combination of a night light and/or an emergency light and fan. The claims further include a fan with at least one lighting means. The lighting means lights up when in darkness and/or lighting means activates when there is power failure to the fan, and wherein the lighting means de-activates once there is light and/or the power supply resumes. It is considered that the lighting means lighting up when in darkness and/or lighting means activates when there is power failure to the fan, and the lighting means de-activates once there is light and/or the power supply resumes comprises a first "special technical feature".

2. Claim 9 is directed to a night light comprising a lighting means attached to a fan, and also includes an electronic circuit further including a charger module to charge backup rechargeable batteries, a photo sensor module to detect the presence of light, and a controller module that turns the lighting means on or off according to the feedback signal from the photo sensor module. It is considered that a night light having an electronic circuit which turns lighting means on/off according to the feedback signal from the photo sensor module as defined, comprises a second "special technical feature".

3. Claim 10 is directed to a night light comprising a lighting means attached to a fan, and also includes an electronic circuit further including a voltage detector module to detect power failure and a controller module that turns the lighting means on or off according to the feedback signal from the voltage detector module. It is considered that a night light having an electronic circuit which turns lighting means on/off off according to the feedback signal from the voltage detector module comprises a third "special technical feature".

Since the above mentioned groups of claims do not share any of the technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept, a priori.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
**PCT/SG03/00236**

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 Member |
|---|---|
| US 6315431 | |
| US 6294874 | US 6201351 |
| US 4719446 | |
| US 5900682 | |
| US 4831505 | |

END OF ANNEX