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(54) **LUMINAIRE MOUNTING**

(57) A luminaire mounting (2) for mounting an outdoor luminaire is described. The luminaire mounting (2) includes a housing (8) securable to a mounting bracket (4) by means of a mechanical fixing (26), e.g., an externally screw-threaded bolt or screw. The mechanical fixing (26) is galvanically isolated from the housing (8) by an interposing first insulator (14) comprising an electrically insulating material.

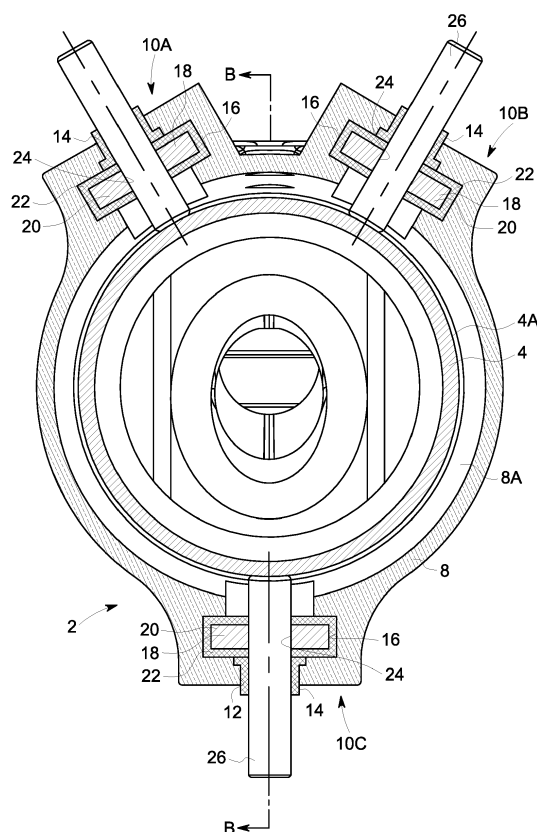


FIG. 2

Description

Technical Field

[0001] The present invention relates to a luminaire mounting, and in particular to a mounting part of an outdoor luminaire, i.e., a complete lighting unit.

Background

[0002] It is known that contact surfaces between dissimilar metals, and in particular metals with different electro-potentials, are prone to galvanic (or electro-chemical) corrosion in the presence of an electrolyte. Such corrosion can lead to the degradation of functional, mechanical and electrical parts of a luminaire. The problem of galvanic corrosion can be more pronounced in outdoor luminaires due to the exposure to humidity and halogenic compounds.

[0003] Accordingly, there is a need for a luminaire mounting that is designed to be resistant to galvanic corrosion.

Summary of the invention

[0004] The present invention provides a luminaire mounting comprising a housing securable to a mounting bracket by means of a mechanical fixing, the mechanical fixing being galvanically isolated from the housing by an interposing first insulator comprising an electrically insulating material. The galvanic isolation provided by the first insulator can prevent the degradation caused by galvanic corrosion.

[0005] The luminaire mounting will form part of a luminaire, optionally an outdoor luminaire.

[0006] The housing can include an opening and the first insulator can be located in the opening to define an inner opening for receiving the mechanical fixing. The first insulator can be provided as an annular insert or bushing, for example, that spaces the mechanical fixing from the housing. The electrically insulating material of the first insulator can comprise a plastics or ceramic material, for example.

[0007] The luminaire mounting can further comprise a fixing plate that includes an internally screw-threaded opening therethrough. The fixing plate can be captively located in a channel of the housing with the screw-threaded opening in register with the inner opening. The mechanical fixing can be an externally screw-threaded mechanical fixing (e.g., a bolt or screw) that is received through the inner opening and the internally screw-threaded opening in the fixing plate. By rotating the mechanical fixing it will typically be selectively adjustable between a securing position where the mechanical fixing is in contact with a mounting surface of the mounting bracket to secure the housing to the mounting bracket, and one of many non-securing positions where the mechanical fixing is not in contact with the mounting surface

of the mounting bracket. It will be readily appreciated that the mounting bracket does not form part of the luminaire but is provided as a separate component to which the luminaire mounting is fixedly secured to mount the luminaire in use.

[0008] The channel can be shaped and sized to restrict the fixing plate to movement along a single lateral direction. This allows the fixing plate to be slidably received within the channel and then to be fixed in position relative to the housing by the mechanical fixing which is received through the housing opening and the internally screw-threaded opening in the fixing plate.

[0009] The fixing plate can comprise a first material that is galvanically isolated from the housing by an interposing second insulator comprising an electrically insulating material. In one arrangement, the second insulator is part of the fixing plate. For example, the first material can be substantially surrounded by an outer layer of electrically insulating material that spaces the first material from the housing. In another arrangement, the second insulator is part of the housing. For example, the part of the housing that defines the channel can include an inner layer of electrically insulating material that spaces the fixing plate from the remainder of the housing.

[0010] The electrically insulating material of the second insulator can comprise a plastics or ceramic material, for example.

[0011] The housing can comprise a second material dissimilar to the first material. Typically the first and second materials will have different electro-potentials and would therefore be susceptible to galvanic corrosion at their contact surfaces without the galvanic isolation provided by the various insulators described herein.

[0012] The first material can comprise iron or an alloy of iron, for example. The first material can comprise steel alloys containing less than about 3% carbon; less than about 21% nickel; less than about 3% silicon; less than about 20% chromium; less than about 6% molybdenum; less than about 2% aluminium; and less than about 1% copper, boron, sulphur and vanadium.

[0013] The second material can comprise aluminium or an alloy of aluminium, for example. The second material can comprise aluminium alloys containing less than about 10% silicon; less than about 10% copper; less than about 2% iron; and less than about 5% manganese, magnesium, chromium, zinc, vanadium, titanium, bismuth, gallium, lead and zirconium.

[0014] The luminaire mounting can further comprise a third insulator comprising an electrically insulating material. The third insulator is interposed between the housing and the mounting bracket when the luminaire mounting is secured to the mounting bracket in use to galvanically isolate the housing from the mounting bracket. The third insulator can be provided as an annular spacer, for example, that spaces the housing from the mounting bracket at a particular location. The electrically insulating material of the third insulator can comprise a plastics or ceramic material, for example. Suitable electrically insulat-

ing materials for the first, second and third insulators include *inter alia* aluminium oxide, aluminium nitride, boron nitride, beryllium oxide, polycarbonate, polyamide (and in particular, PA6 and PA66), ethylene propylene diene monomer (EPDM rubber), polysiloxanes (silicone rubbers), polyoxybenzylmethyleneglycolanhydride (Bakelite), Polyethylene terephthalate (PET), polyepoxides (epoxy), polyvinyl chloride (PVC), vinyl, polystyrene, polyurethane, acrylonitrile butadiene styrene (ABS), cresyl phthalate, bis(2-ethylhexyl) phthalate (DEHP), polytetrafluoroethylene (PTFE), poly(4,4'-oxydiphenylene-pyromellitimide) (Kapton®), aramids (including meta aramids such as Nomex®), polychloroprene (Neoprene®) and mica and other phyllosilicates, optionally in any suitable combination and including any chemically similar materials. In general, the first, second and third insulators should be formed of an electrically insulating material that has sufficient flexibility to be deformed in response to relative movement of other parts of the luminaire mounting in use and be temperature resistant from -50°C to +100°C.

[0015] Part of the housing can be substantially cylindrical and can be adapted to receive the mounting bracket in use. The substantially cylindrical part of the housing can include one or more locating ribs for locating the housing relative to the mounting bracket. In one arrangement, each locating rib extends radially inwardly from an inner cylindrical surface of the housing. Each locating rib can have a substantially v-shaped profile.

[0016] The luminaire mounting can comprise a plurality of mechanical fixings, each mechanical fixing being galvanically isolated from the housing by a respective interposing first insulator.

[0017] In one arrangement, the housing includes a plurality of openings and the fixing plate includes a plurality of internally screw-threaded openings. The housing openings and the internally screw-threaded openings can be axially spaced along the housing. The luminaire mounting can further comprise a plurality of first insulators, each first insulator being located in a respective housing opening to define an inner opening. The fixing plate can be captively located in the channel with the screw-threaded openings in register with the inner openings. The luminaire mounting can further comprise a plurality of mechanical fixings, each mechanical fixing being an externally screw-threaded mechanical fixing that is received through a respective inner opening and a respective internally screw-threaded opening in the fixing plate.

[0018] In one arrangement, the housing includes a second opening. The second opening can be circumferentially spaced from the opening. Each opening can define a fixing location for fixedly securing the housing to the mounting bracket. The luminaire mounting can include any suitable number of fixing locations, e.g., two fixing locations located at an upper part of the housing and one fixing location at a lower part of the housing as determined with reference to the normal orientation of the lu-

minaire mounting in use. Each fixing location can include any suitable number of axially spaced openings for receiving a corresponding number of first insulators and mechanical fixings.

[0019] In the arrangement where the housing includes a second opening, the luminaire mounting can further comprise a fourth insulator located in the second opening to define a second inner opening, and a second fixing plate including an internally screw-threaded opening. The second fixing plate can be captively located in a second channel of the housing with the screw-threaded opening in register with the second inner opening. The luminaire mounting can further comprise a second mechanical fixing. The second mechanical fixing can be an externally screw-threaded mechanical fixing (e.g., a bolt or screw) that is received through the second inner opening and the internally screw-threaded opening in the second fixing plate. The channels can be circumferentially spaced around the housing.

[0020] The present invention further provides an assembly comprising a luminaire mounting as described above and a mounting bracket. The mounting bracket is received within the housing and fixedly secured thereto by the mechanical fixing(s) when adjusted to the securing position. The mounting bracket can comprise the first material, e.g., iron, an alloy of iron, or steel alloys. In other words, the mounting bracket and the fixing plate can comprise the same material. The housing and the mounting bracket can comprise dissimilar materials or the same or similar materials.

[0021] The present invention further provides an assembly comprising a luminaire mounting as described above and a substantially cylindrical mounting bracket. The mounting bracket is received within the housing and fixedly secured thereto by the mechanical fixing(s) when adjusted to the securing position. The third insulator can be substantially annular and is interposed between an inner surface of the housing and an outer surface of the mounting bracket, optionally at an end of the mounting bracket.

[0022] To mount the luminaire, the luminaire mounting can be prepared or assembled by inserting each fixing plate into a respective channel and by inserting and rotating each mechanical fixing so that it is received through a respective housing opening and internally screw-threaded fixing plate opening to secure each fixing plate relative to the housing. Each mechanical fixing is selectively adjusted to a non-securing position.

[0023] The prepared or assembled luminaire mounting is positioned relative to the mounting bracket (e.g., the mounting bracket can be received within the substantially cylindrical part of the housing) and each mechanical fixing is selectively adjusted to the securing position where it is in contact with the mounting surface of the mounting bracket to fixedly secure the housing to the mounting bracket at one or more fixing locations. The luminaire can be removed from the mounting bracket by reversing the steps.

DRAWINGS

[0024]

Figure 1 is a top view of the luminaire with a first luminaire mounting according to the present invention fixedly secured to a mounting bracket;
 Figure 2 is a cross section of the first luminaire mounting of Figure 1 along line A-A;
 Figure 3 is a cross section of the first luminaire mounting of Figures 1 and 2 along line B-B;
 Figure 4 is a perspective view of a second luminaire mounting with cutaway;
 Figure 5 is a perspective view of the second luminaire mounting of Figure 4;
 Figure 6 is a perspective view of the housing of the second luminaire mounting of Figure 4;
 Figure 7 is a cross section of a third luminaire mounting;
 Figure 8 is a cross section of the third luminaire mounting of Figure 7 along line C-C; and
 Figure 9 is a perspective view of the third luminaire mounting of Figure 7 without the mounting bracket.

[0025] Figure 1 shows an outdoor luminaire 1. The luminaire 1 includes a first luminaire mounting 2 for releasably securing the luminaire to a cylindrical mounting bracket 4. The luminaire 1 also includes a main body 6 which can include one or more electric lamps with all the necessary wiring and associated parts.

[0026] With reference to Figures 2 and 3, the first luminaire mounting 2 includes a substantially cylindrical housing 8. The first luminaire mounting 2 is particularly suitable for a luminaire where the mounting bracket 4 and the housing 8 are formed from dissimilar materials that would normally be susceptible to galvanic corrosion at their contact surfaces. The housing 8 includes first and second fixing locations 10A, 10B at an upper part and a third fixing location 10C at a lower part. Each fixing location includes two axially spaced openings 12. An annular insert (or bushing) 14 is received in each opening. Each annular insert 14 includes a cylindrical part that is received in the opening 12 and an annular skirt that is in abutment with the inner surface of the housing 8 as shown. The cylindrical part of each annular insert 14 defines an inner opening for receiving a bolt 26 - see below. Each annular insert 14 is made of a suitable electrically insulating material, e.g., a plastics or ceramic material, and spaces and galvanically isolates the bolt 26 from the housing 8.

[0027] A channel 16 is formed in the housing 8 at each fixing location. Each fixing location 10A, 10B and 10C is defined by a protruding part of the housing 8 that also defines the respective channel 16. A fixing plate 18 is slidably received in each channel 16. The channels 16 are shaped and sized so that the fixing plates 18 can only move in the axial direction, i.e., along an axis of the luminaire mounting 2. In particular, each fixing plate 18 is

prevented from moving in the circumferential direction by side walls of the respective channel 16 and is prevented from moving in the radial direction by the outer wall of the channel and by inner walls that are defined by lip parts of the housing. Movement of each fixing plate 18 in the axial direction is restricted by an end wall of the respective channel 16 against which each fixing plate can be in abutment when properly located. Each channel 16 is open to the interior of the housing 8 and the lip parts define an opening therebetween through which the bolts 26 extend towards the mounting bracket 4.

[0028] Each fixing plate 18 includes an inner part 20 and an outer part 22.

[0029] The inner part 20 of each fixing plate 18 and the mounting bracket are made of a first material, e.g., iron or an alloy of iron. The housing 8 is made of a second material, e.g., aluminium or an alloy of aluminium.

[0030] The outer part 22 of each fixing plate 18 is made of electrically insulating material, e.g., a plastics or ceramic material that spaces and galvanically isolates the inner part from the housing 8. In other words, the outer part 22 of each fixing plate 18 is an interposing insulator.

[0031] Each fixing plate 18 includes two internally screw-threaded openings 24. When each fixing plate 18 is located in a respective channel 16, the internally screw-threaded openings 24 are in register with the openings 12 in the housing 8 and also with the inner openings defined by each annular insert or bushing 14.

[0032] An externally screw-threaded bolt 26 is received through each annular insert 14 and the aligned internally screw-threaded opening 24 in the fixing plate. In Figures 2 to 5 the bolts 26 are shown to be in a securing position in contact with the outer cylindrical surface 4A of the mounting bracket 4, i.e., when the luminaire mounting 2 is fixedly secured to the mounting bracket. Rotation of the bolts 26 allows selective adjustment of their position relative to the housing 8. In particular, rotating a bolt 26 in a first sense (e.g., clockwise) will move the bolt radially inwardly relative to the housing 8 and rotation of a bolt in a second, opposite, sense (e.g., counter-clockwise) will move the bolt radially outwardly. To secure the luminaire mounting 2 to the mounting bracket 4, the bolts 26 are rotated to the securing position where they are in contact with the outer cylindrical surface 4A of the mounting bracket 4. To release the luminaire mounting 2 from the mounting bracket 4, the bolts 26 are rotated to a non-securing position where they are spaced apart from the outer cylindrical surface 4A of the mounting bracket 4.

[0033] Galvanic isolation between the mounting bracket 4 and the housing 8 (via the bolts 26) is provided by the annular inserts 14.

[0034] Further galvanic isolation between the mounting bracket 4 and the housing 8 is provided by an annular spacer 28 which is made of a suitable electrically insulating material, e.g., a plastics or ceramic material. The annular spacer 28 includes a substantially cylindrical part that is received between the outer cylindrical surface 4A of the mounting bracket and the inner surface 8A of the

housing 8 and an annular skirt that is in abutment with an end 4B of the mounting bracket.

[0035] A second luminaire mounting 2' is shown in Figures 4 and 5. Like parts have been given the same reference signs and are not described further. In the second luminaire mounting 2' each fixing location 10A, 10B and 10C includes three openings 12 and each fixing plate 18 includes three internally screw-threaded openings 24. The second luminaire mounting 2' is therefore particularly suitable when greater mechanical performance is required.

[0036] An annular insert 14 is received in each opening 12. An externally screw-threaded bolt 26 is received through each annular insert 14 and the aligned internally screw-threaded opening 24 in the fixing plate.

[0037] Just the housing 8 of the second luminaire mounting 2' is shown in Figure 6. The openings 12 and the channels 16 can be clearly seen. Each channel 16 includes a recess 16A for accommodating the skirts of the annular inserts 14 that are in abutment with the inner surface 8A of the housing 8.

[0038] A third luminaire mounting 2" is shown in Figures 7 to 9. Like parts have been given the same reference signs and are not described further. The third luminaire mounting 2" is particularly suitable for a luminaire where the mounting bracket 4 and housing 8 are formed from the same or similar materials. In the third luminaire mounting 2" there is only one fixing location 10C at a lower part of the housing 8. Two locating ribs 30 are at an upper part of the housing 8. The locating ribs 30 extend radially inwardly from the inner surface 8A of the housing 8 and are used to maintain location between the housing and the mounting bracket 4. In Figure 9 the mounting bracket 4 has been omitted so that the locating ribs 30 are clearly shown.

[0039] In the third luminaire mounting 2" there is no annular spacer between the mounting bracket 4 and the housing 8.

Claims

1. A luminaire mounting (2) comprising a housing (8) securable to a mounting bracket (4) by means of a mechanical fixing (26), the mechanical fixing (26) being galvanically isolated from the housing (8) by an interposing first insulator (14) comprising an electrically insulating material.
2. A luminaire mounting (2) according to claim 1, wherein the housing (8) includes an opening (12) and the first insulator (14) is located in the opening (12) to define an inner opening for receiving the mechanical fixing (26).
3. A luminaire mounting (2) according to claim 2, further comprising a fixing plate (18) including an internally screw-threaded opening (24), the fixing plate (18)

being captively located in a channel (16) of the housing (8) with the screw-threaded opening (24) in register with the inner opening, wherein the mechanical fixing is an externally screw-threaded mechanical fixing (26) that is received through the inner opening and the internally screw-threaded opening (24) in the fixing plate (18).

4. A luminaire mounting (2) according to claim 3, wherein the fixing plate (18) comprises a first material (20) that is galvanically isolated from the housing (8) by an interposing second insulator (22) comprising an electrically insulating material.
5. A luminaire mounting (2) according to claim 4, wherein the second insulator (22) is part of the fixing plate (18).
6. A luminaire mounting (2) according to claim 4 or claim 5, wherein the housing (8) comprises a second material dissimilar to the first material.
7. A luminaire mounting (2) according to any preceding claim, further comprising a third insulator (28) comprising an electrically insulating material, the third insulator (28) being interposed between the housing (8) and the mounting bracket (4) when the luminaire mounting (2) is secured to the mounting bracket (4) in use to galvanically isolate the housing (8) from the mounting bracket (4).
8. A luminaire mounting (2) according to any preceding claim, wherein part of the housing (8) is substantially cylindrical and is adapted to receive the mounting bracket (4) in use.
9. A luminaire mounting (2") according to claim 8, wherein the substantially cylindrical part of the housing (8) includes one or more locating ribs (30).
10. A luminaire mounting (2) according to any preceding claim, comprising a plurality of mechanical fixings (26), each mechanical fixing (26) being galvanically isolated from the housing (8) by a respective interposing first insulator (14) comprising an electrically insulating material.
11. A luminaire mounting (2) according to any of claims 3 to 6, wherein the housing (8) includes a plurality of openings (12) and the fixing plate (18) includes a plurality of internally screw-threaded openings (24), the luminaire mounting (2) further comprising:

a plurality of first insulators (14), each first insulator (14) being located in a respective opening (12) to define an inner opening, the fixing plate (18) being captively located in the channel (16) with the screw-threaded openings (24) in register

ter with the inner openings; and
 a plurality of mechanical fixings, each mechanical fixing being an externally screw-threaded mechanical fixing (26) that is received through a respective inner opening and a respective internally screw-threaded opening (24) in the fixing plate (18). 5

12. A luminaire mounting (2) according to any of claims 3 to 6, wherein: 10

the housing (8) includes a second opening (12),
 the luminaire mounting (2) further comprising:

a fourth insulator (14) located in the second opening (12) to define a second inner opening; 15
 a second fixing plate (18) including an internally screw-threaded opening (24), the second fixing plate (18) being captively located in a second channel (16) of the housing (8) with the screw-threaded opening (24) in register with the second inner opening; and 20
 a second mechanical fixing, wherein the second mechanical fixing is an externally screw-threaded mechanical fixing (26) that is received through the second inner opening and the internally screw-threaded opening (24) in the second fixing plate (18). 25

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13. A luminaire mounting (2) according to claim 12, wherein the channels (16) are circumferentially spaced around the housing (8).

14. An assembly comprising a luminaire mounting (2) according to any of claims 4 to 6 and a mounting bracket (4) comprising the first material, wherein the mounting bracket (4) is fixedly secured thereto by the mechanical fixing(s) when adjusted to a securing position. 35 40

15. An assembly comprising a luminaire mounting (2) according to claim 7 and a substantially cylindrical mounting bracket (4), wherein the mounting bracket (4) is received within the housing (8) and fixedly secured thereto by the mechanical fixing(s) when adjusted to a securing position, the third insulator (28) being substantially annular and interposed between an inner surface (8A) of the housing (8) and an outer surface (4A) of the mounting bracket (4). 45 50

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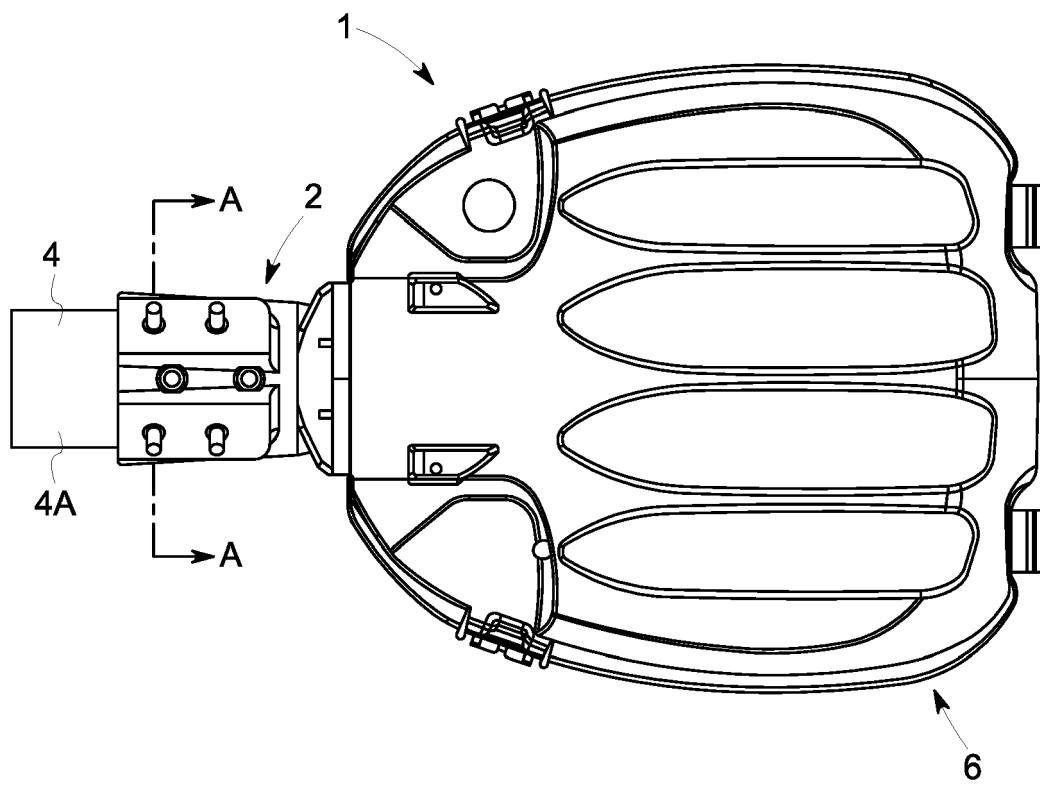


FIG. 1

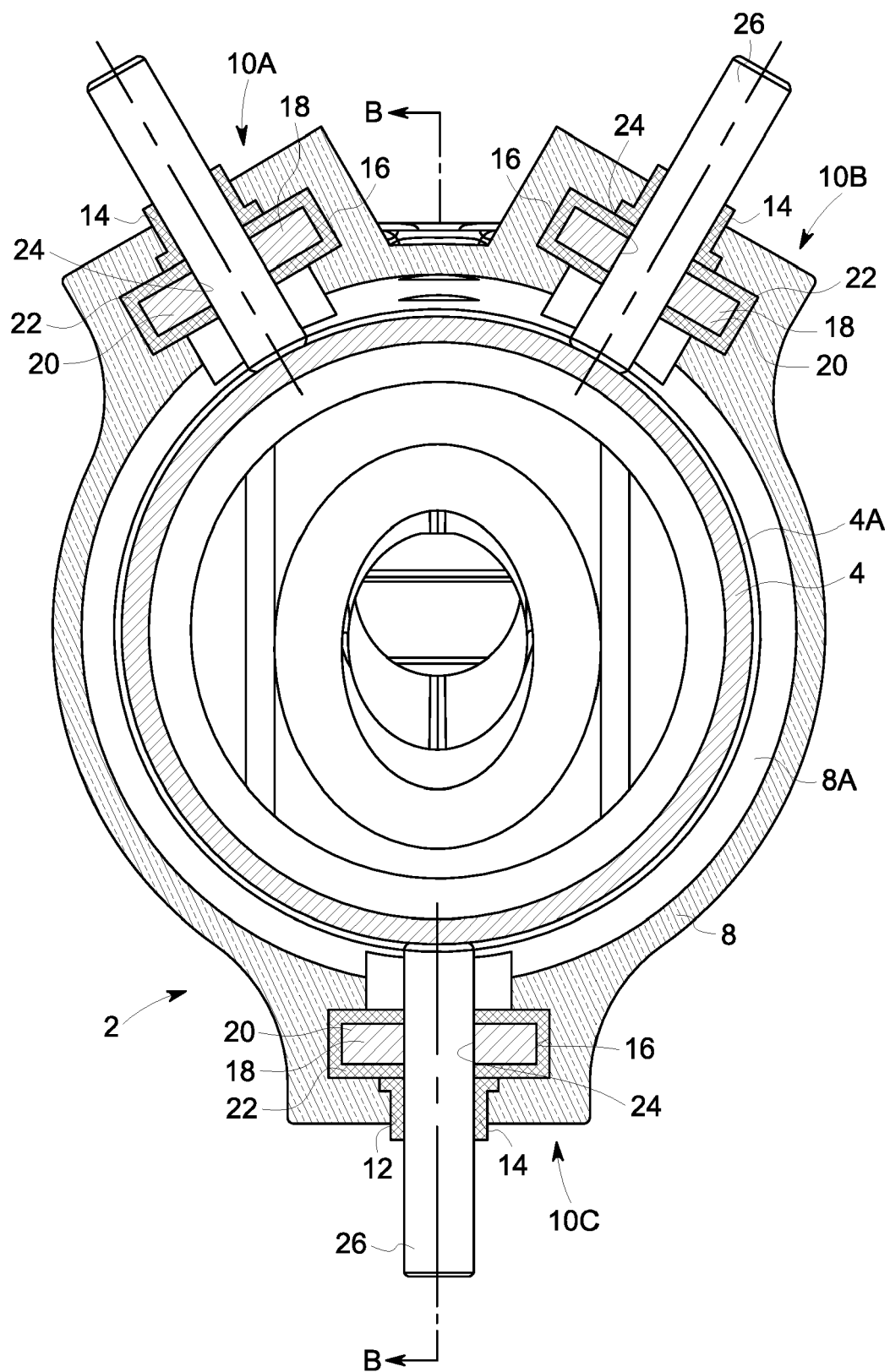


FIG. 2

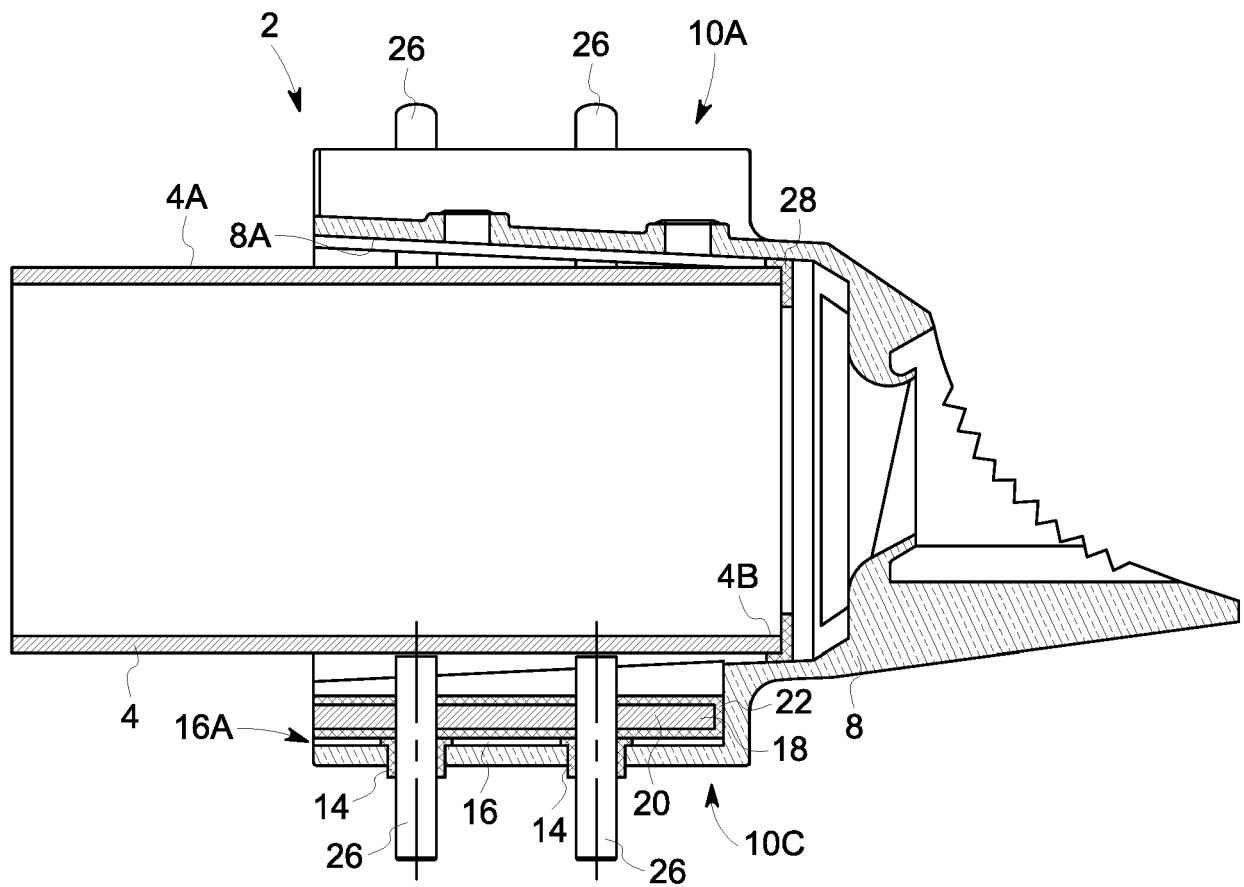


FIG. 3

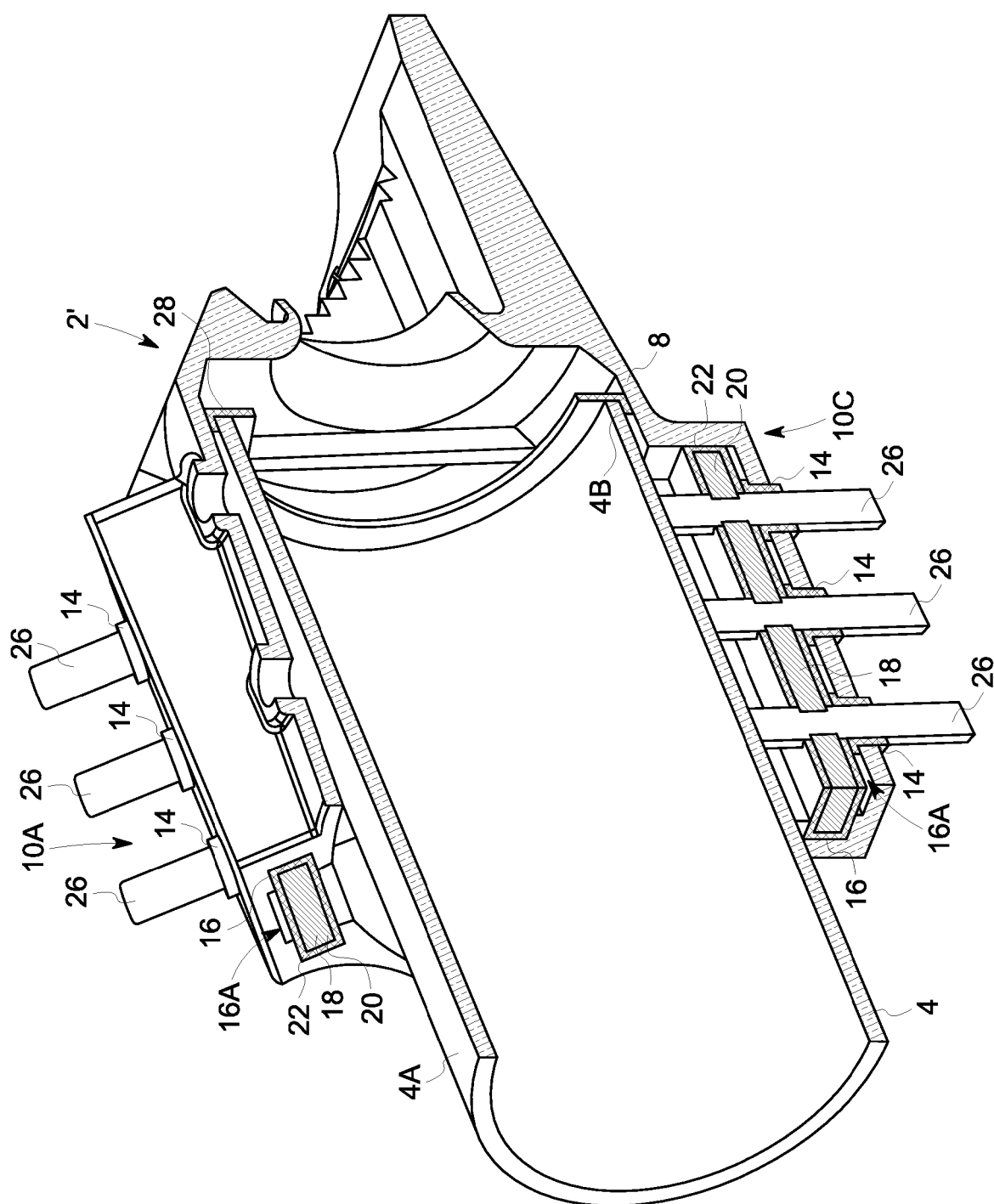


FIG. 4

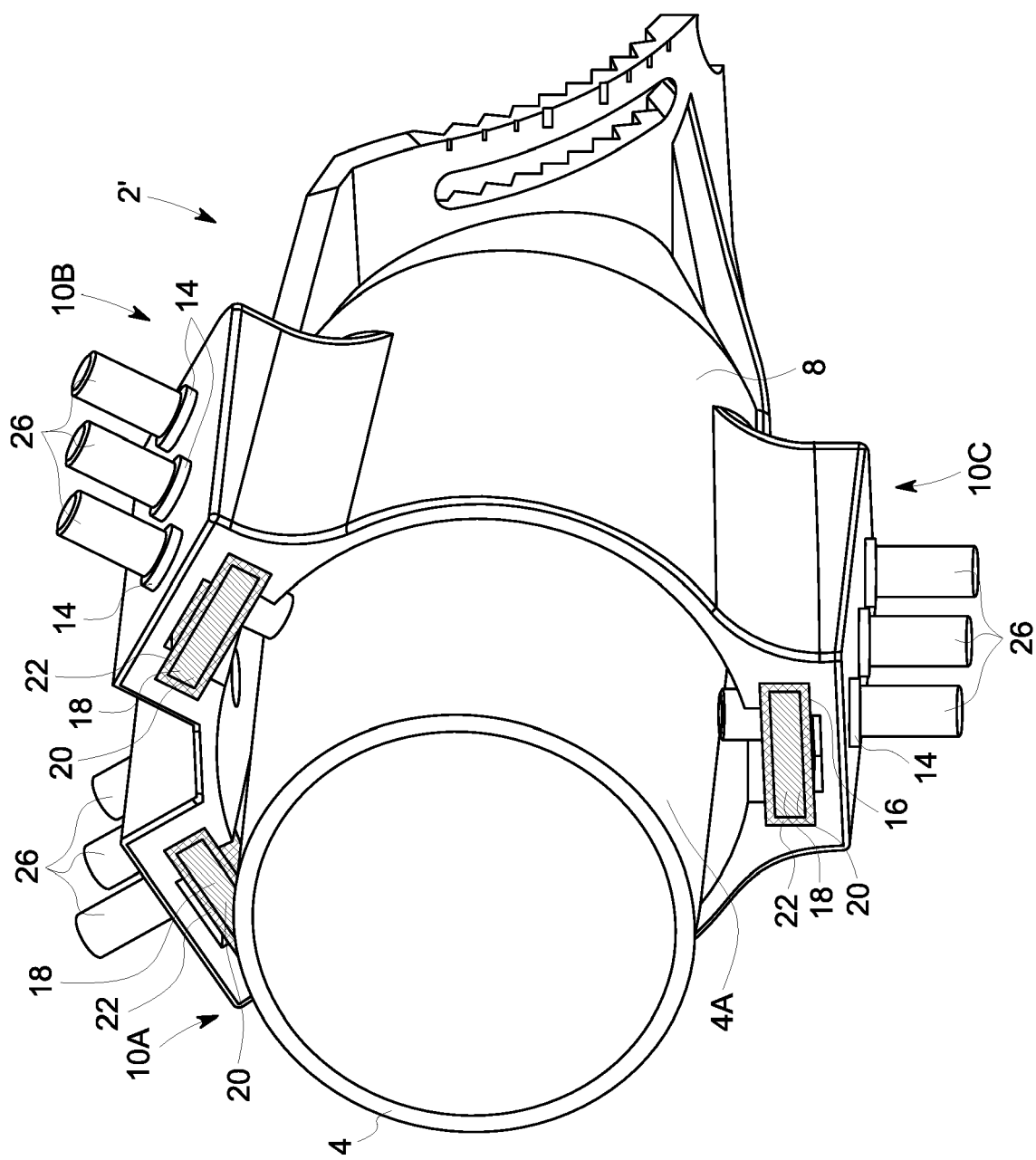


FIG. 5

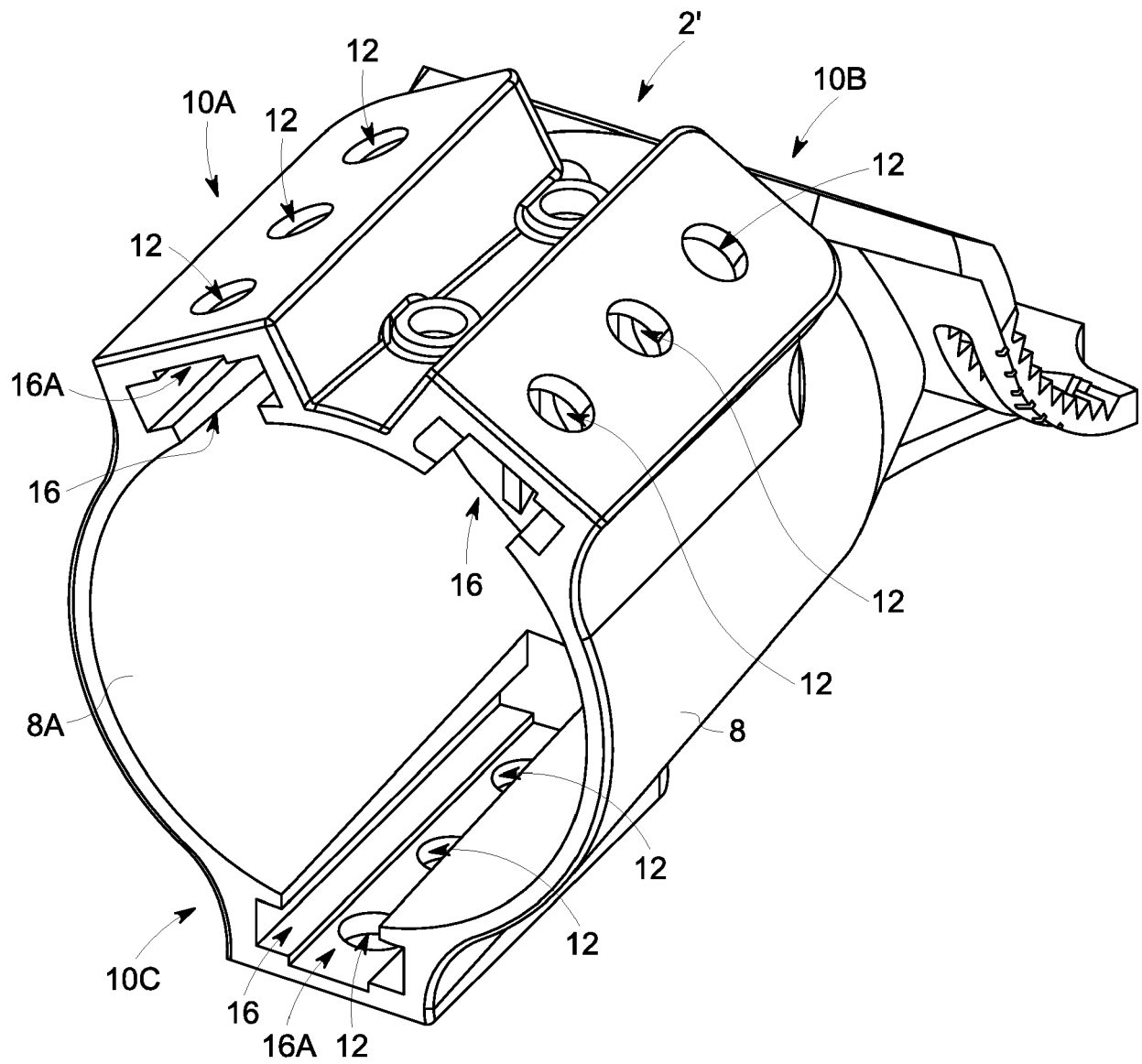


FIG. 6

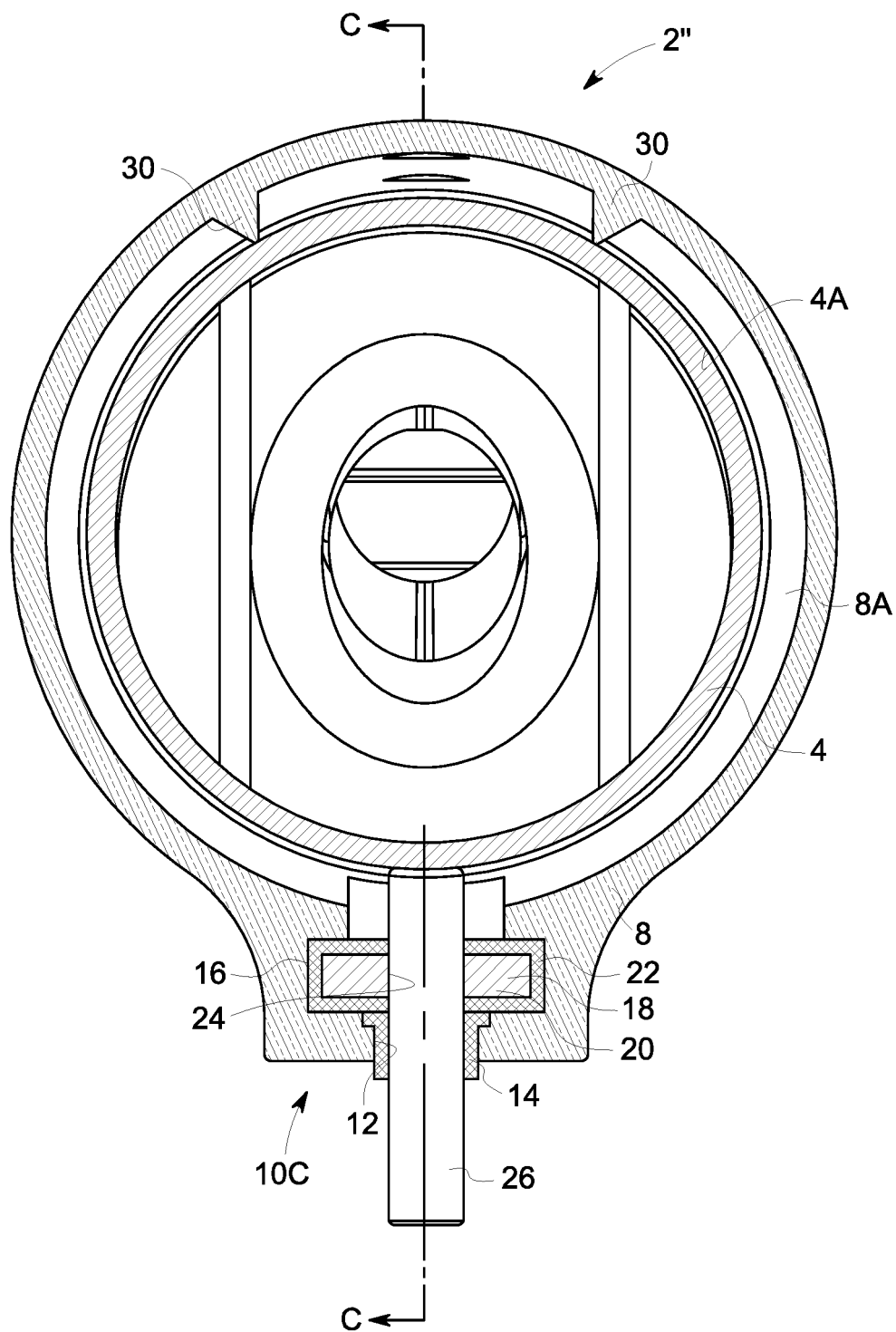


FIG. 7

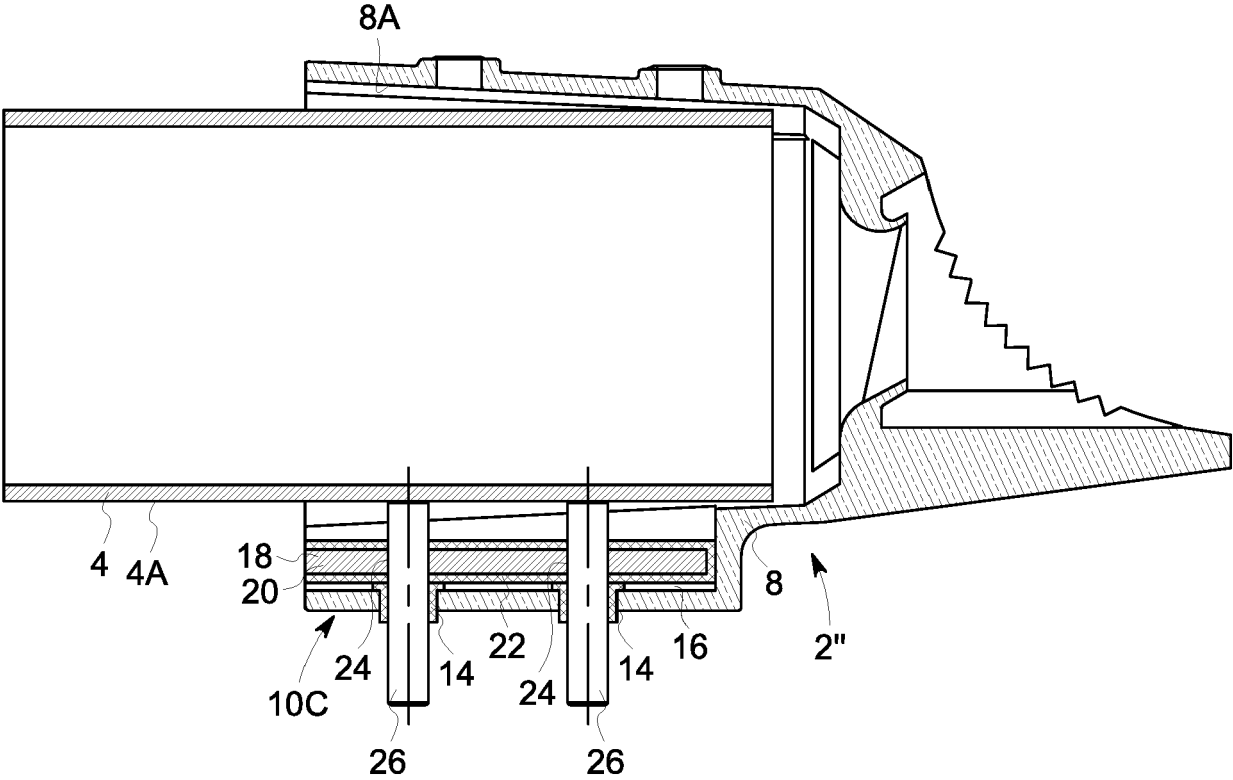


FIG. 8

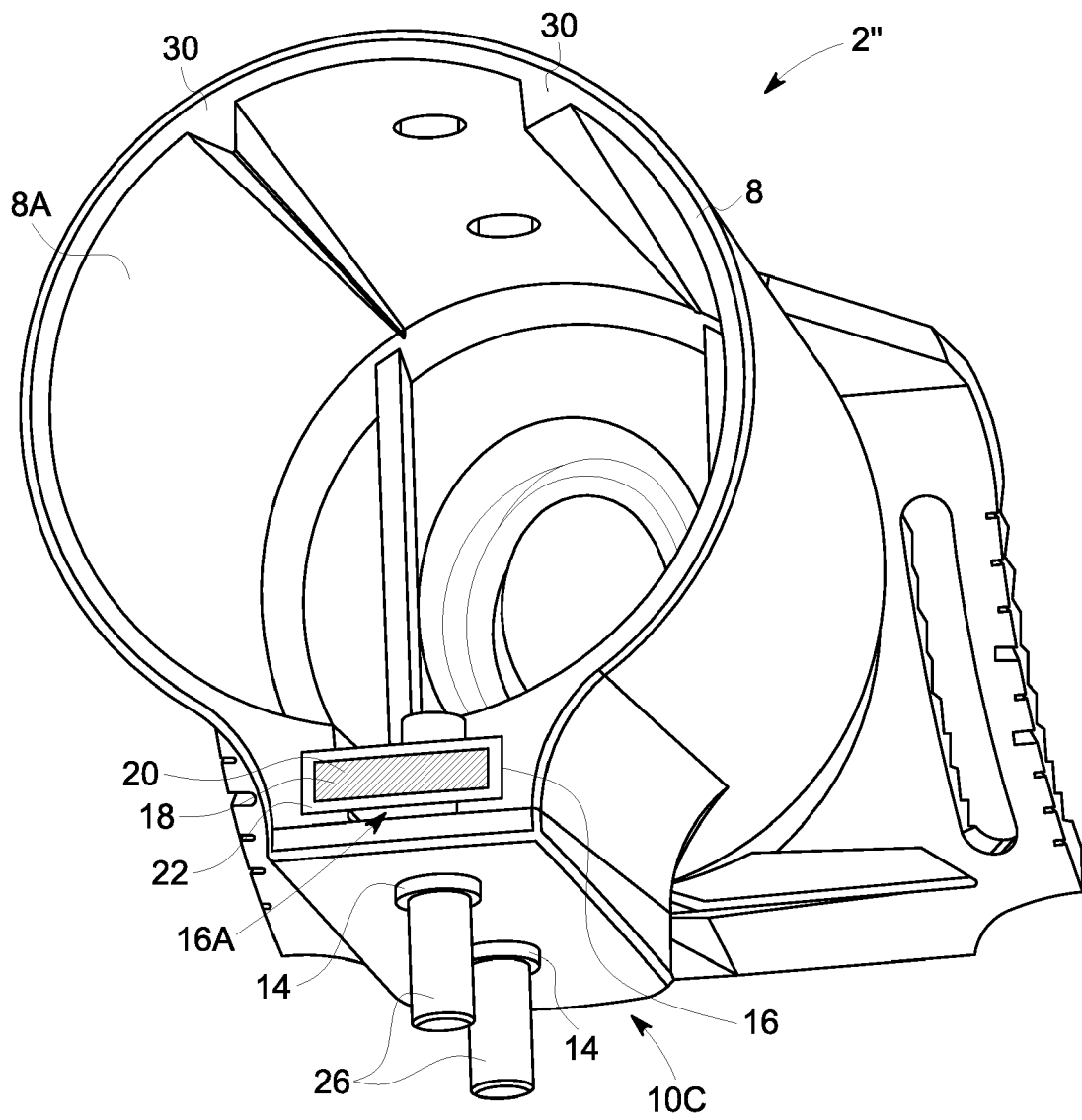


FIG. 9



EUROPEAN SEARCH REPORT

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 EP 16 20 4857

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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