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(56) Documents Cited:
GB 2396206 A **GB 2309838 A**
GB 2267746 A **US 5582478 A**
US 4878107 A **US 4187532 A**
US 3737648 A **US 3479561 A**

(58) Field of Search:
UK CL (Edition W) **F4R**
INT CL[7] **F21L, F21V**
Other: **WPI, EPODOC, PAJ**

(54) Abstract Title: **An electrical light source sensitive to changes in air pressure**

(57) An electrical light source 13 the intensity of illumination of which can be adjusted by a device 19 sensitive to changes in air pressure, such as a piezoelectric device. The embodiment discloses an artificial candle with the light source 13 in the form of an artificial flame, with control means to cause the flame to flicker mimicking a real flame and the pressure sensitive device allowing the intensity of illumination to be controlled or completely extinguished by a person blowing on the artificial flame, as they would a real candle. Further disclosed is incorporating the apparatus in to a greetings card.

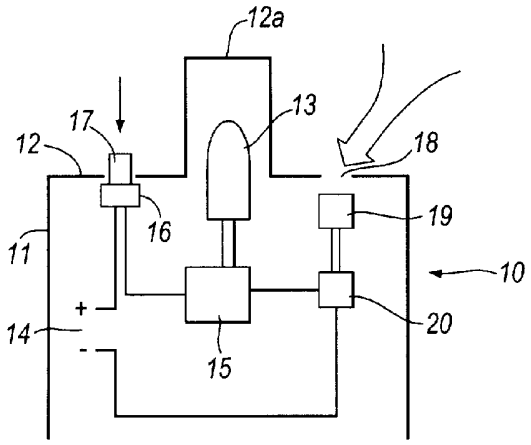

Fig.1

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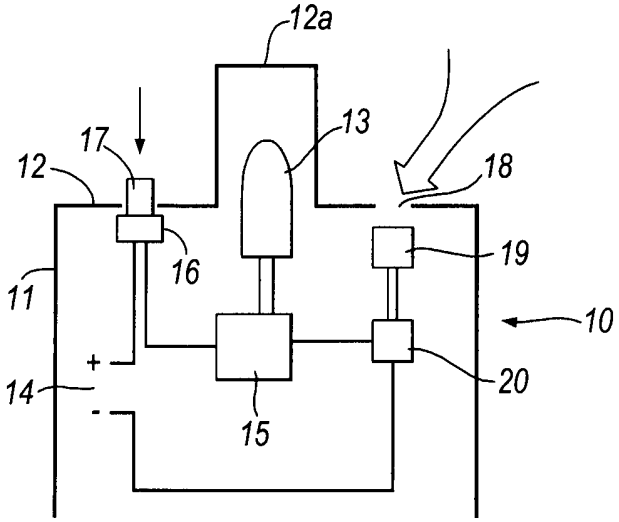

Fig.1

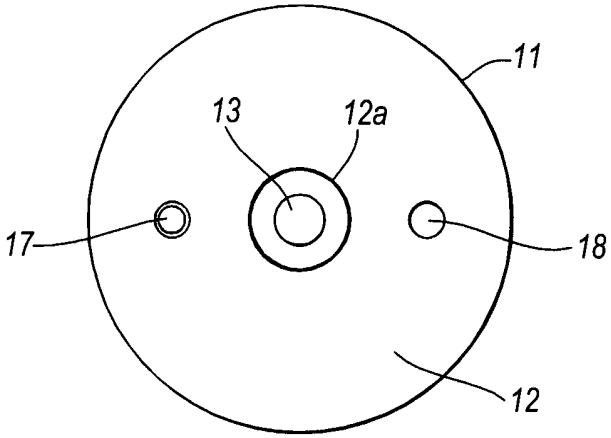

Fig.2

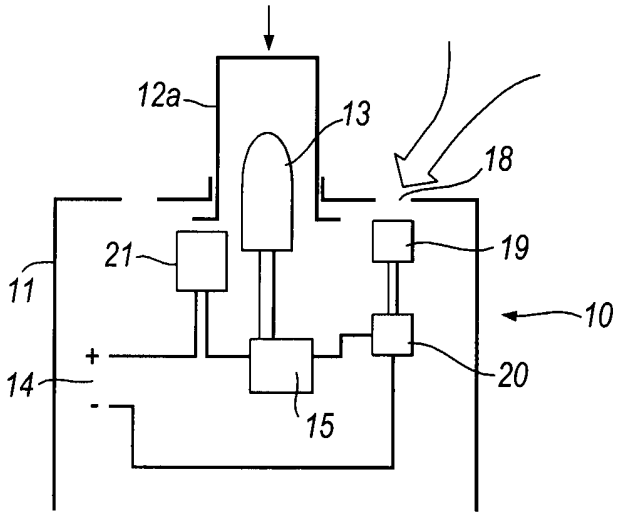

Fig.3

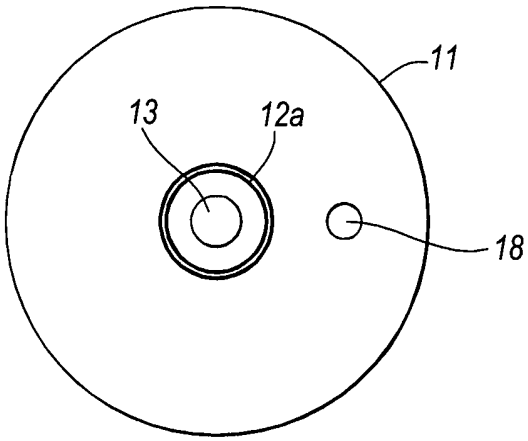

Fig.4

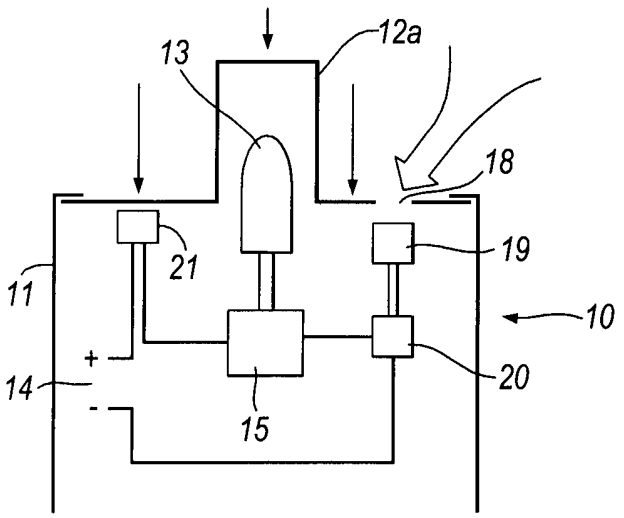

Fig.5

ELECTRICAL LIGHT SOURCES

The invention relates to electrical light sources and particularly, but not exclusively, to electrical light sources in artificial candles.

Electrical light sources are often controlled to vary the intensity of illumination of the light source. An example is an electrical rheostat. In an artificial candle, where the light source is controlled to provide a flickering effect, a manually operated electrical switch may be provided to switch off the light source.

According to the invention, there is provide an electrical light comprising a light source and a device sensitive to changes in air pressure, the device, on sensing a predetermined change in air pressure, controlling the light source to change the intensity of illumination of the light source.

In this way, the intensity of illumination can be controlled by a person blowing on the device.

Referring first to Figures 1 and 2, the artificial candle comprises a generally cylindrical body 10 which may be made from a white plastics material that may be translucent. The body 10 comprises a generally cylindrical shell 11closed at one end by an end wall 12. The end wall 12 is formed with central upstanding cylindrical housing 12a that accommodates a light source 13. The housing 12a is translucent and may provide a suitably coloured filter.

The light source 13 may be a light bulb or a light emitting diode or any other suitable light emitting device. The light source 13 is connected to a power source 14, such as a battery, via a control system 15 and a first switch 16. The control system 15 controls the light source 13 to provide a flickering effect to emulate a candle. The first switch 16 includes an operating buffer 17 that project through the end wall 12.

The end wall also includes a hole 18 beneath which is a pressure sensitive device 19, which may be in the form of a piezo-electric device. The pressure sensitive device 19 is connected to a second switch 20 in the circuit controlling the light source 13.

In use, the first switch 16 is operated by pressing the button 17 to illuminate the light source 13 to provide the flickering candle-emulating effect. When it is desired to switch off the candle, a person blows through the hole 18. The pressure sensitive device 19 senses the change in air pressure as being above a predetermined minimum and produces an electrical signal that is fed to the second switch 20. This switches off the light source 13 and then re-sets so allowing the light source 13 to be switched on again using the first switch 16.

In this way, the artificial candle can be blown out in the same way as a real candle.

A modified form of the artificial candle of Figures 1 and 2 in shown in Figures 3 and 4. Parts common to Figures 3 and 4 and to Figures 1 and 2 are given the same reference numerals and will not be described in detail.

In the embodiment of Figures 3 and 4, the cylindrical housing 12a is movable relative to the end wall 12 in a direction parallel to the axis of the shell 11. The housing 12a is spring loaded urging it outwardly of the end wall 12. The light source 13 moves with the housing 12a. Depression of the housing 12a operates a switch 21, which replaces the first switch 16, and acts to switch on the light source 13. The artificial candle of Figures 2 and 3 operates otherwise in the same way as the artificial candle of Figures 1 and 2.

A further modified form of the artificial candle of Figures 1 and 2 is shown in Figure 5. Parts common to Figure 5 and to Figures 1 and 2 are given the same reference numerals and will not be described in detail.

In the embodiment of Figure 5, the end wall 12 is movable relative to the shell 11 in a direction parallel to the axis of the shell 11. The end wall 12 is spring loaded urging it

outwardly of the shell 11. The light source 13 moves with the end wall 12. Depression of the end wall 12, which may be achieved by pressure on the housing 12a, acts to switch on the light source 13. On release, the end wall 12 returns under the action of the spring to its rest position. The artificial candle of Figure 5 operates otherwise in the same way as the artificial candle of Figures 1 and 2.

It will be appreciated that blowing on the pressure sensitive device 19 need not turn the light source 13 off. It could incrementally increase or decrease the intensity of illumination of the source between the source 13 being out, or nearly out, and full illumination. The pressure sensitive device 19 will be calibrated so that small changes in air pressure, such as occur naturally in the atmosphere, do not result in any change of the light source 13 but only pressure changes caused by blowing achieve that effect.

The end wall 12, including the housing 12a, may be covered in a flexible protection material (not shown) to prevent the egress of contamination into the shell 11. The candle may be of any suitable size or shape.

The arrangement described above with reference to the drawings need not be used with an artificial candle. It could be used with any light source to control the intensity of illumination.

The arrangement described above could also be included in a novelty card, for example, a birthday or Christmas card. Such a card could include a light source in the form of an artificial candle. The arrangement could be in a flattened form for such a use. If the card is one which opens, the opening of the card could actuate a switch for illuminating of the light source.

CLAIMS

1. An electrical light comprising a light source and a device sensitive to changes in air pressure, the device, on sensing a predetermined change in air pressure, controlling the light source to change the intensity of illumination of the light source.

2. A light according to claim 1 wherein the light source forms an artificial flame for an artificial candle, control means controlling the light source to flicker, to emulate a candle, operation of the pressure sensitive device switching off the light source.

3. A light according to any preceding claim wherein the pressure-sensitive device is a piezoelectric device.

4. A light according to any preceding claim wherein the pressure sensitive device is connected to a switch controlling the supply of power to the light source, the pressure sensitive device, when said pressure is varied, causing the switch to change the intensity of illumination of the light source.

5. A light according to claim 4 wherein said switch switches off the light source.

6. A light according to any preceding claim and further comprising a switch for switching on the light source.

7. A light according to claim 6 wherein the light source is moveable to operate said switch.

8. A light according to any preceding claim including a housing carrying said light source and said pressure sensitive device, a hole being provided in said housing to allow the passage of air to the pressure-sensitive device.

9. A light according to claim 8 when dependent on claims 6 or 7 wherein the housing comprises a first portion and a second portion, the first portion holding the light source and being moveable relative to the second portion to operate said switch.

10. A light according to claim 9 wherein the first portion comprises an end wall including a housing covering the light source and the second portion comprises a substantially cylindrical body closed at one end by the end wall, the housing and the light source extending through the remainder of the end wall and being moveable relative thereto to operate said switch.

11. An arrangement according to claim 9 wherein the first portion comprises an end wall including a housing covering the light source, the second portion comprising a cylindrical body closed an one end by the end wall, the end wall and the light source being moveable relative to said second portion to operate said switch.

12. A light according to any one of claim 10 or claim 11 wherein the first portion is spring loaded, the first portion and the light source being moveable against said spring loading to operate said switch.

13. An arrangement according to any one of claims 9 to 12 wherein at least the first portion is made from a translucent or transparent material.

14. An arrangement according to any one of claims 8 to 13 when dependent on claim 6 wherein said hole is formed in said end wall.

15. An arrangement according to any one of claims 8 to 14 wherein the housing is at least partially coated in a flexible material.

16. An arrangement according to any one of claims 9 to 15 wherein said light source is an elongate light source extending generally axially relative to the second portion.

17. An arrangement substantially as hereinbefore described with reference to the accompanying drawings.

18. A card including the arrangement according to any one of claims 1 to 17.

Application No: GB0407604.8 **Examiner:** Gareth Bond

Claims searched: 1 to 18 **Date of search:** 16 September 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	X:1,2,4-6 Y:3,18	GB2309838 A (McCloud) See figures 1 & 2, page 2 lines 9 to 14 and page 3 lines 1 to 23
X,Y	X:1,4-8 Y:2,3,18	GB2267746 A (Chung) See figures 1 to 5, page 1 line 18 to page 2 line 11 and page 5 line 14 to page 6 line 17.
X,Y	X:1,4-6,8 Y:2,3,18	US3479561 A (Janning) See figures 1 to 4, column 2 lines 32 to 38 and column 4 lines 52 to 70.
X,Y	X:1,4-6 Y:2,3	US5582478 A (Ambrosino) See figure 2 and column 2 lines 30 to 63.
X,Y	X:1,4-6,8 Y:2,3,18	US4187532 A (Naffier) See figures 1 & 6, column 1 lines 12 to 28, column 4 lines 3 to 18 and 49 to 61.
Y	2	GB2396206 A (Khademamzadeh) See Whole document for n example of a flicker effect on an artificial candle.
Y	3	US4878107 A (Hopper) See column 7 line 6 to column 8 line 37 (particularly column 8 lines 26 to 29) for a disclosure of a suitable pressure sensitive piezoelectric device.
Y	18	US3737648 A (Franc) see whole document for a disclosure of an electrical light incorporated into a greeting card.

Categories:

	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{W} :

F4R

Worldwide search of patent documents classified in the following areas of the IPC^{07}

F21L; F21V

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, PAJ