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(54) **Built-in home lighting equipment**

(57) A built-in home lighting equipment, especially used for the illumination of expositive areas, shops, bars, houses, etc., comprising a main body (1), obtained by die-casting of aluminium and painted with powders, inside which a reflector (12) made of anodized and polished aluminium is housed, a light source (27), such as a flashover lamp, a ceramic lamp holder (29), supported by a cam system (30) of adjusting the focus of the light source (27), an anti-reflective glass (14) and closing frames (16, 20) of the body (1) used for the orientation of the body (1) itself; in particular, the body (1) can rotate around the vertical axis (K) of installation of the equipment up to 330° and can come out from the installation plane of the ceiling or false ceiling (33) up to 60°.

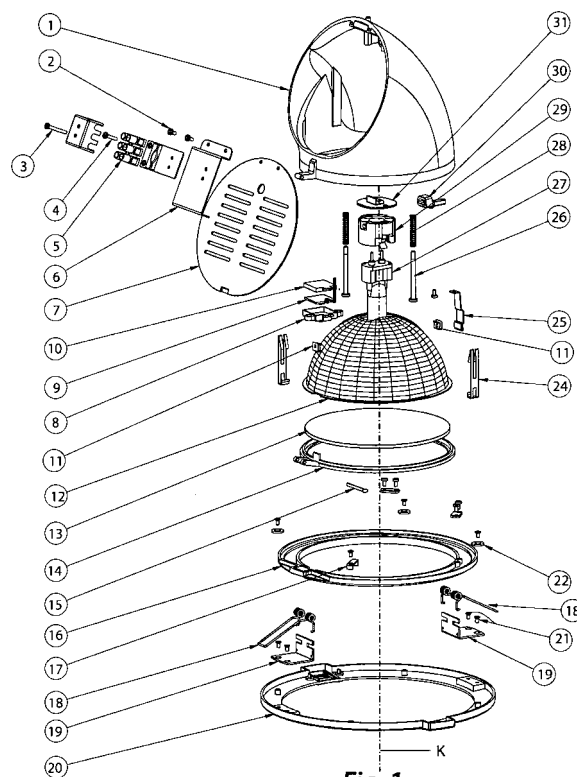


Fig. 1

Description

[0001] The present invention relates generally to built-in home lighting equipment.

[0002] More in particular, the invention concerns a built-in home spotlight, complete with an innovative system for adjusting the light beam.

[0003] Among the systems or equipment for built-in indoor lighting, one of the most widespread types are the spotlights of "Downlight" type.

[0004] They are lighting apparatus of the mono-lamp or bi-lamp type, having a light source of fluorescent, halogen, flashover, etc. type and generally with circular shape, which are embedded in a hole of appropriate diameter (from 50 mm to about 200 mm, depending on the type of apparatus), obtained usually in a false ceiling made of plasterboard.

[0005] Since this lighting equipment is typically used in expositive areas, shops, bars, houses, etc. and, as such, must guarantee very high lighting and sometimes a good chromatic yield, some halogen lamps or flashover lamps are often used as light sources, which, however, present a high thermal dissipation and substantial energy consumption.

[0006] Additionally, the installation in the plasterboard false ceilings rarely reaches considerably high heights from the ground and, therefore, the emitted heat can become tiresome to whom passes or stops below this lighting equipment.

[0007] Purpose of the current invention is, therefore, to eliminate the drawbacks complained and, in particular, to provide a built-in home lighting equipment which, although being able to assure the levels and the characteristics of illumination of a typical lighting equipment of similar sizes, presents extremely lower power consumptions.

[0008] Another purpose of the present invention is to achieve a built-in home lighting equipment which reduces the emission of heat in correspondence of those persons who pass or stop below the lighting equipment.

[0009] Another purpose of the invention is to carry out a built-in home lighting equipment which allows to achieve very high luminous efficiency and remarkable optical performances.

[0010] A further purpose of the invention is to implement a built-in home lighting equipment which has an excellent quality/price ratio and presents an extreme easiness of installation and maintenance.

[0011] These and other purposes, according to the present invention, are achieved by implementing a built-in home lighting equipment, according to the enclosed claim 1.

[0012] Other specific and detailed technical features are contained in the dependent claims.

[0013] Advantageously, the built-in spotlight described in the present invention allows a very high efficiency, exploiting the characteristics of the faceted reflector, while the kind of antireflection glass used, which greatly reduces

es the losses, compared to a tempered glass of traditional type, contributes to increase the optical performances.

[0014] A mechanical system for adjusting the beam allows then to direct the light beam produced by the equipment in a wide area below the installation point, avoiding to concentrate heat below the equipment.

[0015] Furthermore, acting on the beam adjustment system, it is possible to adjust the width of the light beam, for example in order to restrict the light beam over a limited area, as it could be a mannequin or a small dimensions object.

[0016] Further features and advantages of a built-in home lighting equipment, according to the present invention, will result greatly evident from the description that follows, referring to an illustrative and preferred, but not limiting, embodiment and from the attached drawings, in which:

- figure 1 is an exploded view of a built-in home lighting equipment, according to the present invention;
- figure 2 is a plan view from the bottom of the lighting equipment of figure 1, in a first operative position, according to the present invention;
- figure 3 is a first side view of the lighting equipment of figure 1, in the first operative position, according to the present invention;
- figure 4 is a second side view of the lighting equipment of figure 1, in the first operative position, according to the present invention;
- figure 5 is a perspective view from the bottom of the lighting equipment of figure 1, in the first operative position, according to the present invention;
- figure 6A is a first side view of the lighting equipment of figure 1, in a second operative position, according to the present invention;
- figure 6B is a second side view of the lighting equipment of figure 1, in the second operative position, according to the present invention;
- figure 7 is a perspective view from the bottom of the lighting equipment of figure 1, in the second position, according to the present invention;
- figures 8, 9, 10 and 11 are schematic views of the lighting equipment of figure 1, which show an adjustment system of the emitted light beam, according to the invention.

[0017] With reference to the figures mentioned, the built-in home lighting equipment, which is the object of the present invention, actually consists of a built-in spotlight of "Downlight" type and mainly comprises a main body 1, curved-cap shaped and made by die-casting and powders painted, inside which a faceted reflector 12, made of anodized and polished aluminum, is housed, a light source 27, consisting, for example, of a flashover lamp, a lamp holder 29, made of ceramic and supported by a fire adjusting system, including a plate 31, a cam 30, springs 28 and screws 26, an anti-reflective glass 13, arranged inside a chassis or frame 14 and locked in po-

sition by a pin 15, a movable closing frame 16 and a fixed closing frame 20 of the body 1, also used for orienting the body 1 itself.

[0018] The frames 16, 20 are connected together by brackets 19 and springs 18, the latter connected by means of screws 21, while the mobile frame 16 includes an anti-rotation bracket 17 and a block pin 22.

[0019] The reflector 12 is connected with the glass 13 through springs 11 and 24 and through a closing hook 25, while the body 1 is backwardly covered by a plate 7, on which the block 6 is fixed, suitable to contain the electrical terminals 5, through the locking screws 2, 3, 4.

[0020] Finally, on the fixed frame 20, more external, of the equipment it is provided the opportunity to house, within the overall dimensions of the aforesaid frame 20, a LED diodes auxiliary or emergency lighting device, positioned on the board 9, enclosed by the container 8, and protected by the lens 10.

[0021] The built-in spotlight "Downlight" described above allows a very high luminous efficiency, exploiting the characteristics of the faceted reflector 12, which presents a specific structure, designed to get the best photometric performances.

[0022] The kind of reflective glass 13 used, which greatly reduces the losses, compared to a traditional tempered glass, then helps to increase the optical performances.

[0023] In order to exploit at the best the light produced by the spotlight and considering that the typical applications are those which can be made on expositive areas, within which the products to be lighted can often change position, the main body 1 is designed so that it can rotate around the vertical axis K of installation of the equipment, through the movable frame 16, up to 330°.

[0024] This movement can be combined with an additional moving system of the equipment, applied to the body 1, which allows the coming out of the same body 1 from the plane of installation of the ceiling or false ceiling 33 up to 60° (as shown in detail in figures 6A, 6B and 7).

[0025] From the combination of these two movements it is possible to direct the light beam produced by the equipment in a wide area below the installation point, allowing to disperse into the environment the heat emitted from the source 27.

[0026] Moreover, it is possible to adjust the width of the light beam (for example, in order to narrow the light beam over a limited area, as it could be a mannequin or a small dimensions object), acting on a beam adjustment system.

[0027] Indeed, when the equipment is mounted, from a position of body 1 completely extracted up to 60° (fully open position illustrated in figure 7), a hole 34 becomes accessible to the user, from which it is possible to carry out an adjustment, using an Allen spanner 35, which, operated according to the arrow F of the figures 8, 9, 10 and 11, acts on the cam system 30, thus changing the position of the lamp 27, with respect to its own vertical axis H, in four different levels.

[0028] Finally, the use of the LED auxiliary or emergency lighting device 8, which can be housed within the overall dimensions of the more external fixed frame 20 of the spotlight, allows to integrate an emergency lighting system into the lighting equipment, without having to install further dedicated devices.

[0029] Additionally, through a software management of this LED light source 8, it is possible to use it also as night "guiding light".

[0030] This also allows to get a very low energy consumption, since it prevents in the users the habit to leave some lighting devices on at full power.

[0031] From the description made, the technical features of the built-in home lighting equipment, according to the present invention, as well as the resulting benefits, are clear.

[0032] In particular, among them we mention the following:

- limitation of the overall dimensions;
- innovative design;
- optical performances equal to or higher than the market references;
- very high luminous efficiency;
- reduced energy consumptions;
- excellent heat dispersion system;
- ease of installation and maintenance;
- excellent quality/price ratio;
- production processes optimization.

[0033] It is, finally, clear that many other variations can be made to the lighting equipment in question, without for this reason going out of the novelty principles inherent to the inventive idea, as it is clear that, in the practical implementation of the invention, materials, shapes and sizes of the illustrated details may be any, depending on the requirements, and the same may be replaced with others technically equivalent.

Claims

1. Built-in home lighting equipment in particular for illuminating exhibition areas, shops, bars, housing, etc. comprising at least one main body (1), in which a shaped reflector (12) is installed, said reflector (12) containing at least one light source (27) mounted on a lamp holder (29), said main body (1) having, at the exit direction of a light beam emitted from said light source (27), at least one anti-glare transparent surface (13) for diffusing said light beam which is fixed in position by means of at least one first closing frame (14), **characterized in that** at least one mobile closing frame (16) is connected with said first closing frame (14), said mobile closing frame (16) being able to rotate said main body (1) for prefixed angles, which are comprised in a predetermined values interval, around a vertical axis (K) according to which the light-

ing equipment is installed.

2. Lighting equipment according to claim 1, **characterized in that** said main body (1) is able to come out from an installation plane of a ceiling or false ceiling (33), in correspondence of at least one second closing frame (20), up to a point corresponding to a prefixed opening angle. 5
3. Lighting equipment according to claim 2, **characterized in that** said second closing frame (20) is fixed and limits said mobile closing frame (16), said main body (1) coming out from said mobile closing frame (16). 10
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4. Lighting equipment according to claim 1, **characterized in that** said lamp holder (29) is connected to a cam system (30), which is able to vary the position of said light source (27) with respect to said vertical axis (H). 20
5. Lighting equipment according to claim 4, **characterized in that** said cam system (30) is provided for varying a position of said light source (27) among four different levels. 25
6. Lighting equipment according to claim 4, **characterized in that** said cam system (30) is adjustable from the outside by a user through a suitable tool (35), which can be operated according to at least one prefixed direction and/or versus (F). 30
7. Lighting equipment according to claim 4, **characterized in that** said cam system (30) is adjustable from the outside by a user in a prefixed position according to which said main body (1) comes out at least partially of said installation plane of a ceiling or false ceiling (33). 35
8. Lighting equipment according to claim 2, **characterized in that** by the fact that at least one LED-diodes auxiliary or emergency lighting device (8) is housed over said second closing frame (20). 40
9. Lighting equipment according to claim 8, **characterized in that** said auxiliary or emergency lighting device is controlled through a suitable software, so that said device is usable as a night "guiding light". 45

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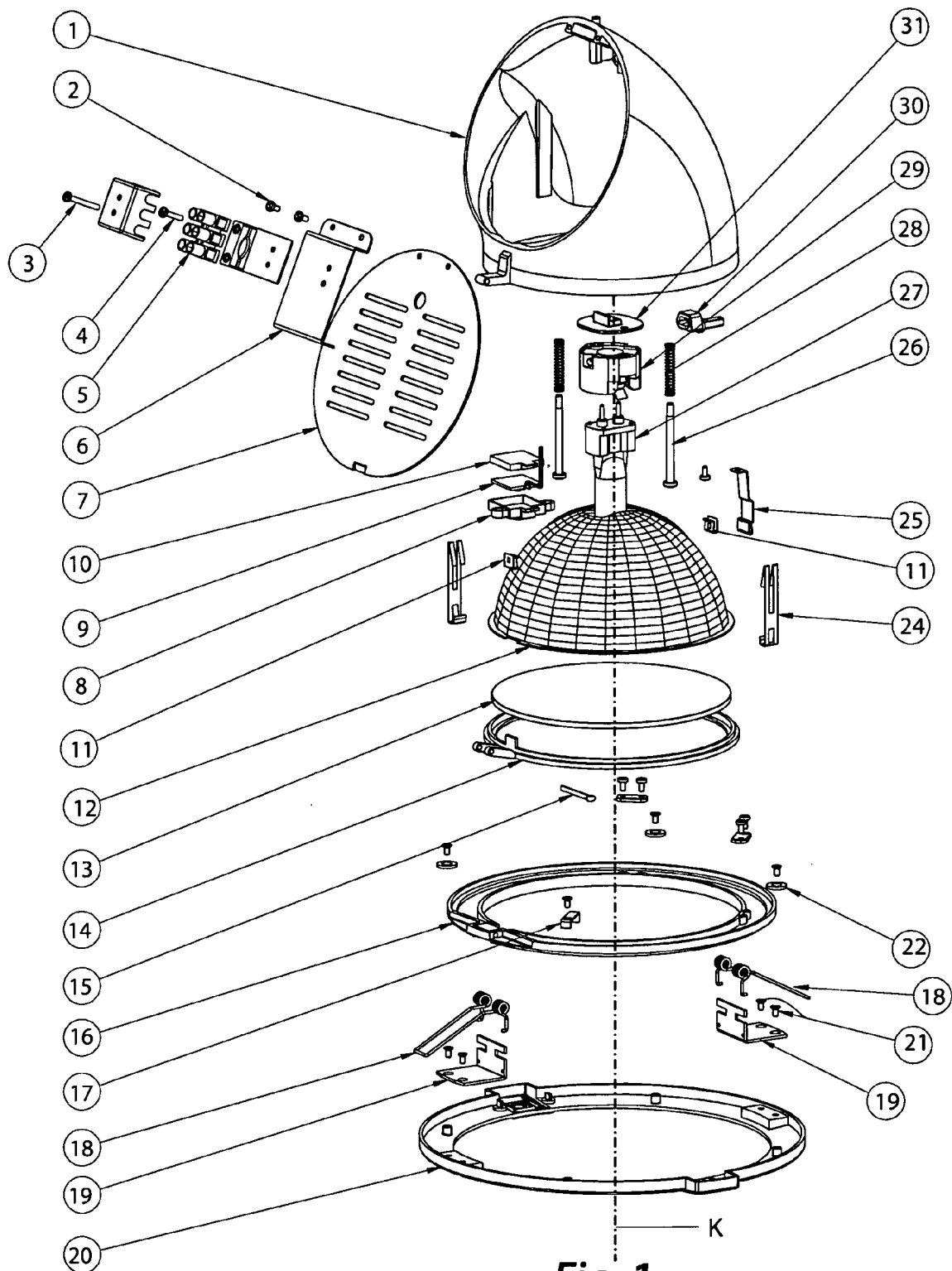


Fig. 1

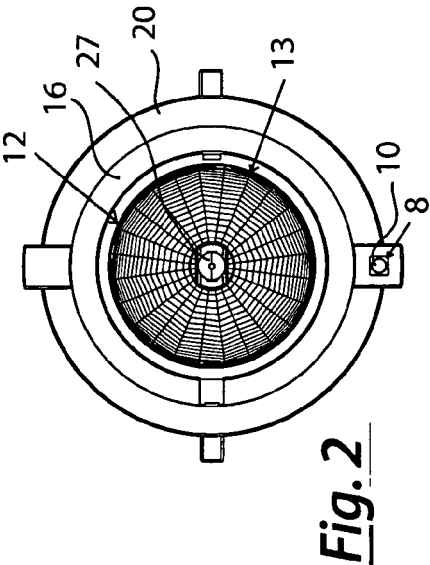


Fig. 2

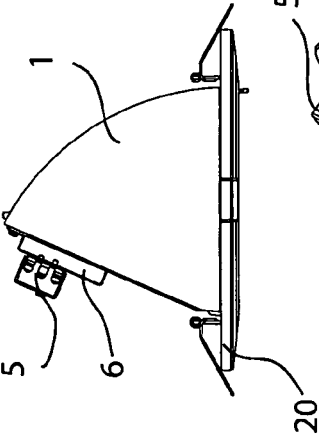


Fig. 3

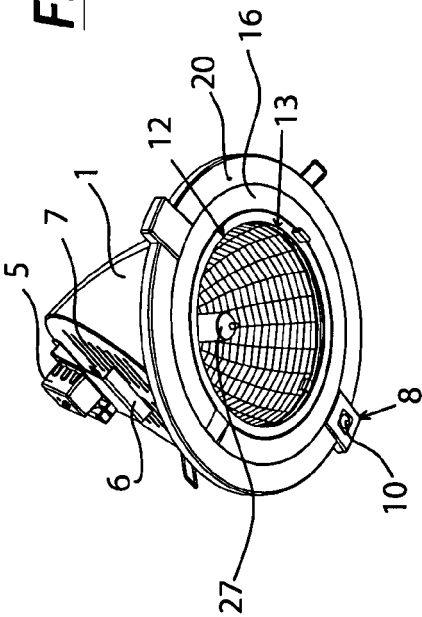


Fig. 4

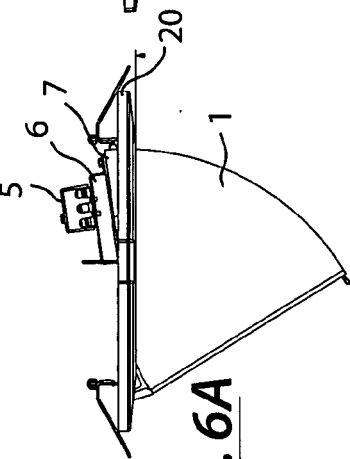


Fig. 5

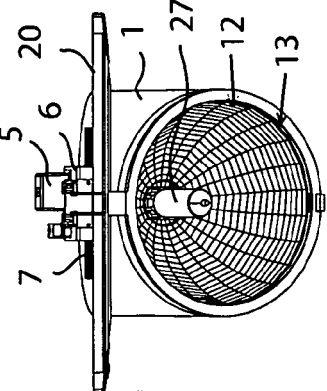


Fig. 6A

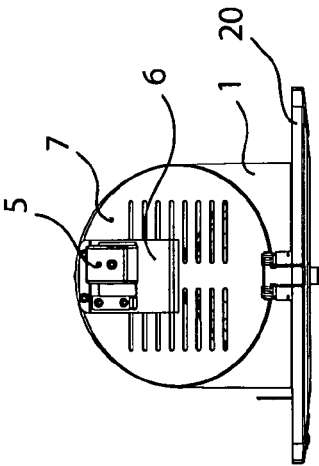


Fig. 6B

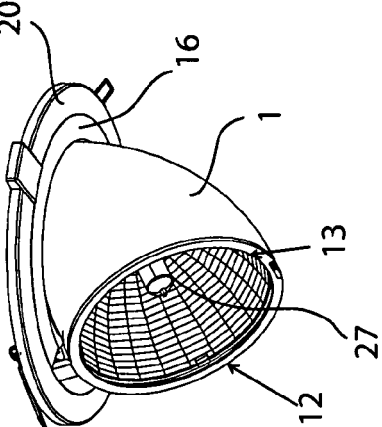


Fig. 7

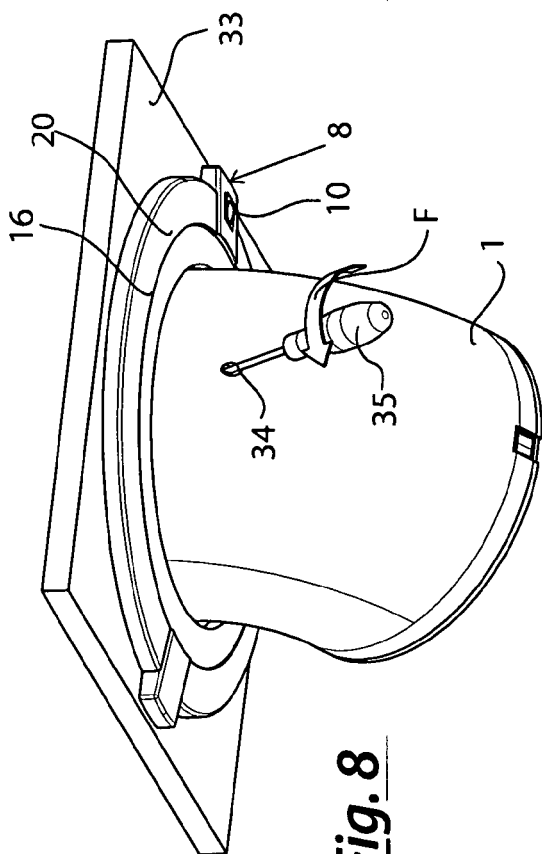


Fig. 8

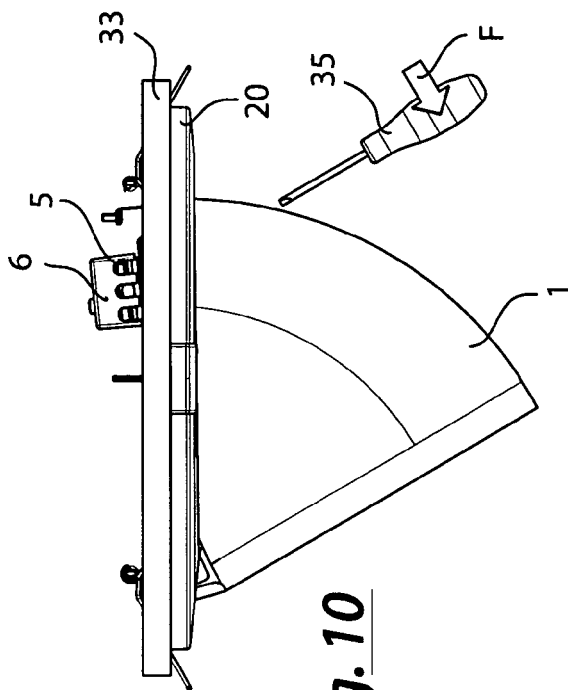


Fig. 10

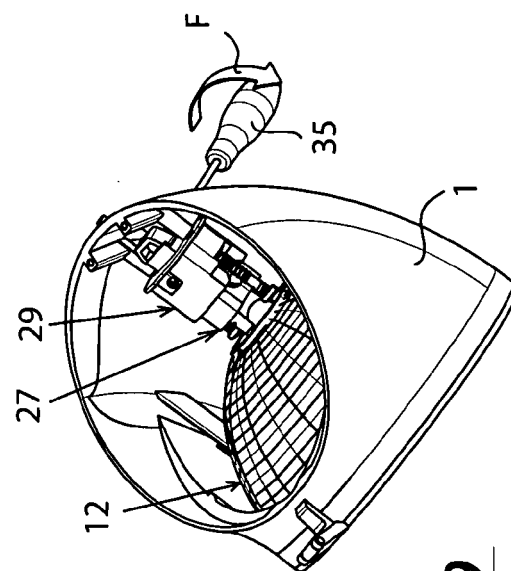


Fig. 9

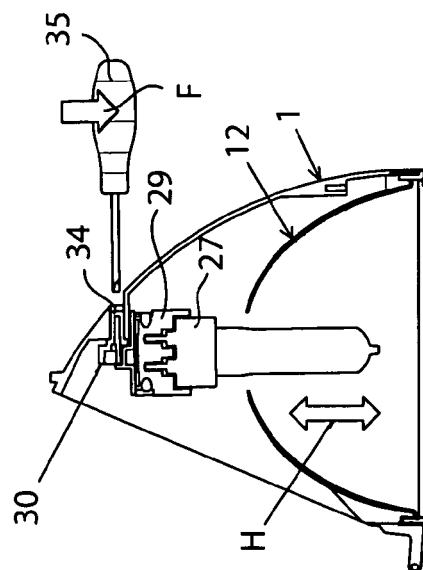


Fig. 11