(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 645 796 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.04.2006 Bulletin 2006/15

(51) Int Cl.:
F21S 6/00 *(2006.01)* ***F21V 9/10*** *(2006.01)*
F21V 14/08 *(2006.01)*

(21) Application number: **05256310.3**

(22) Date of filing: **11.10.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **11.10.2004 EP 04256275**
15.11.2004 GB 0425182

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(54) A mechanical dimmer for a luminaire

(57) The present invention relates to a mechanically dimmable luminaire (1). The luminaire (1) comprises a filter (19) through which light from a light source (11) passes. In use, the filter (19) is movable relative to the light source (11), such that the amount of light from the light source (11) that is filtered by the filter (19) can be adjusted, in order to increase or decrease the brightness of the luminaire (1).

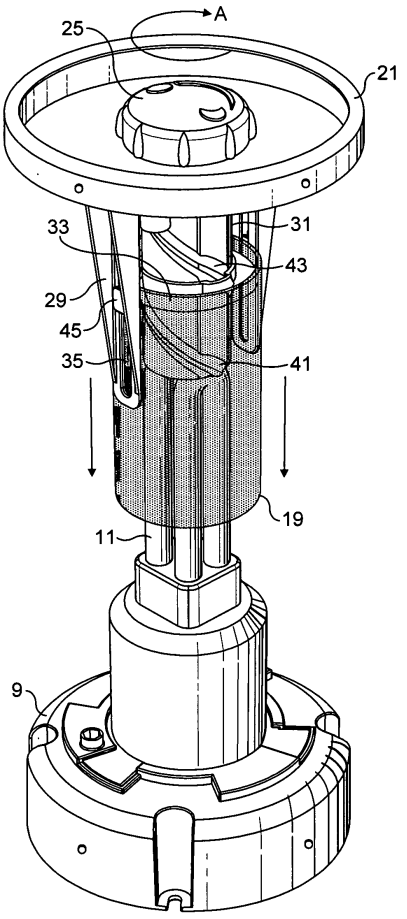

FIG. 7

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Description

[0001] This invention relates to a mechanical device for reducing the brightness of a luminaire. In particular, this invention relates to a device for reducing the brightness of a luminaire using a compact fluorescent tube.

[0002] Often children will not sleep at night unless there is a background light in the room. The present invention provides a luminaire that may be placed at the child's bedside and that may be dimmed to a desired level.

[0003] Many luminaires utilise compact fluorescent tubes because of their low energy consumption and low heat output. Compact fluorescent tubes cannot be dimmed in the same way as incandescent filament lamps. There is therefore a requirement for an alternative method for reducing the perceived light output of a compact fluorescent tube.

[0004] Accordingly, the present invention provides a mechanically dimmable luminaire comprising a filter, a fluorescent light source and an actuation means for providing relative movement between the filter and the fluorescent light source.

[0005] Preferably, the filter may be movable relative to a fixed light source. Alternatively, the light source may be moveable relative to a fixed filter.

[0006] Preferably, the actuation means may comprise means whereby rotation of an actuator results in linear movement of the filter. Alternatively, linear movement of the filter may be achieved by linear movement of an actuator. In an alternative embodiment of the present invention, the filter may be configured to rotate to obscure or partially obscure the light source. For example, the filter may be in two or more parts which when rotated relative to each other allow different levels of light to pass through.

[0007] Preferably, the actuation means may further comprise means to guide the filter during its linear movement. Alternatively, the guide means may guide the filter during its rotational movement.

[0008] Preferably, the filter is tubular. More preferably, the filter is in the form of an open-ended cylinder. The filter is preferably translucent and may be provided with a coloured tint so that when the filter is moved over the light source the light emitted from the luminaire changes in colour. Alternatively, the filter may be provided with a pattern so that when the filter is moved across the light source the pattern is visible through or projected from the luminaire. In a further alternative embodiment the filter may be opaque.

[0009] Preferably, the luminaire may have at least one opaque surface comprising at least one translucent region. Alternatively, the luminaire may have two opaque surfaces, each surface comprising at least one translucent region. However, it is envisaged that the luminaire may not be provided with any opaque surfaces.

[0010] According to a second aspect of the present invention, there is a provided a mechanical dimming device comprising an actuator, to which is attached a rotor, the rotor engaging with a stator, to which is attached a filter, so that, in use, movement of the actuator results in linear movement of the filter.

[0011] Preferably, the actuator is a rotary actuator.

[0012] Preferably, the rotary actuator may be provided around its perimeter with at least one recess for engagement with at least one boss on a mounting plate.

[0013] Preferably, the rotor may be provided with at least one helical thread.

[0014] Preferably, the stator may be provided with at least one part of at least one helical thread complementary with the at least one helical thread provided on the rotor.

[0015] According to a third aspect of the present invention, there is provided a method for variable reduction of the light output of a fluorescent light source by covering at least a portion of the tube with a filter.

[0016] Figure 1 is a front elevation view of the mechanically dimmable luminaire of the present invention, showing an opaque cover provided with a translucent region attached to one side of the lampshade.

[0017] Figure 2 is a rear elevation view of the mechanically dimmable luminaire of the present invention showing, in dashed lines, the compact fluorescent tube, the light fitting and the mechanical dimmer within the lampshade.

[0018] Figure 3 is a front elevation view of the mechanically dimmable luminaire of the present invention, with the front of the lampshade cut away to show the compact fluorescent tube, light fitting and the mechanical dimmer.

[0019] Figure 4 is a top plan view of the mechanically dimmable luminaire of the present invention, showing the mechanical dimmer located within the lampshade.

[0020] Figure 5 is a bottom plan view of the mechanically dimmable luminaire of the present invention, showing the light fitting located within the lampshade.

[0021] Figure 6 is an exploded perspective view of the mechanical dimmer of the present invention.

[0022] Figure 7 is a top perspective view of the mechanical dimmer of the present invention, with the filter in a partially lowered position located around the compact fluorescent tube.

[0023] Figure 8 is a bottom perspective view of the mechanical dimmer of the present invention with the filter in a fully lowered position located around the compact fluorescent tube.

[0024] A preferred embodiment of a mechanically dimmable luminaire according to the present invention is shown in Figure 1. The luminaire 1 comprises a lampshade 3 manufactured from a single sheet of translucent plastic (shown in Figure 4 and Figure 5). The lampshade 3 is folded into a tubular form with a circular cross-sectional profile. In order to retain the lampshade in a circular form each vertical edge of the lampshade is provided with a number of complementary elements, the elements of one edge interlocking with the elements of the other edge. It is envisaged that the lampshade 3 may be formed

in a number of alternative shapes, for example it may have a square cross-sectional profile.

[0025] An opaque cover 5 is attached to the front face of the lampshade 3. The opaque cover 5 is provided with a translucent region 6, through which light from the compact fluorescent tube may pass. The opaque cover 5 is attached to the lampshade 3 by locating holes 8, provided in the cover 5, over studs 7 moulded into the mounting plate 21 and the light fitting 9 (see Figure 2). Preferably, four studs 7 are spaced equally around the circumferences of each of the mounting plate 21 and the light fitting 9. The light fitting 9 is provided inside the lampshade 3 and is fitted with a compact fluorescent tube 11. Provided inside the lampshade 3 at the top of the luminaire 1 is a mechanical dimmer 15. The dimmer 15 is attached to the lampshade 3 by the studs 7 provided on the mounting plate 21.

[0026] The dimmer 15 comprises a filter 19, the mounting plate 21 and an actuating mechanism 23. The actuating mechanism 23 comprises a control wheel 25, an engagement means 27, a guide member 29, a rotor 31 and a stator 33.

[0027] The filter 19 is in the form of an open-ended cylinder, i.e. it is tubular with a circular cross-sectional profile.

[0028] The engagement means 27 is connected to the control wheel 25 and is provided with a number of recesses (not shown) around its perimeter for engagement with a boss 36 provided on the mounting plate 21. The engagement means 27 passes through the mounting plate 21 and through the base of the guide member 29. The guide member 29 is fixed to the underside of the mounting plate 21. After passing through the guide member 29, the engagement means 27 engages with the base of the rotor 31. Once engaged the rotor 31 rotates with the engagement means 27. The rotor 31 extends perpendicularly from the base of the guide member 29 and parallel to two guide slots 35 provided on the guide member 29. The rotor 31 engages with a stator 33 that is provided with two cut-outs 37, 39 the shapes of which are complementary to helical threads 41, 43 provided on the rotor 31. Cut-out 37 engages with one of the helical threads 41, 43 provided on the rotor 31. Recess 39 engages with the other of the helical threads 41, 43 provided on the rotor 31. The stator 33 is also provided with two opposed bosses 45 for engagement with the guide slots 35 and guide member 29. The filter 19 is attached to the stator 33.

[0029] To move the filter 19 relative to the mounting plate 21 the control wheel 25 is rotated. The engagement means 27, attached to the control wheel 25, also rotates causing the rotor 31 to rotate. As the rotor 31 rotates the helical thread 41, 43 passes through the cut-outs 37, 39 of the stator 33 causing the stator 33 and the filter 19 attached to it to move relative to the rotor 31.

[0030] The preferred embodiment of the present invention is configured so that clockwise rotation of the control wheel 25 lowers the filter 19, shown in Figure 7 as rotation in direction A, and so that anti-clockwise rotation of the control wheel 25 raises the filter 19, shown in Figure 8 as rotation in direction B. In order to reduce the perceived brightness of the compact fluorescent tube 11 the dimmer 15 is positioned relative to the light fitting 9 so that when the filter 19 is in a raised position no part of the compact fluorescent tube 11 is contained with the filter 19 and that when the filter 19 is in a lowered position the whole of the compact fluorescent tube 11 is covered.

[0031] The filter 19 is made from a tinted translucent material in order to reduce the transmissibility of the light passing through it.

[0032] It will be appreciated that the present invention provides an improved night light for use in a child's bedroom. The skilled reader will realise that a number of modifications or variations to the precise details described herein may be made without departing from the scope of the claims.

Claims

1. A mechanically dimmable luminaire comprising, a filter, a fluorescent light source and an actuation means for providing relative movement between the filter and the light source.

2. A mechanically dimmable luminaire as claimed in claim 1, wherein the filter is moveable relative to a fixed fluorescent light source.

3. A mechanically dimmable luminaire as claimed in claim 1 or claim 2, wherein the actuation means comprises means whereby rotation of an actuator results in linear movement of the filter.

4. A mechanically dimmable luminaire as claimed in any one of claims 1, 2 or 3, wherein the actuation means further comprises means to guide the filter during its linear movement.

5. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the filter is tubular.

6. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the luminaire has at least one opaque side comprising at least one translucent region.

7. A mechanically dimmable luminaire as claimed in any preceding claim, comprising a mechanical dimming device comprising an actuator, to which is attached a rotor, the rotor engaging with a stator, to which is attached a filter, so that, in use, movement of the actuator results in linear movement of the filter.

8. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the actuator is a rotary

actuator.

9. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the rotary actuator is provided around its perimeter with at least one recess for engagement with at least one boss on a mounting plate.

10. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the rotor is provided with at least one helical thread.

11. A mechanically dimmable luminaire as claimed in any preceding claim, wherein the stator is provided with at least part of at least one helical thread complementary with at least one helical thread on the rotor.

12. A method for variable reduction of light output of a fluorescent light source by covering at least a portion of the light source with a filter.

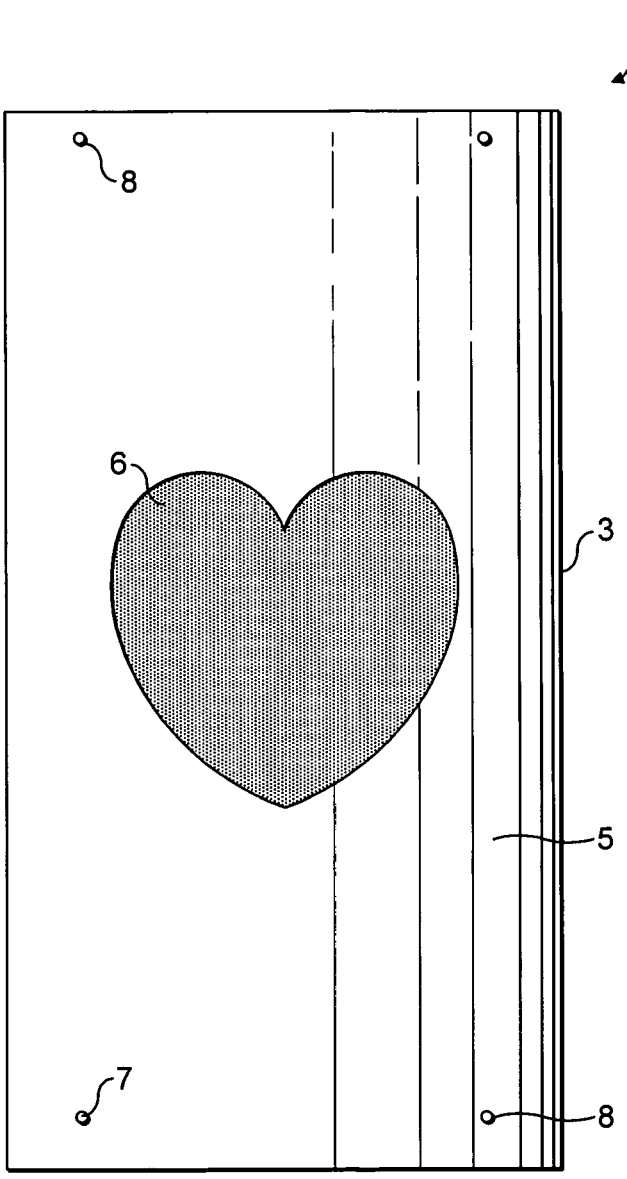

FIG. 1

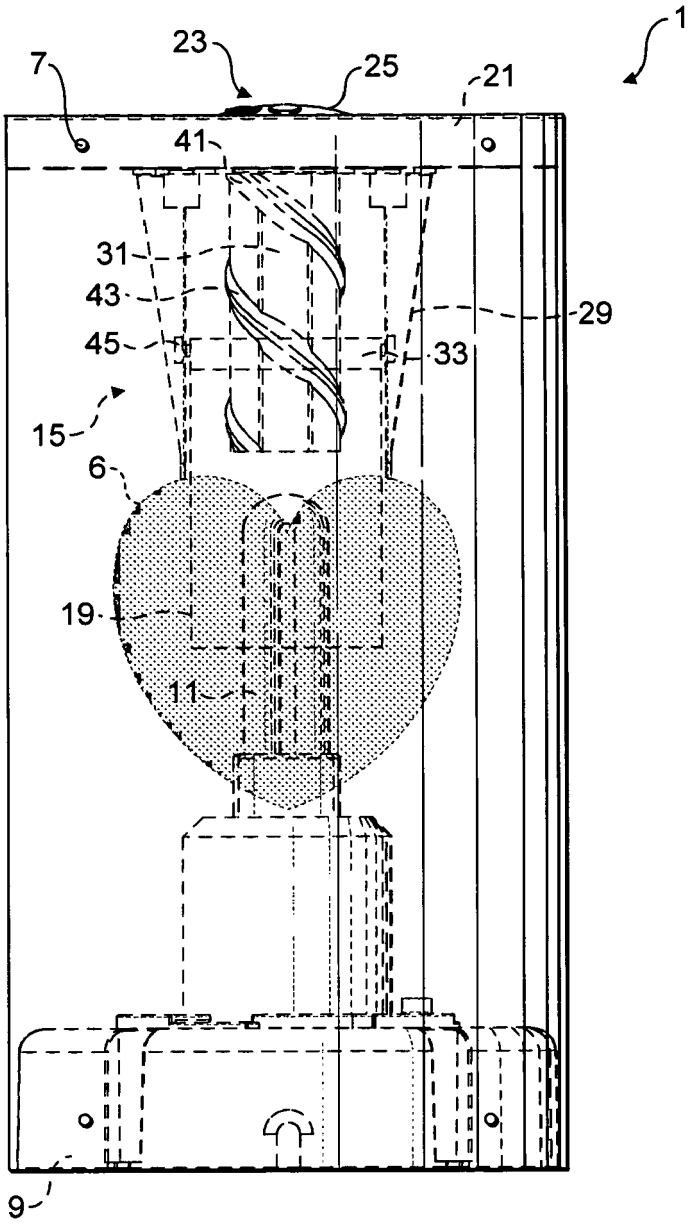

FIG. 2

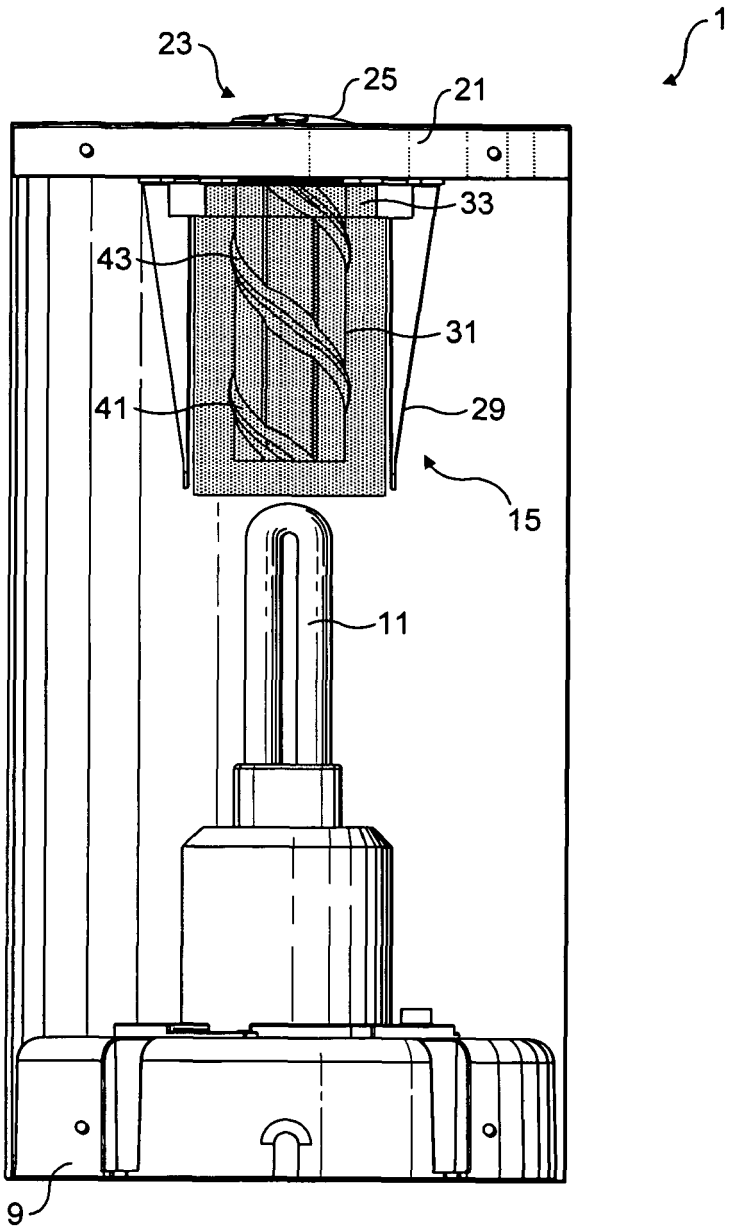

FIG. 3

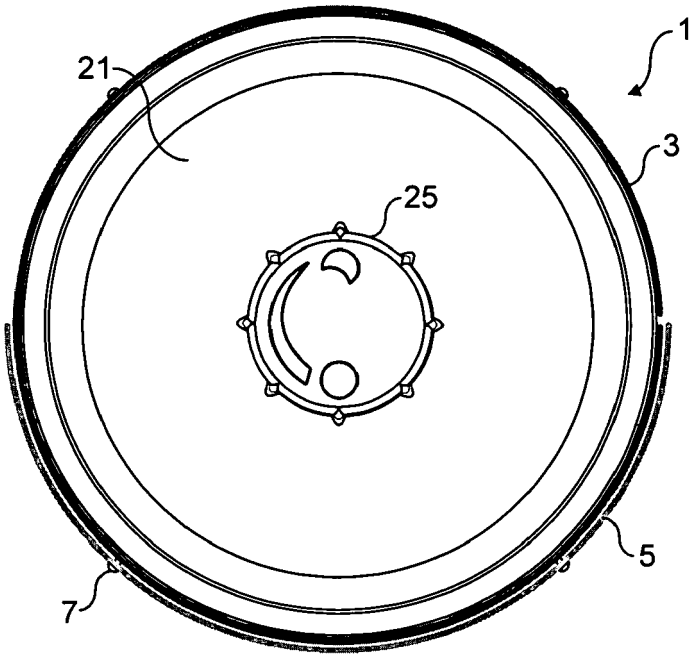

FIG. 4

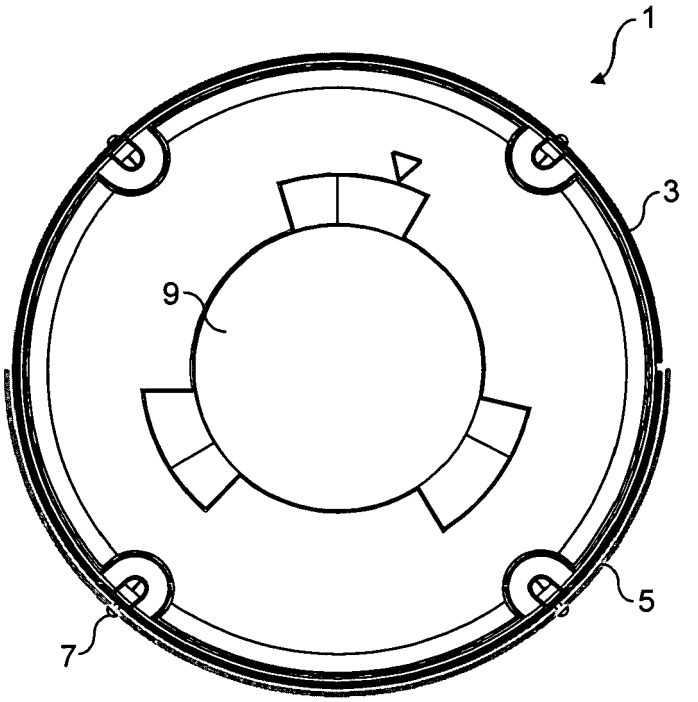

FIG. 5

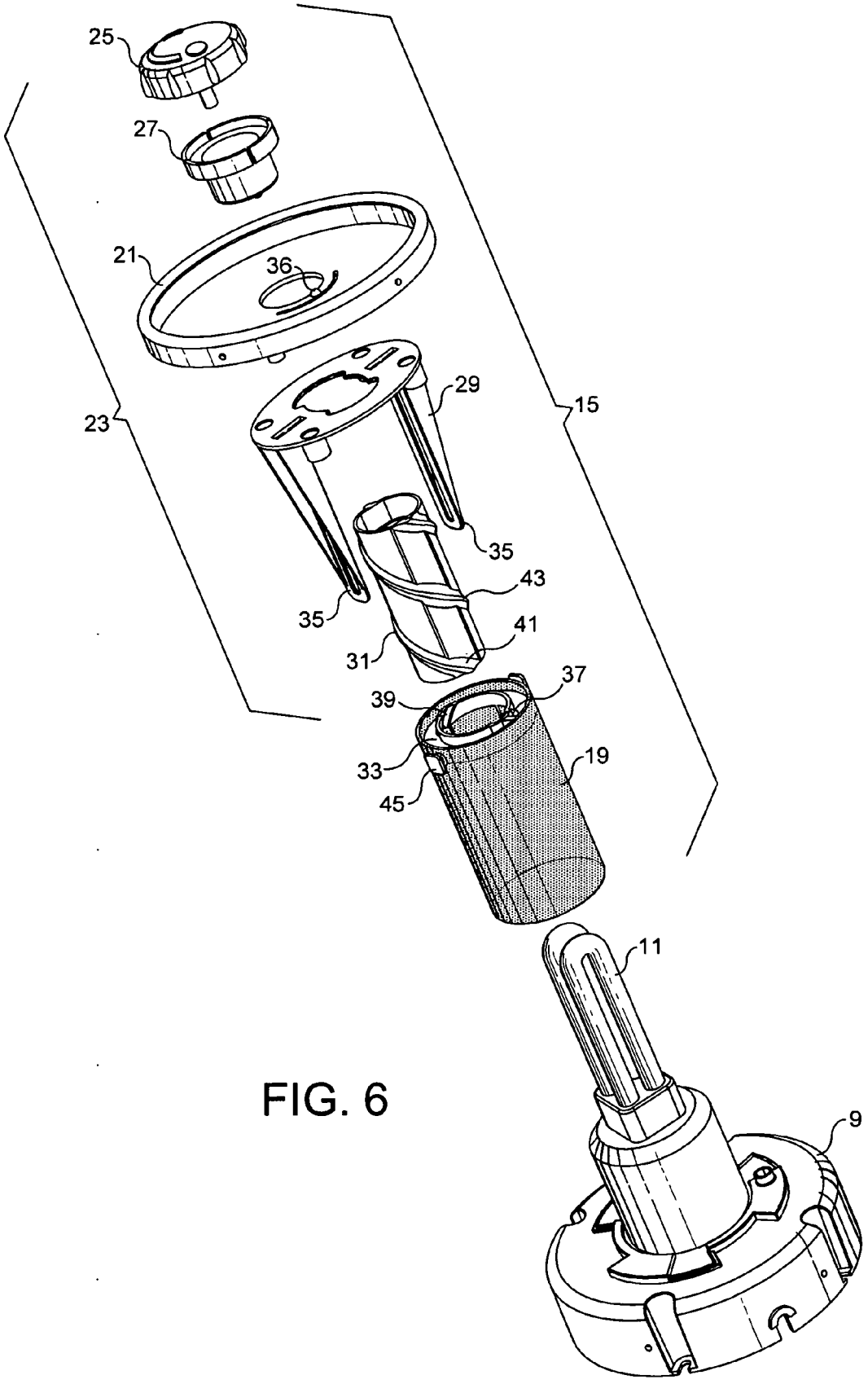

FIG. 6

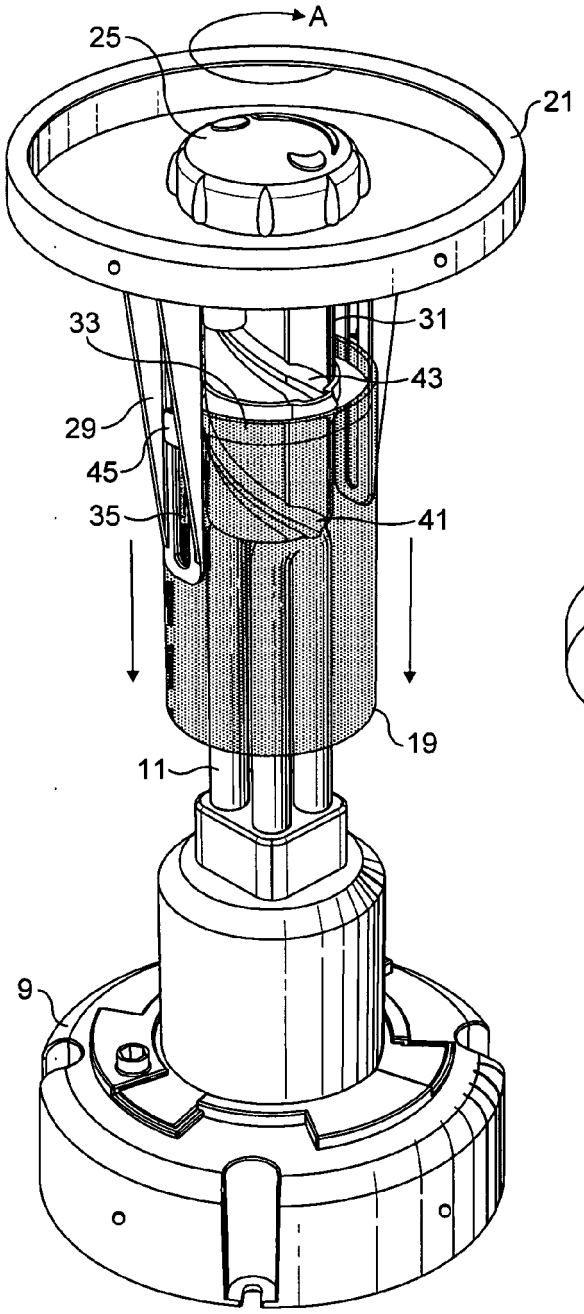

FIG. 7

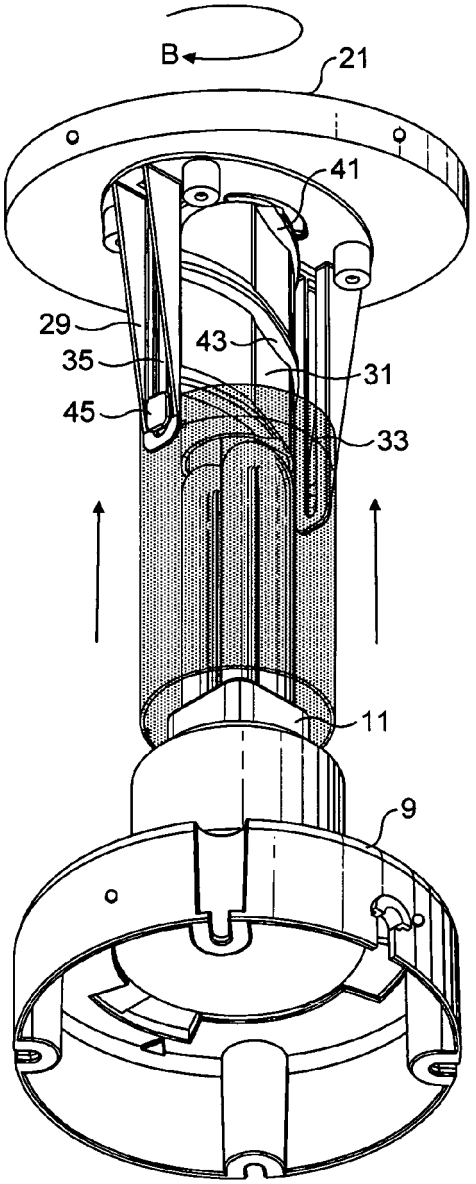

FIG. 8