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(54) **LIGHTING APPARATUS**

(57) Lighting apparatus, comprising a main body having a side wall extending around a longitudinal body axis from a base that is suitable for being fixed to the ground, and a lighting head that is connected to said main body.

The main body has an upper portion that extends

from the side wall and forms, at least in a peripheral sector, a reflective slide that is suitable for reflecting the light generated by the lighting head.

The lighting head houses a light source suitable for projecting a beam of light downwards, above the reflective slide.

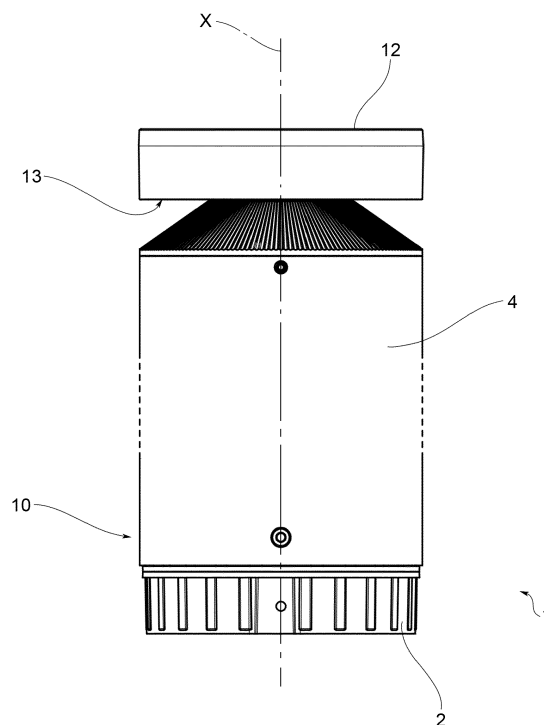


FIG.1

Description

[0001] The present invention relates to a lighting apparatus that comprises a parallelepiped body extending vertically from a base that can be fixed to the ground, and a light source housed in an end portion of the body that can emit a beam of light in the radial direction.

[0002] These types of apparatuses are usually used in external environments, for example for lighting pathways and gardens.

[0003] The light generated by the light source can be emitted at an emission angle of 360° about the vertical apparatus axis, or at smaller angles of a preset size.

[0004] In some embodiments, the light source directly emits the light in the radial direction and an anti-glare screen is therefore provided in the side wall of the body of the apparatus. If the light-emission angle is 360°, the screen may also function as a support for the top of the body of the apparatus that protects or houses the light source.

[0005] The object of the present invention is to provide an apparatus of the type mentioned above, which does not require the presence of an anti-glare screen in the side wall of the body of the apparatus and which is therefore able to offer an improved lighting effect.

[0006] Another object of the invention is to provide a lighting apparatus of the aforementioned type, but which has a different mechanical structure that makes it possible to facilitate the production, assembly and reliability over time of the apparatus.

[0007] These objects are achieved by a lighting apparatus according to claim 1. The dependent claims describe preferred embodiments of the invention.

[0008] The features and advantages of the lighting apparatus according to the invention will, however, become clear from the following description, given by way of non-limiting example, with reference to the attached drawings, in which:

- Fig. 1 is an elevated view of the lighting apparatus according to the invention in a first embodiment suitable for generating a beam of light at an emission angle of 360°;
- Fig. 2 and 2a are two perspective views, one from above and one from below, respectively, of the apparatus in Fig. 1, comprising a main body and a lighting head that are separate from one another;
- Fig. 3 is an axial sectional exploded view of the apparatus in Fig. 1;
- Fig. 4 is an elevated view of the lighting apparatus according to the invention in a second embodiment suitable for generating a beam of light at an emission angle of less than 360°, for example 180°; and
- Fig. 5 and 5a are two perspective views, one from above and one from below, respectively, of the apparatus in Fig. 4, comprising a main body and a lighting head that are separate from one another.

[0009] In said drawings, 1 and 100 indicate a lighting apparatus according to the invention as a whole.

[0010] In the remainder of the description and in the drawings, elements that the different embodiments have in common have been indicated by the same reference numerals.

[0011] In accordance with a general embodiment, the lighting apparatus comprises a main body 10; 110 having a base 2 that can be fixed to the ground. A lighting head 12; 112 is arranged on the main body 10, 110. The main body 10; 110 comprises a side wall 4 that extends from the base around a longitudinal body axis X.

[0012] In the remainder of the description, for simplification purposes, the apparatus will be considered to be oriented in its final use position, that is with the longitudinal body axis X oriented vertically.

[0013] In one embodiment, the side wall 4 is axially symmetrical, for example cylindrical, as in the examples shown.

[0014] The lighting head 12; 112 houses a light source 14, 114 suitable to project a beam of light downwards.

[0015] The main body 10; 110 comprises an upper portion 16; 116 that extends from the side wall 4 and forms, at least in a peripheral sector, a reflective slide 18; 118 suitable to reflect the light generated by the lighting head 12; 112.

[0016] The term "slide" generally means an inclined or tapered surface, including a concave surface, which, upon receiving a beam of light from a light source arranged thereabove, reflects the beam of light in a substantially radial direction. It is clear that the geometric shape of the slide can be selected on the basis of what direction the beam of light leaving the apparatus is intended to go in.

[0017] In one embodiment, the light source 14; 114 is positioned above the reflective slide.

[0018] In one embodiment, the light source 14; 114 comprises an LED printed circuit board housed in a source seat that is made in the lighting head and is open towards the reflective slide 18; 118. For example, the LED printed circuit board is fixed to the particular source seat so as to extend in a plane that is orthogonal to the longitudinal apparatus axis.

[0019] The light source can be protected by a transparent or semitransparent protection plate 14'; 114', which closes the light emission aperture.

[0020] In a preferred embodiment, when observing the lighting apparatus from above, the light emission aperture, which may be provided with a protection plate 14'; 114', has substantially the same shape, in plan view, as the reflective slide 18; 118 arranged therebelow.

[0021] In one embodiment, the lighting head 12; 112 forms a lower light emission wall 13; 113, in other words that faces the upper portion of the main body, which is substantially planar and orthogonal to the longitudinal apparatus axis X.

[0022] In one embodiment, the protection plate 14'; 114' forms a portion of the lower wall of the lighting head.

[0023] In one embodiment, the lighting head 12; 112

has the same shape, in plan view, as the main body.

[0024] The main body 10; 110 ends at the top with a head support neck 20 that extends vertically coaxially with the longitudinal body axis X and has a radial extension that is smaller than the radial extension of the main body and of the lighting head.

[0025] The reflective slide 18; 118 extends between the head support neck 20 and the upper edge of the side wall 4.

[0026] More precisely, the reflective slide 18; 118 extends from the side wall 20' of the head supporting neck 20 to the upper edge of the side wall.

[0027] The lighting head 12; 112 is exclusively fixed to the head support neck 20 by fixing means that are hidden from view and act axially between the head support neck 20 and an inner central portion 22 of the lighting head 12; 112.

[0028] Therefore, in the angular region of the lighting apparatus that is delimited by the reflective slide 18; 118, no connecting elements are provided between the main body and the lighting head. The beam of light reflected by the reflective slide is therefore not interrupted by any structural and/or optical elements of the apparatus.

[0029] In one embodiment, the fixing means are made up of fixing screws 24 supported by the head support neck 20 and screwed into respective threaded seats 26 formed in the inner central portion 22 of the lighting head 12; 112. As can be seen from Fig. 3 in particular, the fixing screws 24 comprise respective heads 24' that can be accessed from inside the upper portion 16.

[0030] For example, the upper portion 16 is substantially hollow on the inside.

[0031] In one embodiment, the fixing screws 24 are supported by radial protrusions 28 that extend towards the longitudinal apparatus axis X from the inside of the side wall 20' of the head support neck 20.

[0032] In one embodiment, the upper portion 16; 116 of the main body and the side wall 4 are formed as separate components and are assembled. For example, the side wall 4 is formed from a tubular body; the upper portion 16; 116 can be formed as one piece by means of die casting. For example, the body and the head can be made of aluminum.

[0033] In one embodiment, the upper portion 16, 116 is provided with a lower collar 30 that is inserted with a form fit into the open upper end of the side wall 4 and can be fastened thereto, for example by means of a radial grub screw (Fig. 3).

[0034] In accordance with one embodiment, the head support neck 20 comprises a side wall 20' that extends vertically from the radially inner edge of the reflective slide 18; 118 and is received in the inner central portion 22 of the lighting head.

[0035] In this way, the head support neck 20 is hidden from view and makes it possible to bring together the lower wall 13; 113 of the lighting head and the upper edge of the reflective slide 18; 118 substantially seamlessly, as can be observed in particular from the elevated views

in Fig. 1 and 4.

[0036] In one embodiment shown in the drawings, the main body 10; 110 is substantially cylindrical.

[0037] In one embodiment, the reflective slide 18; 118 is formed by at least one portion of a truncated cone-shaped side wall.

[0038] In accordance with another aspect of the invention, the reflective slide 18; 118 comprises a surface knurling or groove, suitable to diffuse the light generated by the light source.

[0039] This surface knurling or groove therefore performs an anti-glare function.

[0040] In one embodiment shown in the drawings, the surface knurling or groove is formed by an alternation of ridges and slopes, preferably having a radial extension.

[0041] In one embodiment, the reflective slide 18; 118 also comprises an opaque color, preferably black, which is useful for further improving the visual comfort, particularly in combination with the surface knurling or groove.

[0042] In one embodiment, if the reflective slide is conical, the ridges and slopes of the surface knurling become progressively wider towards the bottom so as to ensure uniform diffusion of the light.

[0043] In one embodiment shown in Fig. 1-3, the reflective slide 18 is formed by a truncated cone-shaped wall that extends at 360° around the longitudinal body axis X.

[0044] In this case, the light source 14 comprises a circular crown-shaped extension that extends around the inner central portion 12. The light emission aperture is preferably superimposed and coincides, in plan view, with the truncated cone-shaped wall 18.

[0045] In one variant shown in Fig. 4-5, which is suitable for generating a beam of light at an emission angle of less than 360°, for example of 180°, the reflective slide 118 is formed by a truncated cone-shaped wall portion that extends through a circular sector around the longitudinal body axis X.

[0046] In this case, the light source 114 comprises an extension that is shape as a sector of a circular crown and extends in part around the inner central portion 22.

[0047] The light emission aperture is preferably superimposed and coincides, in plan view, with the truncated cone-shaped wall portion 118.

[0048] In this embodiment, the upper portion 116 preferably forms a damping sector 120 that extends at an angle between the ends of the truncated cone-shaped wall portion 118 and vertically from the side wall 4 to the lighting head 112.

[0049] In other words, this damping sector 120 fills up the region beneath the lighting head that is not delimited between the reflective slide and the light emission portion of the lower wall of the lighting head.

[0050] In one embodiment, this damping sector 120 is provided with a curb 122, at least along its radial edges, which penetrates the lighting head 112 in order to block the passage of light between the lighting head and the damping sector.

[0051] The description given above shows how the lighting apparatus according to the invention achieves the set aims.

[0052] In particular, the light source housed in a lighting head connected to the main body in the manner described and coupled to the reflective slide makes it possible to generate a considerably effective and high-quality beam of light.

[0053] On account of the knurling of the slide, preferably combined with its opaque color, the observer is not blinded in any case.

[0054] The particular mechanical structure of the apparatus makes it particularly robust and reliable, especially for use in external environments. For example, the complete absence of screws accessible from the lighting head prevents the risk of moisture forming in the head containing the light source.

[0055] Positioning the light source so that the relative protection plate faces the bottom makes it possible, in comparison with a front plate, to prevent the plate from getting dirty or damaged, which would thus compromise the quality of the lighting effect.

[0056] The lighting apparatus is formed by a smaller number of components assembled in a quick and simple manner.

[0057] In order to meet contingent needs, an expert in the field could make modifications and adaptations to the embodiments of the lighting apparatus according to the invention and could substitute elements with other functionally equivalent elements without departing from the scope of the following claims. Each of the features described as belonging to a possible embodiment can be formed independently of the other embodiments described.

Claims

1. Lighting apparatus, comprising a main body having a side wall extending around a longitudinal body axis from a base suitable for being fixed to the ground, and a lighting head connected to said main body, wherein:

- the main body has an upper portion which extends from the side wall and which forms, at least in a peripheral sector, a reflective slide suitable for reflecting the light generated by the lighting head;
- the main body terminates at the top with a head support neck which extends in height coaxially with the longitudinal body axis and which has a radial extension smaller than the radial extension of the main body and the lighting head, the reflecting slide extending between said head support neck and the upper edge of the side wall;
- the lighting head houses a lighting source suitable for projecting a beam of light downwards,

above the reflecting slide;

- the lighting head is fixed exclusively to the head support neck by means of fixing means hidden from view which act axially between the support neck and an inner central portion of the lighting head.

2. Apparatus according to the preceding claim, wherein the reflecting slide has a surface knurling or groove suitable for diffusing the light generated by the lighting source.
3. Apparatus according to claim 1 or 2, wherein the reflecting slide has an opaque color, preferably black.
4. Apparatus according to any one of the preceding claims, wherein said fixing means consist of fixing screws supported by the head support neck and screwed into respective threaded seats formed in said inner central portion of the lighting head, the fixing screws having the respective heads accessible from inside the upper portion.
5. Apparatus according to any one of the preceding claims, wherein the support neck has a side wall which extends in height from the radially inner edge of the reflecting slide and which is received in said inner central portion of the lighting head.
6. Apparatus according to any one of the preceding claims, wherein the lighting head forms a lower light emission wall substantially flat and orthogonal to the longitudinal body axis.
7. Apparatus according to any one of the preceding claims, wherein the main body is substantially cylindrical in shape and wherein the reflecting slide is formed by at least a portion of a truncated cone-shaped side wall.
8. Apparatus according to the preceding claim, wherein the reflecting slide has a surface knurling formed by an alternation of ridges and slopes with radial extension.
9. Apparatus according to claim 7 or 8, wherein the reflecting slide is formed by a truncated cone-shaped wall which extends at 360° about the longitudinal body axis.
10. Apparatus according to the preceding claim, wherein the lighting source is housed in a respective source seat which forms a light emission aperture having a circular crown development which extends around the inner central portion, the light emission aperture being superimposed and coinciding, in plan view, with the truncated cone-shaped wall.

11. Apparatus according to claim 7 or 8, wherein the reflecting slide is formed by a portion of truncated cone-shaped wall which extends through a circular sector around the longitudinal body axis. 5
12. Apparatus according to the preceding claim, wherein the lighting source is housed in a respective source seat which forms a light-emitting aperture having a circular crown sector development which extends partially around the inner central portion, the light emission aperture being superimposed and coinciding, in plan view, with said portion of truncated cone-shaped wall. 10
13. Apparatus according to claim 11 or 12, wherein the upper portion forms a damping sector which extends angularly between the ends of the truncated cone-shaped wall portion and in height from the side wall to the lighting head. 15 20
14. Apparatus according to the preceding claim, wherein said damping sector is provided, at least along its radial edges, with a curb which penetrates within the lighting head to block the passage of light between the lighting head and the damping sector. 25

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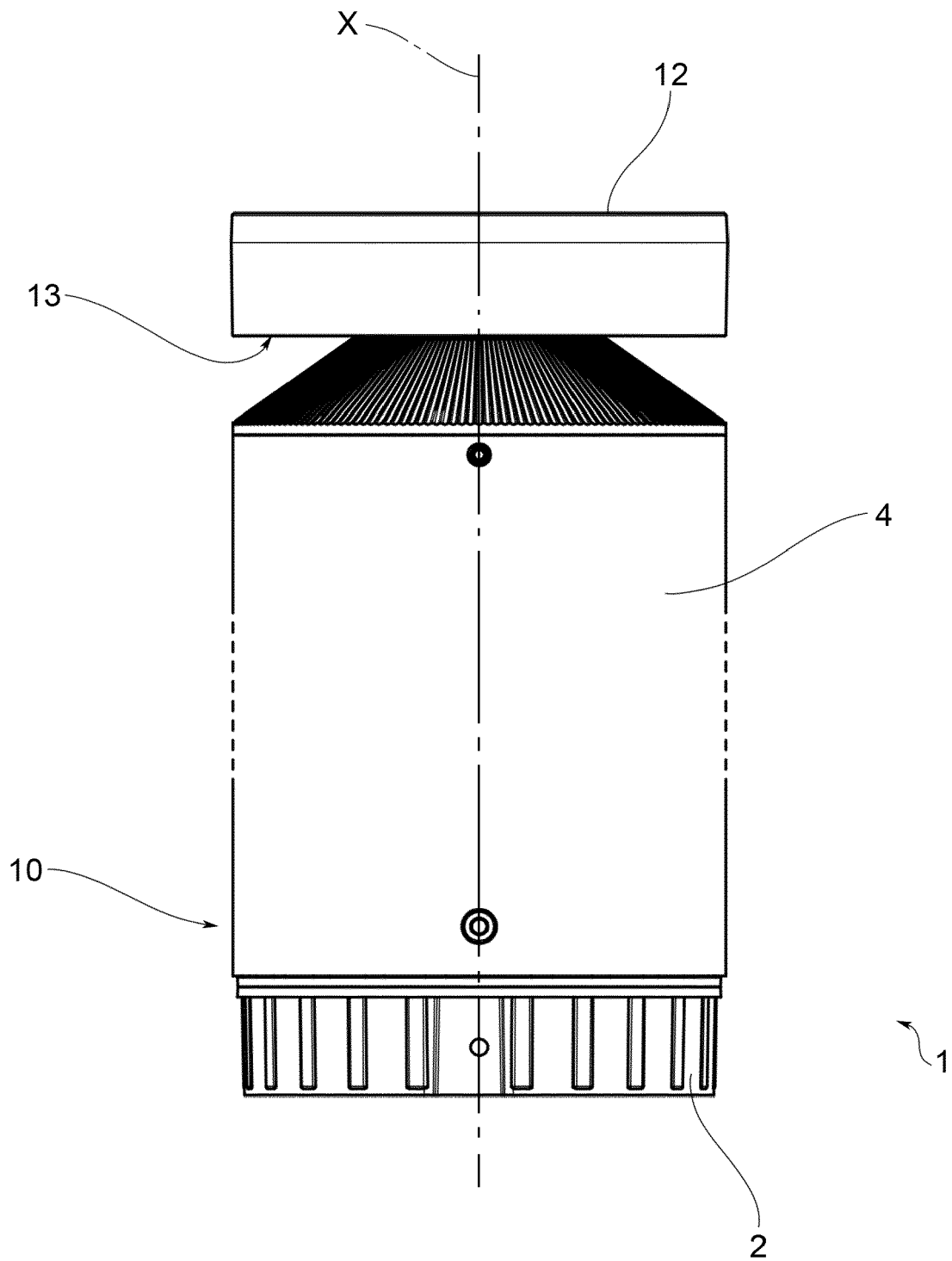


FIG.1

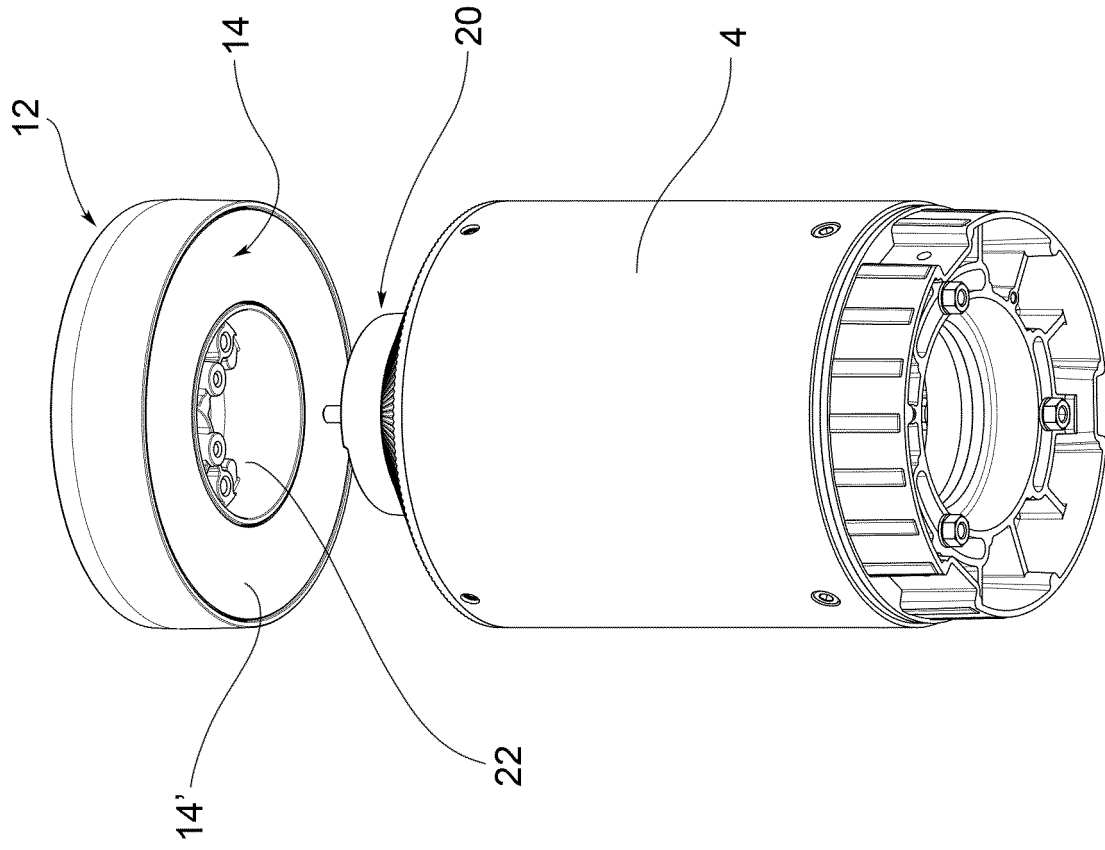


FIG. 2a

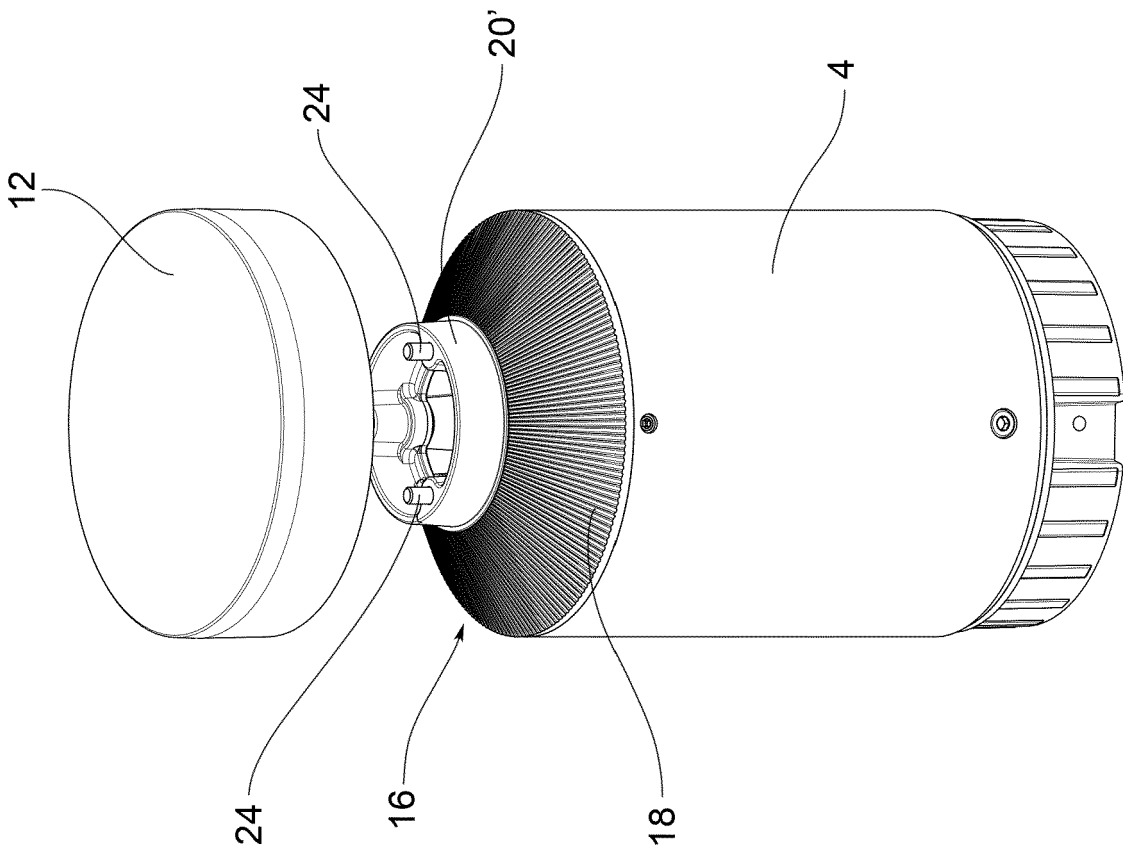


FIG. 2

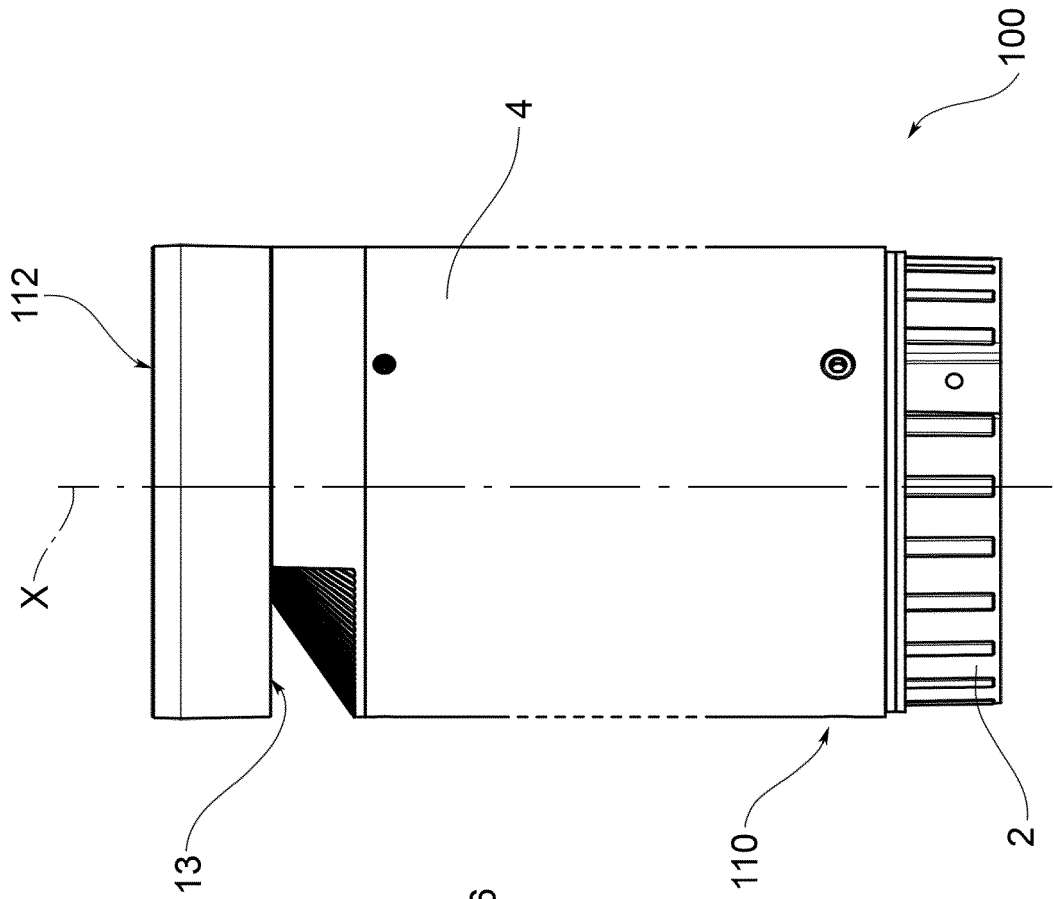


FIG.4

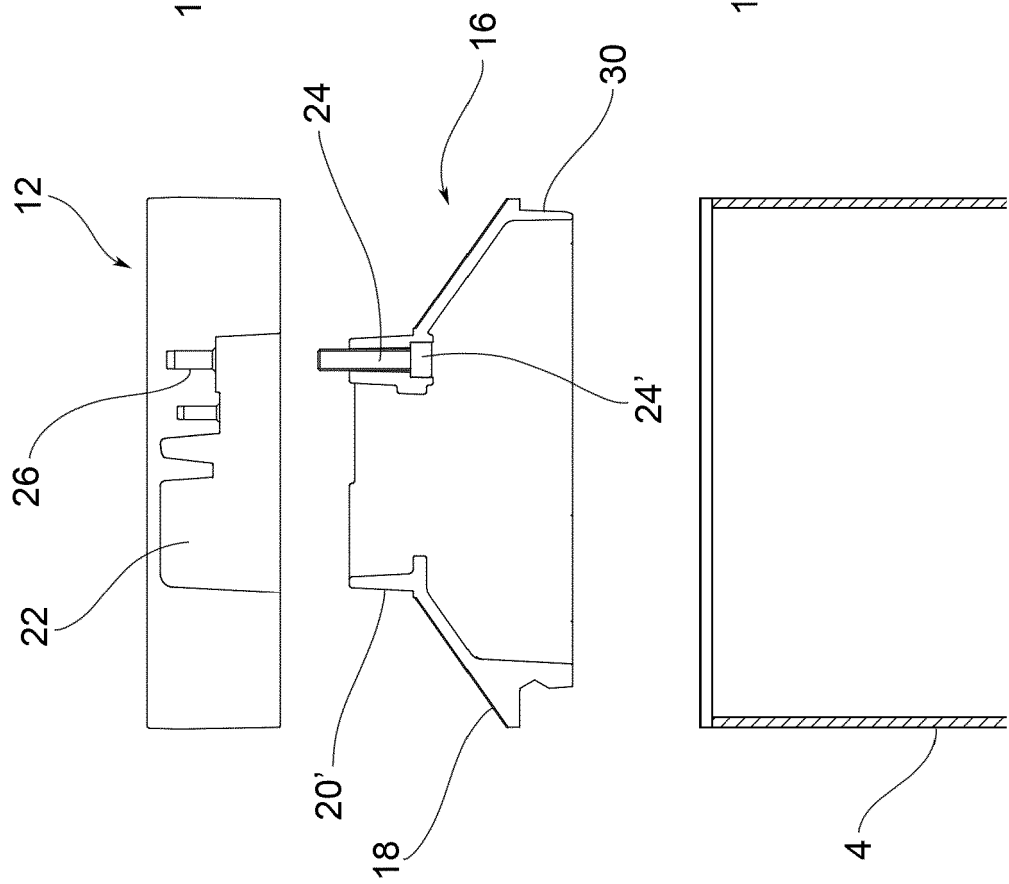


FIG.3

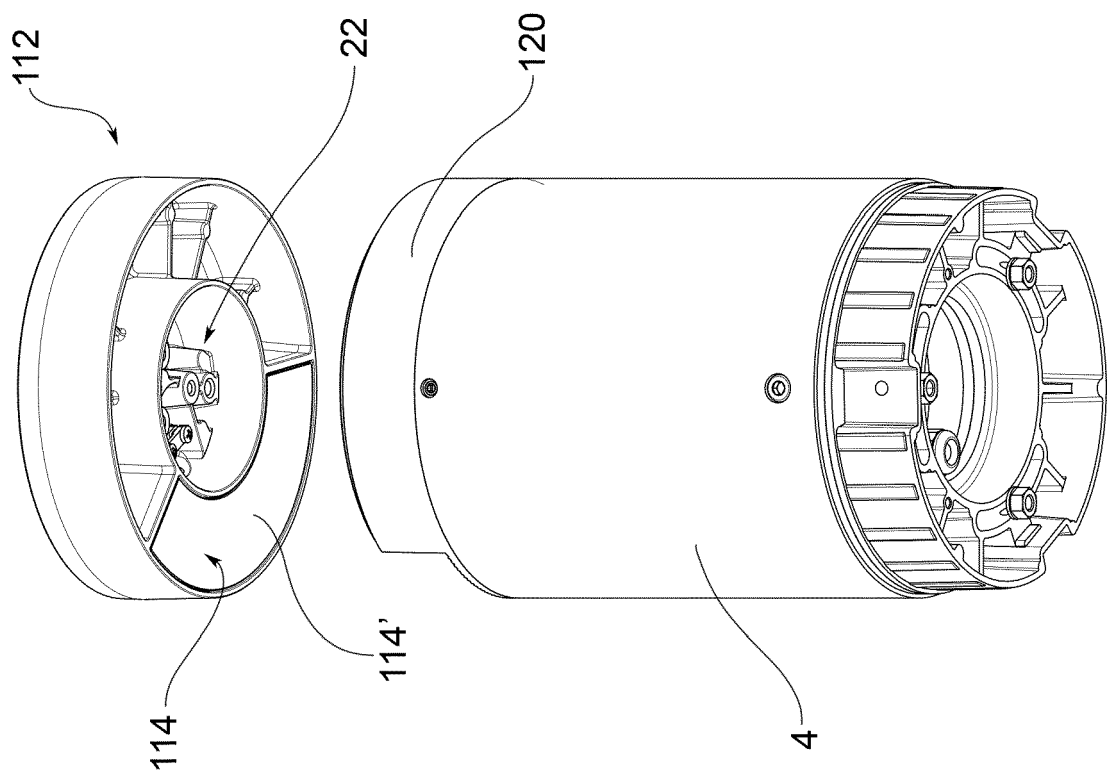


FIG.5a

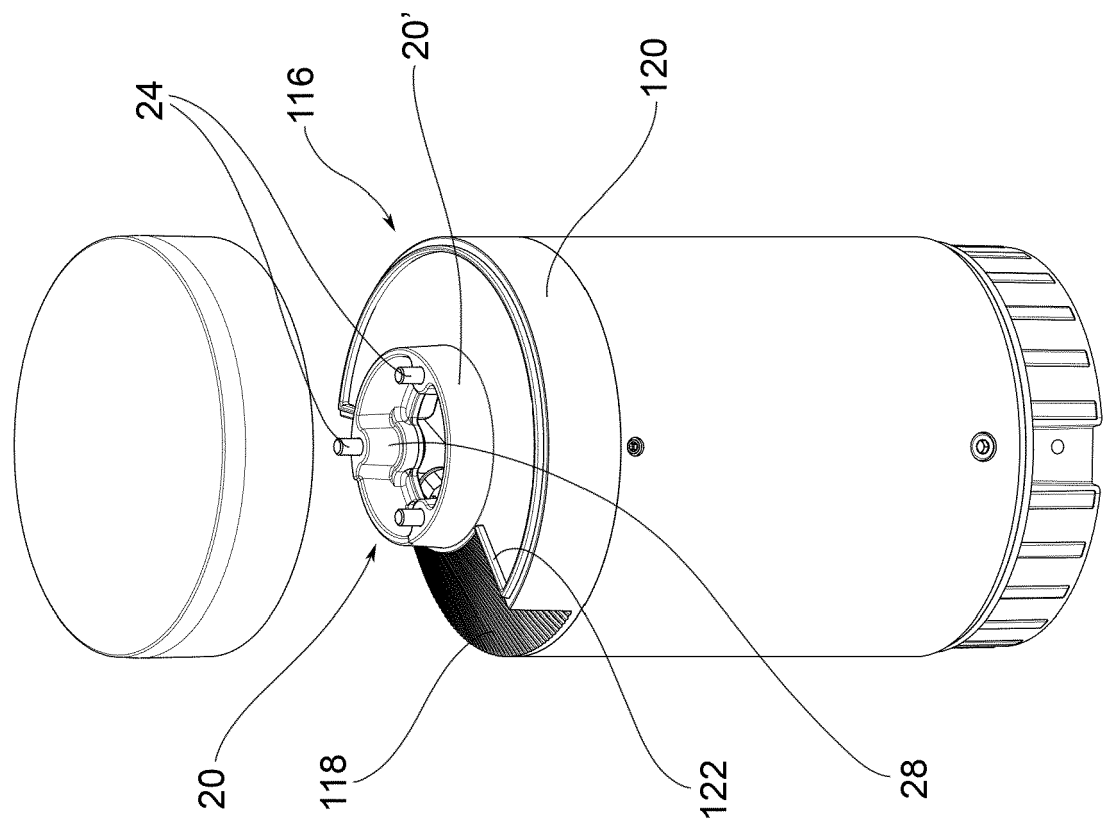


FIG.5



EUROPEAN SEARCH REPORT

Application Number
EP 20 16 5579

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 June 2020	Examiner Demirel, Mehmet
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	

**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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