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(54) Lighting fixture with high antiglare properties

(57) A lighting fixture with high antiglare properties, comprising an outer enclosure (21, 31) capable of being mounted on a wall or ceiling, associated with at least one profiled reflecting element, (40,50) so as to outwardly diffuse a light flux originating from at least one light source (12). The peculiarity of this invention consists in that the lighting fixture provides at least one reflecting antiglare surface (13) opposed to the light source (12) and placed inside the profiled reflecting element (40, 50) in such a position that the light source (12) is not directly visible.

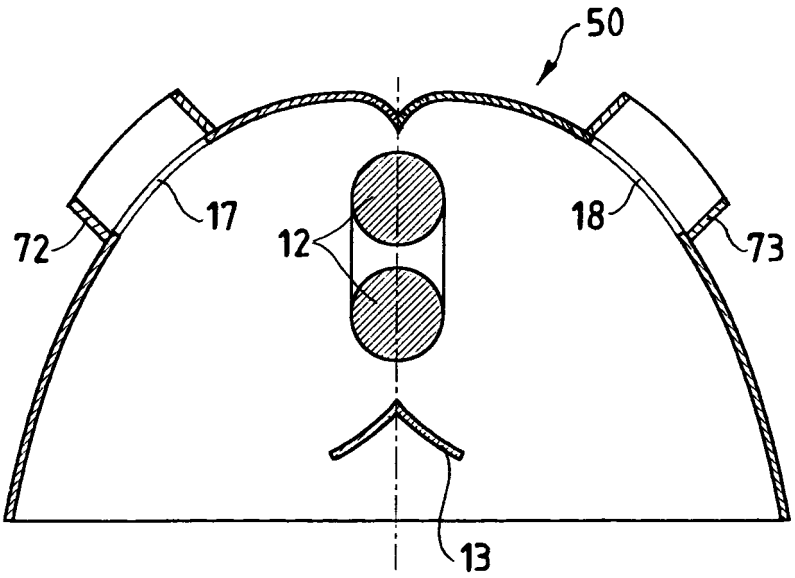

Fig.12

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Description

[0001] This invention refers to a lighting fixture of high antiglare properties.

[0002] It is known that some lighting fixtures of a fluorescent type are capable of overcoming the glare problem caused by a direct view of the light source inside the lighting fixture.

[0003] Such fixtures are designed in such a manner that the light sources are not visible from the most common directions of viewing.

[0004] This effect is generally attained by designing the reflector, or a part of its housing, so as to achieve a desired screening angle.

[0005] This result can normally also be attained by employing metallic grids, in particular laminar screens of a suitable geometric design, eventually configured so as to form an outer screening frame. This produces the so-called "low-luminance" fixture, where luminance stands for the ratio between the intensity of a light source in a certain direction, and its apparent surface viewed in the same direction.

[0006] It is evident, however, that such known fixtures are, precisely because they are employing such laminar screens, unable to make an optimum use of the lighting energy radiated by their light sources.

[0007] These reasons, and an awareness of the current importance of a proper usage and savings of energy, lead to a requirement of overcoming such drawbacks.

[0008] The purpose of this invention is therefore to produce a lighting fixture capable of avoiding the glare generated by a direct viewing of the light source, and at the same time of offering high energy efficiency, expressed in lumens/watt.

[0009] Another purpose of the invention is to produce a lighting fixture of high antiglare properties, capable of offering a chance of producing some suitable combinations of direct and indirect lighting.

[0010] These and other purposes are achieved by a lighting fixture of high antiglare properties according to claim 1, which is being referred to for brevity.

[0011] In an advantageous manner, the lighting fixture of this invention offers, with respect to the usual metallic grids, the advantage of a better energy efficiency, expressed in terms of lumen/watt.

[0012] The fixture of the invention allows, among other things, to screen the light radiated in the most common viewing directions.

[0013] This is achieved by employing at least one suitably shaped reflecting surface interposed between the fixture's light sources and the observer.

[0014] Further indirect lighting properties are obtained by providing, at suitable points, a multiple number of openings of the reflector, in particular for illuminating the ceiling of the premises in which the fixture is installed.

[0015] Further purposes and advantages of this invention will become clear from the following description and the enclosed drawings, offered for purely explanatory and non-limiting purposes, in which:

- Figure 1 represents a bottom view of a first preferential embodiment of a lighting fixture with high antiglare properties according to this invention;
- Figure 2 represents a side view, according to a plane perpendicular to its longitudinal axis, of the lighting fixture of Figure 1;
- Figure 3 represents a side view, according to plane parallel to its longitudinal axis, of the lighting fixture of figure 1;
- Figure 4 represents a top view of the lighting fixture of figure 1;
- Figure 5 represents a first prospective view of the lighting fixture of Figure 1;
- Figure 6 represents a second prospective view of the lighting fixture of Figure 1, in a wall-mounted form;
- Figure 7 represents a bottom view of a second preferential embodiment of a lighting fixture according to this invention,
- Figure 8 represents a top view of the lighting fixture of Figure 7;
- Figure 9 represents a side view, according to a plane parallel to its longitudinal axis, of the lighting fixture of Figure 7;
- Figure 10 represents a side view, according to a plane perpendicular to its longitudinal axis, of the lighting fixture of Figure 7,
- Figure 11 is a cross section, according to a plane perpendicular to the longitudinal axis of the reflector belonging to the lighting fixture of the invention, which shows the configuration of the reflecting surfaces;
- Figure 12 is a cross section, according to a plane perpendicular to the longitudinal axis of the reflector belonging to the lighting fixture according to this invention, which shows, in addition to the configuration of the reflecting surfaces, also some appropriate openings in the reflector, according to a further possible embodiment;
- Figure 13 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a light source of 24W;
- Figure 14 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a pair of 24W light sources;
- Figure 15 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a 38W light source;
- Figure 16 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a pair of 38W light sources;
- Figure 17 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a 55W light source;

- Figure 18 represents a photo-metric curve referring to a lighting fixture according to this invention, equipped with a pair of 55W light sources.

[0016] With particular reference to the Figures 1-6, the lighting fixture with high antiglare properties according to a first preferred embodiment of this invention is indicated in its overall form by the reference number 10.

[0017] The lighting fixture 10, which comprises an outer enclosure 21, may be mounted on the ceiling, as shown in the Figures 1-4, or on the wall, as shown in the Figures 5-6. The wall-mounted lighting fixtures provides for a support 35 and a hinge.

[0018] The inside of the outer enclosure 21 houses a profiled reflecting element 50 (or 40) capable of diffusing toward the outside a light flux originating from a light source 12, for example by a fluorescent tube.

[0019] The lighting fixture 10 presents a reflecting antiglare surface 13 set opposite the light source 12 and inside the profiled reflecting element 50 (or 40), in such a position that the light source 12 is not visible from the most common directions of observation.

[0020] More in detail, the reflecting antiglare surface 13 presents a cusp-shaped section, taken along a plane perpendicular to its longitudinal axis.

[0021] The reflecting surfaces 13 and the profiled reflecting elements 40 and 50 are treated by a metalizing process that turns their surfaces into mirrors.

[0022] Figure 11 represents this configuration of elements in a sectional view, while Figure 12 shows a second preferential embodiment of the invention, again in a sectional view.

[0023] In this second embodiment the profiled reflecting element 50 represents a pair of openings 17 and 18 placed so as to allow the light reflected by the reflecting surfaces 13, 14 and 15 to pass to the outside of the reflecting element 50.

[0024] The outer enclosure 21 offers corresponding passages 27 and 28, so as to allow said light flux to pass to the outside.

[0025] In a preferred variant of the embodiment, the openings 17 and 18 of the profiled reflecting element 50 may be produced by removing the appropriately pierced diaphragms 70 and 71.

[0026] It should be observed in this regard that the use of the pierced diaphragms 70 and 71 allows, at the openings 17 and 18 of the profiled reflecting element 50, to convey the volume of reflected light to the outside, through the openings 17 and 18.

[0027] Moreover, some partition-type structures 72 and 73 are present at the pierced diaphragms 70 and 71, which allow channeling the light flow emerging from the openings 17 and 18 in an appropriate manner toward the passages 27 and 28.

[0028] The walls of the structures 72 and 73 are produced from a non-reflecting and non-absorbing material.

[0029] The Figures 7-10 represent a further possible embodiment of the lighting fixture of the invention, indicated in its overall form by the number 20.

[0030] In this embodiment two lamp bodies are present inside a housing enclosure 31, each of which consists of a profiled reflecting element 50.

[0031] The inside of each of the reflecting bodies 50 contains a light source 12, facing an reflecting antiglare surface 13.

[0032] Based on the particular configuration of the fixture 20, there is only a single opening 17 provided in one of the profiled reflecting elements 50, and a single opening 18 in the other reflecting element 50. Some corresponding passages 27 and 28 are provided on the outer enclosure 31.

[0033] As evident in the Figures 11-12, it is possible to achieve the desired antiglare effect by introducing some surfaces 13 capable of allowing the light to exit from the lighting body, while preventing a direct view of the lamp.

[0034] The presence of the openings 17 and 18 also allows employing a part of the light emitted by the lighting source 12 in an indirect manner, with the aid of the reflecting surface 13, by causing it to be reflected from the walls and/or from the ceiling of the premises where such fixtures are installed.

[0035] It is obvious that the shape and the number, as well as the specific positioning of such openings 17 and 18 and of their corresponding passages 27, 28 may vary depending on the requirements of the project.

[0036] For the purposes of a more complete illustration of the particular properties of the lighting fixtures according to this invention, a few diagrams are enclosed which refer to the photo-metric curves obtained with the mentioned fixtures.

[0037] These diagrams are illustrated in the Figures 13-18, for different types and power ratings of the lighting fixtures.

[0038] The Figures 13, 15 and 17, respectively, represent some photo-metric curves, referring to the lighting fixtures according to this invention, which are equipped with some light sources of 24W, 38W and 55W, respectively.

[0039] The Figures 14, 16 and 18 represent, respectively, some photo-metric curves referring to lighting fixtures according to this invention, equipped with pairs of light sources of 24W, 38W and 55W, respectively.

[0040] In particular, each of these diagrams indicates, by a continuous dashed line L1, the distribution of the lighting intensity originating from the fixture measured, and represented by polar coordinates referred to the orthogonal plane of the lighting fixture (on the C0 - C180 plane).

[0041] Moreover, in each of these diagrams, the continuous dashed line L2 indicates the distribution of the lighting intensity originating from the measured fixture and represented by polar coordinates referred to the longitudinal plane crossing the axis of the same fix-

ture (on the C90-C270 plane).

[0042] The above description clarifies the characteristics as well as the advantages of the lighting fixture with high antiglare properties as an object of this invention.

[0043] In particular, these are represented by:

- High antiglare properties, achieved while maintaining a high lighting performance
- A possibility to graduate the direct and indirect emission of light
- Simplicity of production and design
- Moderate production costs, with respect to those of the known art, in relation to the achievable performance.

[0044] Finally, it is clear that numerous variants may be applied to the lighting fixture with high antiglare properties as an object of this invention, without thereby abandoning the innovative principles inherent in the inventive idea, just as it is clear that in the practical implementation of the invention the materials, the shapes and dimensions of the illustrated details may be of any kind depending on the requirements, and that the same may be replaced by any others of an equivalent technical nature.

Claims

1. A lighting fixture with high antiglare properties, comprising an outer enclosure (21, 31) suitable for wall or ceiling installation, associated with at least one profiled reflecting element (40, 50) for an outward diffusion of the lighting flux originating from at least one lighting source (12), characterized in that it provides at least one reflecting antiglare surface (13) opposed to said lighting source (12) and placed in such a position as to prevent the subject light source (12) from being directly visible.

2. A lighting fixture according to claim 1, characterized in that at least one of the subject reflecting antiglare surfaces (13) is placed inside said reflecting profiled element (40, 50).

3. A lighting fixture according to claims 1 or 2, characterized in that the mentioned reflecting antiglare surface (13) presents a cross section, taken along a plane perpendicular to its longitudinal axis, in the form of a cusp.

4. A lighting fixture according to claim 3, characterized in that the mentioned reflecting surfaces (13) and the profiled reflecting elements (40, 50) are treated with metalized coatings which provide the surfaces with a mirror action.

5. A lighting fixture according to claims 1 or 2, characterized in that the mentioned profiled reflecting element (50) presents a multiple number of openings (17, 18) placed in such a manner as to pass the light reflected from the mentioned reflecting surfaces (13).

6. A lighting fixture according to claim 5, characterized in that the mentioned openings (17, 18) belonging to the mentioned profiled reflecting element (50) are produced by removing appropriate piercing diaphragms (70, 71).

7. A lighting fixture according to claims 5 or 6, characterized in that the mentioned outer enclosure (21, 31) presents passages (27, 28) for a part of the lighting flux facing the mentioned openings (17, 18).

8. A lighting fixture according to claim 7, characterized in that the mentioned piercing diaphragms (70, 71) are facing certain partition-type structures (72, 73) which allow the lighting flux exiting from the mentioned openings (17, 18) to be channeled and conveyed toward the passages (27, 28).

9. A lighting fixture according to claim 8, characterized in that the walls belonging to the mentioned structures (72, 73) are made of a non-reflecting and non-absorbing material.

10. A lighting fixture according to claims 1 or 2, characterized in that the mentioned light source (12) is constituted by at least one fluorescent tube.

Fig.1

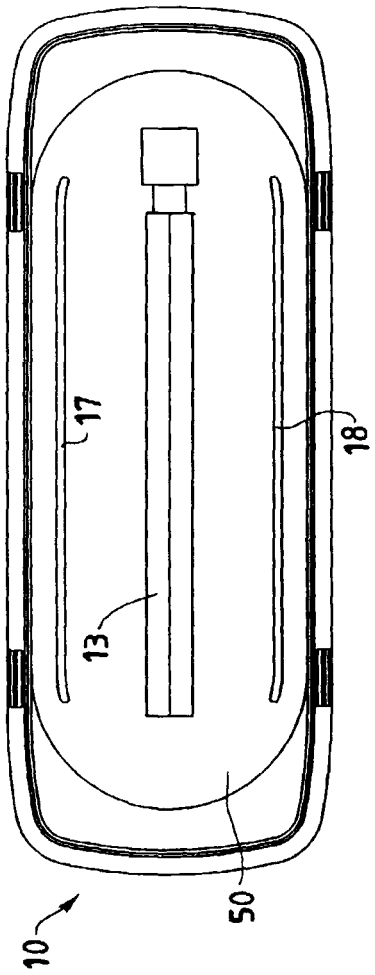


Fig.3

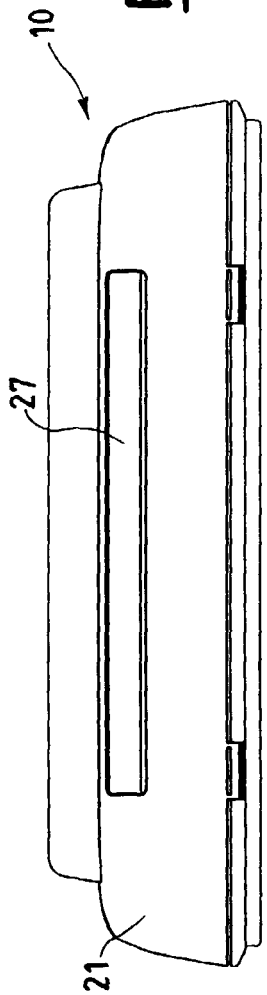


Fig.4

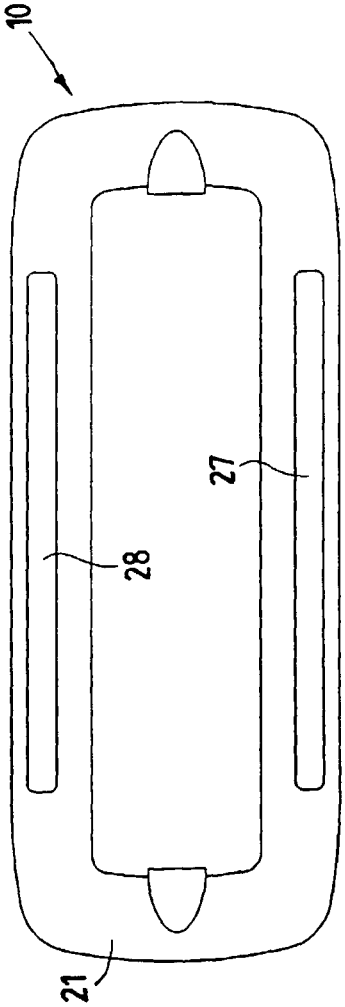
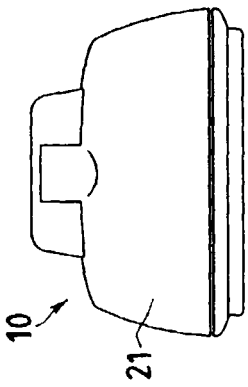


Fig.2



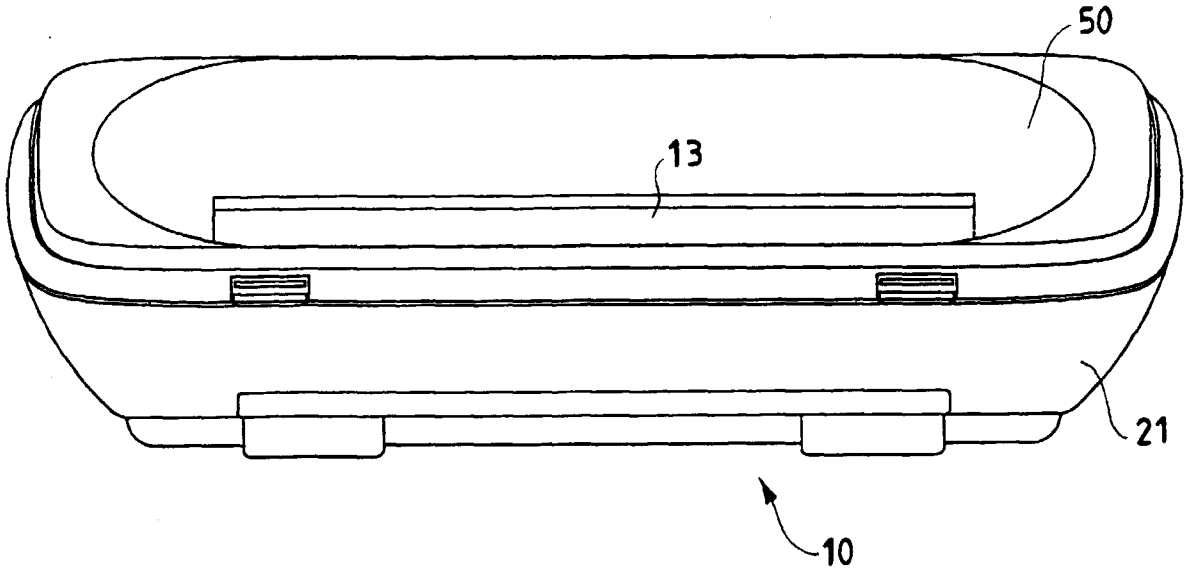


Fig.5

Fig.6

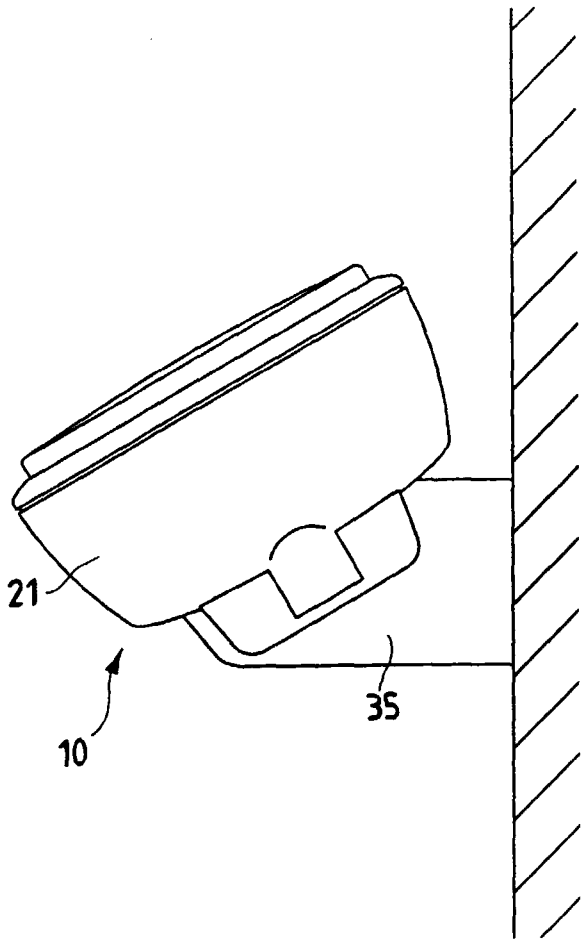


Fig.7

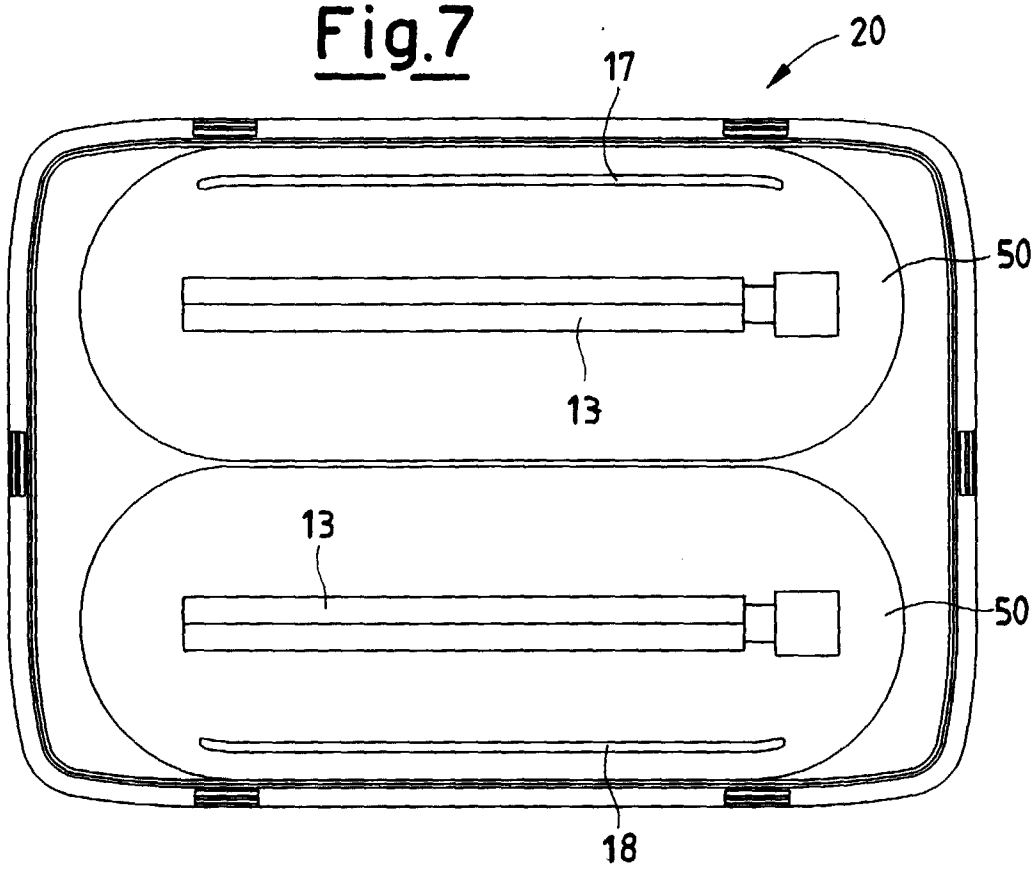


Fig.8

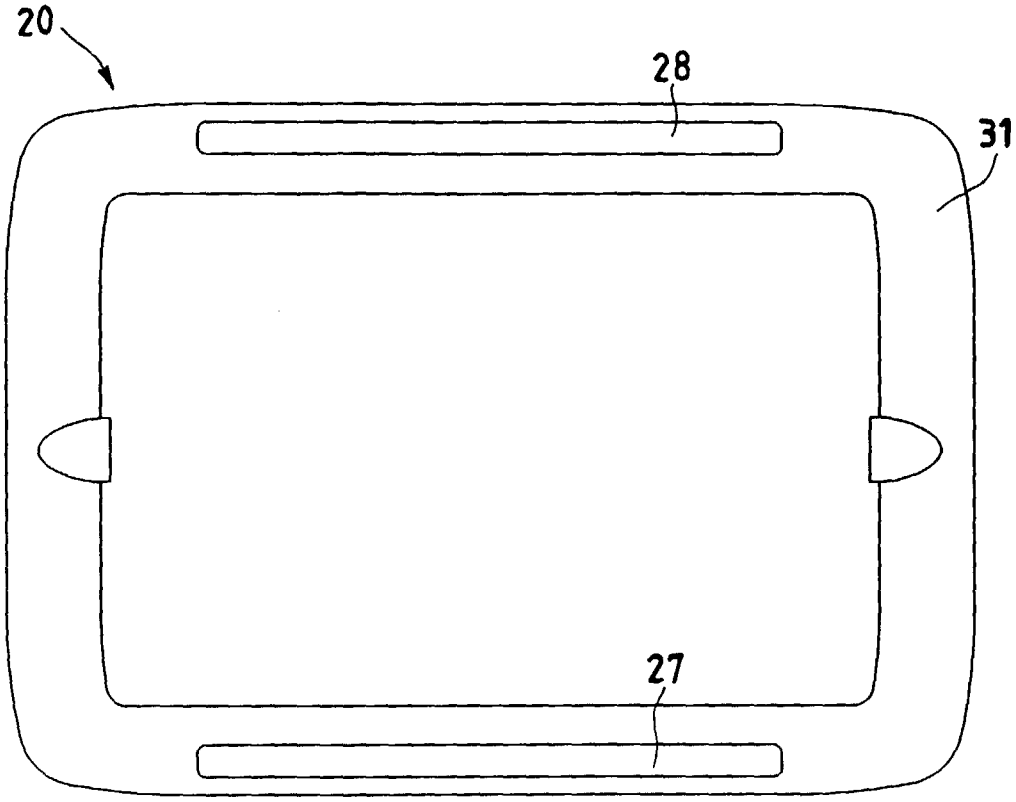


Fig.9

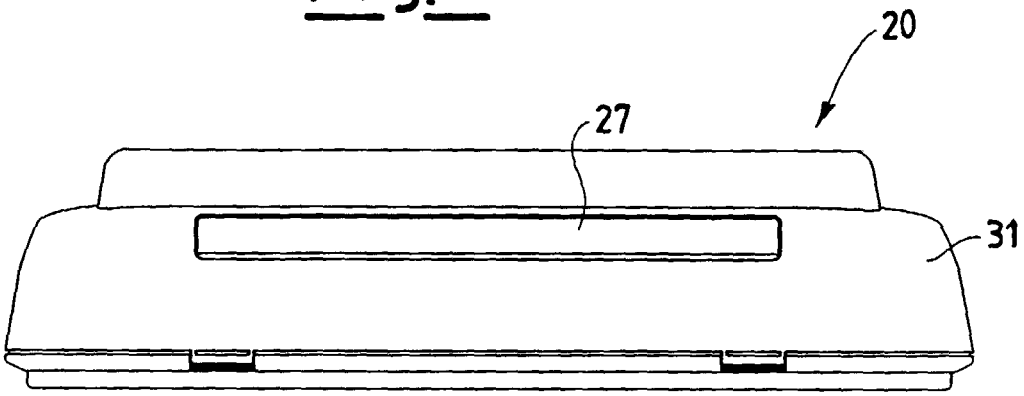
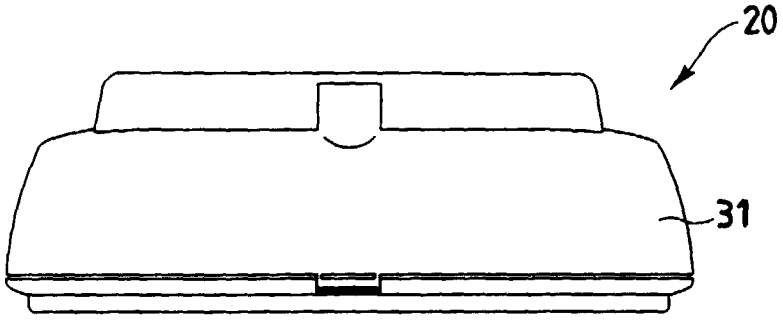


Fig.10



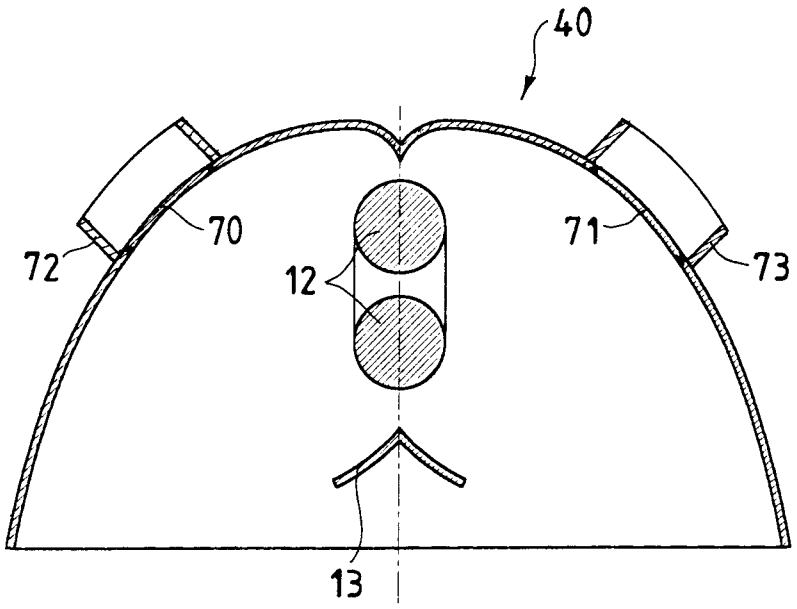


Fig.11

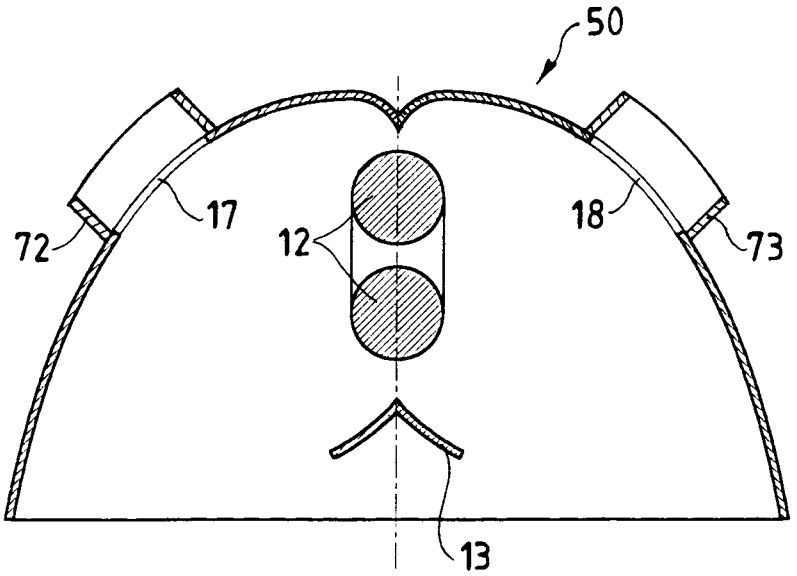


Fig.12

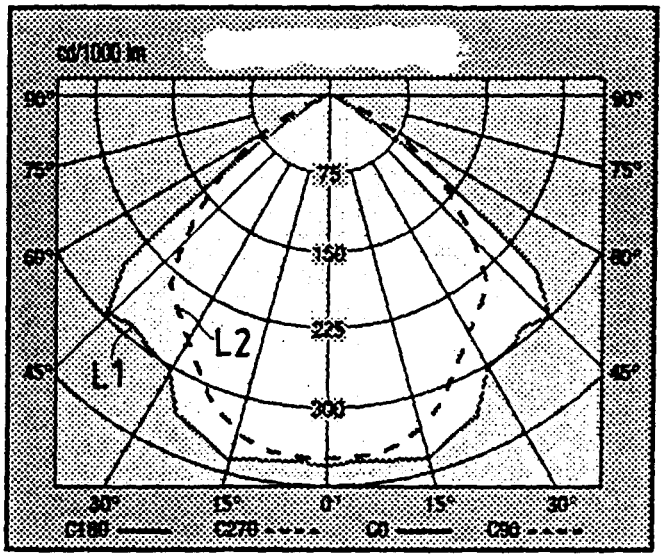


Fig.13

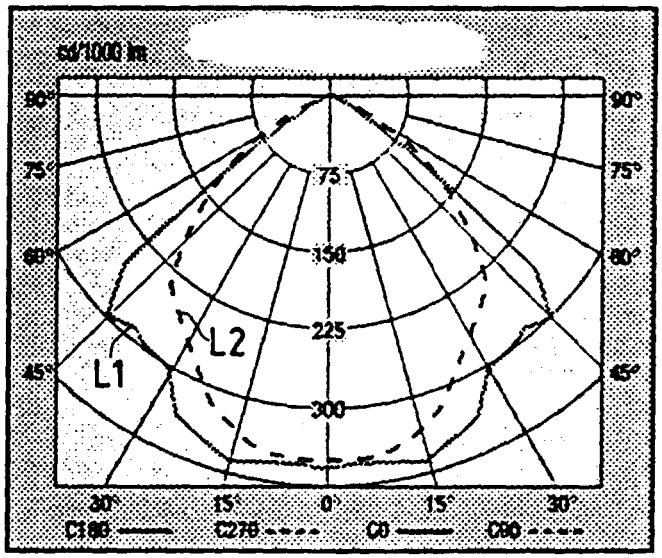


Fig.14

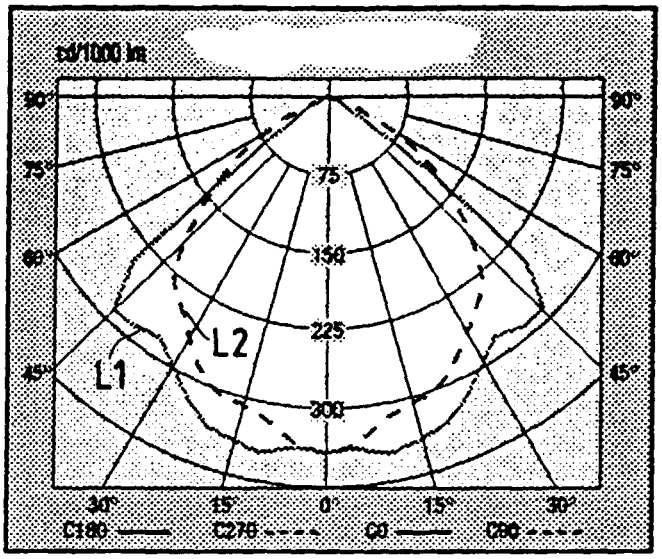


Fig.15

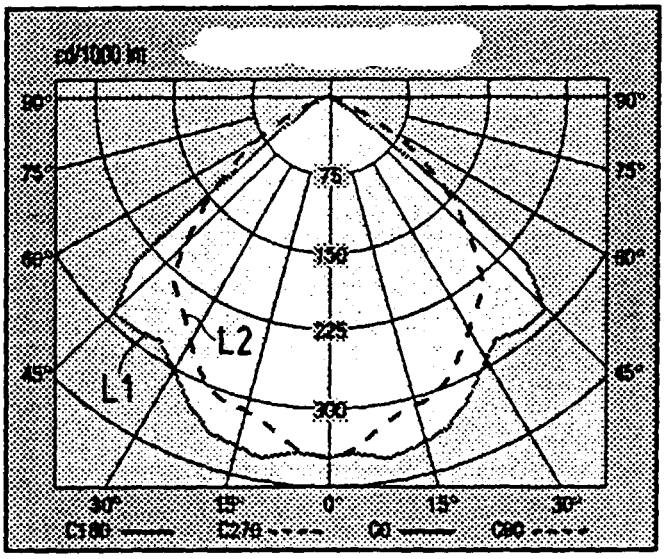


Fig.16

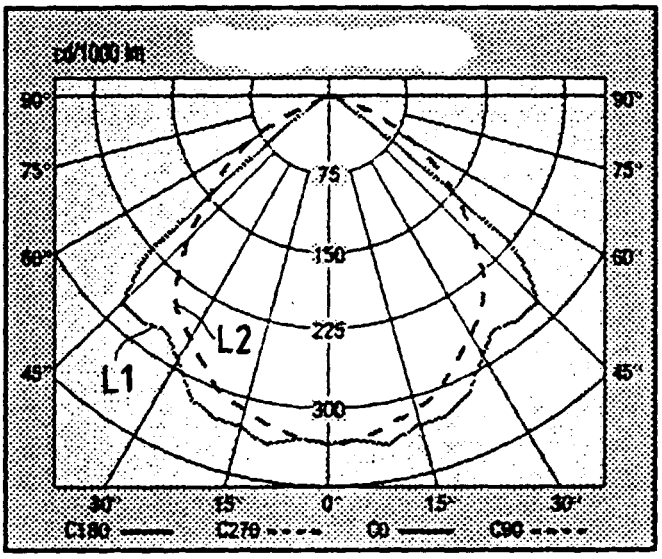


Fig.17

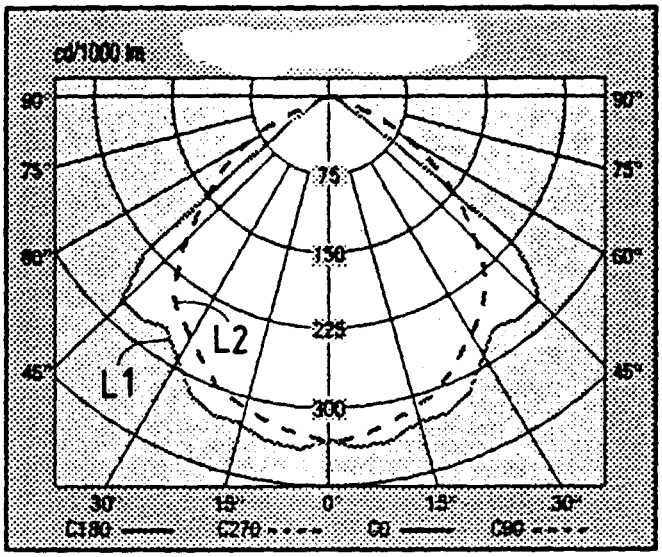


Fig.18