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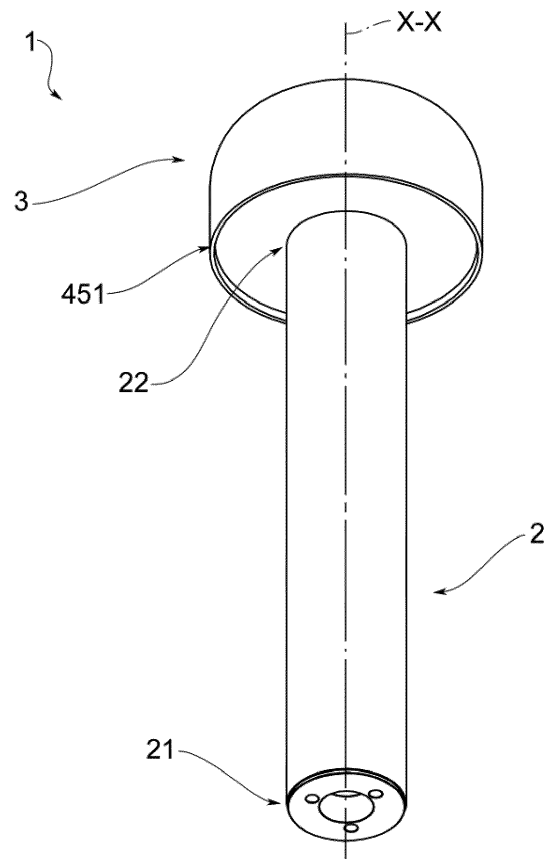
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(54) **LIGHTING DEVICE WITH A STEM AND A LIGHTING CAP**

(57) A lighting device (1) comprising a support stem (2) and a lighting cap (3) mounted on said stem (2).

The lighting cap (3) comprises a bell (4) having a housing (400), a lighting element (5) at least partially housed in the bell (4), and a central group (6) supporting the lighting element (5) and suitable to fasten the stem (2) to the bell (4).

The central group (6) comprises a first portion (61), a second portion (62) and an engagement element (65), arranged therebetween. The central group (6) may be configured in a disengaged configuration and an engaged configuration, wherein the first portion (61) and the second portion (62) are brought together axially and carry out an action on the engagement element (65) which in turn carries out a radial action on the side wall (45) of the bell (4).



**FIG.1a**

## Description

**[0001]** The object of the present invention is a lighting device.

**[0002]** Preferably, said lighting device 1 is of the type for outdoor environments.

**[0003]** Specifically, outdoor environments are both those environments that are completely outdoors, i.e. completely subject to weather conditions, such as a yard, but also those environments that are partially outdoors, such as outdoor balconies or porches, subject to weather conditions although partially protected by roofing elements. More generally, outdoor environments are those environments that are most easily subject to vandalism.

**[0004]** The lighting sector is characterized by vast efforts of innovation, both from the aesthetic point of view, with the constant search for new forms, and from the technical and functional point of view, often precisely in support of the new aesthetic trends.

**[0005]** In particular, one of the predominant trends is to have lighting devices with special shapes, but at the same time are simple to produce and especially to assemble.

**[0006]** Moreover, with particular reference to the embodiments of lighting devices for outdoor environments, it is also necessary that such simplicity of assembly does not make the lighting device easily removable, for example by ill-intentioned persons.

**[0007]** The purpose of the present invention is to create a lighting device that effectively responds to all the afore-said needs.

**[0008]** Such object is achieved by a lighting device made according to claim 1.

**[0009]** The features and advantages of the lighting device according to the present invention will be apparent from the description given hereinafter, provided by way of non-limiting example, according to the accompanying figures, wherein:

- figure 1a and 1b show two perspective views of a lighting device according to the present invention in accordance with an embodiment;
- figure 2 shows a perspective view of the separate parts of the lighting device as shown in figures 1a and 1b;
- figures 2a and 2b show two perspective views of the separate parts of the lighting cap comprised in the lighting device;
- figures 3a and 3b represent two views in cross-section of a lighting device wherein the components thereof are respectively in a disengaged configuration and in an engaged configuration.

**[0010]** With reference to the accompanying figures, a lighting device according to a preferred embodiment of the present invention is indicated collectively at 1.

**[0011]** According to a preferred variant embodiment, the lighting device 1 is of the type for outside environ-

ments.

**[0012]** Preferably, the structure described and the materials that make up the various components are thus suitable to withstand the action of weather conditions.

**[0013]** According to a preferred embodiment, the lighting device 1 is a floor lamp suitable to extend in height from said floor.

**[0014]** According to a preferred embodiment, the lighting device 1 is a wall lamp suitable to protrude from said wall.

**[0015]** According to the present invention, the lighting device 1 mainly extends along a main axis X-X.

**[0016]** The lighting device 1 comprises a support stem 2 extending along said main axis X-X, between a first base end 21 and a second head end 22.

**[0017]** Preferably, depending on the different lengths of the support stem 2, a plurality of embodiments and applications of the lighting device 1 object of the present invention are possible.

**[0018]** According to a preferred embodiment, said support stem 2 is internally hollow.

**[0019]** The preferred embodiment of said stem 2 provides for an axisymmetric shape thereof. However, there are also embodiments envisaged wherein the stem 2 has a polygonal cross-section.

**[0020]** According to the present invention, the lighting device 1 comprises a lighting cap 3.

**[0021]** Preferably, said lighting cap 3 is supported by said stem 2 being positioned at the second end 22 thereof.

**[0022]** In particular, as described below and widely shown by way of example in the accompanying figures, the lighting cap 3 is specially designed to illuminate, when switched on, in the direction of said stem 2.

**[0023]** According to the present invention, in fact, the lighting cap 3 comprises a bell 4 wherein is housed, at least partially, the second end 22 of the stem 2. Preferably, in fact, the lighting device 2 is substantially mushroom-shaped.

**[0024]** The bell 4 has a housing 400 accessible through an opening 451 and defined laterally by a side wall 45. Preferably, the bell 4 has a top wall 41 that extends substantially transversely relative to the main axis X-X, wherein said side wall 45 extends in an axial direction starting from the top wall 41.

**[0025]** According to a preferred embodiment, the bell 4 has an axisymmetric shape, with the side wall 45 having an annular shape relative to the main axis X-X. However, alternative polygonal embodiments are also envisaged.

**[0026]** According to a preferred embodiment, the bell 4 therefore has an arched shape. However, embodiments wherein the bell has a conical or prismatic shape are envisaged.

**[0027]** Preferably, the second end 22 is housed in said housing 400 through said opening 451.

**[0028]** According to the present invention, the lighting cap 3 comprises a lighting element 5 housed at least partially in the bell 4, i.e. in the housing 400.

**[0029]** Said lighting element 5 is electrically connectible to the electrical transmission grid. Preferably, the power cables extend through the stem 2.

**[0030]** The lighting element 5 comprises a light source 51 suitable to deliver light through the opening 451. Specifically, said light source 51 is directed towards said opening 451.

**[0031]** According to a preferred embodiment, the light source 51 has an annular shape, extending proximally to the side wall 45 around the stem 2.

**[0032]** Preferably, the light source 51 is of the LED type.

**[0033]** According to the present invention, moreover, the lighting cap 3 comprises a central group 6 supporting the lighting element 5 and suitable to fasten the stem 2 to the bell 4. In other words, the central group 6 is fixable to the stem 2 and thereby a fixing action on the bell 4 is carried out.

**[0034]** In particular, in fact, the central group 6 comprises a first portion 61, a second portion 62 and an engagement element 65, arranged therebetween.

**[0035]** Preferably, the reciprocal axial position of the first portion 61 and the second portion 62 involves an action on the engagement element 65 which in turn discharges an action on the bell 4, in particular on its side wall 45.

**[0036]** According to the present invention, the central group 6 is configurable in a disengaged configuration, wherein the first portion 61 and the second portion 62 are axially separated from each other and the engagement element 65 is radially disengaged from the bell 4. Moreover, the central group 6 is configurable in an engaged configuration, wherein the first portion 61 and the second portion 62 are brought together axially in such a way as to carry out an action on the engagement element 65 which moves it radially, transmitting a radial action to the side wall 45 of the bell 4.

**[0037]** According to a preferred embodiment, the first portion 61 is suitable to be fastened to the stem 2 in a predefined axial position.

**[0038]** According to a preferred embodiment, the central group 6 comprises command means 66, engaging, for example with threaded coupling, the first portion 61 and the second portion 62, which are manipulable to adjust the mutual axial position thereof.

**[0039]** In other words, said command means 66 comprise a plurality of screws, for example, arranged angularly and spaced from each other, suitable to cooperate with threaded holes made in the first portion 61 and/or in the second portion 62. Preferably, said screws pass through the first portion 61 to be screwed to the second portion 62.

**[0040]** According to a preferred embodiment, said command means 66 are accessible through the opening 451 of the bell 4. This means that said command means 66 are not accessible for example by carrying out an action on the bell 4.

**[0041]** According to a preferred embodiment, the en-

gagement element 65 is sandwiched between the first portion 61 and the second portion 62.

**[0042]** According to a preferred embodiment, in fact, the first portion 61 and the second portion 62 comprise respectively a first annular compartment 610 and a second annular compartment 620 respectively facing each other axially so as to define a command slot 650 wherein the engagement element 65 is housed.

**[0043]** Preferably, the first annular compartment 610 and the second annular compartment 620 are respectively defined by a first annular surface 611 and a second annular surface 621 which have different radial dimensions such that when bringing the first portion 61 and the second portion 62 together, the first surface 611 is housed in the second compartment 620 or the second surface 621 is housed in the first compartment 610.

**[0044]** In other words, the first annular surface 611 and the second annular surface 621 are specially shaped to define the first annular compartment 610 and the second annular compartment 620 in such a way that in bringing the first portion 61 and the second portion 62 together they penetrate each other, reducing the space of the command slot 65, discharging thereon a thrust action that in turn is discharged by the engagement element 65 in the radial direction on the side wall 45.

**[0045]** According to a preferred embodiment, the first annular surface 611 has an inclined or arched profile.

**[0046]** According to a preferred embodiment, the second annular surface 621 has an inclined or arched profile.

**[0047]** According to a preferred embodiment, the engagement element 65 is elastically yielding, being suitable to undergo an axial compression, modifying its shape in the radial direction.

**[0048]** Preferably, the engagement element 65 is a toroidal gasket.

**[0049]** Thus, according to an embodiment, the engagement element 65 also carries out a sealing action.

**[0050]** According to a preferred embodiment, the lighting element 5 is housed on the first portion 61.

**[0051]** In particular, the lighting element 5 is housed in a light source accommodating groove 615 facing the opening 451. Preferably said light source accommodating groove 615 is closed by a special protective screen 6150.

**[0052]** Preferably, the protective screen 6150 blocks access to the command means 66. In other words, the command means 66 are commandable once the protective screen 6150 is removed. That is, the aforesaid screws are inserted and manipulated through said light source accommodating groove 615.

**[0053]** According to some variant embodiments, preferably the lighting device 1 comprises a floor support base located at the first end 21 of the stem 2.

**[0054]** According to further examples, the stem 2 is suitable to hang the device 1 on a wall.

**[0055]** Innovatively, the lighting device according to the present invention fully meets all the requirements cited. In particular, the invention allows the bell to be fastened

to the stem in a simple, but, at the same time, safe way.

**[0056]** Advantageously, moreover, the engagement action is discharged circumferentially on the inner bell.

**[0057]** Advantageously, the lighting cap is designed to prevent disassembly that does not involve manipulation of its command means. Advantageously, manipulation of the command means is only possible following an initial disassembly of the protective screen and thereby providing access to the command means. Advantageously, the action of an ill-intentioned person or vandal is averted or at least made more complicated.

**[0058]** Advantageously, the central group is suitable to engage also sealingly to the bell.

**[0059]** It is clear that one skilled in the art, in order to meet contingent needs, may make changes to the lighting device described above, all contained within the scope of protection defined by the following claims.

## Claims

1. A lighting device (1), preferably for outdoor environments, which extends predominantly along a main axis (X-X) comprising:

- a support stem (2) extending between a first base end (21), and a second head end (22);
- a lighting cap (3) comprising:

- i) a bell (4) having a housing (400) accessible through an opening (451) and laterally defined by a side wall (45), wherein the second end (22) is housed in said housing (400) through said opening (451);

- ii) a lighting element (5) housed at least partially in the bell (4), electrically connected to the electrical transmission grid preferably through the stem (2), comprising a light source (51);

- iii) a central group (6) supporting the lighting element (5) and suitable to fasten the stem (2) to the bell (4), wherein the central group (6) comprises a first portion (61), a second portion (62) and an engagement element (65), arranged therebetween, wherein the central group (6) is configurable in a disengaged configuration, wherein the first portion (61) and the second portion (62) are axially separated from each other and the engagement element (65) is radially disengaged from the bell (4), and in an engaged configuration, wherein the first portion (61) and the second portion (62) are axially brought together in such a way as to perform an action on the engagement element (65) which in turn performs a radial action on the side wall (45) of the bell (4).

2. Lighting device (1) according to claim 1, wherein the central group (6) comprises command means (66) engaging, for example with threaded coupling, the first portion (61) and the second portion (62), which are manipulable to adjust the mutual axial position thereof.

3. Lighting device (1) according to any one of the preceding claims, wherein the first portion (61) and the second portion (62) comprise respectively a first annular compartment (610) and a second annular compartment (620) respectively facing each other axially so as to define a command slot (650) wherein the engagement element (65) is housed.

4. Lighting device (1) according to claim 3, wherein the first annular compartment (610) and the second annular compartment (620) are respectively defined by a first annular surface (611) and a second annular surface (621) which have different radial dimensions such that when the first portion (61) and the second portion (62) are brought together, the first surface (611) is housed within the second compartment (620) or the second surface (621) is housed within the first compartment (610).

5. Lighting device (1) according to claim 4, wherein the first annular surface (611) and/or the second annular surface (621) have an inclined or arched profile.

6. Lighting device (1) according to any one of the preceding claims, wherein the engagement element (65) is elastically yielding, being suitable to undergo an axial compression modifying its shape in a radial direction.

7. Lighting device (1) according to claim 6, wherein the engagement element (65) is preferably a toroidal gasket.

8. Lighting device (1) according to any one of the preceding claims, wherein the light source (51) has an annular shape, extending proximally to the side wall (45) around the stem (2).

9. Lighting device (1) according to any one of the preceding claims, wherein the light source (51) is of the LED type.

10. Lighting device (1) according to any one of the preceding claims, wherein the lighting element (5) is housed on the first portion (61), preferably in a light source accommodating groove (615).

11. Floor lighting device, made according to any one of the claims 1 to 10.

12. Wall lighting device, made according to any one of

the claims 1 to 10.

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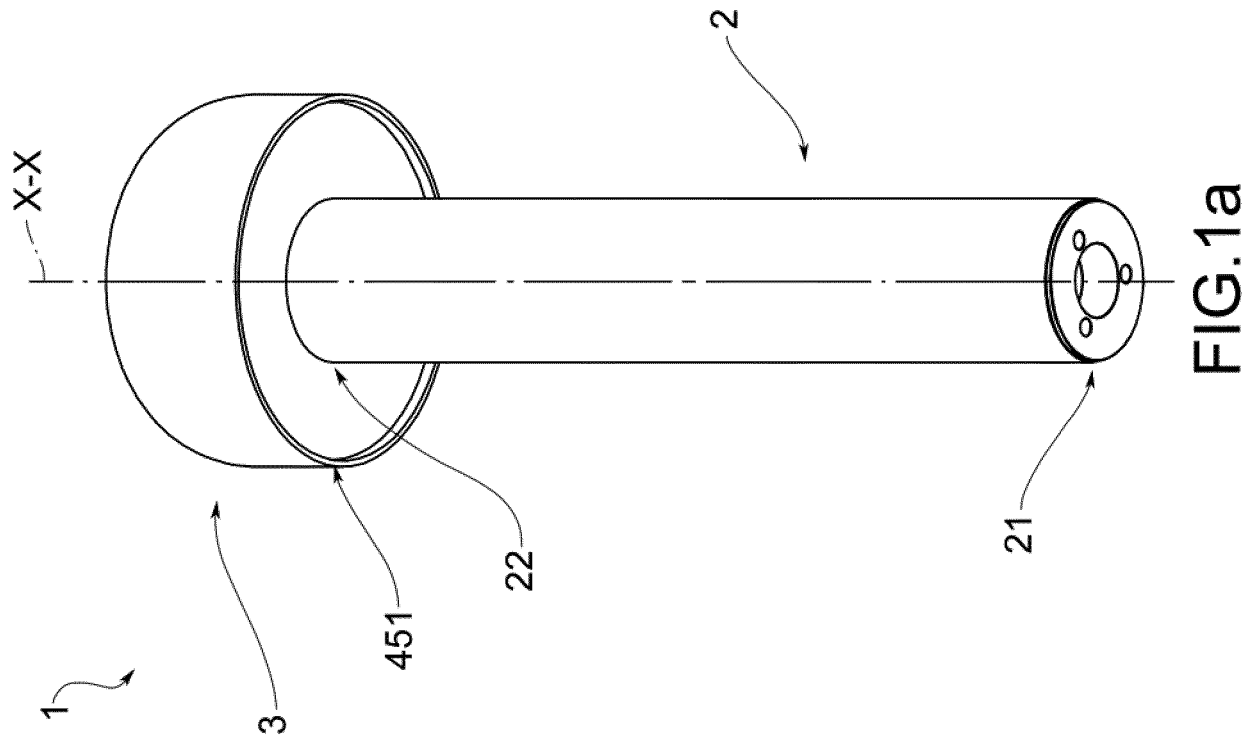
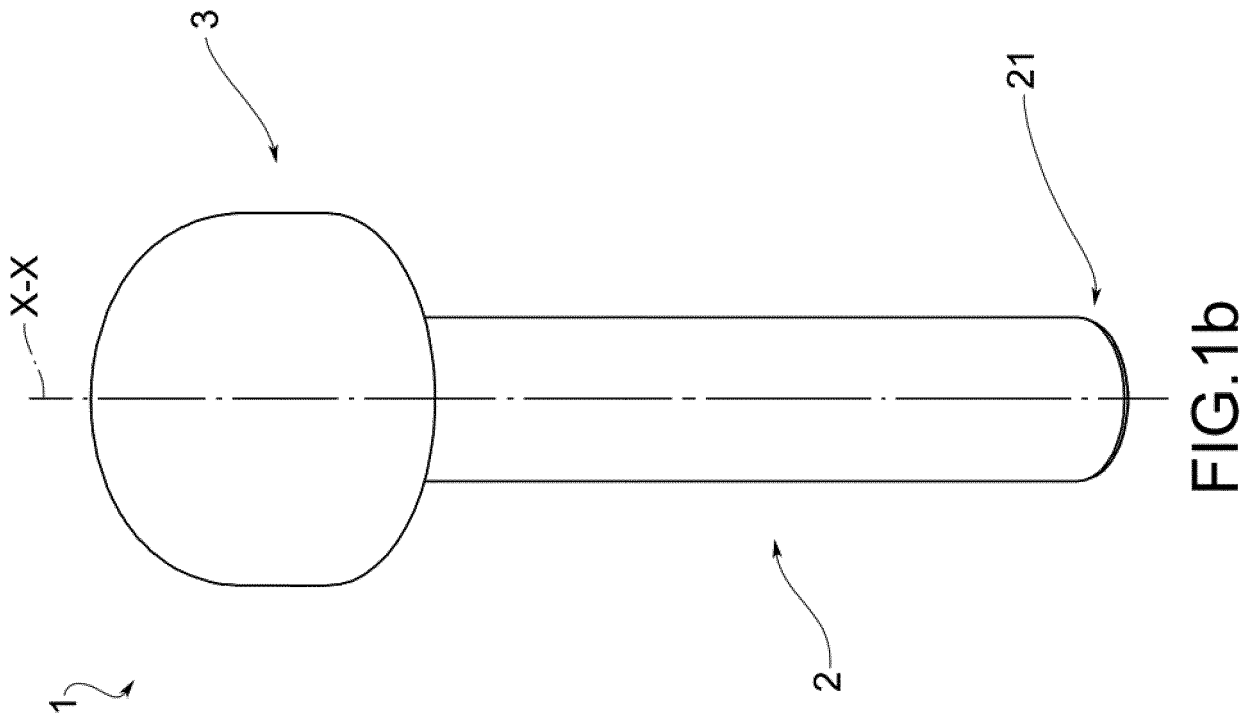
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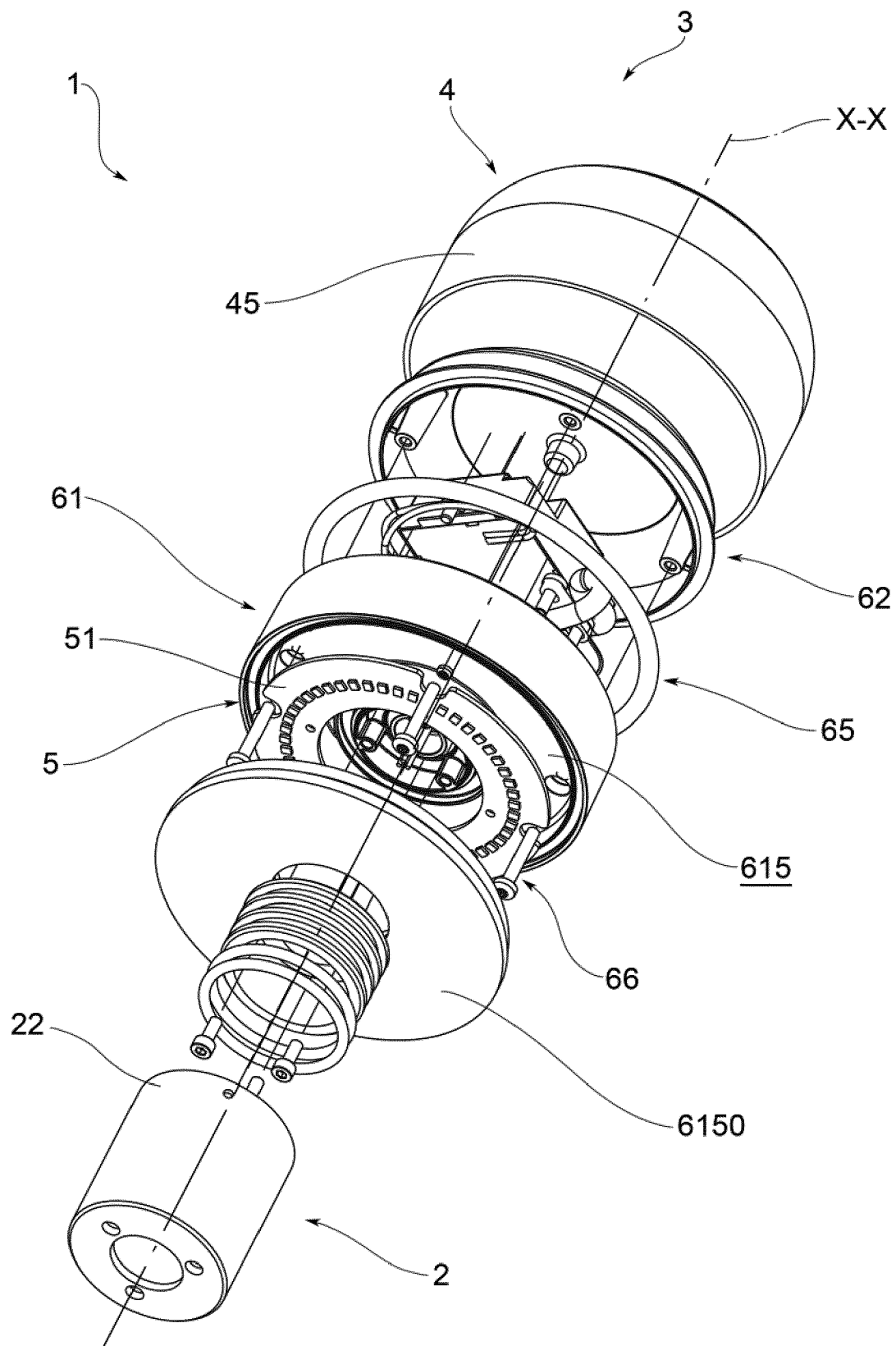


FIG.2

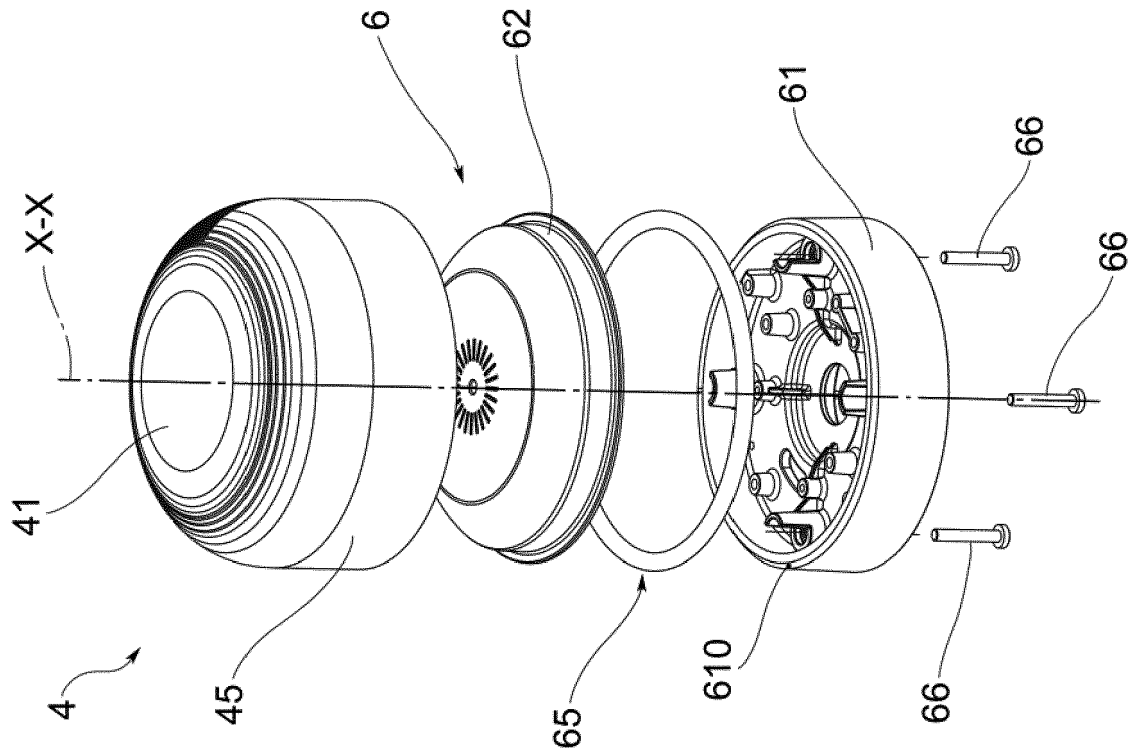


FIG. 2b

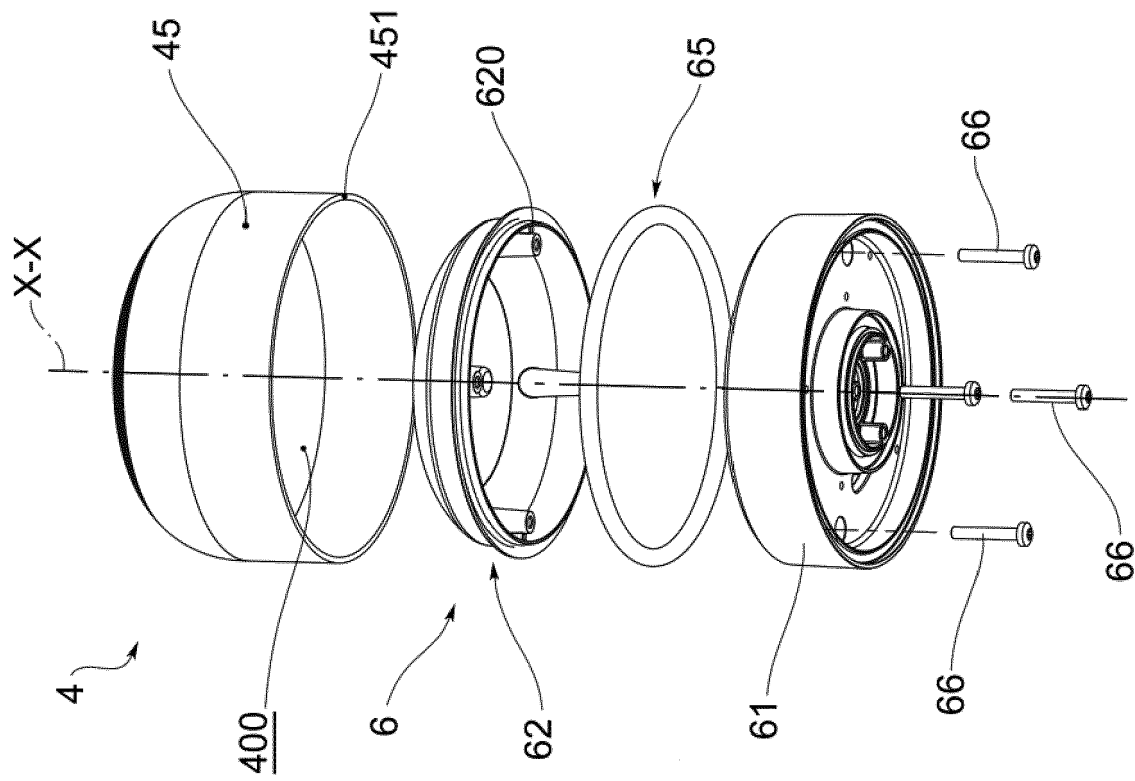


FIG. 2a

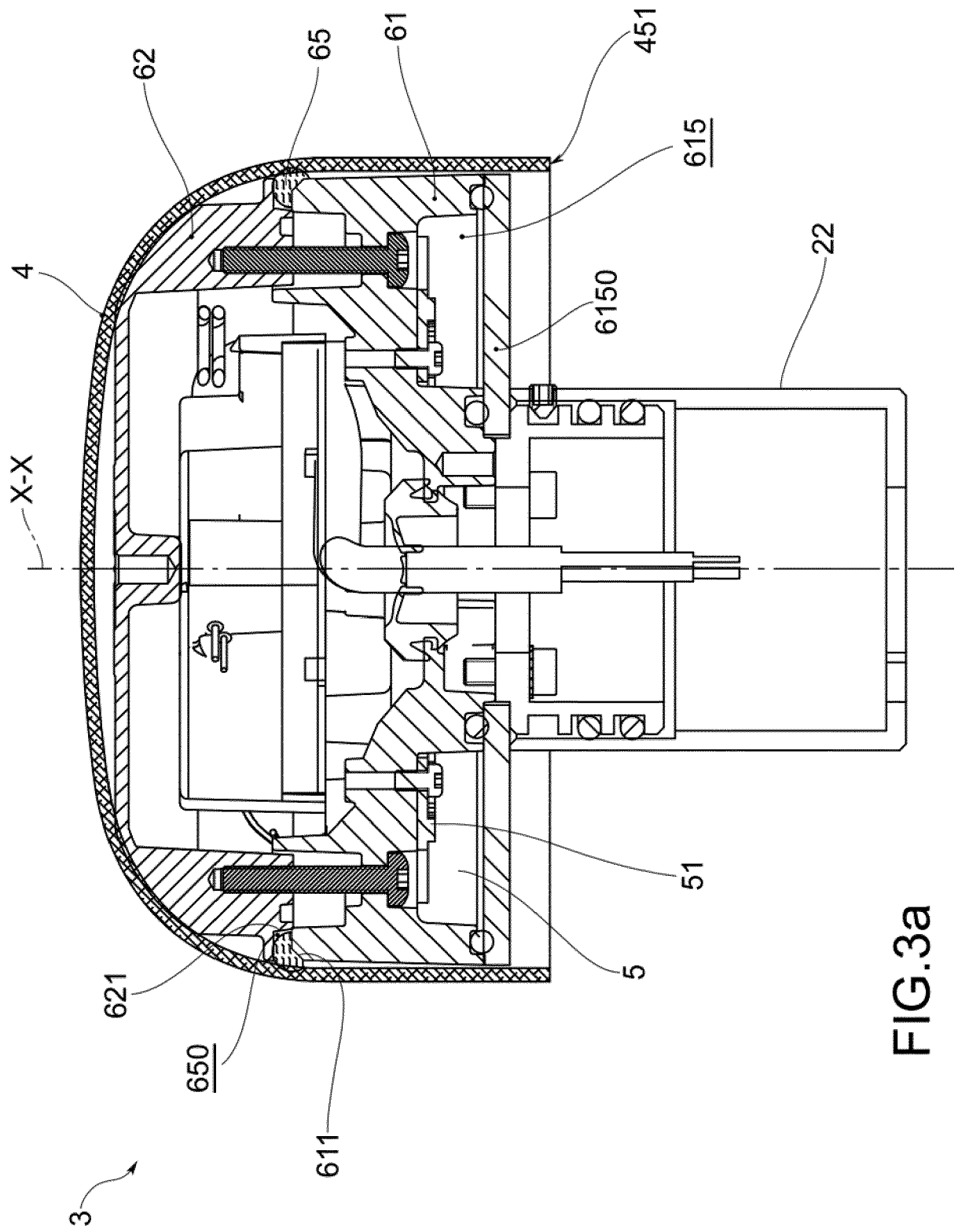


FIG.3a

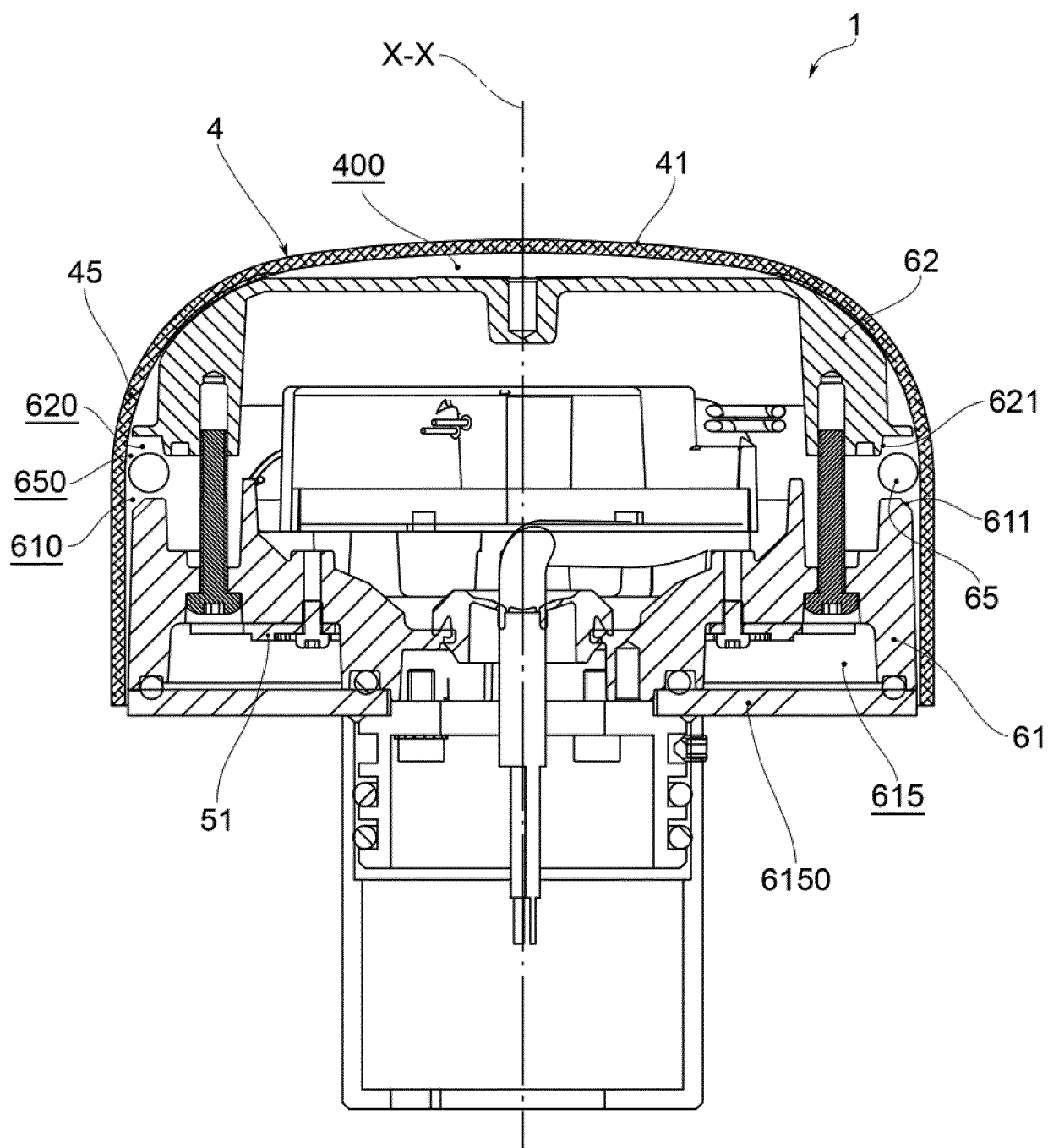


FIG.3b



## EUROPEAN SEARCH REPORT

 Application Number  
 EP 19 16 0009

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 6 341 877 B1 (CHONG KWAN YEW [MY]) 29 January 2002 (2002-01-29) * claim 1; figure 2 *	1	
A	US 7 387 409 B1 (BEADLE JOSHUA Z [US]) 17 June 2008 (2008-06-17) * claim 1; figure 3 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21S F21V F21W
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>11 April 2019</b>	Examiner <b>Krikorian, Olivier</b>
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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