



(11) **EP 3 795 888 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.03.2021 Bulletin 2021/12

(51) Int Cl.:
F21K 9/272 (2016.01) **F21S 2/00** (2016.01)
F21V 15/015 (2006.01) **F21V 19/00** (2006.01)
H01R 13/717 (2006.01) **H01R 33/08** (2006.01)

(21) Application number: **20000340.8**

(22) Date of filing: **23.09.2020**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **23.09.2019 IT 201900017039**

(54) **LED LAMP**

(57) Lamp (10) with at least one low voltage LED light source (T), wherein said LED light source (T) has, at its axial ends, at least one electrical and/or mechanical connecting plug (T1) said lamp (10) comprising:

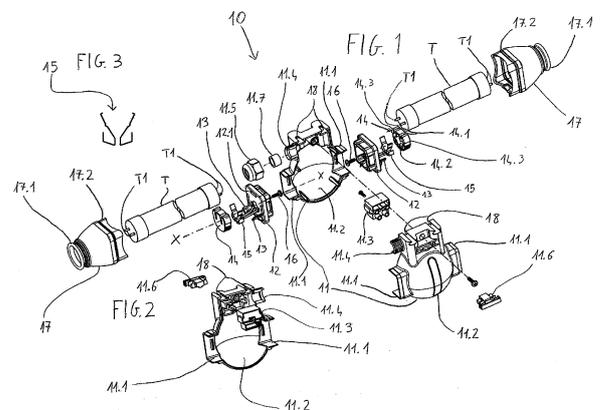
- at least one supporting body (11) for said LED light source (T);
- at least one supporting plate (12) for said at least one LED light source (T), wherein:
 - said at least one supporting plate (11) has at least one housing seat (11.1) for said at least one supporting plate (12) of said at least one LED light source (T),
 - said at least one supporting plate (12) comprises a fixed and rotation limiting circular arc-shaped cradle support (13), having an axis (X-X), and
 - said at least one plate (12) is disposed fixed and prevented from rotating with respect to said supporting body (11);

- at least one rotational connector means (14) of said at least one LED light source (T) in said rotation limiting cradle support (13), oscillating around said axis (X-X), configured as a small plate (14) having at least one notch (14.1) open on the peripheral boundary to create a mechanical connection with said plug (T1) and at least one shoulder (14.3) cooperating with said rotation limiting cradle support (13);
- at least one laminar electrical contact (15), which creates an electric contact with said at least one LED light source (T);
- connecting means (16) of said supporting plate (12) and said rotational connector means (14) with the possibility of oscillating around said axis (X-X).

According to the invention, said lamp (10) also com-

prises:

- said at least one LED light source (T) having on each of its axial ends at least two plugs (T1);
- at least a pair of notches (14.1) made in said small plate (14), parallel to one another and having a distance between one another equal to the distance between said two plugs (T1) protruding from a respective end of said at least one LED light source (T);
- at least one pair of laminar electrical connectors (15) fixed to said rotational connector means (14) and which create an electrical contact with said two plugs (T1), which are mechanically connected to said notches (14.1).



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Description

[0001] The present invention relates to a low-voltage LED lamp.

[0002] The LED tube lamp is known, which is a particular LED lamp with the same shape as tubular linear fluorescent lamps. Inside, it is composed of many LED diodes that emit light.

[0003] Document WO 2010/005682 A2 describes a LED lamp having the characteristics specified in the pre-characterizing part of claim 1.

[0004] There is felt a need to provide a lamp with at least one LED light source electrically and mechanically connectable to a plurality of mechanical supports such as, for example, busways or flat surfaces, in a simple and safe manner.

[0005] There is also felt a need to connect a plurality of LED lamps, even of different shapes and lengths, by means of interchangeable, structurally simplified means that are small in volume, easy to clean and safe to use.

[0006] Moreover, it is desirable to have LED lamps whose light beam can be oriented to optimise the ambient illumination, to obviate the technical limit of the strong directionality of light from a LED lamp with respect to an equivalent fluorescent or incandescent lamp.

[0007] There is also felt the need to configure the LED lamp in an appropriate manner depending on the different conditions of use.

[0008] In view of these objects, the present invention provides a lamp with at least one low-voltage LED light source, the essential characteristic of which forms the object of claim 1.

[0009] Further advantageous characteristics of the invention are described in the dependent claims.

[0010] Characteristics and advantages of the invention will become more evident from the following detailed description of examples of embodiments thereof, with reference to the attached drawings, which show important details for the invention, and from the claims.

[0011] The characteristics illustrated herein should not necessarily be considered as being to scale and are shown in such a way that the particular features of the invention are clearly highlighted.

[0012] The various characteristics can be produced singly or in any combination with one another, as variants of the invention.

[0013] In particular, the lamp comprises at least one low-voltage LED light source, wherein said LED light source has, at its axial ends, at least one electrical and/or mechanical connecting plug. Furthermore, said lamp comprises:

- at least one supporting body for said LED light source;
- at least one supporting plate for said at least one LED light source, wherein:
 - said at least one supporting body has at least

one housing seat for said at least one supporting plate of said at least one LED light source,

- said at least one supporting plate comprises a fixed and rotation limiting circular arc-shaped cradle support having an axis X-X, and
- said at least one plate is disposed fixed and prevented from rotating with respect to said supporting body;

- 10 - at least one rotational connector means for said at least one LED light source in said rotation limiting cradle support, oscillating around said axis X-X, configured as a small plate having at least one notch open on the peripheral boundary to create a mechanical connection with said plug and at least one shoulder cooperating with said rotation limiting cradle support;
- 15 - at least one laminar electrical contact, which creates an electrical contact with said at least one LED light source;
- 20 - connecting means for said supporting plate and said rotational connector means with the possibility of oscillating around said axis X-X.

25 **[0014]** According to the invention, said lamp further comprises:

- said at least one LED light source having on each of its axial ends at least two plugs;
- 30 - at least a pair of notches made in said small plate, parallel to one another and having a distance between one another equal to the distance between said two plugs protruding from a respective end of said at least one LED light source;
- 35 - at least one pair of laminar electrical connectors fixed to said rotational connector means, and which create an electrical contact with said two plugs, which are mechanically connected to said notches.

40 **[0015]** Moreover, said lamp is characterised in that it comprises at least one LED light source, a pair of said supporting bodies mechanically independent from one another, with respective supporting plates and corresponding rotation limiting cradle supports, wherein said LED light source has at each end at least one plug mechanically connected to a corresponding notch of a corresponding rotational connector means, with only one plug being electrically connected to a low voltage electrical grid.

45 **[0016]** Moreover, said lamp is characterised in that said supporting body is made of at least one part, which has a housing for at least one supporting plate and includes an electrical connector board configured to electrically connect said at least one laminar electrical connector to a low voltage electrical grid. Advantageously, said lamp is also characterised in that said supporting body comprises two specularly symmetrical half-shells.

[0017] Said lamp is further characterised in that it com-

prises at least one threaded sleeve integrated with said supporting body and a corresponding locking nut screwed onto said sleeve, configured to internally detachably fix an electrical connection means to said electrical connector board, and a tubular gasket housed inside said threaded sleeve and configured to internally contain said electrical connection means and to prevent the entrance of contaminants external to said locking nut via said threaded sleeve.

[0018] Furthermore, said lamp is characterised in that said rotational connector means comprises a hollow plate which houses internally said at least one laminar electrical connector corresponding to a respective notch, and said supporting plate comprises at least one opening configured to allow the passage of an electrical connection between said laminar electrical connector and said electrical connector board.

[0019] Said lamp is also characterised in that it comprises an automatic electrical disconnection device between said at least one laminar electrical connector and a low voltage electrical grid.

[0020] Moreover, said lamp is characterised in that it comprises, in at least an extremity zone of said LED light source, a cap comprising a collar shoed onto said at least one LED light source and a peripheral boundary, opposed to said collar, shaped like said housing seat and shoed onto it.

[0021] Furthermore, said lamp is characterised in that said supporting body cooperates with corresponding connection means with respect to an external supporting means, which are configured to mechanically support said supporting body by detachably fixing with at least one coupling device.

[0022] Moreover, said lamp is characterised in that said supporting plate comprises, on one of its external surfaces, said rotation limiting cradle support.

[0023] Said lamp is further characterised in that it comprises:

- at least one supporting body, having at least one first housing seat;
- at least one connecting hollow body which comprises at least a part comprising:
- at least one second housing seat of a corresponding supporting plate for at least one LED light source, wherein said plate comprises a fixed and rotation limiting circular arc-shaped cradle support having axis X'-X', and wherein said plate is disposed fixed and prevented from rotating with respect to said hollow body;
- at least one rotational connector means of said at least one LED light source in said rotation limiting cradle support, oscillating around said axis X'-X', configured as a small plate having at least one notch open on its peripheral boundary to create a mechanical connection with said plug e and at least one shoulder cooperating with said rotation limiting cradle support;

- at least one laminar electrical contact which creates an electrical contact with said at least one LED light source;
- connecting means for said supporting plate and said rotational connector means with the possibility to oscillate around said axis X'-X';
- wherein said connecting hollow body comprises also at least one coupling device configured to cooperate with said first housing seat of said first supporting body, detachably fixing said connecting hollow body to said supporting body.

[0024] Said lamp also comprises at least one closing means configured to be detachably fixed with respect to said second housing seat, or to said first housing seat and a cover shoed onto said at least one closing means and said second housing seat, or said first housing seat.

[0025] In the drawing:

- figure 1 shows an exploded perspective view of the lamp with two LED tubes, according to a first embodiment of the invention;
- figure 2 shows a partial perspective view of a part of the lamp shown in figure 1, including an electrical connector board and an automatic electrical disconnection device;
- figure 3 shows a schematic view of the electrical contacts used in the lamp according to the examples shown;
- figure 4 shows an elevated view of an LED lamp comprising two supporting bodies according to figures 1 and 5;
- figure 5 shows a perspective view of a supporting body when assembled in the lamp configuration shown in figure 1;
- figure 6 shows a perspective view of said supporting body when assembled in a different lamp configuration from that shown in figure 1;
- figure 7 shows an exploded perspective view of the lamp with two LED tubes, according to a different configuration from that shown in figure 1;
- figure 8 shows an elevated view of an LED lamp comprising two supporting bodies according to figure 7;
- figure 9 shows an elevated view of an LED lamp comprising two supporting bodies according to figure 7, mechanically connected to a busway for the distribution of electrical energy;
- figure 10 shows an exploded perspective view of the lamp with two LED tubes, according to a different configuration from that shown in figures 1 and 6;
- figure 11 shows an elevated view of the LED lamp comprising two supporting bodies according to figure 10;
- figure 12 shows a perspective view of a supporting body when assembled in the lamp configuration shown in 10;
- figure 13 shows a perspective view of said support-

ing body when assembled in a different lamp configuration from that shown in figure 10;

- figure 14 shows an exploded perspective view of a second embodiment of the LED lamp according to the invention, comprising a supporting body when assembled and two connecting hollow bodies each supporting two LED tubes, respectively.

FIRST EMBODIMENT

[0026] With reference to the drawing, the reference number 10 indicates in figure 1 the lamp with two low-voltage LED T tubes, according to a first example of embodiment. Each LED T tube has a generally cylindrical shape and at the axial ends a respective pair of electrical and mechanical connecting plugs T1. According to the invention, said lamp 10 comprises, with reference to figure 1:

- a hollow supporting body 11 with a generally ovoid shape, which has a housing seat 11.1 for a corresponding supporting plate 12, comprising on one of its external surfaces 12.1 a fixed and rotation limiting circular arc-shaped cradle support 13 having axis X-X, wherein said plate 12 is disposed fixed and prevented from rotating with respect to said hollow supporting body 11. Said hollow body 11 also has a second seat 11.1 aligned along said axis X-X, wherein a second plate 12 is disposed fixed and prevented from rotating with respect to said supporting body 11. Said hollow body 11 is made of a moulded plastic material and has a generally ovoid shape with overlying an essentially prismatic integrated body;
- a rotational connector means 14 of said LED T tube in said rotation limiting cradle support 13, oscillating around said axis X-X, configured as a small plate 14 having a pair of notches 14.1, open on the peripheral boundary, configured to create a mechanical connection with said plugs T1 protruding from each end of each of said LED T tubes, fully inserted from the top towards the bottom in said notches 14.1. Said rotational connector means 14 is made of a hollow plate 14.2 in moulded plastic material and has on its peripheral boundary a pair of shoulders 14.3 cooperating with said cradle support 13 to limit the rotation of said small plate around said axis X-X;
- a pair of laminar electrical contacts 15, made of a conductive material, fixed to said rotational connector means 14, which create an electrical contact with each of said two plugs T1 fully inserted in said notches 14.1;
- connecting means 16 for said supporting plate 12 and said rotational connector means 14. Said connecting means 16 comprise screw means, also configured as a pin with an axis coincident with said axis X-X;
- a pair of detachable coupling devices 18 configured to support said hollow supporting body 11, by means

of elastic snap fastening, with a pair of respective mutually cooperating devices of a fitting not illustrated.

[0027] In particular, said hollow supporting body 11 is made of two half-shells 11.2 specularly symmetrical with respect to a plane containing said axis X-X, and which contain an electrical connector board 11.3 configured for the electrical connection between said pair of laminar electrical connectors 15 and a low voltage electrical grid.

[0028] Said lamp 10 also comprises a threaded sleeve 11.4 integrated with the hollow body 11 and a locking nut 11.5 screwed onto said sleeve 11.4, configured to internally detachably fix an electrical connection means (an electric cable) electrically branched from said electrical grid and electrically connected to said electrical connector board 11.3.

[0029] Said lamp 10 also comprises a tubular gasket 11.7 housed inside said threaded sleeve 11.4 and configured to internally contain the electrical connection means coming from said electrical grid and to prevent the entrance of contaminants external to said locking nut 11.5 via said threaded sleeve 11.4.

[0030] Said lamp 10 also comprises an automatic electrical disconnection device 11.6, for example a fuse, which creates an electrical connection between said pair of laminar contacts 15 and said connector board 11.3.

[0031] With reference to figures 5 and 6, which illustrate the supporting body 11 without the corresponding LED tube, it will be noted that said supporting body 11 can for example be arranged in a vertical position (figures 5 and 12), wherein the sleeve 11.4 overlies said plate 14, or in a horizontal position (figures 6 and 13), wherein said sleeve 11.4 is lateral with respect to said plate 14, while still maintaining the arrangement of the notches 14.1 vertical and open at the top. This characteristic is achieved by arranging the supporting plate 12 in a different relative position with respect to the corresponding seat 11.1 of the body 11, i.e. by rotating it around the axis X-X by an angle of 90° in an anticlockwise direction.

[0032] In the example shown in figure 1, two LED T tubes, aligned axially, are each supported in an overhanging manner by a single supporting body 11.

[0033] In the example shown in figure 4, on the other hand, a single LED T tube is supported by a pair of supporting bodies 11 mechanically independent from one another. It will be noted that, at each end of the LED T tube, there is provided a cap 17, made of flexible plastic material, having a cylindrical collar 17.1 shoed onto the LED T tube and an opposed quadrangular peripheral boundary 17.2 shoed onto a corresponding seat 11.1 of each supporting body 11.

[0034] Although not illustrated in figure 1, the two LED tubes shown in said figure are provided with respective caps 17, similar to those shown in figure 4, which cooperate with the corresponding seats 11.1 of the supporting body 11 in the overhanging support of the respective LED tube.

[0035] With reference to figures 7 to 9, an embodiment variant of the invention is shown, wherein said pair of detachable coupling devices 18 of said hollow supporting body 11 cooperate with a respective pair of devices present on an overlying part B for elastic snap fastening. This configuration enables the suspension of said hollow supporting body 11 from a busway for the distribution of electrical energy.

[0036] Figure 9 also shows a closing means 11.8, configured as a safety plug made of plastic material, elastically snap fastened into a seat 11.1 not occupied by a small plate 12.

[0037] Figures 10 to 13 show another embodiment variant of the invention, wherein said pair of detachable coupling devices 18 of said hollow supporting body 11 cooperate with a respective pair of devices present on the part P for elastic snap fastening. This configuration enables said hollow supporting body 11 to be supported by flat surfaces by means of other known fastenings not illustrated here, such as, for example, dowels, magnets, screw clamps or elastic clamps.

SECOND EMBODIMENT

[0038] With reference to the drawing, the reference number 20 indicates in figure 14 the lamp with four low-voltage LED T tubes, according to a second example of embodiment.

[0039] Said supporting body 11 provides a pair of housing seats 11.1, each one elastically snap fastened to a respective coupling device 28 of a cross-shaped connecting hollow body 21. Said cross-shaped connecting hollow body 21 comprises two specularly symmetrical half-shells made of a plastic material and provides said coupling device 28 and three housing seats 21.1 configured to receive respective supporting plates 22, or respective safety plugs 21.8 made of a plastic material, elastically snap fastened and covered by corresponding covers 21.9 made of an elastomeric material. In the example shown in figure 14, with reference to one of said cross-shaped bodies 21, said safety plug 21.8 is placed in a distal position with respect to said supporting body 11, and a pair of supporting plates 22, opposite one another, occupy the two remaining housing seats 21.1. Each of said supporting plates 22 is provided with rotational means 24 for connecting a LED T tube to a corresponding rotation limiting cradle support 23, oscillating around an axis X'-X', and is configured as a small plate 24 having a pair of notches 24.1, open on the peripheral boundary and creating a mechanical connection with respective plugs T1 protruding from each end of each said LED T tube, fully inserted from the top towards the bottom in said notches 24.1. Said rotational connector means 24 is made of a small hollow plate 24.2 in a moulded plastic material and has a pair of shoulders 24.3 cooperating with said cradle support 23 to limit the rotation of said small plate around said axis X'-X'. A pair of laminar electrical contacts 25, made of a conductive material,

fixed to said rotational connector means 24 create an electrical contact with each pair of plugs T1 of respective LED T tubes. Connecting means 26 for said supporting plates 22 and said rotational connector means 24 comprise screw means, also configured as a pin with an axis coincident with said axis X'-X'.

[0040] A possible variant of the invention, not illustrated, involves the electrical connection between said LED tube and said electrical connector board of a hollow supporting body by means of a pair of said laminar electrical connectors, electrically connected with a respective pair of small metallic plates disposed in contact on the longitudinal surface of said LED tube in a proximal position with respect to said rotational connector means of said hollow supporting body.

[0041] A further possible variant of the invention, not illustrated, involves the electrical connection between said LED tube and said electrical connector board by means of a single laminar electrical connector, placed at a respective notch cavity of said rotational connector means, thereby creating an electrical connection with at least one of said plugs of said LED tube.

[0042] As is evident from the above description, the present invention makes it possible, in a simple, effective manner, to achieve the objects set out in the introductory part of this description.

Claims

1. Lamp (10) with at least one low-voltage LED light source (T), wherein said LED light source (T) has, at its axial ends, at least one electrical and/or mechanical connecting plug (T1), said lamp (10) comprising:
 - at least one supporting body (11) for said LED light source (T);
 - at least one supporting plate (12) for said at least one LED light source (T), wherein:
 - said at least one supporting body (11) has at least one housing seat (11.1) for said at least one supporting plate (12) of said at least one LED light source (T),
 - said at least one supporting plate (12) comprises a fixed and rotation limiting circular arc-shaped cradle support (13), having an axis (X-X), and
 - said at least one plate (12) is disposed fixed and prevented from rotating with respect to said supporting body (11);
 - at least one rotational connector means (14) for said at least one LED light source (T) in said rotation limiting cradle support (13), oscillating around said axis (X-X), configured as a small plate (14) having at least one notch (14.1) open

on the peripheral boundary to create a mechanical connection with said plug (T1) and at least one shoulder (14.3) cooperating with said rotation limiting cradle support (13);

- at least one laminar electrical contact (15), which creates an electrical contact with said at least one LED light source (T);

- connecting means (16) for said supporting plate (12) and said rotational connector means (14) with the possibility of oscillating around said axis (X-X),

characterised in that said lamp (10) further comprises:

- said at least one LED light source (T) having on each of its axial ends at least two plugs (T1);

- at least a pair of notches (14.1) made in said small plate (14), parallel to one another and having a distance between one another equal to the distance between said two plugs (T1) protruding from a respective end of said at least one LED light source (T);

- at least one pair of laminar electrical connectors (15) fixed to said rotational connector means (14), and which create an electrical contact with said two plugs (T1), which are mechanically connected to said notches (14.1).

2. Lamp (10) according to claim 1, **characterised in that** it comprises at least one LED light source (T), a pair of mechanically independent said supporting bodies (11), with respective supporting plates (12) and corresponding rotation limiting cradle supports (13), wherein said LED light source (T) has at each end at least one plug mechanically connected to a corresponding notch (11.1) of a corresponding rotational connector means (14), with only one plug (14) being electrically connected to a low voltage electrical grid;

3. Lamp (10) according to claim 1 and/or 2, **characterised in that** said supporting body (11) is made of at least one part (11.2), which has a housing for at least one supporting plate (12) and includes an electrical connector board (11.3) configured to electrically connect said at least one laminar electrical connector (15) to a low voltage electrical grid.

4. Lamp (10) according to one or more of the preceding claims, **characterised in that** said supporting body (11) comprises two specularly symmetrical half-shells (11.2).

5. Lamp (10) according to one or more of the preceding claims, **characterised in that** it comprises at least one threaded sleeve (11.4) integrated with said supporting body (11) and a corresponding locking nut

(11.5) screwed onto said sleeve, configured to internally detachably fix an electrical connection means to said electrical connector board (11.3), and a tubular gasket (11.7) housed inside said threaded sleeve (11.4) and configured to internally contain said electrical connection means and to prevent the entrance of contaminants external to said locking nut (11.5) via said threaded sleeve (11.4).

6. Lamp (10) according to one or more of the preceding claims, **characterised in that** said rotational connector means (14) comprises a hollow plate (14.2) which houses internally said at least one laminar electrical connector (15) corresponding to a respective notch (14.1), and said supporting plate (12) comprises at least one opening configured to allow the passage of an electrical connection between said laminar electrical connector (15) and said electrical connector board (11.3).

7. Lamp (10) according to one or more of the preceding claims, **characterised in that** it comprises an automatic electrical disconnection device (11.6) between said at least one laminar electrical connector (15) and a low voltage electrical grid.

8. Lamp (10) according to one or more of the preceding claims, **characterised in that** it comprises, in at least an extremity zone of said LED light source (T), a cap (17) comprising a collar (17.1) shoed onto said at least LED light source (T) and a peripheral boundary (17.2), opposed to said collar (17.1), shaped like said housing seat (11.1) and shoed onto it.

9. Lamp (10) according to one or more of the preceding claims, **characterised in that** that said supporting body (11) cooperates with corresponding connection means with respect to an external supporting means (B, P), which are configured to mechanically support said supporting body (11) by detachably fixing with at least one coupling device (18).

10. Lamp (10) according to one or more of the preceding claims, **characterised in that** said supporting plate (12) comprises, on one of its external surfaces (12.1), said rotation limiting cradle support (13).

11. Lamp (10) according to one or more of the preceding claims, **characterised in that** it comprises:

- at least a supporting body (11), having at least one first housing seat (11.1);

- at least one connecting hollow body (21) which comprises at least a part comprising:

- at least one second housing seat (21.1) of a corresponding supporting plate (22) for at least one LED light source (T), wherein said

plate (22) comprises a fixed and rotation limiting circular arc-shaped cradle support (23) having axis (X'-X'), and wherein said plate (22) is disposed fixed and prevented from rotating with respect to said connecting hollow body (21);

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- at least one rotational connector means (24) of said at least one LED light source (T) in said rotation limiting cradle support (23), oscillating around said axis (X'-X'), configured as a small plate (24) having at least one notch (24.1) open on its peripheral boundary to create a mechanical connection with said plug (T1) and at least one shoulder (24.3) cooperating with said rotation limiting cradle support (23);
- at least one laminar electrical contact (25) which creates an electrical contact with said at least one LED light source (T);
- connecting means (26) for said supporting plate (22) and said rotational connector means (24) with the possibility to oscillate around said axis (X'-X');
- said connecting hollow body (21) comprises also at least one coupling device (28) configured to cooperate with said first housing seat (11.1) of said supporting body (11) detachably fixing said connecting hollow body (21) to said supporting body (11).

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12. Lamp (10) according to one or more of the preceding claims, **characterised in that** it comprises at least one closing means (11.8, 21.8) configured to be detachably fixed with respect to said second housing seat (21.1), or to said first housing seat (11.1), and a cover (21.9) shoed onto said at least one closing means (11.8, 21.8) and said second housing seat (21.1), or said first housing seat (11.1).

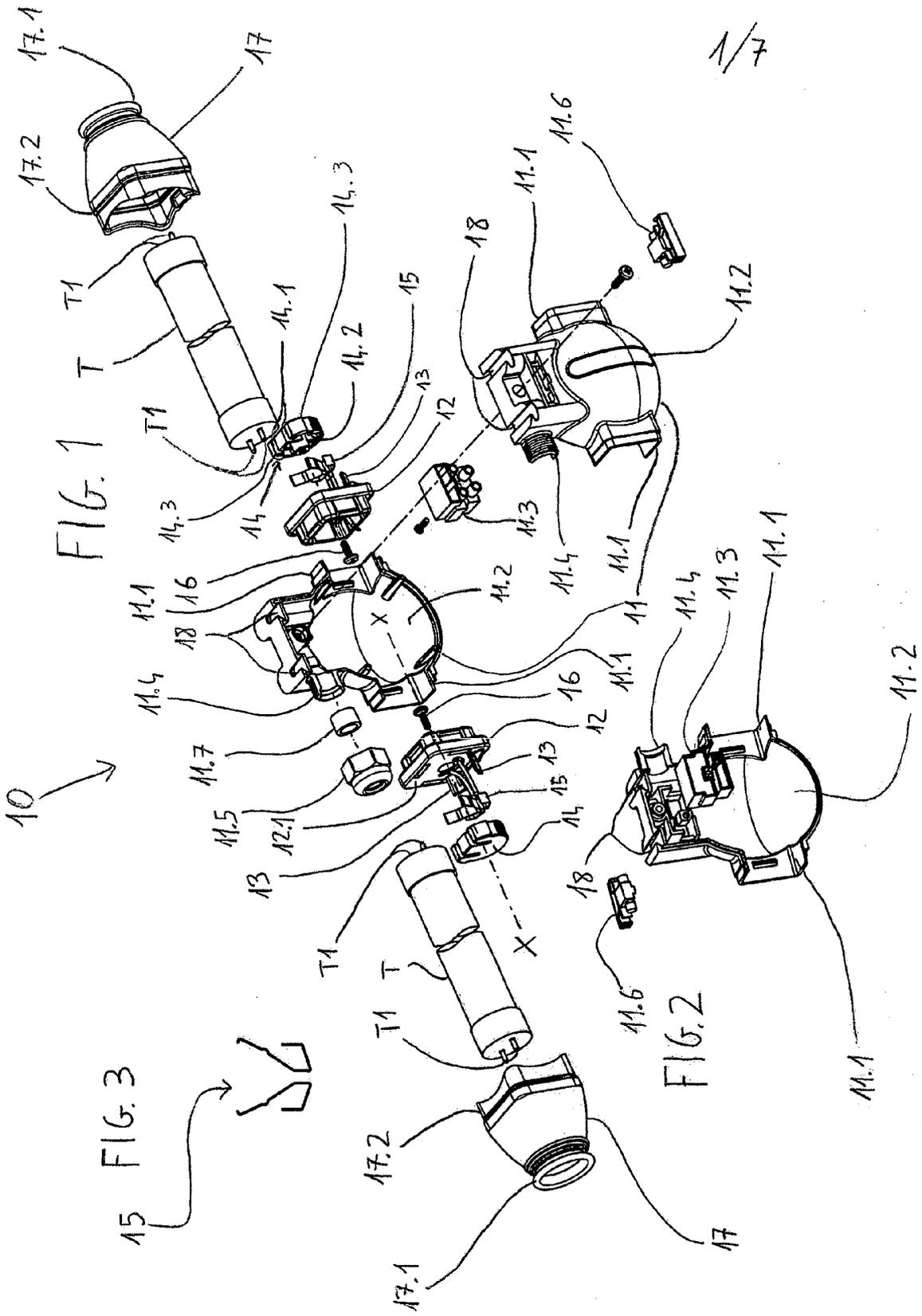
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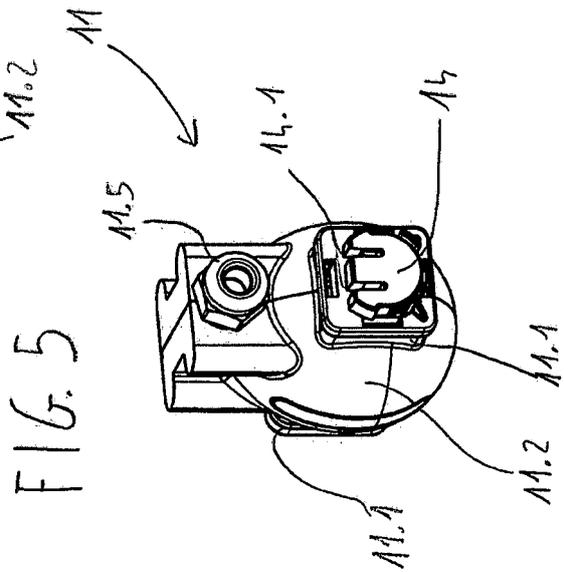
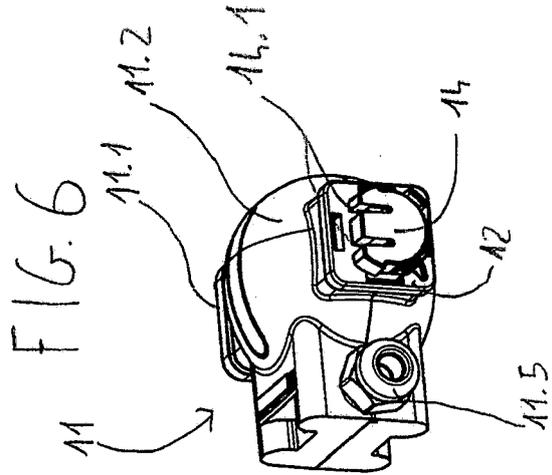
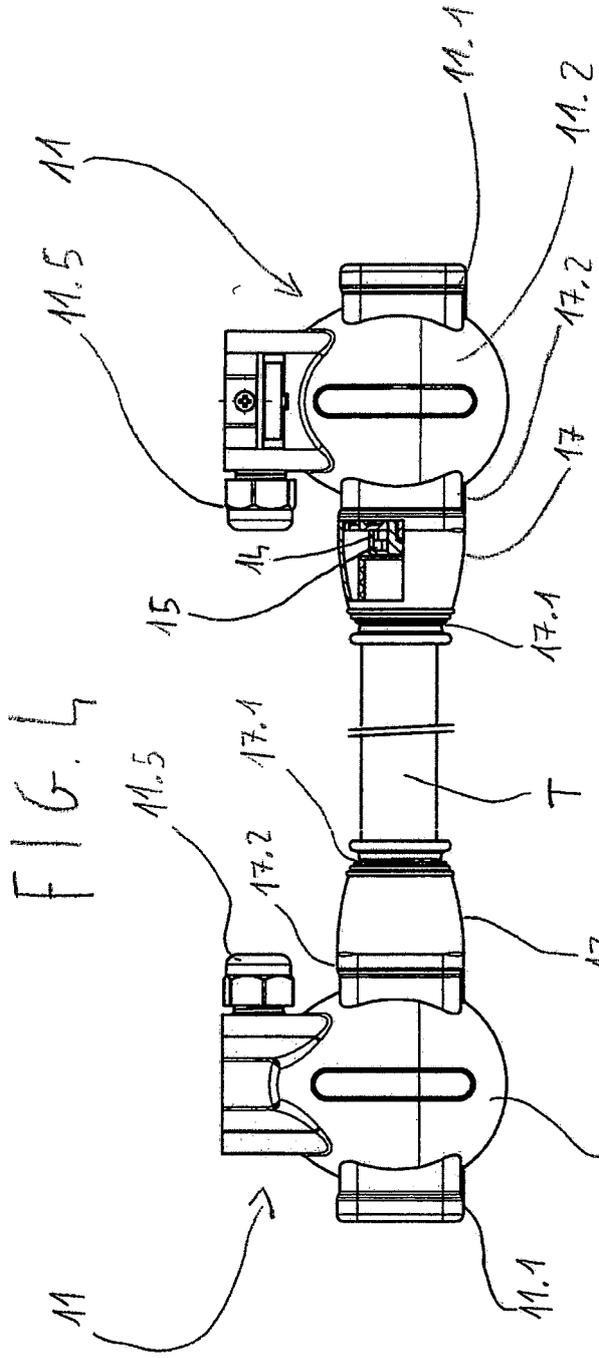
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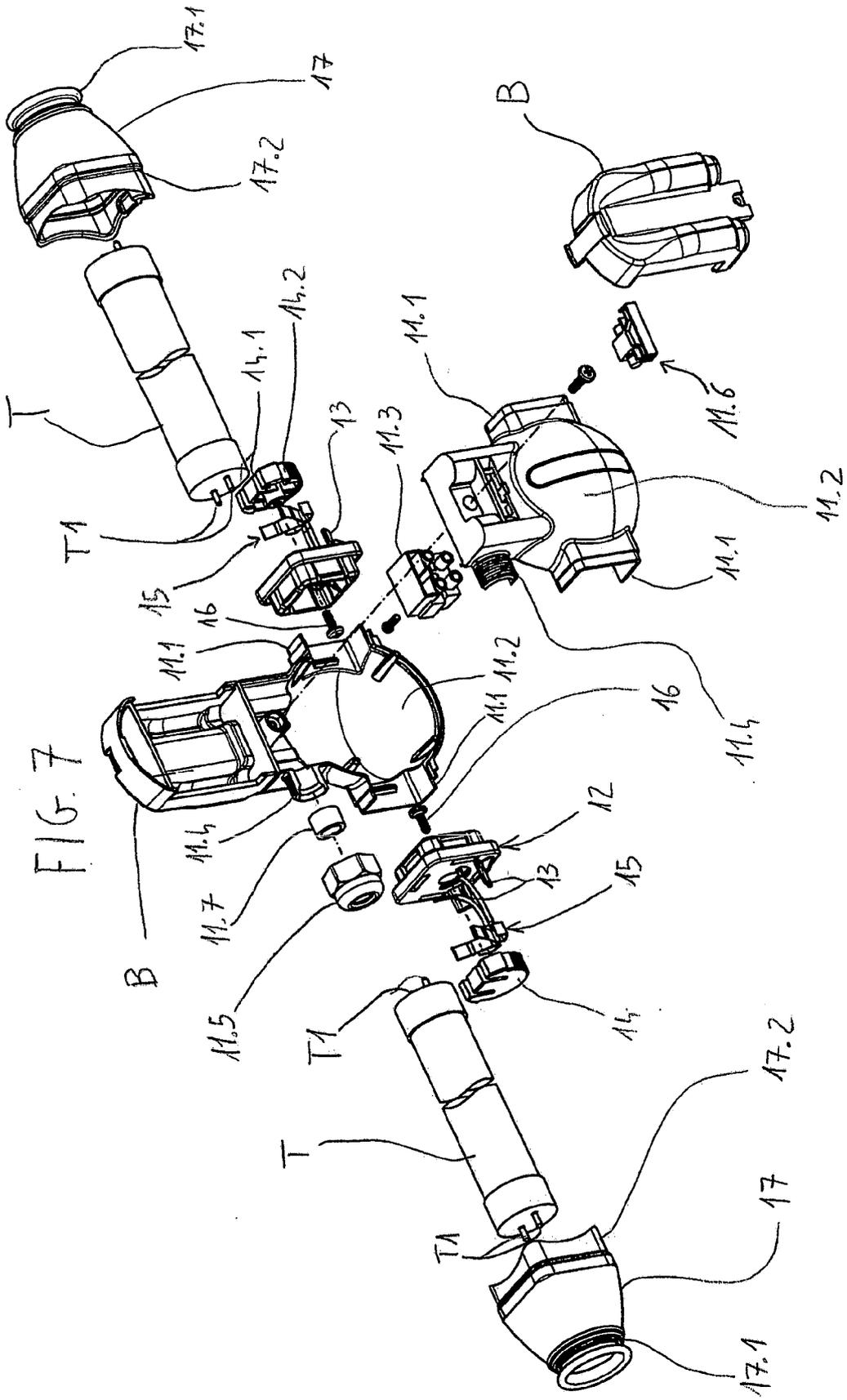
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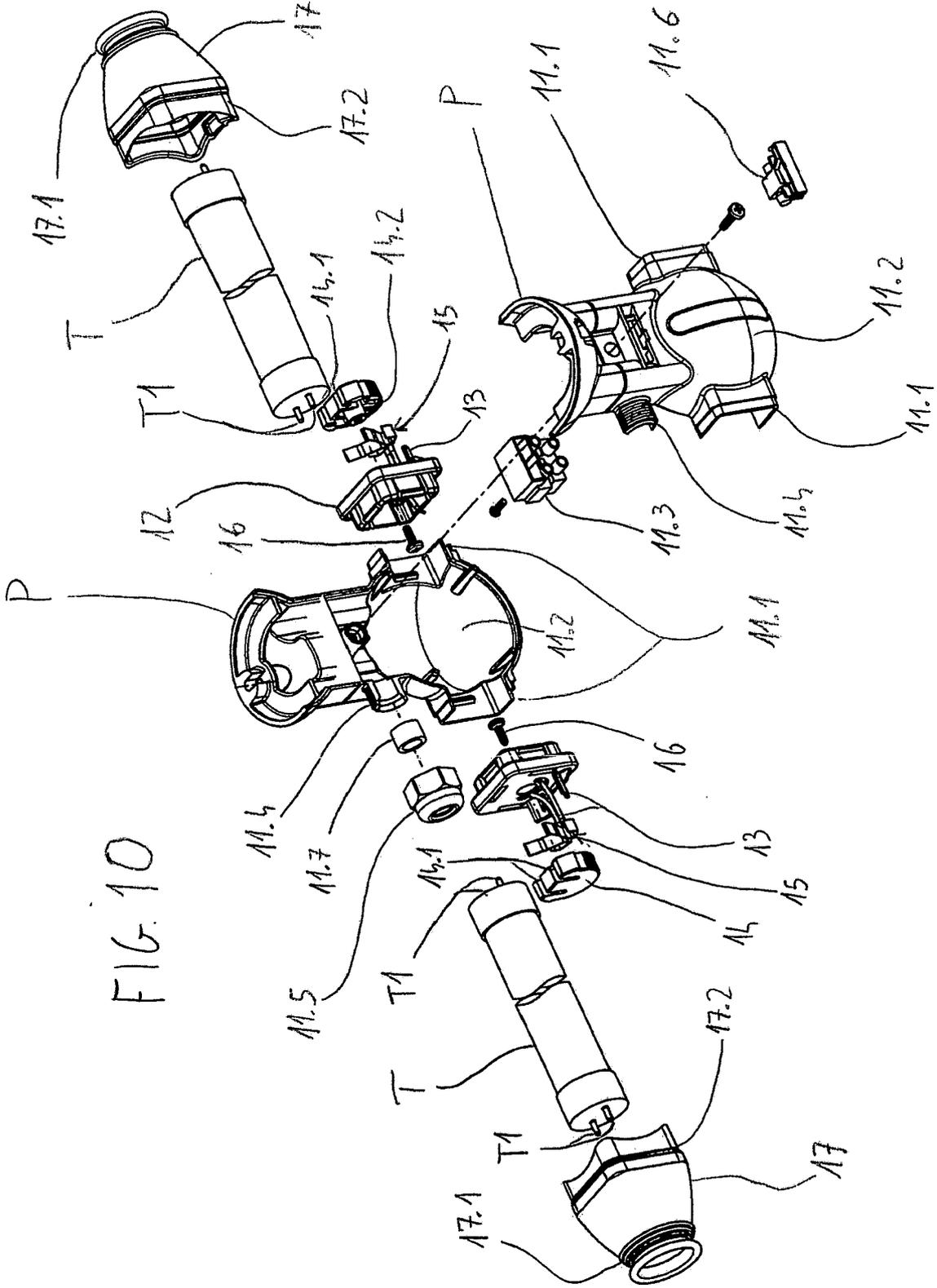


FIG. 10

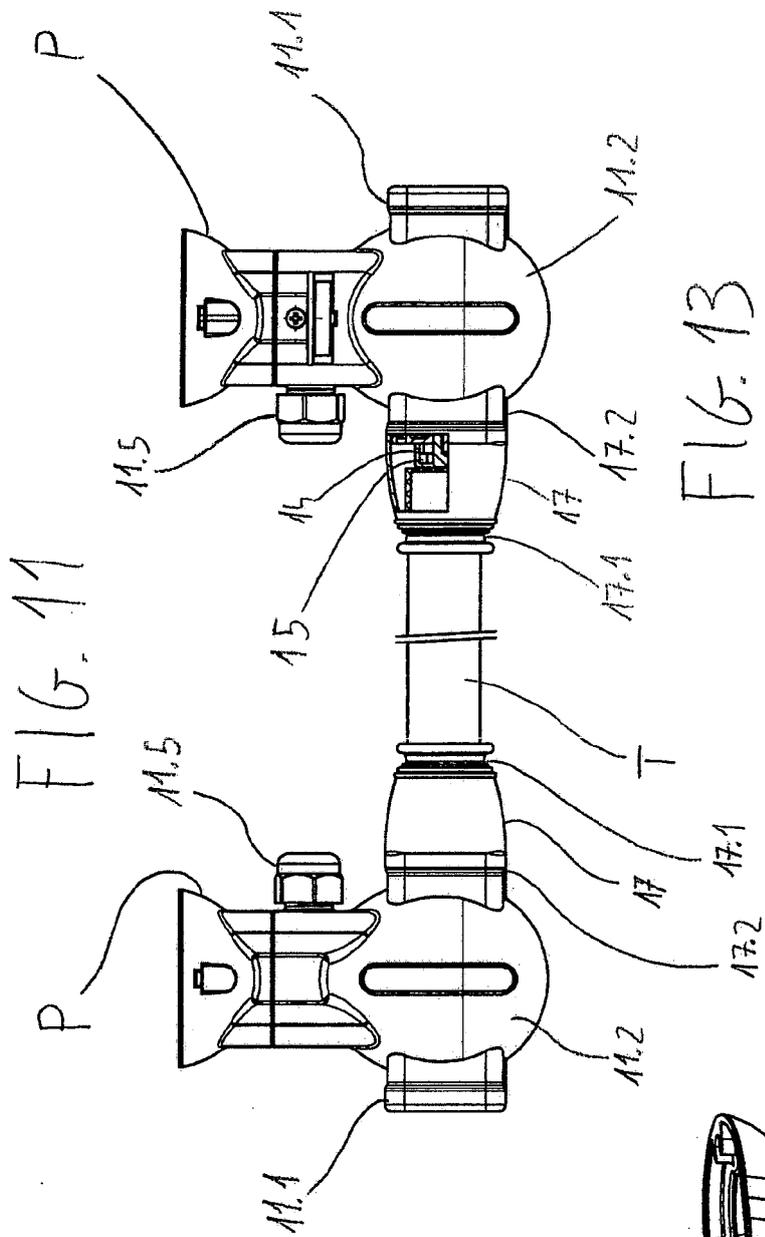


FIG. 13

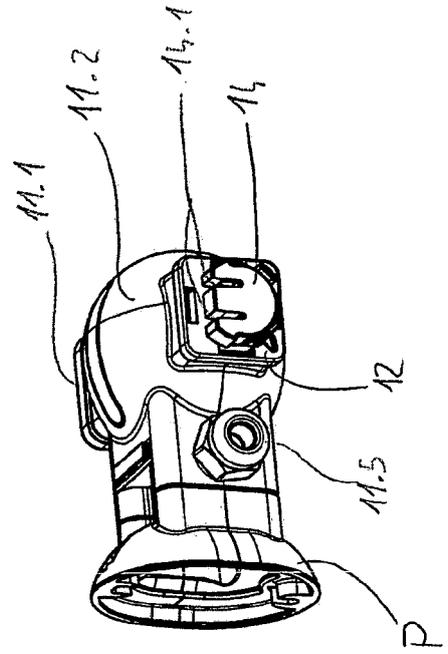
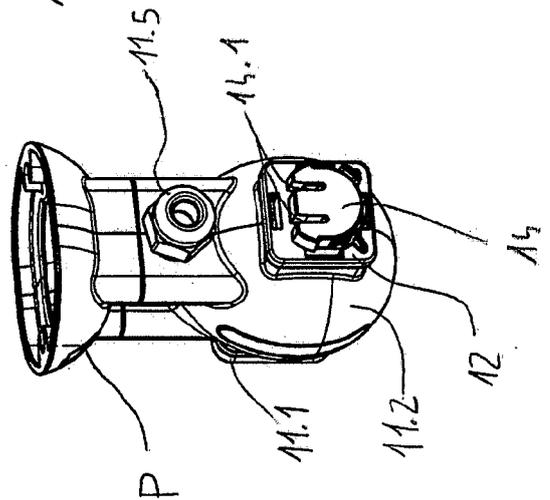


FIG. 12





EUROPEAN SEARCH REPORT

Application Number
EP 20 00 0340

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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)
A	WO 2010/005682 A2 (LIGHT SOURCES INC [US]; SAUSKA CHRISTIAN L [US] ET AL.) 14 January 2010 (2010-01-14) * figures 44,45,50-55 * -----	1-12	INV. F21K9/272 F21S2/00 F21V15/015 F21V19/00
A	US 2017/241599 A1 (OSADA TAKESHI [JP] ET AL) 24 August 2017 (2017-08-24) * figures 1-3,5 * -----	1-12	H01R13/717 H01R33/08
A	US 2011/235319 A1 (FUKANO SATOSHI [JP] ET AL) 29 September 2011 (2011-09-29) * figures 4-8 * -----	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21K F21S F21V F21Y H01R
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 January 2021	Examiner Kebemou, Augustin
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