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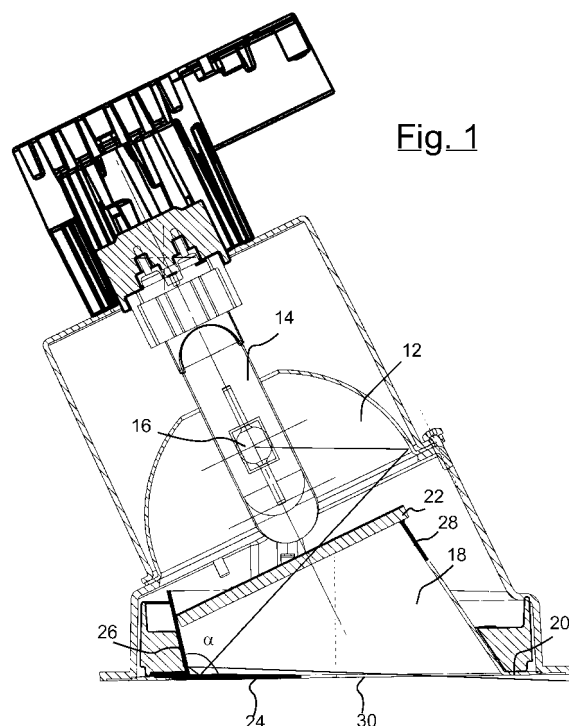
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(54) **Recessed fixture for the uniform lighting of walls**

(57) A lighting fixture (10) is described, of the type which is recess-installable on a wall (P), on a ceiling (S) or on a floor, comprising at least one light source (14) operatively connected to a casing (18) provided with a substantially flat outer perimeter edge (20), shaped for lying on the same plane as the wall (P), ceiling (S) or floor on which the fixture (10) is recessed. The outer perimeter edge (20) surrounds and defines at least one outlet mouth (30) through which the light beam emitted by the light source (14) exits. At the outer perimeter edge (20) of the casing (18) is provided at least one first substantially flat reflecting wall (24) which at least partially blocks the outlet mouth (30), the first reflecting wall (24) deflecting part of the light rays emitted by the light source (14) in order to direct them towards at least one second reflecting wall (26) which at least partially covers the inner side surface of the casing (18). The second reflecting wall (26) is tilted with respect to the first reflecting wall (24) by a predefined angle (α) in order to direct the deflected light ray part in a direction nearly parallel to the wall (P), to the ceiling (S) or to the floor on which the fixture (10) is recessed.



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Description

[0001] The present invention refers to light devices in general and, more in particular, to a recessed lighting fixture intended for lighting vertical and/or horizontal walls in a uniform manner.

[0002] It is known that the lighting bodies or fixtures recess-mounted on walls, ceilings or false ceilings normally generate disagreeable light and shadow effects on the illuminated wall. In particular, "strips" of light are formed which identify non-illuminated zones, which become increasingly evident as one moves away from the light source.

[0003] These light and shadow zones are geometrically determined by the structural characteristics of the employed lighting fixture: the hidden zone of the wall surface, with respect to the light, remains dark, while the free zone is hit with a considerable light quantity. A clear line is thus defined, normally comparable to a parabola, between the dark part and the illuminated part.

[0004] In order to reduce the aforementioned effects, use is sometimes made of a greater quantity of recessed lights, placed at a reduced distance from each other with the surface to be illuminated being equal, but the disadvantages due to an increase of the installation costs and a greater energy consumption are evident.

[0005] Moreover, the illuminated zone inevitably begins a certain distance from the mouth of the lighting fixture, so to make the lighting fixture itself seem further away from illuminated zone than it actually is. In other words, in the case, for example, of recessed ceiling fixture, the virtual height of the lighting fixture is decidedly greater than its actual height. Such problem moreover results irresolvable by simply using a greater quantity of lighting fixtures.

[0006] A known lamp type made for overcoming the abovementioned drawbacks therefore provides for the mounting of a single reflecting wall in front of the lamp itself. The function of such reflecting wall is that of directing a part of the light rays emitted from the lamp towards the area normally in shadow.

[0007] Even if at least partially resolving the mentioned problems, one such solution has however the drawback of requiring additional elements with respect to the lamp body, which project in a more or less evident manner from the ceiling, from the wall or from the floor on which the lamp itself is recessed, with clear anti-aesthetic effect.

[0008] The object of the present invention is therefore that of making a recessed lighting fixture capable of making as uniform as possible the lighting of the wall, ceiling or floor towards which the light beam is directed, eliminating the shadow zones on the sides and near the light source.

[0009] Another object of the present invention is that of making a recessed lighting fixture which lacks any projecting element, thus resulting perfectly flush with respect to the plane of the wall or ceiling in which it is recessed.

[0010] A further object of the present invention is that

of making a recessed lighting fixture which, while being designed for multiple installation, ensures the best possible illumination with the least number of flanked lamps, hence maximising the efficiency of the entire lighting system and reducing its costs.

[0011] These objects according to the present invention are achieved by making a recessed lighting fixture as set forth in claim 1.

[0012] Further characteristics of the invention are indicated by the subsequent claims.

[0013] The characteristics and advantages of a recessed lighting fixture according to the present invention will be clearer from the following exemplifying and non-limiting description referred to the attached schematic drawings, in which:

Figure 1 is a section view of an embodiment of a recessed lighting fixture according to the present invention;

Figure 2 is a schematic section view of the lighting fixture of figure 1, operatively installed, in which the progression of the light beam is shown with respect to the ceiling, wall or floor on which the fixture itself was installed;

Figure 3 is a schematic section view of the lighting fixture of figure 2, in which the progression of the light beam is shown both with respect to the wall on which the fixture is installed and with respect to a second wall perpendicular to the first; and

Figure 4 is a perspective view of a component of the lighting fixture of figure 1, in which the exit path is shown of part of the light beam emitted by the lighting fixture itself.

[0014] With reference in particular to figure 1, an embodiment of a recessed lighting fixture is schematically shown in vertical section, indicated in its entirety with the reference number 10.

[0015] The lighting fixture 10 substantially comprises an optical space 12 inside of which at least one light source 14 is installed, provided with a light emitter bulb 16, such as for example a discharge lamp or a filament lamp. In the illustrated example, the optical space 12 is then fixed, by means of one or more known fixing means (not shown), to a casing 18 placed downstream of the optical space 12 itself. The entire lighting fixture 10 thus formed is in turn suitably provided with further fixing means (not shown) for a recessed wall, ceiling and/or floor mounting thereof, or in any case on any one substantially flat surface.

[0016] According to another embodiment, not shown in the attached figures, the optical space 12 can also be formed integrally with the casing 18, rather than being fixed to the same.

[0017] More precisely, the casing 18, intended for being retractably inserted, together with the optical space 12, inside a wall P of a ceiling or false ceiling S or a floor (not shown), provides for a substantially flat outer perim-

eter edge 20, which remains visible from the outside and is shaped for lying on the same plane as the wall P, ceiling S or floor on which the lighting fixture 10 is recessed. The outer perimeter edge 20 of the casing 18 then surrounds and defines an outlet mouth 30 through which the lighted emitted by the light source 14 is irradiated.

[0018] Inside the casing 18, at variable distances and slopes with respect to the outlet mouth 30 and consequently from the wall P, ceiling S or floor, one or more transparent screens 22 can be provided for (or not provided for), such as for example coloured, neutral, sand-blasted or prismatic glass sheets, interposed between the light source 14 and said outlet mouth 30.

[0019] According to the invention, at the outer perimeter edge 20 of the casing 18, at least one substantially flat first reflecting wall or tab 24 is provided for, lying on the same plane on which such outer perimeter edge 20 lies along with the wall P, ceiling S or floor on which the fixture 10 is installed in operative position, said reflecting tab 24 at least partially blocking the outlet mouth 30.

[0020] In the particular illustrated embodiment, in which the outlet mouth 30 of the lighting fixture 10 has substantially circular or elliptical form, the reflecting tab 24 is made in circular segment or arc-shaped form and has suitable dimensions for obtaining the desired lighting effect. It is intended that, by varying the shape and size of the outlet mouth 30, and consequently of the entire lighting fixture 10, the shape and size of the reflecting tab 24 will also vary, without departing from the protective scope of the invention.

[0021] The function of the reflecting tab 24 is that of deflecting a part of the light rays emitted by the bulb 16 and intended to exit from the outlet mouth 30, in a manner such to direct such deflected light rays towards a second reflecting wall 26 which at least partially covers the inner side surface of the casing 18. The form of the tab 24, arc-shaped in the particular non-limiting embodiment of figure 4, allows distributing the light amount in a manner such to obtain the most uniform possible lighting effect on the wall P, ceiling S or floor.

[0022] In practice, the uniform distribution of the light on the wall P, ceiling S or floor is obtained due to the combined effect of the reflecting wall 26, the reflecting tab 24, and when present the screen 22.

[0023] According to the shape and size of the casing 18, as well as the distribution of the light beam which one wishes to obtain, the surface of the second reflecting wall 26 can either be flat or curved and can cover a more or less extensive portion of the inner side surface of the casing 18 itself.

[0024] Therefore, due to the simultaneous presence of the reflecting walls 24 and 26, a part of the light emitted by the source 14 exits directly from the outlet mouth 30 of the fixture 10, as occurs in the recessed lamps of known type, while the remaining light part is recovered and reflected from the flat tab 24 onto the reflecting side wall 26.

[0025] Conveniently, the reflecting wall 26 is tilted by

a predefined angle α with respect to the tab 24 and consequently, with respect to the plane of the ceiling S, wall P or floor on which the lighting fixture 10 is operatively mounted, thus to permit directing the recovered light quantity in a direction nearly parallel to the surface, for example, of the ceiling S shown in figure 2.

[0026] In this manner, it is possible to nearly completely illuminate the shadow zones (strips) formed by the recessed lighting fixtures of known type at the intersection between the ceiling S, on which the fixture 10 is mounted, and the walls P orthogonal to such ceiling S on which the light beam emitted by the fixture 10 is directed, as can be seen for example in the schematic representation of figure 3.

[0027] Experimentally, in order to ensure a particularly effective lighting using the fixture 10 according to the invention, it was identified that the flat tab 24 and the reflecting wall 26 can be tilted with respect to each other with an angle α between the parts which varies from 90° to 160°.

[0028] Finally, on the inner side surface portion of the casing 18 opposite that on which the reflecting wall 26 is situated, an opaque wall 28 can be provided for which prevents the formation of parasitic light. The extension of the opaque wall 28 substantially depends on the slope of the casing 18, and thus also of the light source 14, with respect to the plane of the ceiling S, as well as the overall size of the lighting fixture 10. In practice, it has been found that for small size lamps, the presence of the opaque wall 28 improves the visual comfort of the fixture, decreasing its glare, while for larger lamps such walls can also be absent.

[0029] It is therefore understood that the recessed lighting fixture according to the present invention achieves the objects indicated above, in particular providing for a lamp which is perfectly flush with the wall, ceiling or floor on which it is recessed and which is capable of drastically reducing (even nearly eliminating) the light and shadow effects of the traditional recessed lamps, due to the combined action of the reflecting walls which are appropriately positioned and tilted with respect to each other. The double advantage is thus obtained of improving the efficiency of the lighting fixture and ensuring at the same time achieving a pleasant aesthetic effect due to the total absence of projecting elements and/or additional pieces on the fixture itself.

[0030] Moreover, the presence of the flat, more or less extensive reflecting tab which at least partially covers the outlet mouth of the light beam is also useful for increasing the shielding of the lighting fixture and for limiting undesired glare effects.

[0031] The recessed lighting fixture of the present invention as conceived is in any case susceptible to numerous modifications and variants, all part of the same inventive concept; moreover, all details can be substituted by technically equivalent elements.

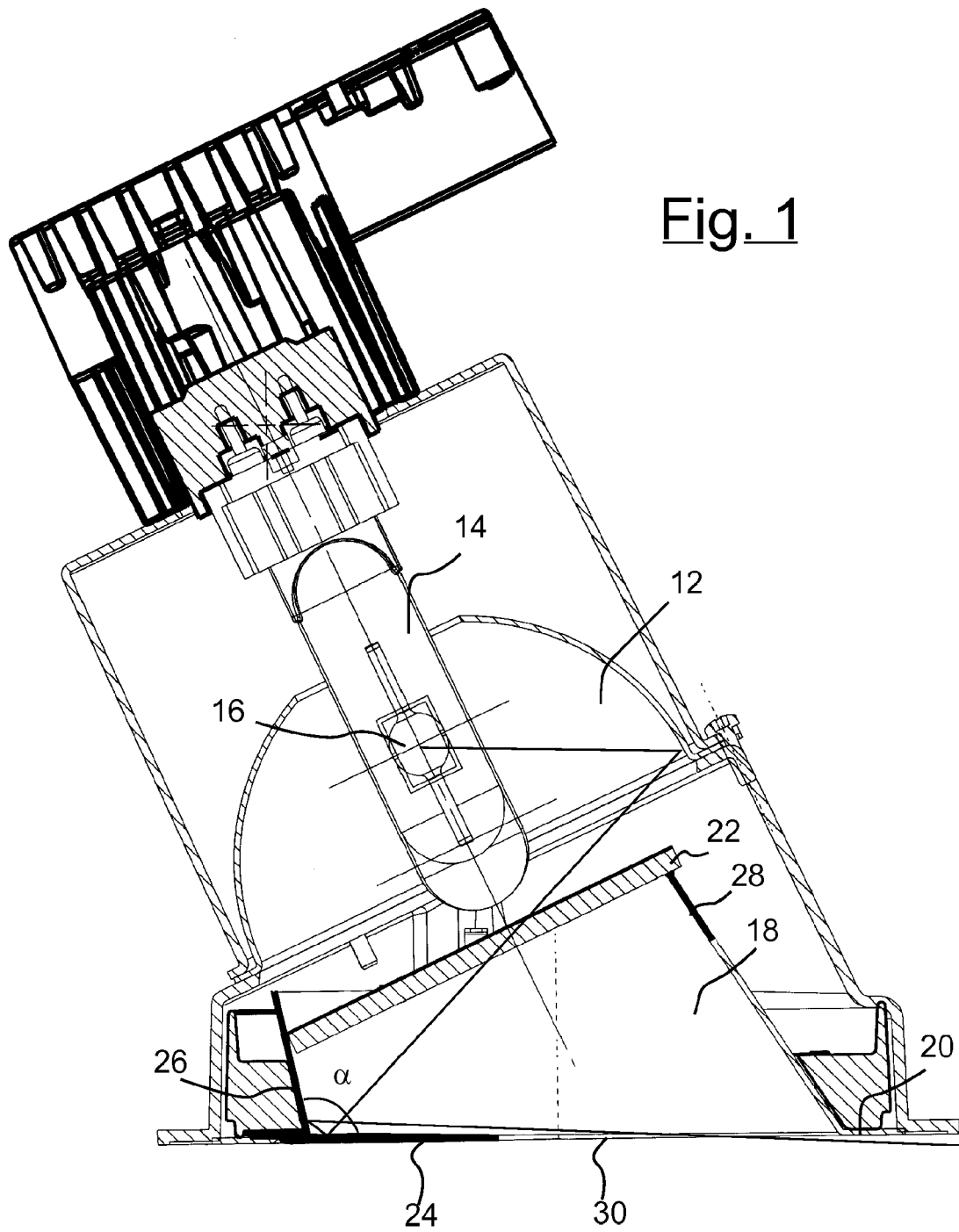
[0032] In practice, the materials used, as well as the sizes, can be of any type according to the specific tech-

nical requirements.

Claims

1. Lighting fixture (10), of the type which is recess-installable on a wall (P), on a ceiling (S) or on a floor, comprising at least one light source (14) operatively connected to a casing (18) provided with a substantially flat outer perimeter edge (20), shaped for lying on the same plane of the wall (P), ceiling (S) or floor on which said fixture (10) is recessed, said outer perimeter edge (20) surrounding and defining at least one outlet mouth (30) through which the light beam emitted by said light source (14) exits, **characterised in that** at said outer perimeter edge (20) of said casing (18) is provided at least one first substantially flat reflecting wall (24) which at least partially blocks said outlet mouth (30), said first reflecting wall (24) deflecting part of the light rays emitted by said light source (14) in order to direct them towards at least one second reflecting wall (26) which at least partially covers the inner side surface of said casing (18), said second reflecting wall (26) being tilted with respect to said first reflecting wall (24) by a predefined angle (α) in order to direct said light ray part in a direction nearly parallel to said wall (P), to said ceiling (S) or to said floor on which said fixture (10) is recessed.
2. Lighting fixture (10) according to claim 1, **characterised in that** said first reflecting wall (24) lies on a same plane on which said outer perimeter edge (20) and said wall (P), said ceiling (S) or said floor lie when said lighting fixture (10) is recess-installed in operative position.
3. Lighting fixture (10) according to claim 1, **characterised in that** said angle (α) between said first reflecting wall (24) and said second reflecting wall (26) varies from 90° to 160°.
4. Lighting fixture (10) according to claim 1, **characterised in that** one or more transparent screens (22) are provided inside said casing (18), said one or more transparent screens (22) being placed at variable distances and slopes with respect to said outlet mouth (30) and consequently with respect to said wall (P), said ceiling (S) or said floor.
5. Lighting fixture (10) according to claim 4, **characterised in that** said one or more transparent screens (22) cooperate with said first reflecting wall (24) and with said second reflecting wall (26) in order to direct said light ray part in a direction nearly parallel to said wall (P), to said ceiling (S) or to said floor on which said fixture (10) is recessed.
6. Lighting fixture (10) according to claim 4, **characterised in that** said one or more transparent screens (22) are composed of coloured, neutral, sand-blasted or prismatic glass sheets.
7. Lighting fixture (10) according to claim 1, **characterised in that** on the inner side surface portion of said casing (18) opposite to that on which said second reflecting surface (26) is situated, at least one opaque wall (28) is provided which prevents the formation of parasite light reflections.
8. Lighting fixture (10) according to claim 7, **characterised in that** the extension of said opaque wall (28) depends on the slope of said light source (14) with respect to the plane on which said wall (P), said ceiling (S) or said floor lie and on the overall dimensions of said lighting fixture (10).
9. Lighting fixture (10) according to claim 1, **characterised in that** said first reflecting wall (24) is made in circular segment or arc-shaped form.
10. Lighting fixture (10) according to claim 1, **characterised in that** the surface of said second reflecting wall (26) is flat.
11. Lighting fixture (10) according to claim 1, **characterised in that** the surface of said second reflecting wall (26) is curved.

Fig. 1



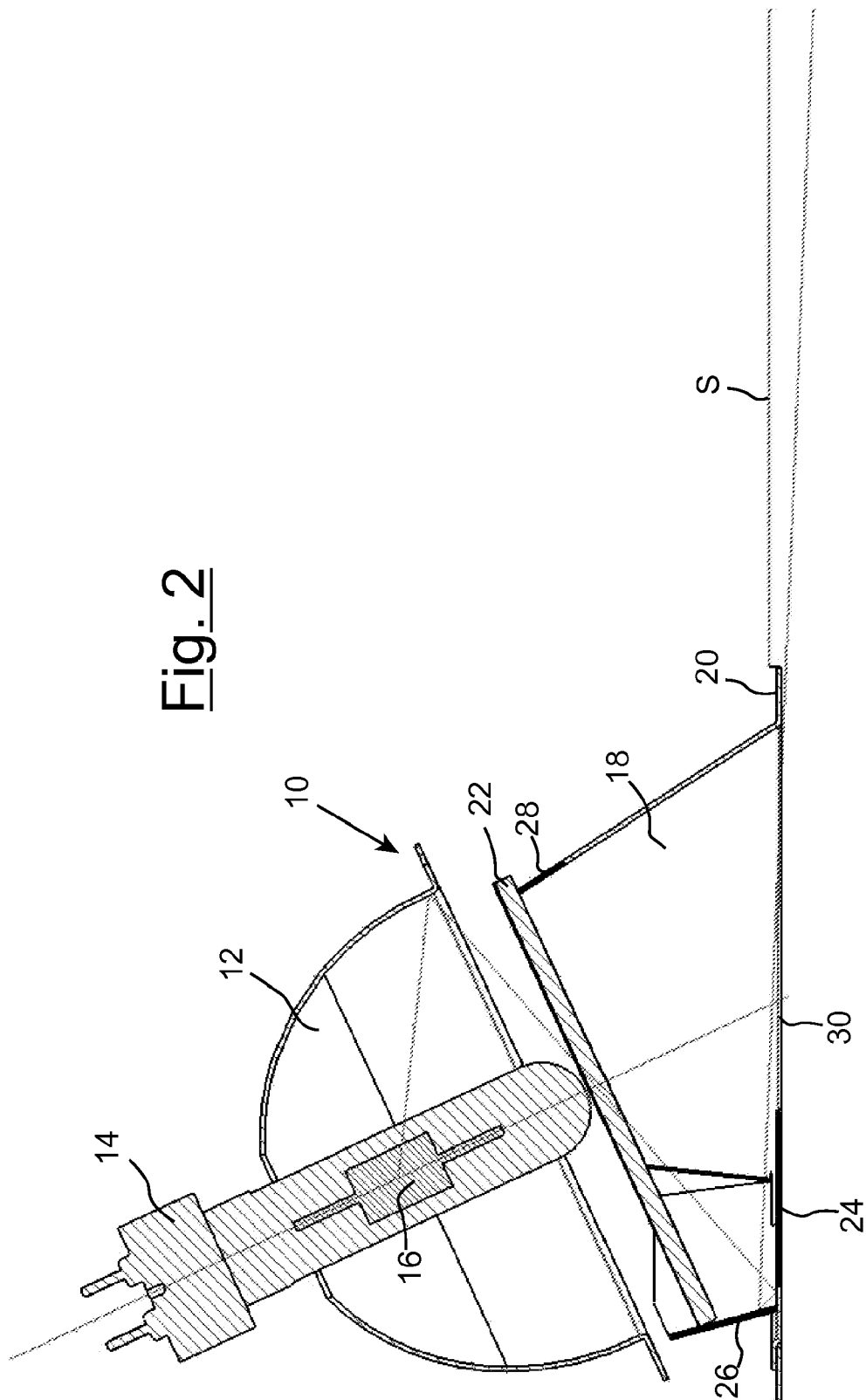
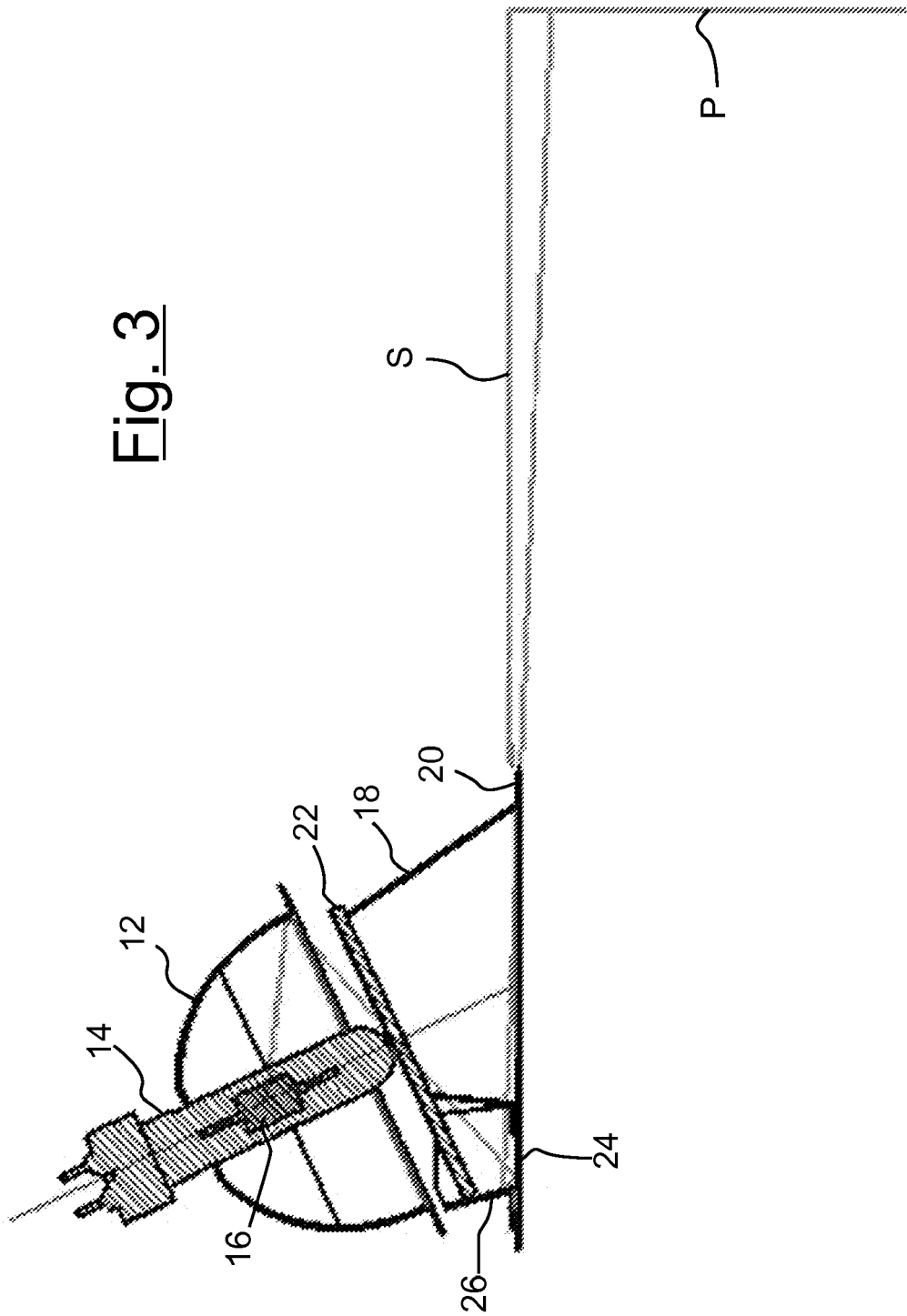


Fig. 3



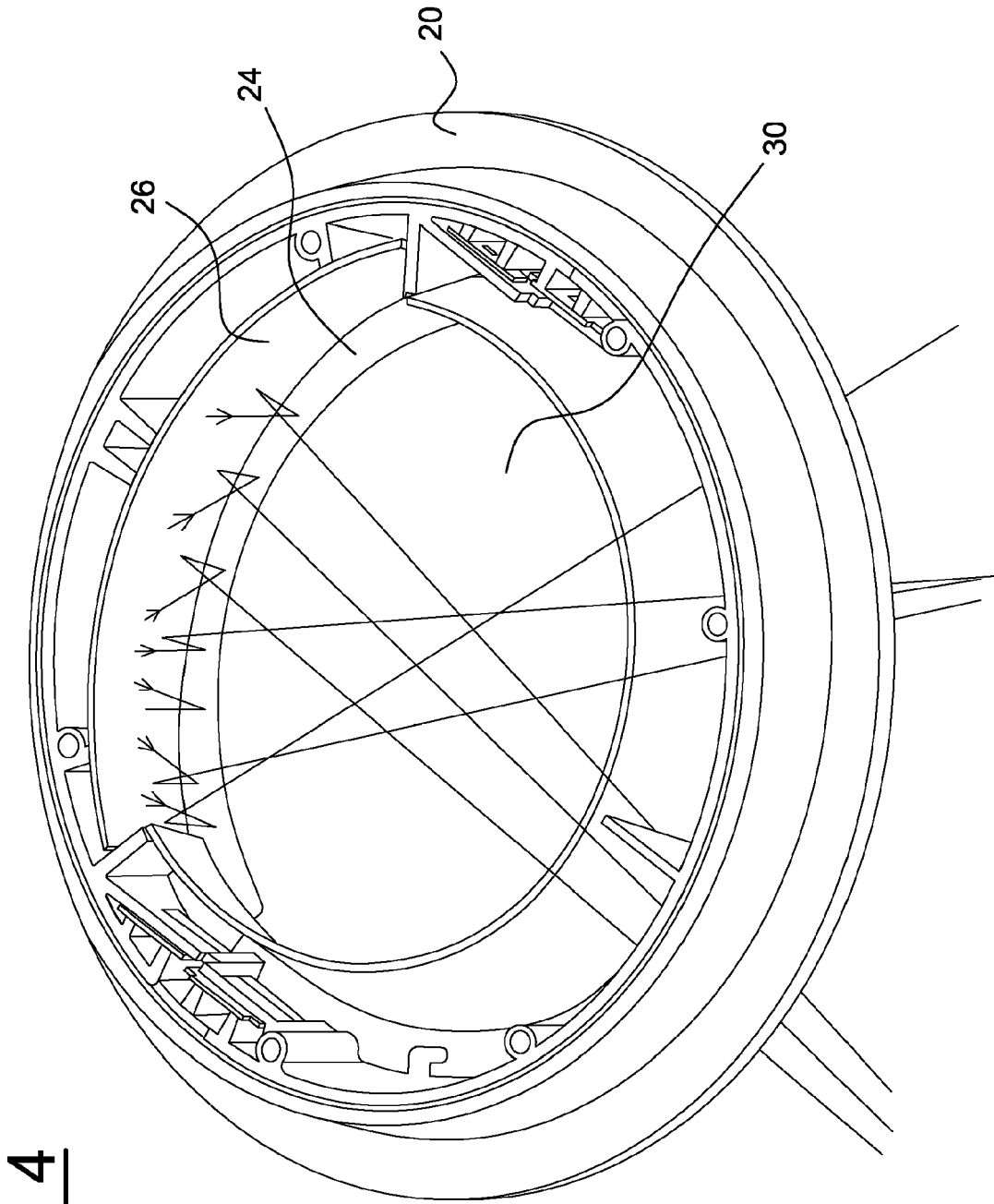


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 9104

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Place of search The Hague		Date of completion of the search 18 January 2008	Examiner Blokland, Russell
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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