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(54) **BASE FOR A LUMINAIRE**

(57) There is described a base 100 for a luminaire, the base 100 comprising: a fixing plate 110 for attaching the base 100 to a panel, wherein the fixing plate 110 comprises: an aperture; and an internal thread 118 that extends along a wall of the aperture; and a mounting collar 120 comprising an external thread 122, wherein the external thread 122 of the mounting collar 120 is arranged to interact with the internal thread 118 of the fixing plate 110 so as to secure the mounting collar 120 within the fixing plate 110.

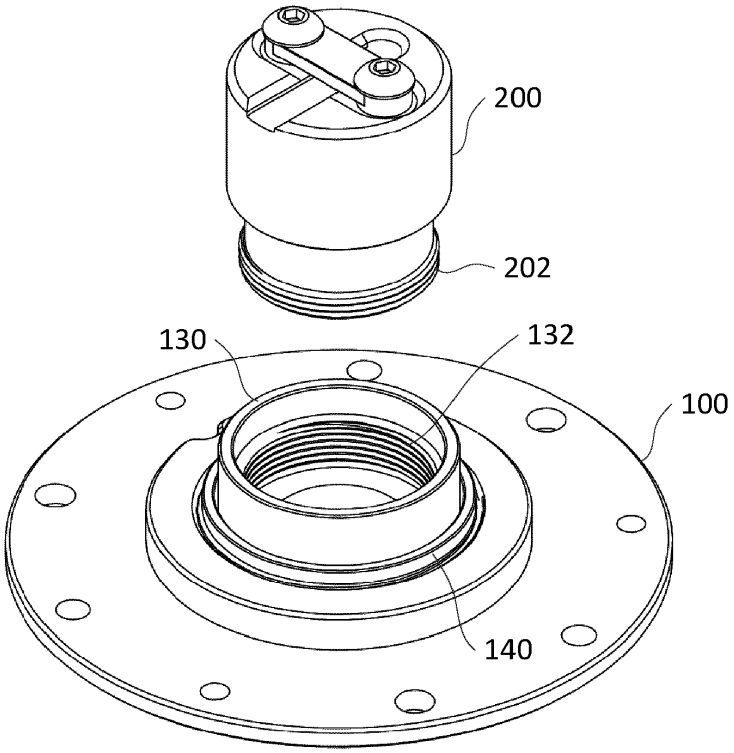


Figure 2b

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## Description

### Field of the disclosure

**[0001]** The present disclosure relates to a base for a luminaire, to a luminaire comprising the base and to a kit of parts for the luminaire.

### Background of the disclosure

**[0002]** For the purposes of lighting a room, or a building, it is desirable to use luminaires that are simple to manufacture, simple to install, simple to adjust, versatile and effective in providing a desired lighting output. Conventional luminaires typically fail to provide such features.

### Summary of the disclosure

**[0003]** Aspects and embodiments of the present invention are set out in the appended claims. These and other aspects and embodiments of the invention are also described herein.

**[0004]** According to an aspect of the present disclosure, there is described a base for a luminaire, the base comprising: a fixing plate for attaching the base to a panel, wherein the fixing plate comprises: an aperture; and an internal thread that extends along a wall of the aperture; and a mounting collar comprising an external thread, wherein the external thread of the mounting collar is arranged to interact with the internal thread of the fixing plate so as to secure the mounting collar within the fixing plate.

**[0005]** Preferably, the fixing plate comprises a hole for a screw, preferably a screw that is arranged to resist and/or prevent rotation of the mounting collar relative to the fixing plate.

**[0006]** Preferably, the base comprises the screw.

**[0007]** Preferably, the screw comprises a grub screw, preferably wherein the grub screw comprises a roughened tip and/or a nylon tip.

**[0008]** Preferably, the hole of the fixing plate passes through the internal thread of the fixing plate.

**[0009]** Preferably, the fixing plate comprises a depression, preferably wherein a/the hole of the fixing plate is located at the depression.

**[0010]** Preferably, the fixing plate comprises an elongated aperture, wherein the internal thread extends along a wall of the aperture.

**[0011]** Preferably, the base comprises a head attachment for attaching a luminaire head to the fixing plate, preferably wherein the head attachment is connected to the mounting collar by a connecting component that enables rotation of the head attachment relative to the fixing plate.

**[0012]** Preferably, the connecting component comprises an O-ring.

**[0013]** Preferably, the head attachment comprises a thread for interacting with a thread of the luminaire head. Preferably, the head attachment comprises an internal thread.

**[0014]** Preferably, the head attachment comprises a recess for a/the connecting structure.

**[0015]** Preferably, the head attachment comprises a first part and a second part, wherein the second part of the head attachment is arranged to rotate relative to the first part of the head attachment.

**[0016]** Preferably, the fixing plate comprises an attachment structure for attaching the fixing plate to the panel. Preferably, the attachment structure comprises a plurality of holes for screws.

**[0017]** Preferably, the base comprises a waterproofing component. Preferably, the waterproofing component is attached to the head attachment.

**[0018]** According to another aspect of the present disclosure, there is described an apparatus (e.g. a luminaire) comprising the aforesaid base and a luminaire head. Preferably, the luminaire head comprises one or more of: a light source; a power source; control electronics; and a heat sink.

**[0019]** According to another aspect of the present disclosure, there is described a method of installing the aforesaid base.

**[0020]** Preferably, the method comprises attaching the fixing plate to a first side of a panel, preferably using one or more screws.

**[0021]** Preferably, the method comprises inserting the mounting collar into the fixing plate from a second side of the panel.

**[0022]** Preferably, the method comprises inserting a/the head attachment and/or a/the luminaire head into the fixing plate from a/the second side of the panel.

**[0023]** According to another aspect of the present disclosure, there is described a method of operating a luminaire that comprises the aforesaid base. Preferably, the method comprises operating a plurality of luminaires. Preferably, operating the luminaire comprises controlling one or more of: a brightness, an orientation, and/or a colour of the luminaire.

**[0024]** According to another aspect of the present disclosure, there is described a kit of parts comprising the aforesaid luminaire base and a luminaire head (e.g. an lighting engine).

**[0025]** According to a further aspect, there is provided a computer program product comprising computer implementable instructions for causing a programmable computer device to carry out the method as described.

**[0026]** The invention extends to methods and/or apparatus substantially as herein described with reference to the accompanying drawings.

**[0027]** Any apparatus feature as described herein may also be provided as a method feature, and vice versa.

**[0028]** Any feature in one aspect of the invention may be applied to other aspects of the invention, in any appropriate combination. In particular, method aspects may be applied to apparatus aspects, and vice versa. Further-

more, any, some and/or all features in one aspect can be applied to any, some and/or all features in any other aspect, in any appropriate combination.

**[0029]** It should also be appreciated that particular combinations of the various features described and defined in any aspects of the invention can be implemented and/or supplied and/or used independently.

**[0030]** The term 'comprising' as used in this specification and claims preferably means 'consisting at least in part of'. When interpreting statements in this specification and claims which include the term 'comprising', other features besides the features prefaced by this term in each statement can also be present. Related terms such as 'comprise' and 'comprised' are to be interpreted in a similar manner.

## Brief Description of the Figures

**[0031]** One or more aspects will now be described, by way of example only and with reference to the accompanying drawings having like-reference numerals, in which:

Figures 1a, 1b, 1c, and 1d show views of a luminaire base according to the present disclosure.

Figures 2a and 2b show views of the luminaire base with a luminaire head attached.

Figures 3a and 3b show exploded views of the luminaire base.

Figure 4 shows a method of installing the luminaire base (and a luminaire head) in a panel.

Figures 5a and 5b show views of an adjustable luminaire base.

## Detailed Description

**[0032]** Figures 1a, 1b, 1c, and 1d show, respectively, an isometric view, a side view, a top view, and a bottom view, of a luminaire base 100.

**[0033]** As shown in these figures, the luminaire base 100 comprises:

- A fixing plate 110 that comprises a fixing structure 112. The fixing plate enables the luminaire base to be attached to a panel (e.g. a panel of a ceiling) via the fixing structure.

**[0034]** In this embodiment, the fixing structure comprises a plurality of holes, where screws can be placed through the holes to secure the luminaire to the panel. It will be appreciated that other fixing structures are possible, for example the fixing plate may be attached to a panel using an adhesive and/or clips. Furthermore, it will be appreciated that the fixing plate may be of any shape; while in this embodiment the fixing plate has a circular cross-section, the fixing plate could equally have a square cross-section, a rectangular cross-section, etc.

**[0035]** The fixing plate 110 comprises an elongated aperture that comprises an internal thread. That is, the internal thread extends along a wall of the aperture. This internal thread enables a component to be secured within the aperture of the fixing plate. In particular, a mounting collar 120 may be secured within the aperture of the fixing plate.

**[0036]** The fixing plate 110 typically comprises a raised portion 114. The raised portion may be used to aid the accurate placement of the fixing plate into a panel where a hole may be cut into a panel that is the shape/size of the raised portion. The raised portion can then be placed into the hole so that the remainder of the fixing plate lies flush against the panel. In some embodiments, screws are inserted through the 'front' of the holes of the fixing structure 112 to securely attach the fixing plate to the panel. Equally, the fixing plate may be secured onto the 'rear' of a panel by screws being inserted through the 'rear' of the holes of the fixing structure so that the main body of the fixing plate is not visible from the front of the panel.

**[0037]** Typically, the fixing plate 110, and/or the raised portion 114 of the fixing plate, comprises a depression 116 and/or a protrusion that simplifies the orienting of the fixing plate. A user is able to use the depression to ensure that the fixing plate is correctly oriented in the ceiling. The depression may also be used to simplify the insertion of a screw for resisting the loosening of the mounting collar 120 (this is described further below).

- The mounting collar 120 comprises an external thread 122 that extends along the exterior of the mounting collar. The external thread is arranged to interact with an internal thread of the fixing plate so as to enable the mounting collar to be inserted into, and secured within, the fixing plate 110.

**[0038]** The arrangement of a mounting collar 120 with an external thread and a fixing plate 110 with an internal thread enables the luminaire base 100 to be used with panels of varying thickness, since the placement of the mounting collar relative to the panel can be varied by altering the degree to which the mounting collar is screwed into the fixing plate.

- A head attachment 130 for attaching a luminaire head to the luminaire base 100. In order to provide light, a luminaire head (e.g. a lighting engine and/or a lamp holder) is attached to the luminaire base 100 using the head attachment. The luminaire head typically comprises one or more of: a light source (e.g. an LED); a power source and/or power supply; control electronics; and a heat sink. Equally these components may be included in the luminaire base.

- A connecting component 140 for attaching the head attachment 130 to the remainder of the luminaire base 100 (e.g. to the mounting collar 120). The connecting component typically comprises an O-ring, which provides a secure connection while enabling the head attachment to rotate relative to the fixing plate and the mounting collar. This enables a user to rotate the head attachment so as to alter the direction of light that is emitted from a luminaire head attached to the head attachment.

**[0039]** Typically, the head attachment 130 is connected to the mounting collar 120 (e.g. via the connecting component 140). In some embodiments, the head attachment is connected directly to the mounting collar 120 and/or the fixing plate 110. For example, the mounting collar may comprise clips that can hold the head attachment and/or a thread that interacts with a thread of the head attachment.

**[0040]** Referring to Figure 2a, there is shown a view of the luminaire base 100 with a luminaire head 200 attached to the base. Figure 2b shows an exploded view of the luminaire base and the luminaire head.

**[0041]** As shown in Figure 2b, the head attachment 130 of the luminaire base 100 comprises a thread 112 that is arranged to interact with a thread 202 of the luminaire head 200 so that the luminaire head can be screwed into the head attachment (and the luminaire base). It will be appreciated that other structures for attaching the luminaire head to the luminaire base are possible; for example, the head attachment may comprise an adhesive surface and/or may comprise a clip.

**[0042]** Referring to Figures 3a and 3b, there are shown exploded views of the luminaire base 100 (with Figure 3b also showing the luminaire head 200).

**[0043]** As shown by these figures, the head attachment 130 typically comprises a recess into which the connecting component 140 is able to fit so as to retain the head attachment within the remainder of the luminaire base 100.

**[0044]** The aperture of the fixing plate 110 comprises an internal thread 118 that is arranged to interact with the external thread 122 of the mounting collar 120 so as to secure the mounting collar within the fixing plate. By screwing the mounting collar into the fixing plate to varying extents, the placement of the mounting collar (and the head attachment 130, and the luminaire head 200) relative to a panel onto which the fixing plate is secured can be altered. Therefore, the luminaire base 100 can be used with various thicknesses of panel while providing a consistent look and operation.

**[0045]** The wall of the aperture of the fixing plate 110 comprises a hole 119; typically, this hole is arranged to pass through the internal thread 118 of the fixing plate (which thread extends along the wall of the aperture). Similarly, the mounting collar 120 may comprise a hole 129, which hole of the mounting collar is (typically) arranged to pass through the external thread that extends along the exterior of the mounting collar.

**[0046]** The holes 119, 129 may be used to suspend the luminaire base 100 using a wire that passes through the holes. For example, these holes may be used to suspend the luminaire base so as to dip the luminaire base into a plating tank.

**[0047]** The hole 119 of the fixing plate 110 and the hole 129 of the mounting collar may be arranged to receive a screw 150 that passes through each hole 119, 129. Such a screw is useable to align the components in a desired orientation and is further useable to reduce the vibration of the luminaire and to avoid the mounting collar coming loose due to such vibration.

**[0048]** In some embodiments, the fixing plate 110 and/or the mounting collar 120 comprises a plurality of holes, so that the screw 150 can be inserted at a plurality of relative orientations of these components.

**[0049]** Typically, the screw 150 comprises a grub screw, which may comprise and/or be tipped with a rough material, such as nylon. The use of a grub screw enables only the fixing plate 110 to be provided with a hole; that is, the mounting collar 120 may comprise no hole. The mounting collar is then held in place by friction caused by the grub screw pressing against the mounting collar, where this friction resists and/or prevents rotation of the mounting collar relative to the fixing plate.

**[0050]** Typically, the hole 119 of the fixing plate is located at the depression 116. Therefore, the screw 150 is located within the depression (which protects the screw from external influences).

**[0051]** In some embodiments, the mounting collar 120 comprises a trim. The provision of a trim enables the mounting collar to be used with various types of panels (e.g. panels made of different materials).

**[0052]** Typically, the luminaire is adjustable; for example, an O-ring may be used so that the luminaire head 200 and/or the mounting collar 120 can be rotated relative to the fixing plate 110 around an axis perpendicular to the panel/the fixing plate. Specifically, one or more of the luminaire head and the mounting collar may comprise an O-ring to enable rotation of these components relative to the (other) components of the luminaire base. Furthermore, the luminaire head may be arranged so that the angle of light emitted by the luminaire head can altered (e.g. so that the luminaire head can be rotated around an axis parallel to the panel/the fixing plate).

**[0053]** In some embodiments, the luminaire head 200 and/or the head attachment 130 is arranged to be rotatable relative to the fixing plate 110. For example, the head attachment may be attached to the fixing plate in a manner (e.g. using a pin) that enables the head attachment to rotate relative to the fixing plate. A user may, for example, be able to press on the front of the head attachment to rotate the head attachment (and the luminaire head).

**[0054]** In some embodiments, the luminaire is arranged to include (either as part of the luminaire base 110 or the luminaire head 120) a shroud that directs the

light emitted from the luminaire, which shroud is rotatable. In particular, the shroud may be attached to the head attachment 130 using a pin and/or screw so that the shroud can be rotated relative to the remainder of the head attachment and relative to the fixing plate. A user is then able to adjust the direction (and/or the amount) of light emitted from the luminaire by adjusting the shroud.

**[0055]** In some embodiments, the luminaire base 100 is arranged so as to prevent rotation of the luminaire head 200 (e.g. by inserting a screw through the fixing plate 110 and the head attachment 130).

**[0056]** Referring to Figure 4, there is described a method of installing the luminaire base 100 in a panel and attaching the luminaire head 200 to the luminaire base.

**[0057]** In a first step 11, the fixing plate 110 is placed against a panel, typically against the rear of a panel (with the 'front' of the panel being the side of the panel from which light is emitted, and the rear being the opposite side of the panel).

**[0058]** In a second step 12, the fixing plate 110 is secured to the panel using the fixing structure 112, e.g. by placing screws through the holes of the fixing structure. Typically, the fixing plate is secured to the panel using at least (and/or exactly) three screws.

**[0059]** The locating and securing of the fixing plate 110 may occur before the panel is installed. For example, the fixing plate may be secured onto the rear of a ceiling panel before that panel is installed in the ceiling.

**[0060]** In a third step 13, the mounting collar 120 is screwed into the fixing plate 110. Typically, the mounting collar is screwed into the fixing plate from the front of the panel. The amount to which the mounting collar is screwed into the fixing plate typically depends on the depth of the panel, where the mounting collar may be screwed in further with shallow panels (so as not to extrude beyond the front of the panel). Typically, the mounting collar is screwed into the fixing plate so that the front of the mounting collar does not extend beyond the front of the panel to which the fixing plate is secured.

**[0061]** The mounting collar 120 and/or the fixing plate 110 may comprise one or more indexing structures that indicate when the mounting collar has reached a predetermined depth in the fixing collar; for example, there may be one or more notches on the external thread 122 of the mounting collar and/or on the internal thread 118 of the fixing plate so that a user is able to accurately identify when the mounting collar has reached a given depth in the fixing plate. The indexing structures may relate to expected depths of panels, so that the luminaire base may be provided to be particularly suitable for a plurality of panels of different depths.

**[0062]** In a fourth step 14, the screw 150 is inserted into the hole 119 of the fixing plate 110. The screw thereafter resists relative rotation of the mounting collar 120 and the fixing plate.

**[0063]** In a fifth step 15, the luminaire head 200 is inserted into the head attachment 130. Typically, this comprises screwing the luminaire head into the head attachment.

**[0064]** In a sixth step 16, the head attachment 130 is passed through the fixing plate 110 and in a seventh step 17 the head attachment is secured to the fixing plate using the connection structure 140.

**[0065]** It will be appreciated that the fifth to seventh steps 15, 16, 17 may be performed in any order.

**[0066]** With the luminaire and the head attachment 130 of the present disclosure, the luminaire head 200 (and the head attachment 130) may be inserted through the fixing plate 110 through the front of the panel. This simplifies installation so that the panel may installed after the insertion of the screw 150 (e.g. the fourth step 14), with the luminaire head then inserted into the panel at a later date.

**[0067]** In some embodiments, the luminaire (e.g. via the head attachment 130) comprises a waterproofing component, e.g. so that the luminaire can be IP rated. The waterproofing component may comprise a silicone boot that is attached around the luminaire head 200 and/or the head attachment. The waterproofing component may, for example, be secured about the head attachment using screws that define a tilt axis for the head attachment.

**[0068]** The luminaire base 100 as described may be used in marine environments, where the thicknesses of panels are not standardised. Waterproofing of the luminaire is of particular benefit in such environments. For example, the luminaire may be installed (or arranged to be installed) in a naval vessel, a boat, a yacht, and/or a superyacht. The present disclosure extends to a naval vessel, a boat, a yacht, and/or a superyacht comprising the luminaire base and/or the luminaire disclosed herein.

**[0069]** Referring to Figures 5a and 5b, there is shown an adjustable version of the luminaire.

**[0070]** As has been described above, the direction and intensity of light that is emitted from the luminaire may be adjusted using a shroud. Equally, the direction and intensity of the emitted light may be adjusted using lenses and/or filters. Figures 5a and 5b show an embodiment in which the head attachment 130 comprises a plurality of parts so as to enable adjustment the direction of the light emitted by the luminaire.

**[0071]** Specifically, Figures 5a and 5b show an embodiment in which the head attachment 130 comprises a first part 130-1, and a second part 130-2. The first part 130-1 of the head attachment is arranged to rotate relative to the second part 130-2 of the head attachment so that the first part of the head attachment can be attached (directly or indirectly) to the fixing plate 110 (e.g. using the connecting component 140) and the second part of the head attachment can then be rotated relative to the first part and thus relative to the fixing plate.

**[0072]** Typically, the first part 130-1 of the head attachment 130 is attached to the second part 130-2 of the head attachment using one or more screws 160, where the second part is arranged to rotate relative to the first part about these screws. Equally, the first part and the second

part may be attached using pins, or any other connecting component that enables relative rotation of the second part about the first part.

**[0073]** In this embodiment, the head attachment 130 comprises a third part 130-3 that is located between the first part 130-1 and the second part 130-2 to ensure a tight fit of the head attachment in the remainder of luminaire base. It will be appreciated that the multi-part head attachment may be provided without this third part.

**[0074]** With the embodiment of Figures 5a and 5b, a user may be able to rotate the head attachment 130 about an axis that passes through the aperture of the fixing ring 110 (e.g. due to the connecting component 140 allowing such rotation) and may also be able to rotate the head attachment about an axis perpendicular to this axis by rotating (e.g. tilting) the second part 130-2 of the head attachment relative to the first part 130-1 of the head attachment. The combination of these axes of rotation axes provides precise control of the direction of light emitted from the luminaire.

Alternatives and Modifications

**[0075]** Various other modifications will be apparent to those skilled in the art. It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

**[0076]** Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

**[0077]** Reference numerals appearing in the claims are by way of illustration only and shall have no limiting effect on the scope of the claims.

## Claims

**1.** A base 100 for a luminaire, the base 100 comprising:

a fixing plate 110 for attaching the base 100 to a panel, wherein the fixing plate 110 comprises:

an aperture; and
an internal thread 118 that extends along a wall of the aperture; and

a mounting collar 120 comprising an external thread 122, wherein the external thread 122 of the mounting collar 120 is arranged to interact with the internal thread 118 of the fixing plate 110 so as to secure the mounting collar 120 within the fixing plate 110.

**2.** The base of claim 1, wherein the fixing plate 110 comprises an elongated aperture, wherein the internal thread 118 extends along a wall of the aperture.

**3.** The base 100 of any preceding claim, comprising a head attachment 130 for attaching a luminaire head 200 to the fixing plate 110, preferably wherein the head attachment 130 is connected to the mounting collar 120 by a connecting component 140 that enables rotation of the head attachment 130 relative to the fixing plate 110, more preferably wherein the connecting component 140 comprises an O-ring.

**4.** The base of claim 3, wherein the head attachment 130 comprises:

a thread 132 for interacting with a thread of the luminaire head 200, preferably wherein the head attachment 130 comprises an internal thread; and/or
a recess 134 for a/the connecting structure.

**5.** The base of claim 3 or 4, wherein the head attachment 130 comprises a first part 130-1 and a second part 130-2, wherein the second part 130-2 of the head attachment 130 is arranged to rotate relative to the first part 130-1 of the head attachment 130.

**6.** The base 100 of any preceding claim, wherein the mounting collar 120 and/or the fixing plate 110 comprise one or more indexing structures that indicate when the mounting collar has reached a predetermined depth in the fixing collar.

**7.** The base 100 of any preceding claim, wherein the fixing plate 110 comprises a hole 119 for a screw 150, preferably a screw 150 that is arranged to resist and/or prevent rotation of the mounting collar 120 relative to the fixing plate 110.

**8.** The base 100 of claim 7, comprising the screw 150, preferably wherein the screw 150 comprises a grub screw, more preferably wherein the grub screw comprises a roughened tip and/or a nylon tip.

**9.** The base 100 of claim 7 or 8, wherein the hole 119 of the fixing plate 110 passes through the internal thread 118 of the fixing plate.

**10.** The base 100 of any preceding claim, wherein the fixing plate 110 comprises a depression 116, preferably wherein a/the hole 119 of the fixing plate 110 is located at the depression 116.

**11.** The base 100 of any preceding claim, wherein the fixing plate 110 comprises an attachment structure 112 for attaching the fixing plate 110 to the panel, preferably wherein the attachment structure 112 comprises a plurality of holes for screws.

**12.** The base of any preceding claim, comprising a waterproofing component, preferably wherein the wa-

terproofing component is attached to the head attachment 130.

**13.** A luminaire comprising the base 100 of any preceding claim and a luminaire head 200, preferably wherein the luminaire head 200 comprises one or more of: a light source; a power source; control electronics; and a heat sink.

**14.** A method of operating the luminaire of claim 13, preferably wherein the method comprises altering one or more of: a brightness, an orientation, and/or a colour of the luminaire.

**15.** A method of installing the base 100 of any of claims 1 to 12, preferably comprising one or more of:

attaching the fixing plate 110 to a first side of a panel, preferably using one or more screws;
inserting the mounting collar 120 into the fixing plate 110 from a second side of the panel;
inserting a/the head attachment 130 and/or a/the luminaire head 200 into the fixing plate from a/the second side of the panel.

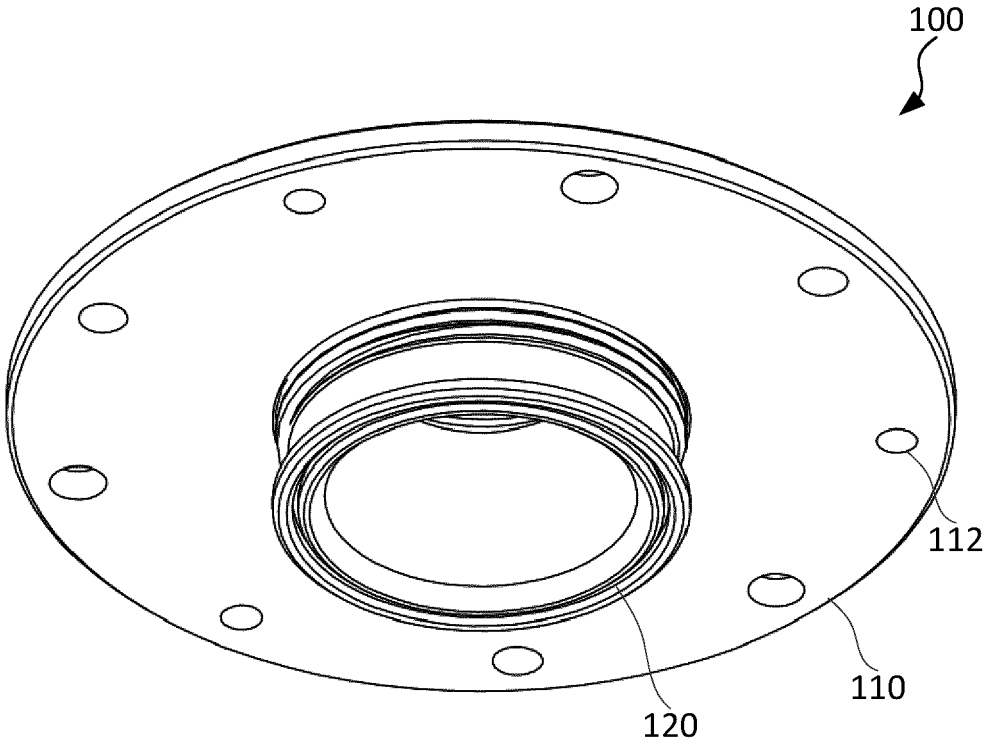


Figure 1a

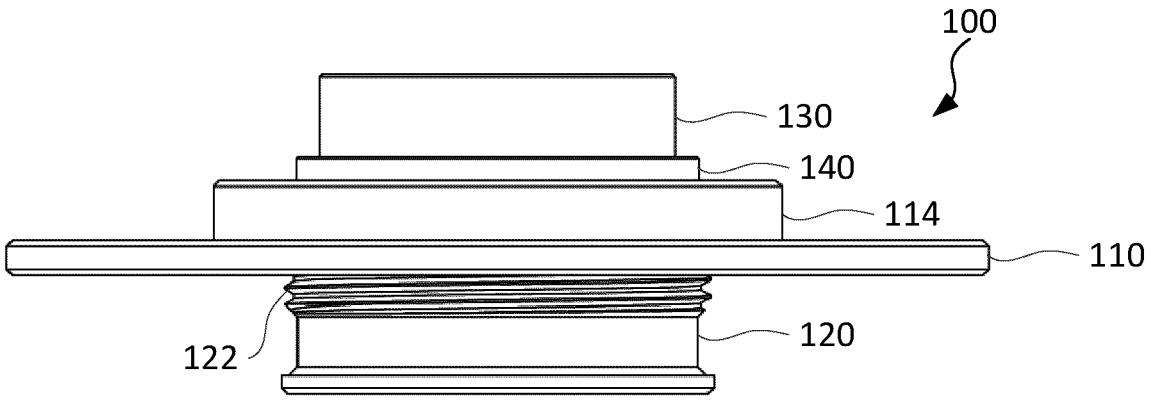


Figure 1b

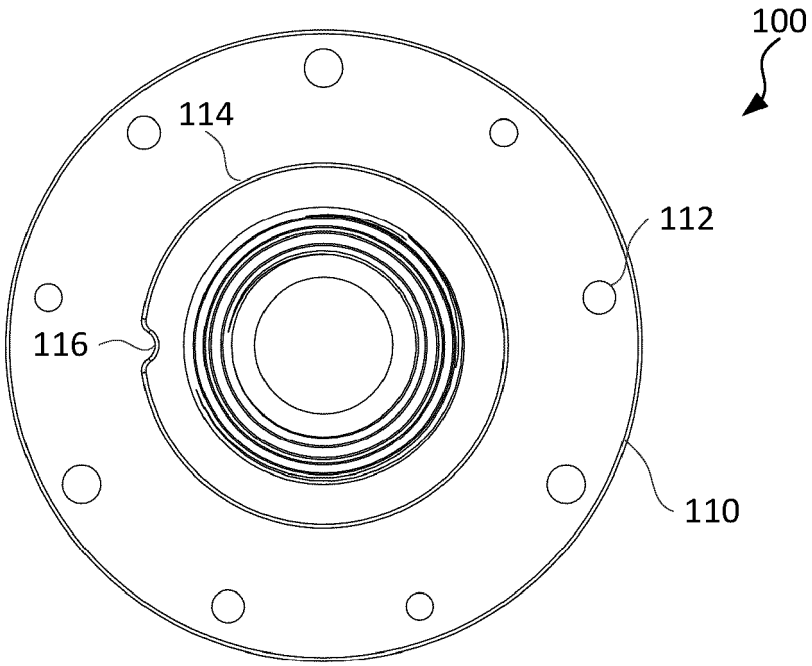


Figure 1c

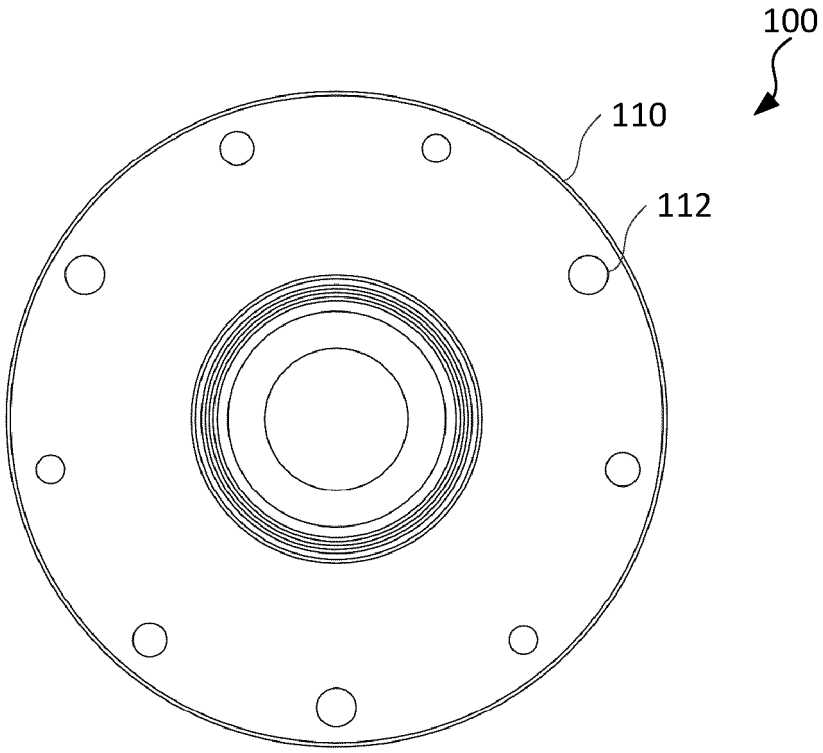


Figure 1d

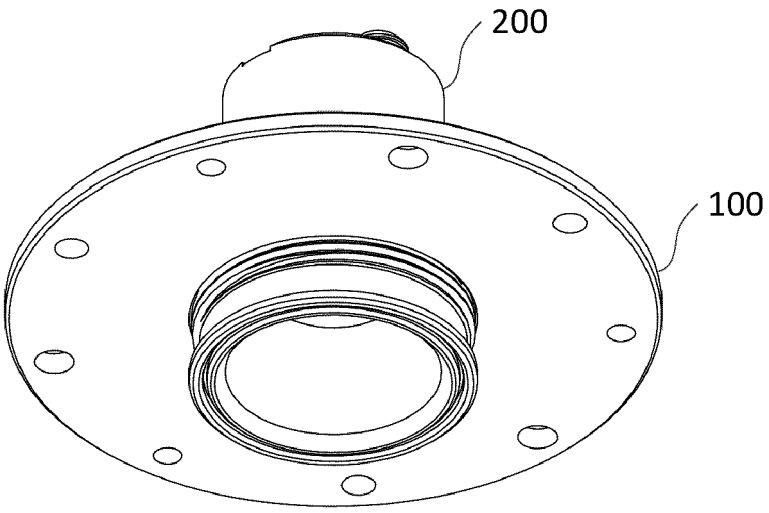


Figure 2a

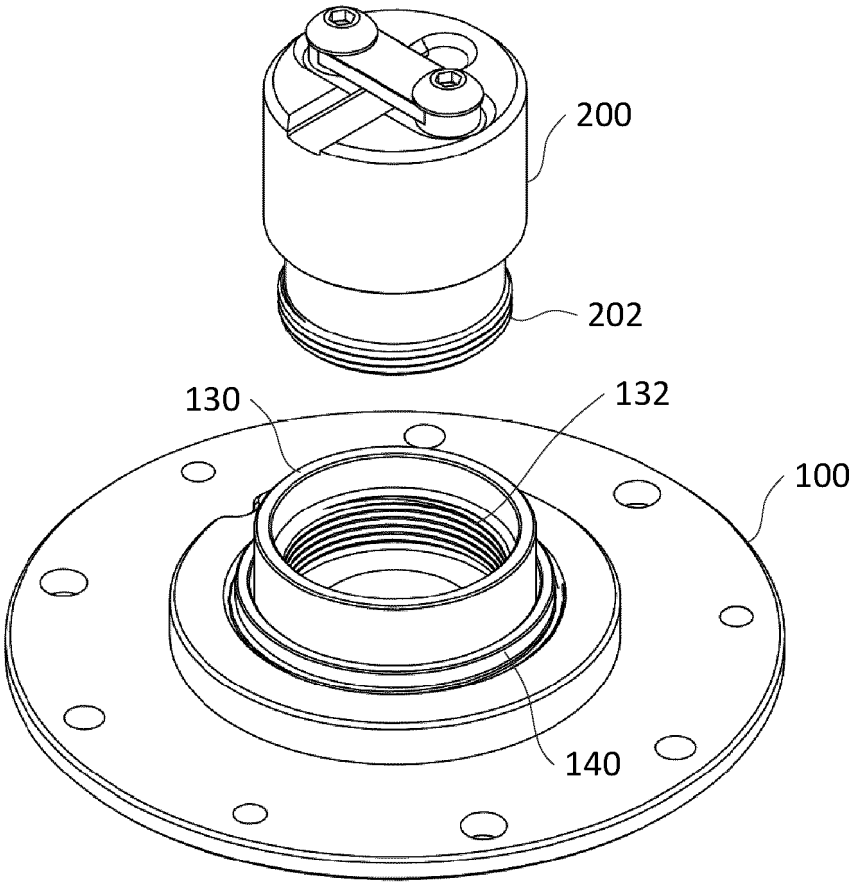


Figure 2b

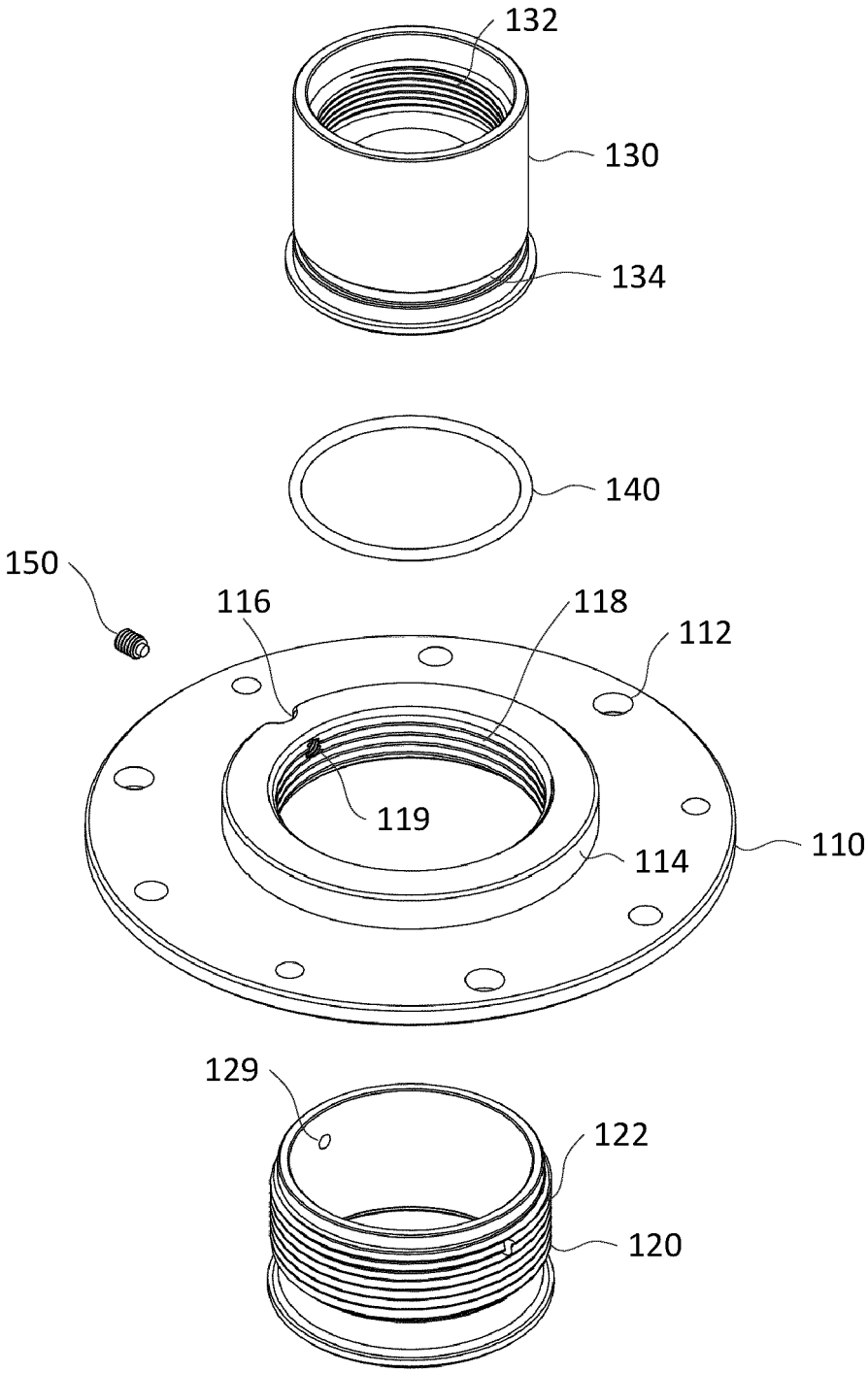


Figure 3a

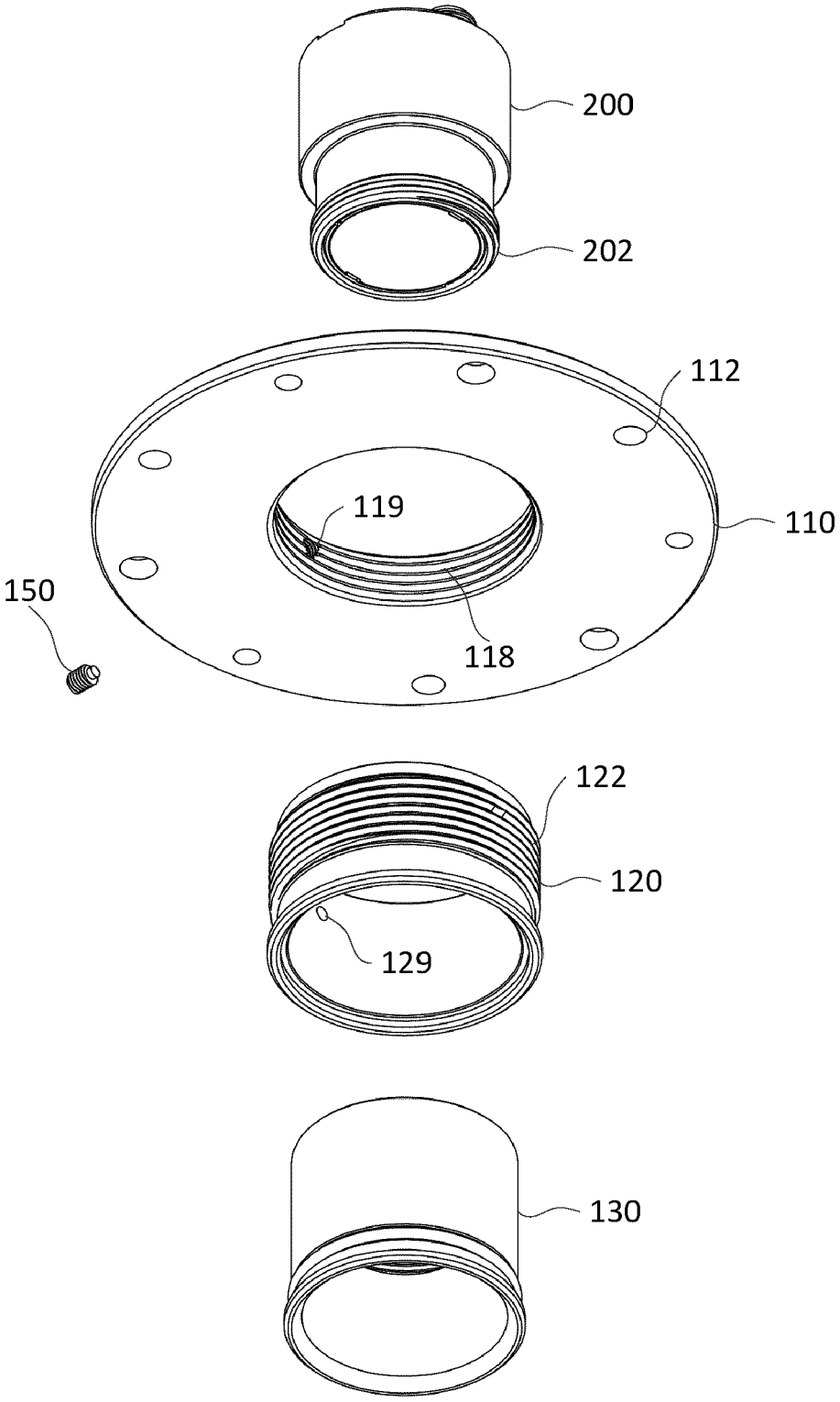


Figure 3b

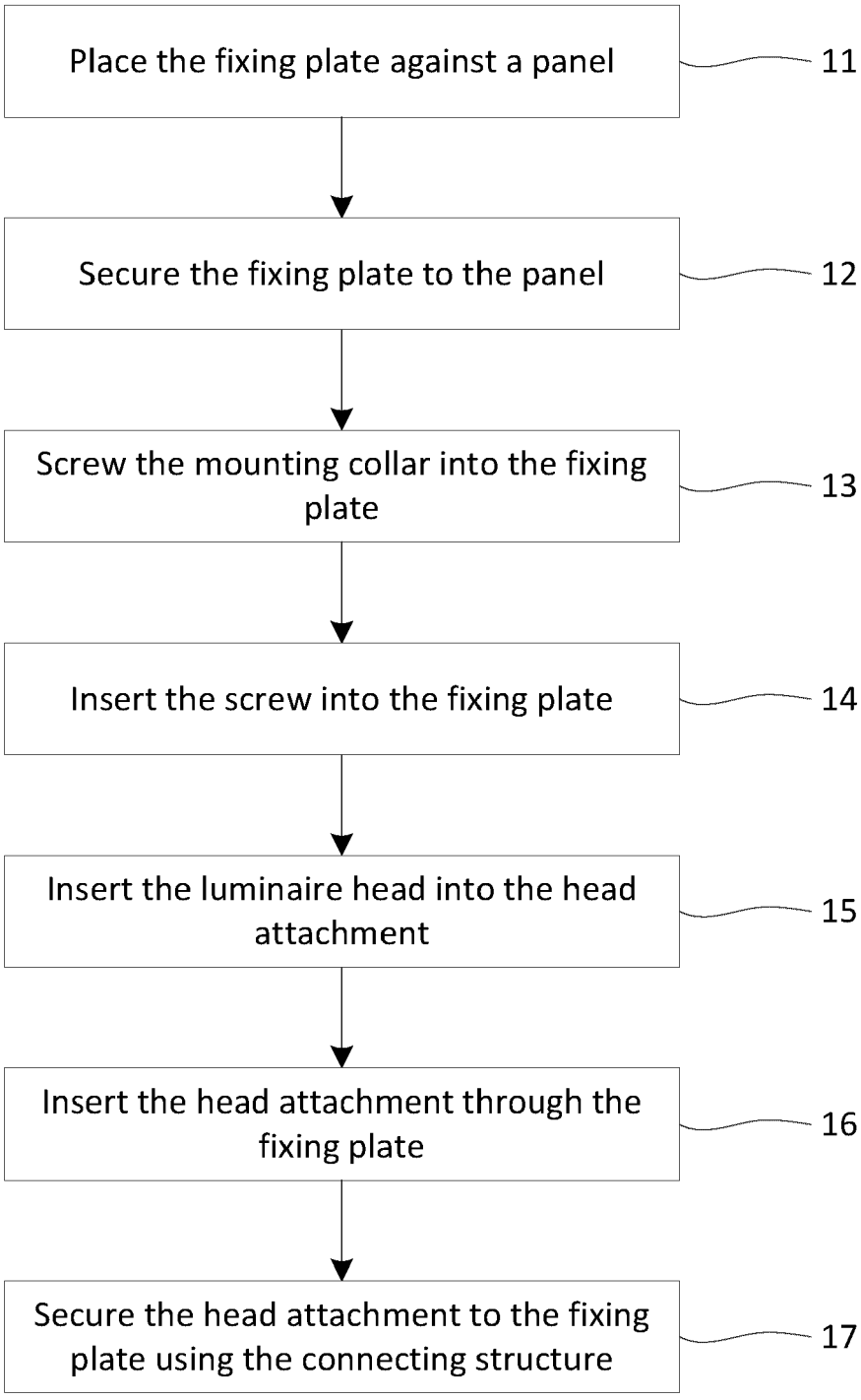
Place the fixing plate against a panel
11
Secure the fixing plate to the panel
12
Screw the mounting collar into the fixing plate
13
Insert the screw into the fixing plate
14
Insert the luminaire head into the head attachment
15
Insert the head attachment through the fixing plate
16
Secure the head attachment to the fixing plate using the connecting structure
17

Figure 4

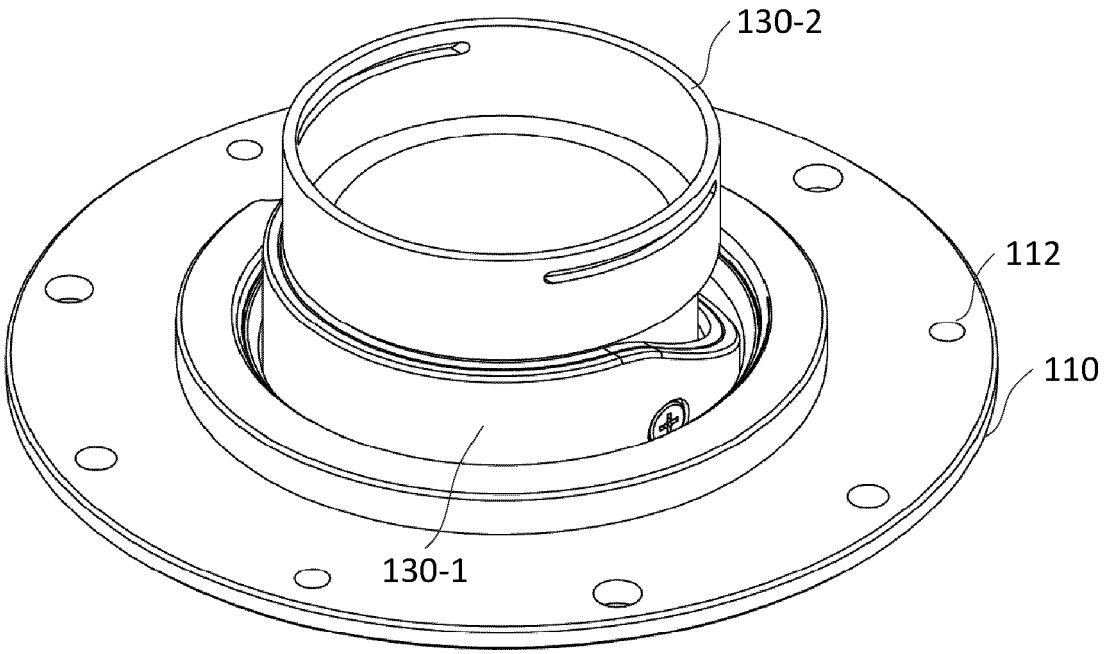


Figure 5a

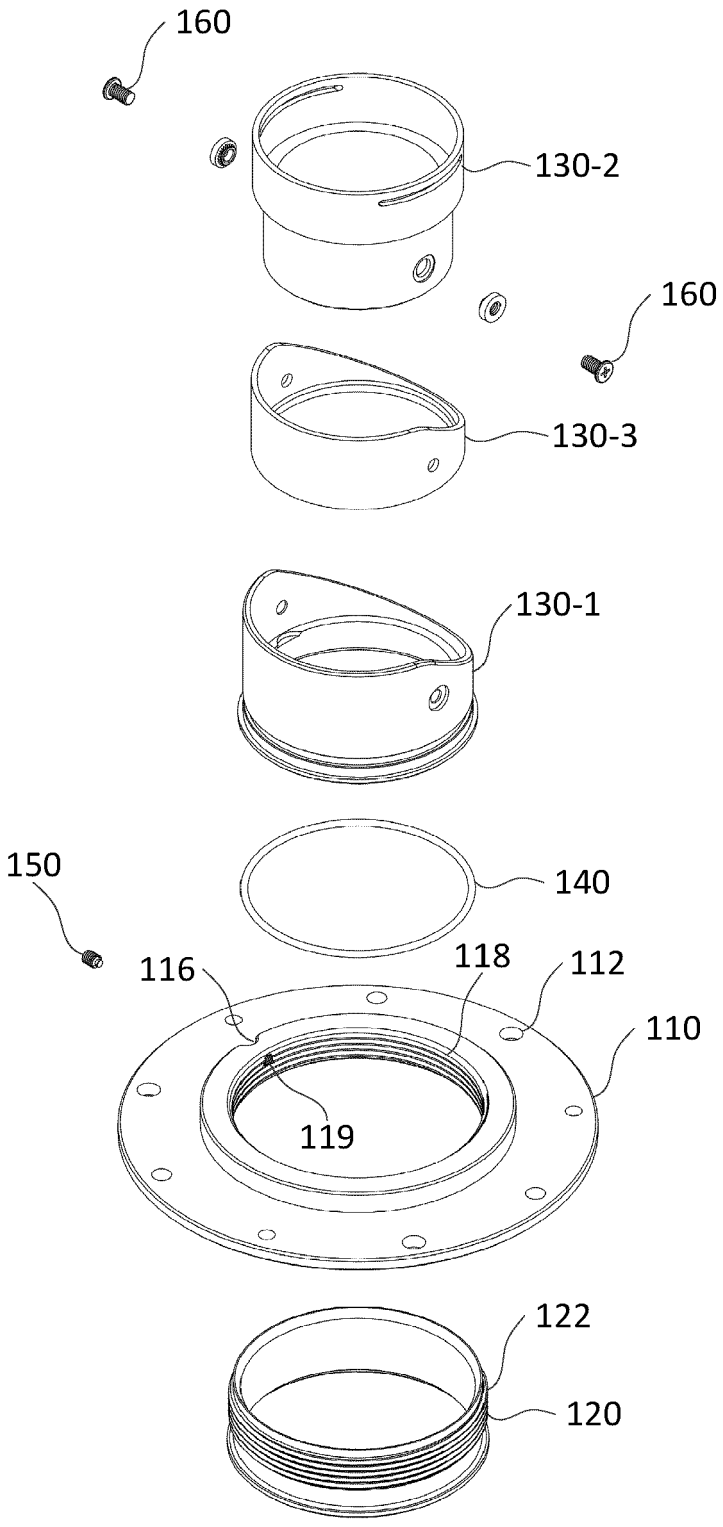


Figure 5b

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# EUROPEAN SEARCH REPORT

Application Number
EP 22 20 7059

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