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(54) **LIGHTING DEVICE**

(57) A lighting device (1) comprises an anchoring base (10) on the ground or wall, a stem (12), a lamp body (14) supported by the stem (12), and a lighting source (16) supported by the lamp body (14) so as to make a projector that emits a light beam oriented radially with respect to the stem (12). A proximal stem portion (12a) is axially rotatable with respect to the anchoring base (10) along a first rotation angle (α), and the lamp body (14) is axially rotatable with respect to a distal stem portion (12b) along a second rotation angle (β).

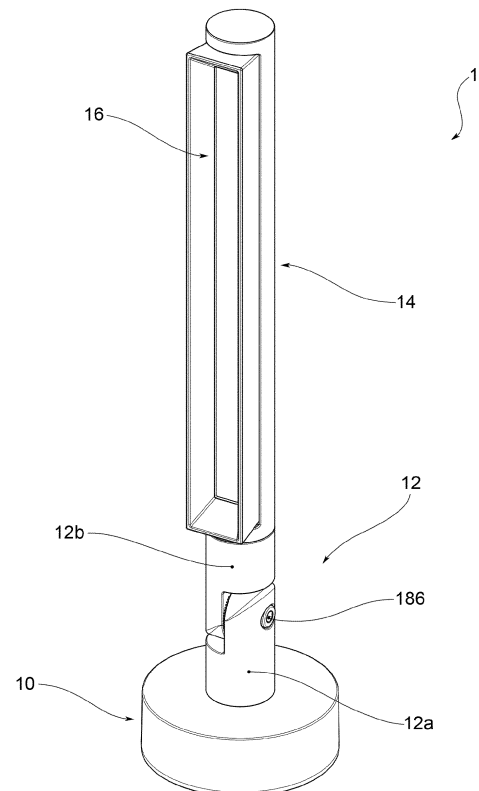


FIG.1

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Description

[0001] This invention relates to a lighting device of the type comprising a floor or wall anchoring base, a stem extending from the anchoring base, a lamp body supported by the stem, and a lighting source housed in the lamp body so as to obtain a projector suitable to emit a light beam with an emission angle below 360° .

[0002] Projectors of this type are already known. Some of these projectors have elements connected in such a way that, once installed, the lighting source can be oriented in a desired direction.

[0003] However, the possibilities of orientation of the lighting source in known projectors are rather limited, especially in the case of lighting devices for outdoor environments, which require adopting technical measures that ensure a high degree of IP protection and which, however, conflict with the need to make the parts movable.

[0004] The object of this invention is to propose a lighting device that, once installed, allows the lighting source to be easily oriented in any direction in space.

[0005] Another object of the invention is to combine maximum freedom in the orientation of the light beam with the protection features required for use in outdoor environments.

[0006] A further object of the invention is to propose a lighting device which, while allowing maximum freedom in the orientation of the light beam, has a compact, solid structure with very clean lines.

[0007] These objects are achieved with a lighting device according to claim 1. The dependent claims describe preferred or advantageous embodiments of the lighting device.

[0008] The features and the advantages of the lighting device according to the invention shall be made apparent from the following description of preferred embodiments thereof, provided purely by way of non-limiting example, with reference to the accompanying figures, wherein:

- Fig. 1 is a perspective view of the lighting device according to the invention;
- Fig. 2 and 2a are two exploded perspective views of the lighting device in Fig. 1;
- Fig. 3 and 3a are two elevation views (one rotated 90° with respect to the other) of the lighting device;
- Fig. 4 is an axial cross section of the lighting device;
- Fig. 5 is another axial cross section of the lighting device, with the sectional plane orthogonal to the sectional plane of Fig. 4;
- Fig. 6 is an elevation view of the lamp body of the lighting device.

[0009] In said drawings, a lighting device according to the invention has been collectively indicated with 1.

[0010] The lighting device 1 is usable in particular as a projector suitable to light a portion of the surrounding space, for example an object, a portion of a wall, a portion

of a garden, a passageway, etc.

[0011] In a general embodiment, the lighting device 1 comprises an anchoring base 10 for fastening the lighting device to the floor or wall, a stem 12 extending from the anchoring base 10, a lamp body 14 supported by the stem 12, and a lighting source 16 supported by the lamp body 14.

[0012] The stem 12 has a proximal stem portion 12a, extending from the anchoring base 10 along a first stem axis X, and a distal stem portion 12b, extending along a second stem axis Y.

[0013] The lamp body 14 is supported by the distal stem portion 12b.

[0014] The lighting source 16 is supported by the lamp body 14 so as to make a projector that emits a light beam oriented radially with respect to the second stem axis Y and with an emission angle below 360° .

[0015] The proximal stem portion 12a is axially rotatable with respect to the anchoring base 10 along a first rotation angle (α) below 360° so as to stably assume a desired first angular position with respect to the anchoring base 10.

[0016] The lamp body 14 is axially rotatable with respect to the distal stem portion 12b along a second rotation angle (β) below 360° so as to stably assume a desired second angular position with respect to the distal stem portion 12b.

[0017] The combination of the first rotation angle with the second rotation angle form a total rotation angle of at least 360° . In this way, despite the fact that the safety regulations for these apparatuses prohibit a 360° rotation to avoid twisting the electrical cables, the double axial rotation allows this constraint to be overcome, and the lighting source 16 can thus be rotated 360° .

[0018] As will be described below in reference to a particular embodiment, the feature of "stably assuming a desired angular position" implies that the movable part in question can be rotated by a user so as to assume a desired angular position and, once this desired position is reached, remains there stably until any subsequent movement by the user.

[0019] Moreover, the distal stem portion 12b is connected to the proximal stem portion 12a by means of a connection joint 18 suitable to allow a rotation of the distal stem portion 12b with respect to the proximal stem portion 12a about a joint axis Z perpendicular to the first and second stem axes X, Y.

[0020] Therefore, the lamp body 14, and thus the lighting source 16, can be oriented to direct the light beam in any direction in space.

[0021] In one embodiment, the first rotation angle (α) and the second rotation angle (β) are equal to about 350° .

[0022] The first and second rotation angles (α , β) can be limited by mechanical stops.

[0023] In one embodiment, the anchoring base 10 is formed of an anchoring flange 110, suitable to be fixed to the ground or wall, and a cover plate 112 superimposed on the anchoring flange 110.

[0024] In one embodiment, the anchoring base 10 and the proximal stem portion 12a are configured to achieve a male-female geometric coupling.

[0025] In one embodiment, one or more sealing rings 104 are fitted about the male portion 102 of said geometric coupling, which engage the female portion 122a of the geometric coupling. The sealing rings 104 can serve the dual function of being a hermetic seal against water and other outdoor elements, and can allow for a controlled rotation between the male and female portions about the first stem axis X.

[0026] For example, the male portion 102 is formed by a tang extending about the first stem axis X from the cover plate 112. The female portion 122a is formed by an axial recess formed in the proximal stem portion 12a.

[0027] In one embodiment, the angular position of the proximal stem portion 12a with respect to the base 10, once selected, can be locked by means of a first radial dowel 40. Further, the proximal stem portion 12a can be axially locked to the base 10 by means of a first radial pin 42. This radial pin 42 prevents the stem 12 from slipping axially from the base 10 even during the rotation of the proximal stem portion 12a, for example when the first radial dowel 40 is in the inactive retracted position.

[0028] In one embodiment, the lamp body 14 and the distal stem portion 12b are configured to achieve a male-female geometric coupling.

[0029] In one embodiment, one or more sealing rings 144 are fitted about the male portion 142 of said geometric coupling, which engage the female portion 122b of the geometric coupling. The sealing rings 144 can serve the dual function of hermetically sealing against water and other outdoor elements, and can allow for a controlled rotation between the male and female portions about the second stem axis Y.

[0030] For example, the male portion 142 is formed by a tang extending from the lamp body 14. The female portion 122b is formed by an axial recess formed in the distal stem portion 12b.

[0031] In one embodiment, the angular position of the lamp body 14 with respect to the distal stem portion 12b, once selected, can be locked by means of a second radial dowel 44. Further, the lamp body 14 can be axially locked to the distal stem portion 12b by means of a second radial pin 46. This second radial pin 46 prevents the lamp body 14 from slipping axially from the stem 12 even during rotation of the lamp body 14, for example when the second radial pin 44 is in the inactive retracted position.

[0032] In one embodiment, the lamp body 14 comprises a shade 20 positioned about the lighting source 16 so as to shield the light beam projected from the lighting source 16 when viewing the lamp body from a direction other than precisely in front of the lighting source 16.

[0033] For example, the shade 20 comprises a frame, the inner walls 20', 20" of which have a truncated pyramid shape with a rectangular base.

[0034] In one embodiment, the shade 20 is interlocked with the lamp body 14 and is stably locked to the lamp

body 14 by means of at least one threaded shade locking dowel 22 screwed into a respective threaded hole 24 formed in the lamp body 14. The threaded dowel 22 has a conical tip 22' that engages an inclined plane 26 formed in an outer side wall of the shade 20 whereby screwing the threaded dowel 22 causes the shade 20 to tighten against the lamp body 14.

[0035] This technical solution makes it possible to reduce the use of screws, which brings a number of advantages: reduction of the overall dimensions of the lamp body, reduction of the number of device components to be managed, greater simplicity and speed of assembly, reduction of components subject to wear or deterioration, especially in the case of outdoor use.

[0036] In one embodiment, the lamp body 14 is provided with a sealing gasket 28 positioned about the lighting source 16. The shade 20 is coupled to the lamp body 14 so as to engage the sealing gasket 28. Therefore, the outdoor elements can not reach the lighting source 16 by penetrating between the shade and the lamp body 14.

[0037] In one embodiment, the shade 20 supports a glass plate 23 placed to protect the lighting source 16. For example, the glass plate 23 is held in a plate seat 23' formed at the minor base of the shade 20, i.e., on the side facing the lighting source 16. In one embodiment, the glass plate 23 is attached to the glass plate seat 23' by silicone adhesive, which provides a hermetic seal. It should be noted that the glass plate 23 imparts a high rigidity to the shade 20, even though its frame is made with low thickness. Such rigidity of the shade 20 enhances its action on the sealing gasket 28, which helps protect the lighting source 16 from water or other outdoor elements.

[0038] Returning now to the stem 12, in one embodiment, the connection joint 18 is obtained by a geometric coupling between a circular notch 182 and a corresponding circular ferrule 184 formed about the joint axis Z in respective facing surfaces of the stem portions 12a, 12b. The circular notch 182 and the circular ferrule 184 are engageable/disengageable by means of a joint screw 186 that engages one stem portion, e.g., the proximal portion 12a, and is screwed into a corresponding threaded seat formed in the other stem portion, e.g., the distal portion 12b.

[0039] For example, the circular notch 182 and the circular ferrule 184 are made to allow an adjustment of the rotation about the joint axis Z with a step of 5°.

[0040] It should be noted that such an embodiment of the connection joint 18 by coupling the notch to the ferrule allows the joint to be locked in the desired position with a simple clamping screw 186.

[0041] In one embodiment, the lamp body 14 extends primarily along the second stem axis Y as an extension of the distal stem portion 12b. In other words, the lamp body 14 has an elongated shape that allows the lighting source 16 to be obtained by making use of a plurality of LEDs 162 aligned parallel to the second stem axis Y. The LEDs 162 are mounted on an elongated lighting elec-

tronic board 164 housed in a respective board seat 166 formed in the lamp body 14. The string of LEDs 162 allows for high lighting power. Each LED source can be equipped with respective optics.

[0042] In one embodiment, internal passages 60, 62, 64 are obtained in the anchoring base 10, in the stem 12, and in the lamp body 14 for passing electrical cables—not shown—for powering and/or controlling the lighting source 16.

[0043] The lighting device can then be powered by the mains voltage and/or controlled via a digital control network while keeping the electrical cables completely hidden from view and protected from water or other outdoor elements to ensure the necessary IP rating for outdoor use.

[0044] A person skilled in the art may make several changes, adjustments, adaptations, and replacements of elements with others that are functionally equivalent to the embodiments of the lighting device according to the invention in order to meet incidental needs without departing from the scope of the following claims. Each of the features described as belonging to a possible embodiment may be obtained independently of the other described embodiments.

Claims

1. A lighting device, comprising:

- an anchoring base (10) for fastening the lighting device to the ground or to a wall;
- a stem (12) having a proximal stem portion (12a) extending from the anchoring base (10) along a first stem axis (X) and a distal stem portion (12b) extending along a second stem axis (Y);
- a lamp body (14) supported by the distal stem portion (12b);
- a lighting source (16) supported by the lamp body (14) so as to obtain a projector emitting a light beam oriented radially with respect to the second stem axis (Y) and with an emission angle below 360° , wherein:
 - the proximal stem portion (12a) is axially rotatable with respect to the anchoring base (10) along a first rotation angle (α) below 360° , so as to stably take a desired first angular position with respect to the anchoring base (10);
 - the lamp body (14) is axially rotatable with respect to the distal stem portion (12b) along a second rotation angle (β) below 360° so as to stably take a desired second angular position with respect to the distal stem portion (12b), the combination of the first rotation angle with the second rotation angle forming a total rotation angle of at least 360° , and wherein
 - the distal stem portion (12b) is connected to

the proximal stem portion (12a) by means of a connection joint (18) suitable to allow a rotation of the distal stem portion (12b) with respect to the proximal stem portion (12a) about a joint axis (Z) perpendicular to the first and second stem axes.

2. A lighting device according to claim 1, wherein the first rotation angle (α) and the second rotation angle (β) are of about 350° .
3. A lighting device according to claim 1 or 2, wherein the anchoring base (10) and the proximal stem portion (12a) are configured so as to obtain a geometric coupling of the male-female type, one or more sealing rings (104) being fitted about the male part (102) of said geometric coupling to engage the female part (122a) of the geometric coupling so as to allow a controlled rotation between the male part and the female part about the first stem axis (X).
4. A lighting device according to any one of the preceding claims, wherein the lamp body (14) and the distal stem portion (12b) are configured so as to obtain a geometric coupling of the male-female type, one or more sealing rings (144) being fitted about the male part (142) of said geometric coupling to engage the female part (122b) of the geometric coupling so as to allow a controlled rotation between the male part and the female part about the second stem axis (Y).
5. A lighting device according to any one of the preceding claims, wherein the lamp body comprises a shade (20) positioned about the lighting source (16) so as to achieve a shielding effect of the light beam projected by the lighting source (16).
6. A lighting device according to the preceding claim, wherein the shade (20) is interlocked with the lamp body (14) and is stably locked to the lamp body (14) by means of at least one threaded dowel (22) screwed in a respective threaded hole (24) obtained in the lamp body (14), the threaded dowel (22) having a conical tip engaging an inclined surface (26) obtained in a side wall of the shade so that the screwing of the threaded dowel (22) causes the shade (20) to tighten against the lamp body (14).
7. A lighting device according to claim 5 or 6, wherein the lamp body (14) is provided with a sealing gasket (28) positioned about the lighting source (16), and wherein the shade (20) is coupled to the lamp body (14) so as to engage the sealing gasket (28).
8. A lighting device according to any one of claims 5-7, wherein the shade (20) supports a glass plate (22) placed to protect the lighting source (16).

9. A lighting device according to any one of the preceding claims, wherein the connection joint (18) is obtained by means of a geometric coupling between a circular notch (182) and a corresponding circular ferrule (184) obtained about the joint axis (z) in respective facing surfaces of the stem portions (12a, 12b), the circular notch (182) and the circular ferrule (184) being engageable/disengageable by means of a joint screw (186) which engages a stem portion and is screwed into a corresponding threaded seat obtained in the other portion of the stem.
10. A lighting device according to any one of the preceding claims, wherein the lamp body (14) mainly extends along the second stem axis (Y) as an extension of the distal stem portion (12b), and wherein the lighting source (16) comprises a plurality of LEDs (162) aligned parallel to the second stem axis (Y) on a lighting electronic board (164) which is elongated in shape and accommodated in a respective board seat (166) obtained in the lamp body (14).
11. A lighting device according to any one of the preceding claims, wherein internal passages are obtained inside the anchoring base (10), the stem (12) and the lamp body (14) for the passage of electrical power and/or control cables of the lighting source (16).

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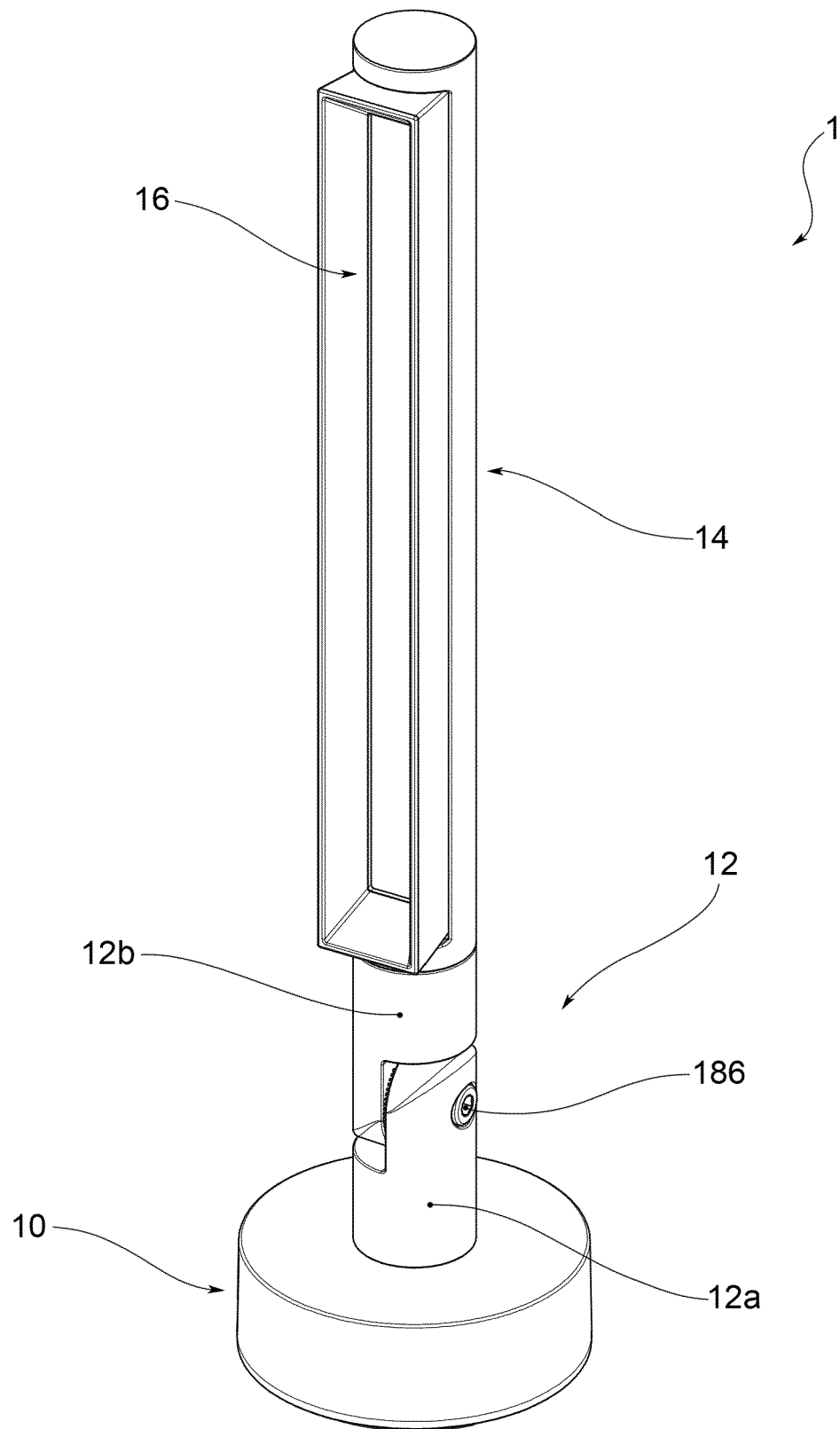
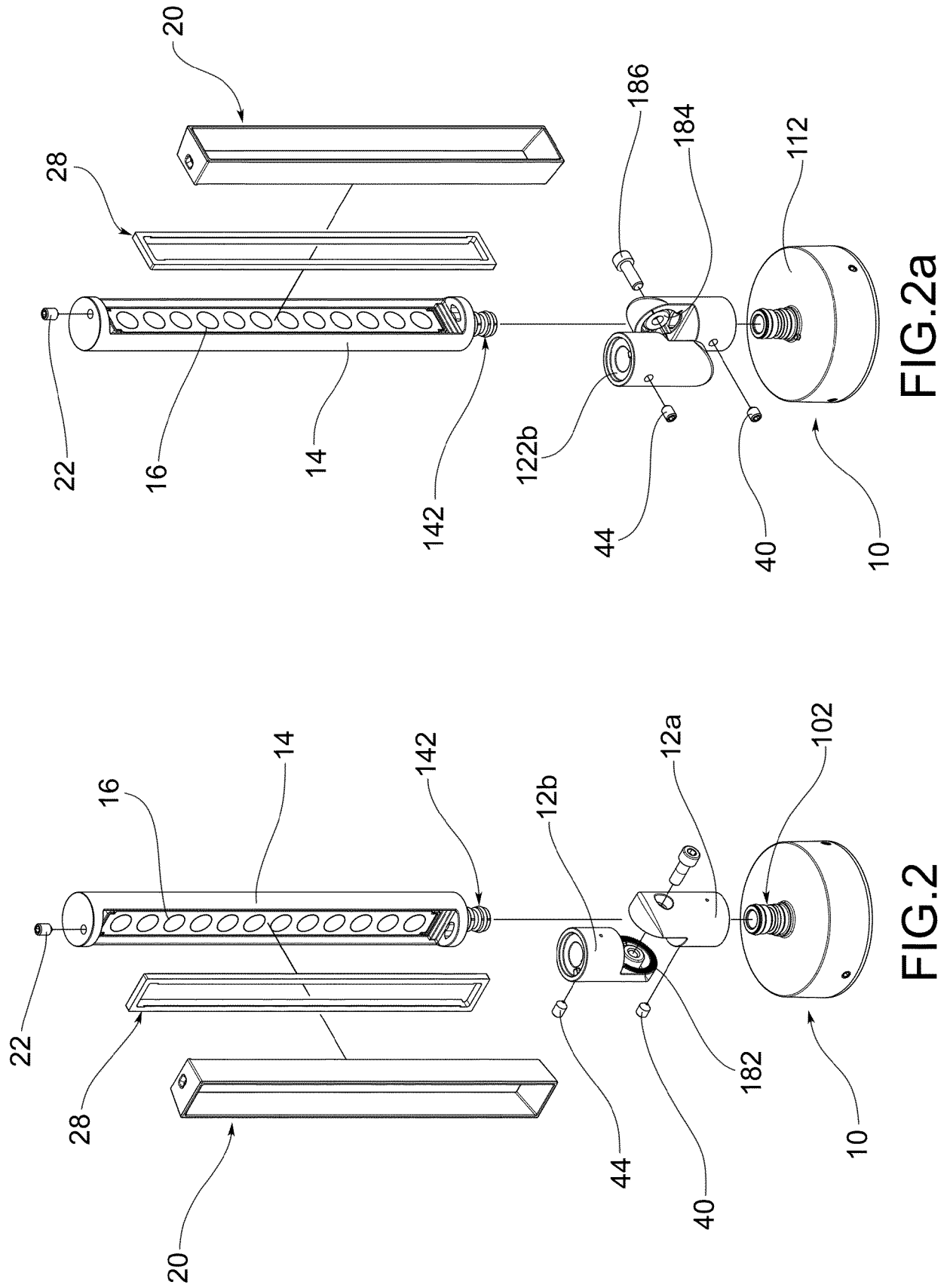


FIG.1



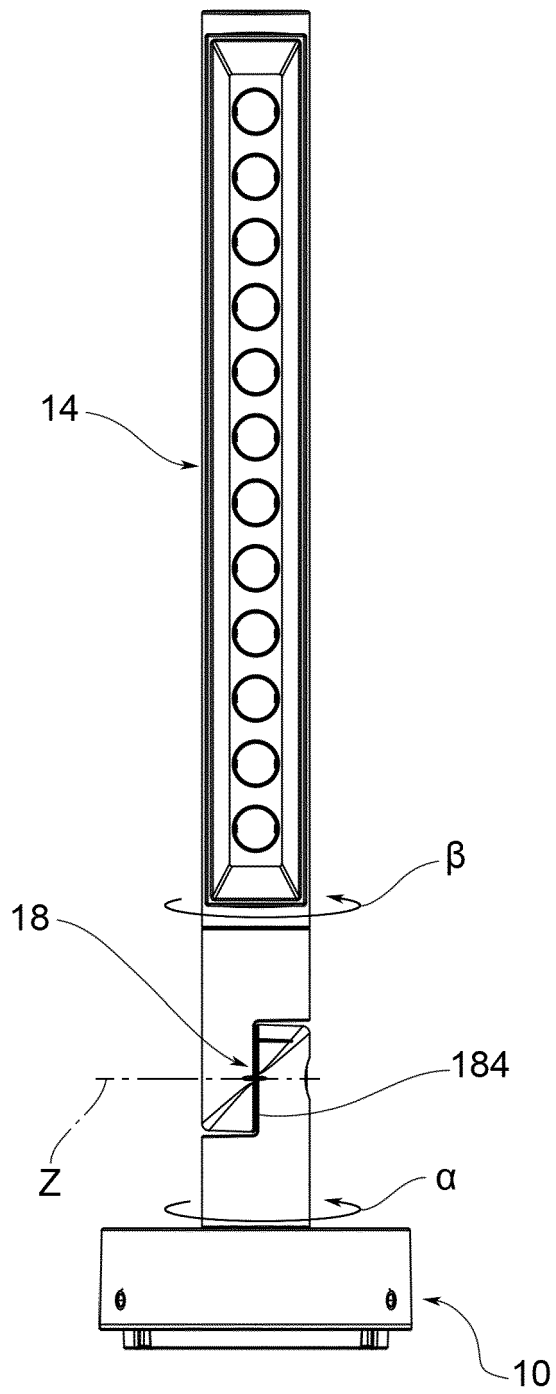


FIG.3

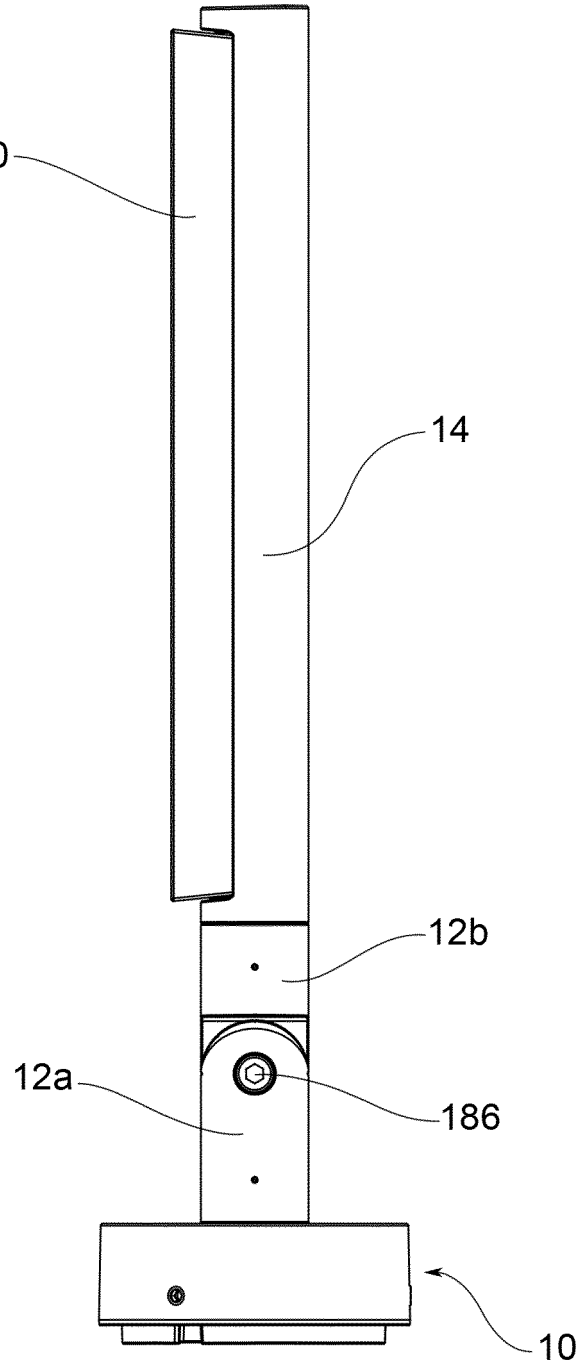
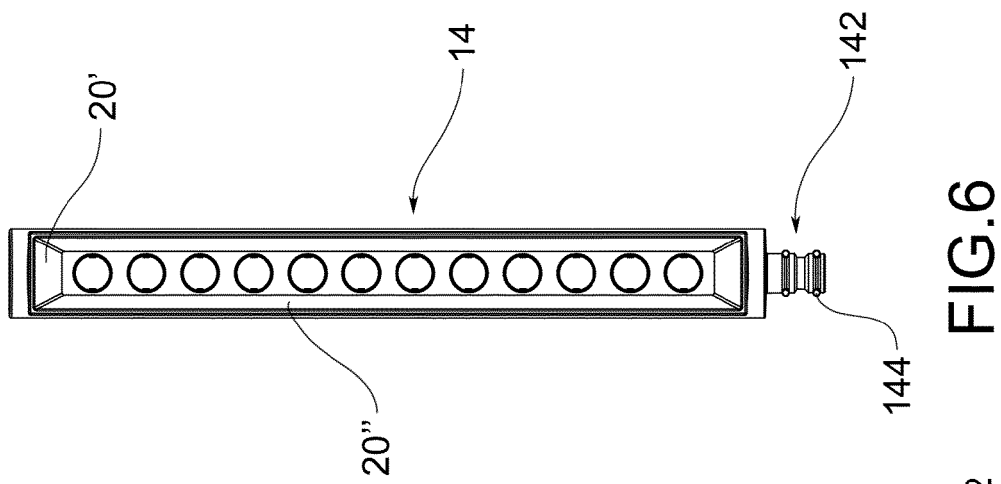
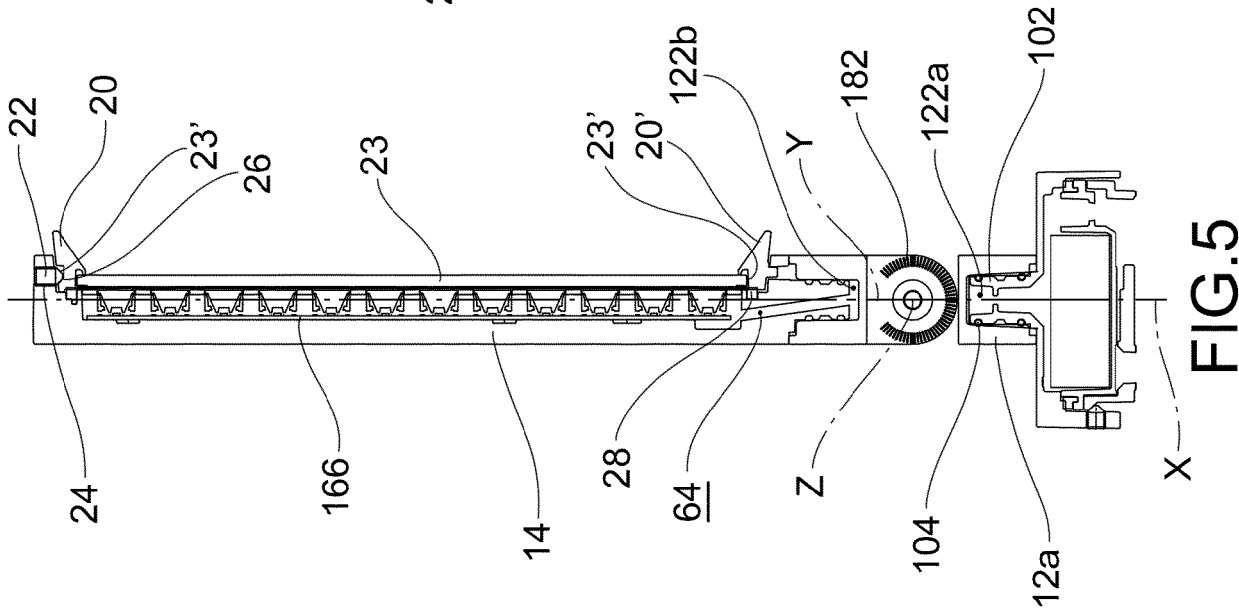
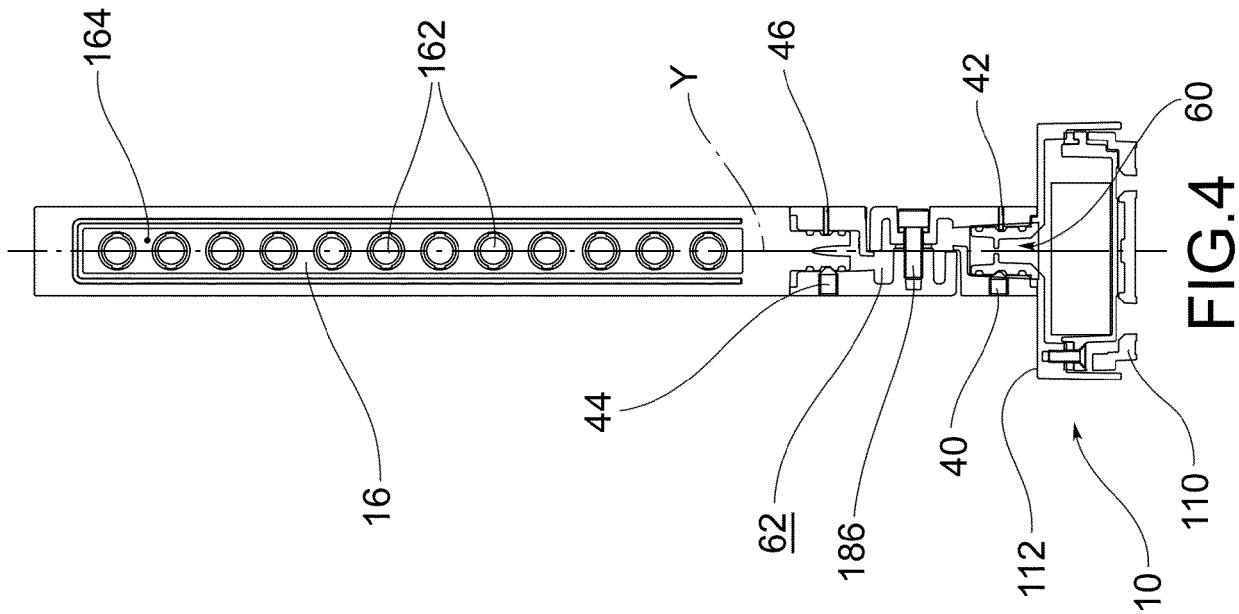


FIG.3a





EUROPEAN SEARCH REPORT

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Place of search The Hague		Date of completion of the search 19 January 2022	Examiner Menn, Patrick
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