(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 410 001 A1

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**05.12.2018 Bulletin 2018/49**

(21) Application number: **18175132.2**

(22) Date of filing: **30.05.2018**

(51) Int Cl.:
***F21S 8/02*** *(2006.01)* ***F21V 21/14*** *(2006.01)*
***F21V 14/02*** *(2006.01)* *F21V 21/22* *(2006.01)*
*F21V 21/30* *(2006.01)*

(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**

(30) Priority: **31.05.2017 IT 201700059401**

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## (54) LIGHTING DEVICE

(57) The present invention relates to a lighting device (1) that comprises a frame (2) configured to be mounted in a ceiling and/or in a suspended ceiling; a lighting body (7) having a longitudinal direction (B), that can be connected to the frame (2) and is movable with respect to the frame (2) at least along said longitudinal direction (B). A characteristic of the device is the one of having a plurality of abutment members (21) connected to the frame (2) and defining a seat (20) for receiving said lighting body (7), said lighting body (7) being insertable in said seat (20) and being slidable with respect to said abutment members (21), said lighting body (7) having at least one abutment area (22) engageable by said abutment members (21) to lock said lighting body (7) at least along said axial direction (B) inside said seat (20).

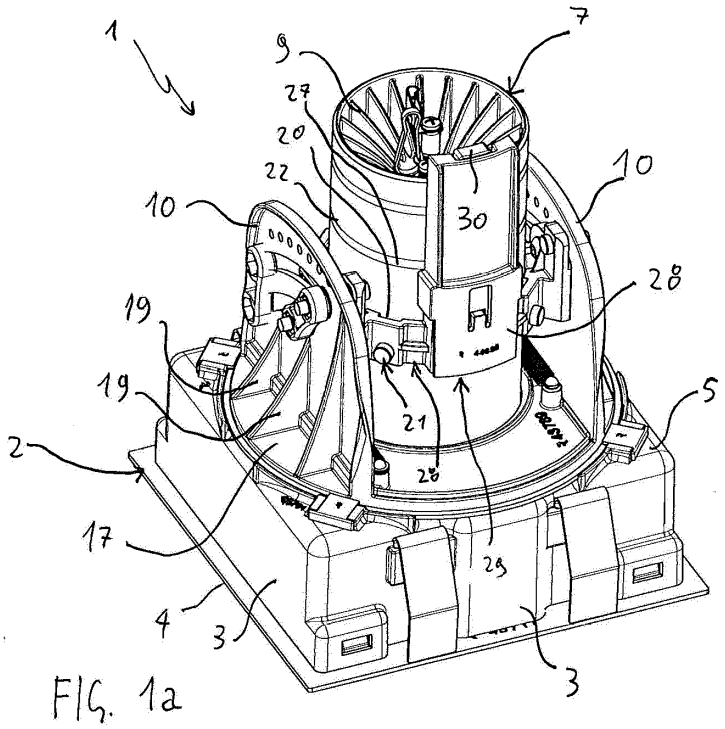


FIG. 1a

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## Description

*Technical Field*

**[0001]** The present invention relates to a lighting device, in particular capable of directing a light beam or cone in direction of an area or of an object to be illuminated, according to the preamble of claim 1.

**[0002]** By pure way of example, the present description refers to a spotlight recessed in a suspended ceiling, without however losing generality.

*Background*

**[0003]** Spotlights used for example in shop windows are known in the background art. All spotlights comprise a fixed frame, recessed in a suspended ceiling. A window is made in the frame.

**[0004]** A lighting body is connected to the frame and has a longitudinal extension axis. In particular, the lighting body is movable with respect to the frame, at least along the longitudinal extension axis. In greater detail, the adjustment of the position of the lighting body on the frame is carried out by means of connecting screws. This allows varying the width of the beam, which may be widened or closed on the area to be illuminated respectively by moving away or nearing the lighting body from/to the area to be illuminated. Once the adjustment is made, the lighting body is locked with respect to the frame, so as not to be able to move along the longitudinal axis.

*Problem of the known art*

**[0005]** Disadvantageously, the adjustment mechanism by means of screws is rather complex to use. Indeed, the user is to have a screwdriver to carry out an adjustment of the light beam and then is to act on each individual adjustment screw.

**[0006]** Moreover, the whole adjustment mechanism is to be disassembled should there be a need to disassemble the lighting body, for example to replace the lighting body itself and/or the lightbulb or to perform any other type of maintenance.

SUMMARY OF THE INVENTION

**[0007]** In this context, the technical aim at the basis of the present invention is to propose a lighting device which overcomes the above-mentioned drawbacks of the known technique.

**[0008]** In particular, it is the object of the present invention to make available a lighting device capable of simplifying the insertion and the fixing of the lighting body with respect to the frame.

**[0009]** The technical task identified and objects specified are substantially achieved by a lighting device comprising the technical features explained in one or more of the appended claims.

*Advantages of the invention*

**[0010]** In particular, a lighting device according to the present invention comprises a frame that is configured to be mounted in a ceiling and/or in a suspended ceiling and/or in any type of vertical, horizontal or oblique support.

**[0011]** The device also comprises a lighting body having a longitudinal direction. Such lighting body can be connected to the frame. Moreover, the lighting body is movable with respect to the frame, at least along the longitudinal direction.

**[0012]** The device further comprises a plurality of abutment members connected to the frame and defining a seat for receiving the lighting body. The lighting body is insertable in the seat so as to be slidable with respect to the abutment members. The lighting body has at least one abutment area, which is engageable by the abutment members so as to lock the lighting body inside the seat at least along the axial direction.

**[0013]** Such device resolves the technical problem because the mechanism for adjusting the position of the lighting body exclusively provides the engagement of the abutment members in one or more abutment areas. Indeed, the abutment members are capable of locking the lighting body in a predetermined position. Accordingly, tools are no longer needed to make the position adjustment of the lighting body.

LIST OF DRAWINGS

**[0014]** Further features and advantages of the present invention shall be more apparent from the indicative, and therefore non-limiting, description of a preferred, but not exclusive, embodiment of a lighting device, as illustrated in the accompanying drawings, in which:

- Figure 1a is a perspective top view of a lighting device according to the present invention, in a first operating configuration;
- Figure 1b is a perspective top view of the lighting device of figure 1a, in a second operating configuration;
- Figure 2 is a perspective bottom view of the lighting device of figures 1a and 1b;
- Figure 3 is a side view of the lighting device of figures 1a and 1b;
- Figure 4 is a perspective view of a first detail of the lighting device of figures 1a and 1b;
- Figure 5 is a side section view of the device of figures 1a and 1b;
- Figure 5a is an enlarged view of a detail of figure 5;
- Figure 6 is a perspective view of a second detail of the lighting device of figures 1a and 1b;
- Figure 7 is a perspective view of a detail of a second embodiment of a lighting device according to the present invention;
- Figure 8 is a perspective view of a third embodiment

of a lighting device according to the present invention;

- Figure 9 is a top view of the device of figure 8;
- Figure 10 is a perspective view of a detail of the embodiment of Figures 8 and 9; and
- Figures 11a to 11c are side views of the device of Figures 8 and 9, sectioned along line I-I of Figure 9 in respective operating configurations.

## DETAILED DESCRIPTION

**[0015]** The apparatus illustrated in the accompanying drawings is diagrammatically depicted, is not necessarily to scale, and does not necessarily have the proportions depicted between the various forming elements.

**[0016]** Even when not expressly indicated, the individual characteristics described in reference to the specific embodiments shall be intended as accessories and/or interchangeable with other characteristics described in reference to other embodiments.

**[0017]** With reference to the accompanying drawings, 1 indicates a lighting device according to the present invention.

**[0018]** The device 1 described preferably is of the type that can be oriented, that is to say it allows varying at least one angle of incidence of the light beam. Reference is made in the present description to the spatial orientation of the device 1, as shown in drawings 1a, 1b and 3, that is the spatial orientation that it would have if it were inserted in a horizontal ceiling.

**[0019]** Within this context, the terms "above", "below" and the like refer to the arrangement of the various elements in Figure 1, in particular with reference to an orthogonal direction "A" which, if the device 1 were positioned as in Figure 1, is oriented vertically.

**[0020]** Naturally, the device 1 is not limited to the orientation shown in Figure 1 because it may also be inserted in vertical and/or oblique walls and/or in floors. In this latter case, the lighting device 1 is overturned with respect to the orientation of Figures 1a and 1b.

**[0021]** The device 1 comprises a frame 2 that is configured to be mounted in a ceiling and/or in a suspended ceiling or in any type of vertical, horizontal or oblique support.

**[0022]** The frame 2 has substantially rectangular plan and is defined by four walls 3. A frame 4 is placed at the base of the walls 3, while a bottom 5 is placed at the top of the walls 4.

**[0023]** In the embodiment illustrated for example in Figure 1a, the frame 2 is provided to be inserted in a seat (not illustrated) in which for the most part, hidden from view.

**[0024]** In particular, the walls 3 and the bottom 5 are hidden from view, while the frame 4 is facing the area to be illuminated and therefore is visible.

**[0025]** The frame 2 has a window 6, in particular made at the bottom 5. Such window 6 preferably has a circular shape, but it may have any shape in alternative embodiments.

**[0026]** The device 1 comprises a lighting body 7 that can be connected to the frame 2 and at least partly inserted in the window 6. Such lighting body 7 substantially has a prismatic shape. In greater detail, in the embodiment illustrated in Figure 7, the lighting body has the shape of a prism with a rectangular base, in particular a square base. In the embodiment shown in Figures 1a to 6, the lighting body 7 has a cylindrical shape.

**[0027]** According to one aspect, the lighting body 7 has a first 7a and a second end 7b, which are opposite to each other. The first end 7a is open and visible from the outside so that a light source 8 - for example a lightbulb - may project a light beam or cone outside the device 1. The second end 7b is closed by a grid 9 and in use, is hidden from view. It is worth noting that the grid 9 is provided to allow the passage of the air so as to dissipate the heat generated inside the lighting body 7.

**[0028]** The lighting body 7 also has a longitudinal direction "B", shown for example in Figure 5. The lighting body 7 comprises a side surface 7c that substantially extends along the longitudinal direction "B".

**[0029]** The lighting body 7 can be oriented with respect to the frame 2. In particular, the lighting body 7 may vary an angle of inclination and an azimuth angle with respect to the frame 2. Moreover, according to the present invention, the lighting body 7 is movable with respect to the frame 2, along the longitudinal direction "B".

**[0030]** With particular reference to Figures 3 and 6, it is worth noting that the device 1 comprises a plurality of abutment members 21. Such abutment members 21 are connected to the frame 2 so as to define a seat 20 for receiving the lighting body 7. Such lighting body 7 in particular is insertable in the seat 20 and may slide with respect to the abutment members 21.

**[0031]** The lighting body 7 has at least one abutment area 22, which may be engaged by the abutment members 21 so as to lock the lighting body 7 at least along the axial direction "B" inside the seat 20. Preferably, the lighting body 7 has a plurality of abutment areas 22 spaced apart along the longitudinal direction B. By pure way of example, Figure 7 shows a lighting body 7 having three abutment areas 22.

**[0032]** In greater detail, the abutment area 22 comprises a groove 27 made on the side surface 7c of the lighting body 7. Preferably, the groove 27 extends along a perimeter of the lighting body 7 and is arranged on a plane having section perpendicular to the longitudinal direction "B".

**[0033]** The lighting body 7 is switchable between a sliding configuration and a locking configuration. The abutment members 21 are slidable on the lighting body 7 in the sliding configuration. Contrarily, the abutment members 21 are engaged in the abutment area 22 in the locking configuration. It is worth noting that if the lighting body has several abutment areas 22, each of them is associated with a respective locking configuration.

**[0034]** According to the present invention, the lighting

body 7 is configured to spontaneously pass from the sliding configuration to the locking configuration each time the abutment members 21 engage the abutment area 22.

**[0035]** Contrarily, the lighting body 7 does not spontaneously pass from the locking configuration to the sliding configuration. To carry out such passage, the user applies a predetermined axial force on the lighting body 7. In other words, by applying a force along the longitudinal direction "B" of the lighting body 7, it is possible to release the sliding of the lighting body 7 itself with respect to the frame 2. Advantageously, the predetermined force required for such operation is greater than the weight of the lighting body 7 itself so that the lighting body 7 cannot pass into the sliding configuration only by gravity.

**[0036]** In greater detail, it is worth noting that each abutment member 21 is transversely movable and in particular, perpendicularly movable, with respect to the longitudinal direction "B" of the lighting body 7. In particular, each abutment member 21 may switch between a retracted position and an extended position. In the extended position, the lighting body 7 is in the locking configuration. Moreover, the abutment member 21 is extended towards the central axis of the lighting body 7. In the retracted position, the lighting body 7 is in the sliding configuration. Here, the abutment member 21 is further away from the axis of the lighting body 7.

**[0037]** It is worth noting that the device 1 comprises elastic means 23 associated with the abutment member 21 to push it from the retracted position to the extended position. Such elastic means 23 comprise a spring 24 associated with the abutment member 21.

**[0038]** With reference in particular to figure 5a, it is worth noting that the abutment member 21 is defined by a ball 25 connected to the frame 2. Such ball 25 is pushed by a respective spring 24 against the side surface 7c of the lighting body 7 when the lighting body 7 is inserted in the seat 20. A ring 26, of smaller diameter than the ball 25 and integral with the frame 2, is placed between the ball 25 and the side surface 7c of the lighting body 7. Such ring 26 traps the ball 25, in particular acting as abutment for the ball 25 itself, which is pushed against it by the spring 26.

**[0039]** It is worth noting that when the abutment member 21 is in retracted position, the ball 25 is not in contact with the ring 26, while it has a rolling contact with the side surface 7c of the lighting body 7. Advantageously, this allows an easy movement of the lighting body 7 along the longitudinal direction "B". Contrarily, when the abutment member is in extended position, the ball 25 is abutting against the ring 26 and is inserted in one of the grooves 27 that define the respective abutment areas 22. Accordingly to push the ball 25 out of the groove 27, there is a need to exert a force in axial direction contrasting with the spring 24. Contrarily, the rotation of the lighting body 7 is not prevented because the ball 25 does not keep a rolling contact with the inside of the groove 27.

**[0040]** The device 1 comprises a support 28 for the lighting body 7. Such support 28 has a ring portion 28a that, in use, surrounds the lighting body 7 and defines the seat 20. The mentioned abutment members 21 are arranged on the ring portion 28a. It is worth noting that such ring portion 28a is countershaped with respect to the lighting body 7, that is to say it has a circular shape if the lighting body 7 is cylindrical (as in Figures 1a to 6), or a rectangular shape if the lighting body 7 has the prismatic shape of Figure 7.

**[0041]** The device 1 also comprises a guide 29 connected to the frame 2, in particular fixed to the support 28. Such guide is arranged parallel to the longitudinal direction "B" of the lighting body 7. Accordingly, the guide 29 substantially is perpendicular to the ring portion 28a of the support 28.

**[0042]** The lighting body 7 also comprises a slider 30 provided to be inserted in the guide 29 so as to slide inside the guide 29. It is worth noting that the guide 29 has a recess 29a that is countershaped to the slider 30 so as to prevent a rotation of the lighting body 7 about the longitudinal direction when the slider 30 is inserted in the guide 29.

**[0043]** With particular reference to Figures 8 to 10, the guide 29 has a pair of ends 29b, 29c. In detail, a first end 29b is located in a distal position with respect to the frame 2, in particular with respect to the bottom 5. A second end 29c is opposite to the first end 29b, and is located in proximal position to the bottom 5.

**[0044]** Preferably, the recess 29a has a diverging portion 31. Such diverging portion 31 is placed at the second end 29c of the guide 29 so as to facilitate the insertion of the slider 30 into the recess 29a when the lamp body 7 is inserted.

**[0045]** The device 1 comprises a tooth 33 inserted in the guide 29 to prevent the undesired release of the lamp body 7. The tooth 33 in particular is placed close to the second end 29c of the guide 29. In particular, the tooth 33 is switchable between an interfering configuration and an open configuration. The tooth 33 is at least partly inserted in the recess 29a of the guide 29 in the interfering configuration so as to lock the extraction of the slider 30 from the guide 29. Contrarily, the tooth 33 frees the passage for the slider 30 inside the recess 29a in the open configuration so as to allow the insertion and/or removal of the slider 30 into/from the guide 29.

**[0046]** It is worth noting that since the tooth 33 is elastically connected to the guide 29, it is capable of spontaneously passing from the open configuration to the interfering configuration. Vice versa, to pass from the interfering configuration to the open configuration, the tooth 33 is provided to be pushed by the mentioned slider 30.

**[0047]** In particular, it is worth noting that the tooth 33 has an inclined surface 34 facing towards the second end 29c of the guide 29. Such inclined surface is adapted to be pushed by the slider during the insertion of the lighting body 7 in such a manner as to cause the tooth 33 to rotate into the open configuration. Once the slider 30 is inserted in the guide 29, the tooth 33 spontaneously returns to the interfering configuration as described above.

**[0048]** The tooth 33 also has an abutment surface 35 facing towards the first end 29b of the guide 29 and in particular, opposite to the inclined surface 34. The abutment surface is adapted to prevent the exit of the slider 30 from the guide under the action of the weight or of a slight force of traction.

**[0049]** It is worth noting that according to the present invention, the tooth 33 is configured to pass from the interfering configuration to the open configuration when the lighting body 7 is subjected to a predetermined axial force of traction equal to six times the weight of the lighting body 7 itself. Such force is in fact sufficient to move the tooth 33 also when the slider 30 is in contact with the mentioned abutment surface 35.

**[0050]** In the embodiment shown in Figure 6, the guide 29 has a shorter length than the length of the lighting body 7. Both the first 29b and the second end 29c are open, that is to say they allow the slider 30 to enter and exit the recess 29a.

**[0051]** It is worth noting that by completely inserting the lighting body 7 into the seat 20, the slider 30 comes out from the opposite side of the guide 29 with respect to the ring portion 28a. It therefore is possible to rotate the lighting body 7 about the longitudinal direction "B", thus moving the slider 30 externally with respect to the guide 29. In this condition, the complete extraction of the lighting body 7 is prevented because the slider 30 - externally with respect to the guide 29 - abuts with the ring portion 28a of the support 28.

**[0052]** With reference to the embodiment in Figures 8 to 10, it is worth noting that the guide 29 has a substantially similar length to the lighting body 7. The first end 29b of the guide 29 here is closed by a cap 32.

**[0053]** The device 1 also comprises a pair of uprights 10.

**[0054]** Such uprights 10 extend along the orthogonal direction "A" away from the frame 2, and in particular from the bottom 5.

**[0055]** In use, the uprights 10 are located behind the bottom 5, and therefore are hidden from view.

**[0056]** The lighting body 7 is arranged between the uprights 10 and is connected thereto so as to be able to vary its angle of inclination with respect to the orthogonal direction "A". In other words, the longitudinal direction "B" of the lighting body 7 may be inclined with respect to the orthogonal direction "A". It is worth noting that the lighting body 7 is connected to the uprights through the support 28 that defines the seat 20.

**[0057]** With particular reference to Figure 1, the uprights 10 are arranged at the window 6.

**[0058]** The uprights 10 are fixed to a base 17 inserted in the window 6.

**[0059]** Reinforcing ribs 19 connect each upright 10 to the base 17 so as to increase the structural rigidity.

**[0060]** It is worth noting that the base 17 may rotate about the orthogonal direction "A" so as to modify the azimuth angle of the lighting body 7.

**[0061]** Optionally, also with reference to Figure 4, the device 1 also comprises a cover element 11 superimposed over the window 6.

**[0062]** In particular, the cover element 11 is arranged between the uprights 10.

**[0063]** Such cover element 11 has an opening 12 that is movable inside the window 6 so as to allow the orientation of the lighting body 7.

**[0064]** In particular, the cover element 11 is also inside the window 6 so as to vary the position and the shape of the opening 12. This in particular allows the opening 12 to follow the variation of inclination of the lighting body 7 with respect to the orthogonal direction "A".

**[0065]** In greater detail, the opening 12 is arranged between the uprights 10.

**[0066]** The opening 12 also has an edge 12a. The edge 12a surrounds the lighting body 7 and preferably is placed in contact with the lighting body 7.

**[0067]** With reference in particular to Figure 4, it is worth noting that the edge 12a is countershaped with respect to the lighting body 7.

**[0068]** Moreover, as clarified below, the shape of the edge 12a is variable so as to remain in contact with the lighting body 7 at any inclination.

**[0069]** The cover element 11 comprises a pair of half-parts 13 connected to each other and movable away from/close to each other to vary the shape of the opening 12. Each half-part 13 at least partly defines the mentioned edge 12a.

**[0070]** In particular, each half-part 13 has a semi-circular profile that partly defines the edge 12a of the opening 12.

**[0071]** In greater detail, the cover element 11 comprises a pair of coplanar flanges 14 juxtaposed to each other. Each flange 14 defines a respective half-part 13.

**[0072]** In detail, the flanges 14 are connected to each other by at least one elastic element 15 so as to move away from/close to each other to adapt to the inclination of the lighting body 7.

**[0073]** Preferably, the cover element 11 comprises a pair of elastic elements 15, each defined by a respective spring and connected to both the flanges 14.

**[0074]** The elastic elements 15 surround the opening 12 and accordingly, the lighting body 7.

**[0075]** Thanks therefore to the cover element 11, the result is that the lighting body 7 completely engages the window 6 so as to prevent the formation of an annular area that is free. Accordingly, a person located close to the lighting device 1 is not capable of observing the parts of the ceiling or of the suspended ceiling, given that the cover element 11, in particular the half-parts 13 thereof, always remain in contact with the lighting body 7 for any inclination the lighting body is caused to take on.

**[0076]** Moreover, precisely thanks to the fact that the half-parts 13 of the cover element 11 are reciprocally movable, it is always possible to completely cover the window 6 also should the lighting body 6 be moved to be directed along the desired direction.

**[0077]** Obviously, in order to meet contingent and spe-

cific needs, those skilled in the art may make several modifications to the variants described above, all however contained within the scope of protection as defined by the following claims.

## Claims

**1.** A lighting device (1), comprising:

- a frame (2) configured to be mounted in a ceiling and/or in a suspended ceiling;
- a lighting body (7) having a longitudinal direction (B) that can be connected to the frame (2) and is movable with respect to the frame (2) at least along said longitudinal direction (B);

**characterized in that** it comprises:

- a plurality of abutment members (21) connected to the frame (2) and defining a seat (20) for receiving said lighting body (7), said lighting body (7) being insertable in said seat (20) and being slidable with respect to said abutment members (21), said lighting body (7) having at least one abutment area (22) engageable by said abutment members (21) to lock said lighting body (7) at least along said longitudinal direction (B) inside said seat (20).

**2.** A device (1) according to the preceding claim, **characterized in that** it comprises a guide (29) connected to the frame (2) and arranged parallel to the longitudinal direction (B), said guide (29) having a first end (29b) placed in a distal position with respect to said frame (2), and a second end (29c) opposite to said first end (29b), said guide (29) having a recess (29a), said lighting body (7) comprising a slider (30) insertable in said guide (29) to slide inside said recess (29a).

**3.** A device (1) according to claim 2, **characterized in that** it comprises a cap (32) placed at the first end (29b) of the guide (29) and configured to retain the slider (30) in said recess (29a).

**4.** A device (1) according to claim 2 or 3, **characterized in that** said recess (29a) has a diverging portion (31) placed at said second end (29c) to facilitate the insertion of said slider (30).

**5.** A device (1) according to any one of claims 2 to 4, **characterized in that** it comprises a tooth (33) inserted in said guide (29) and preferably placed close to the second end (29c), said tooth (33) being switchable between an interfering configuration wherein it is at least partly inserted in said recess (29a) to lock the extraction of the slider (30) from said guide (29), and an open configuration wherein it allows the insertion and/or removal of said slider (30) into/from said guide (29).

**6.** A device (1) according to claim 5, **characterized in that** said tooth (33) is elastically connected to said guide (29) to spontaneously pass from the open configuration to the interfering configuration.

**7.** A device (1) according to claim 5 or 6, **characterized in that** said tooth (33) is configured to be pushed by said slider (30) to pass from the interfering configuration to the open configuration.

**8.** A device (1) according to any one of claims 5 to 7, **characterized in that** said tooth (33) is configured to pass from the interfering configuration to the open configuration when the lighting body (7) is subjected to a predetermined axial force of traction equal to six times its weight.

**9.** A device (1) according to claim 2, **characterized in that** said guide (29) has a shorter length than the length of said lighting body (7).

**10.** A device (1) according to any one of the preceding claims, **characterized in that** said frame (2) comprises a support (28) that can be connected to said lighting body (7), said support (28) comprising a ring portion (28a), said abutment members (21) being arranged on said ring portion (28a), said guide (29) being fixed to said support (28).

**11.** A device (1) according to claim 10, **characterized in that** said lighting body (7) is switchable between a sliding configuration, wherein the abutment members (21) are slidable on the lighting body (7), and at least one locking configuration, wherein the abutment members (21) are engaged on said abutment area (22), said lighting body (7) being configured to spontaneously pass from the sliding configuration to the locking configuration when said abutment members (21) engage said abutment area (22); said lighting body (7) being configured to pass from the locking configuration to the sliding configuration by means of the application of a predetermined axial force greater than the weight of said lighting body (7).

**12.** A device (1) according to claim 11, **characterized in that** said lighting body (7) has a plurality of abutment areas (22) spaced apart along the longitudinal direction (B), each corresponding to a respective locking configuration.

**13.** A device (1) according to claim 11 or 12, **characterized in that** said abutment member (21) is movable transversely to said longitudinal direction (B) to pass from a retracted position, wherein said lighting body

(7) is in the sliding configuration, to an extended position, wherein said lighting body (7) is in the locking configuration, said device (1) optionally comprising elastic means (23) associated with said abutment member (21) to push it from the retracted position to the extended position.

**14.** A device (1) according to any one of the preceding claims, **characterized in that** said lighting body (7) has a side surface (7c), said abutment area (22) comprising a groove (27) made on said side surface (7c).

**15.** A device (1) according to the preceding claim, **characterized in that** said groove (27) extends along a perimeter of said lighting body (7) and is arranged on a plane having section perpendicular to said longitudinal direction (B).

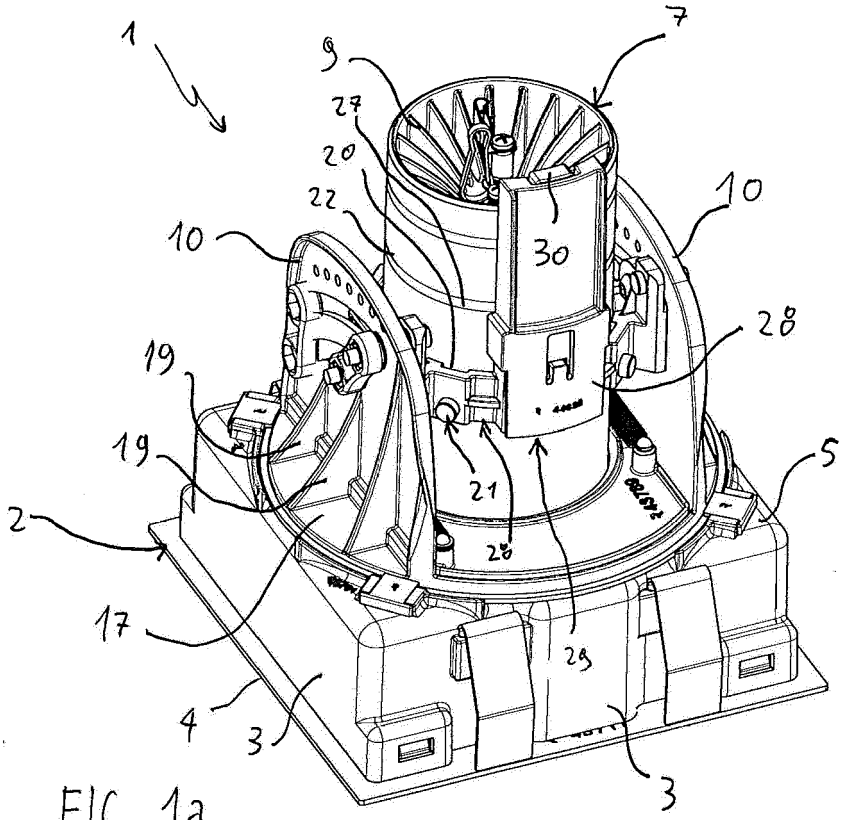
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FIG. 1a

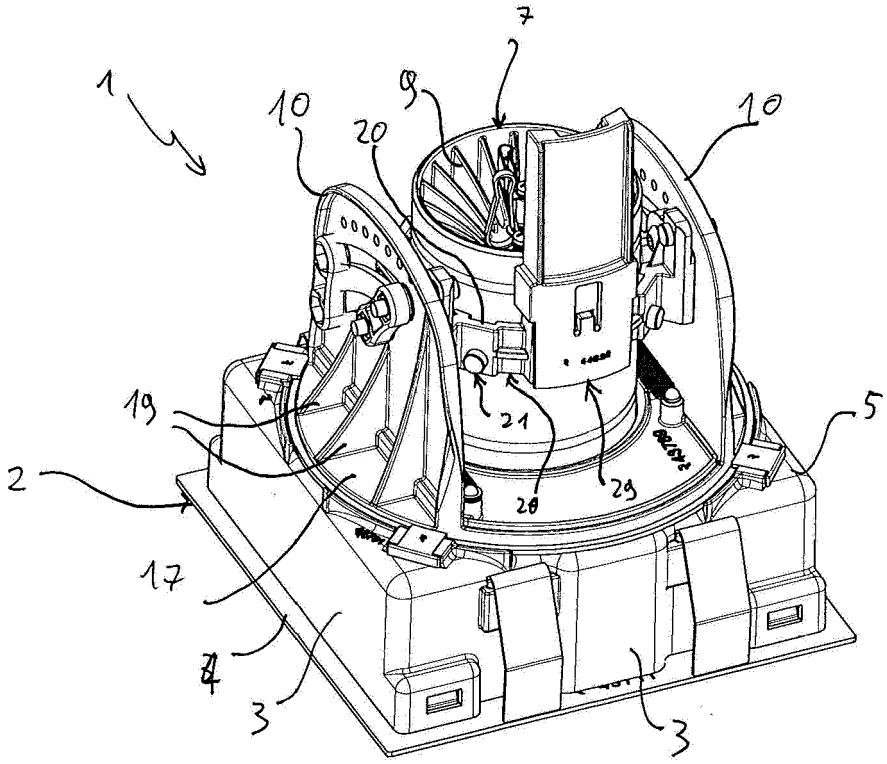
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FIG. 1b

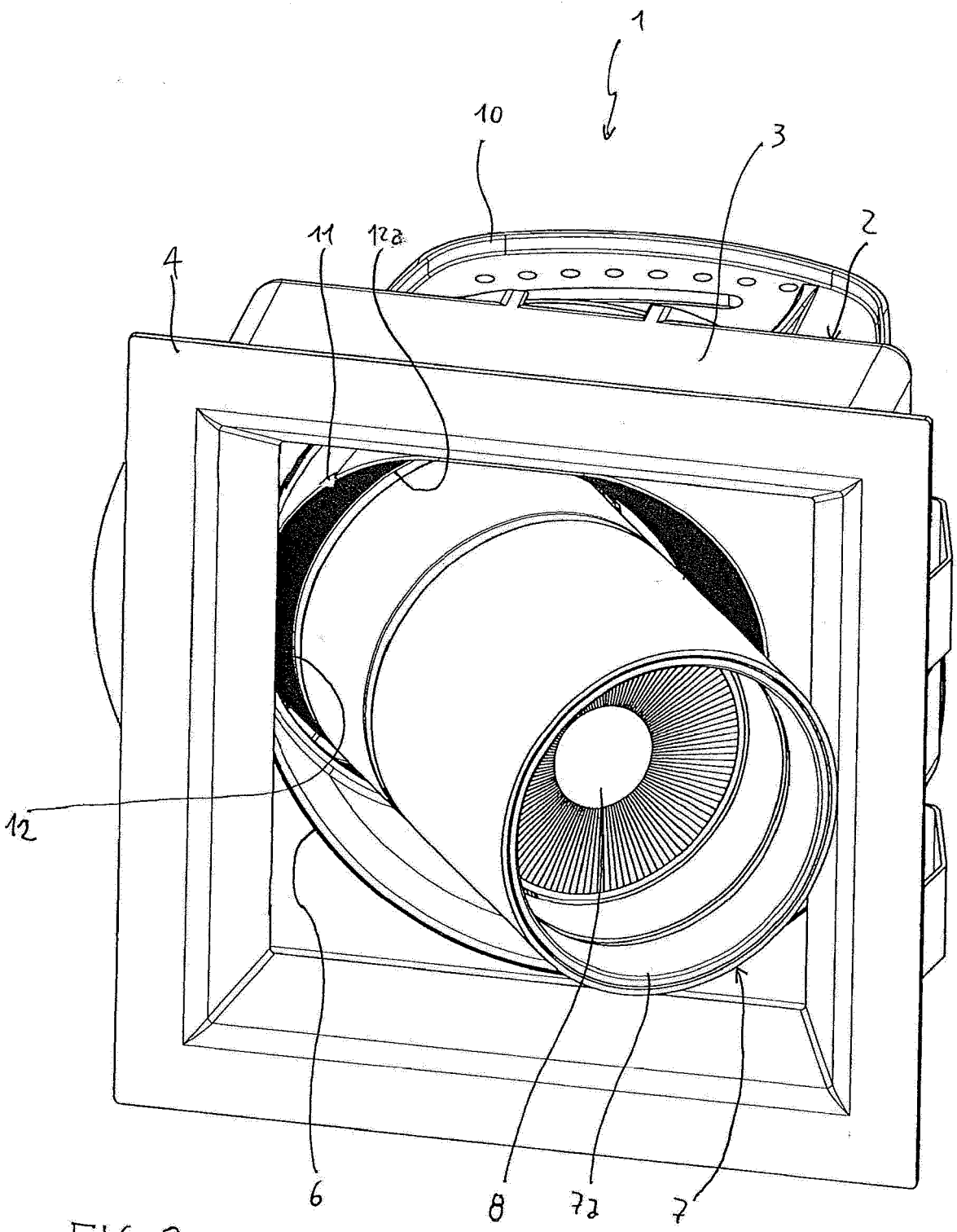


FIG. 2

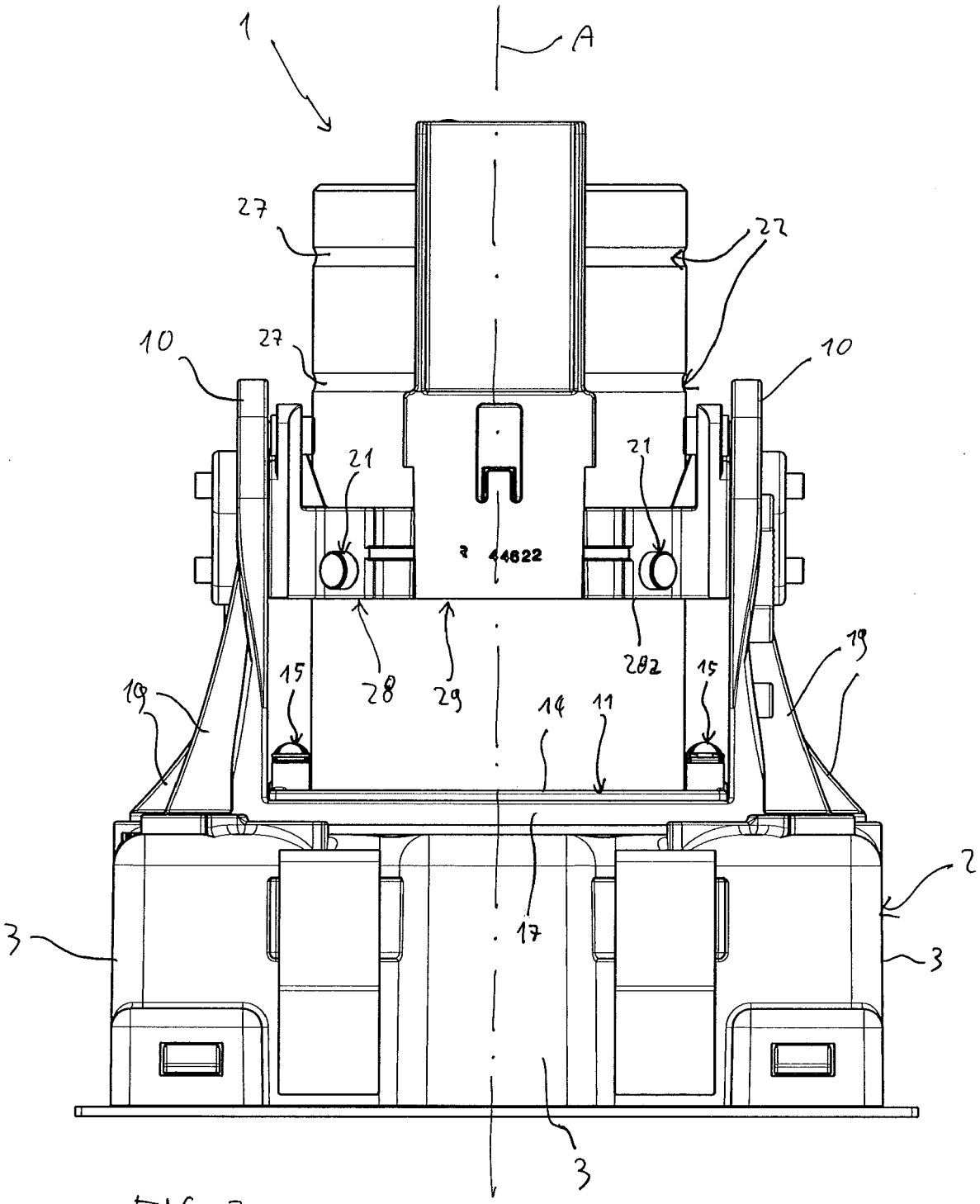


FIG. 3

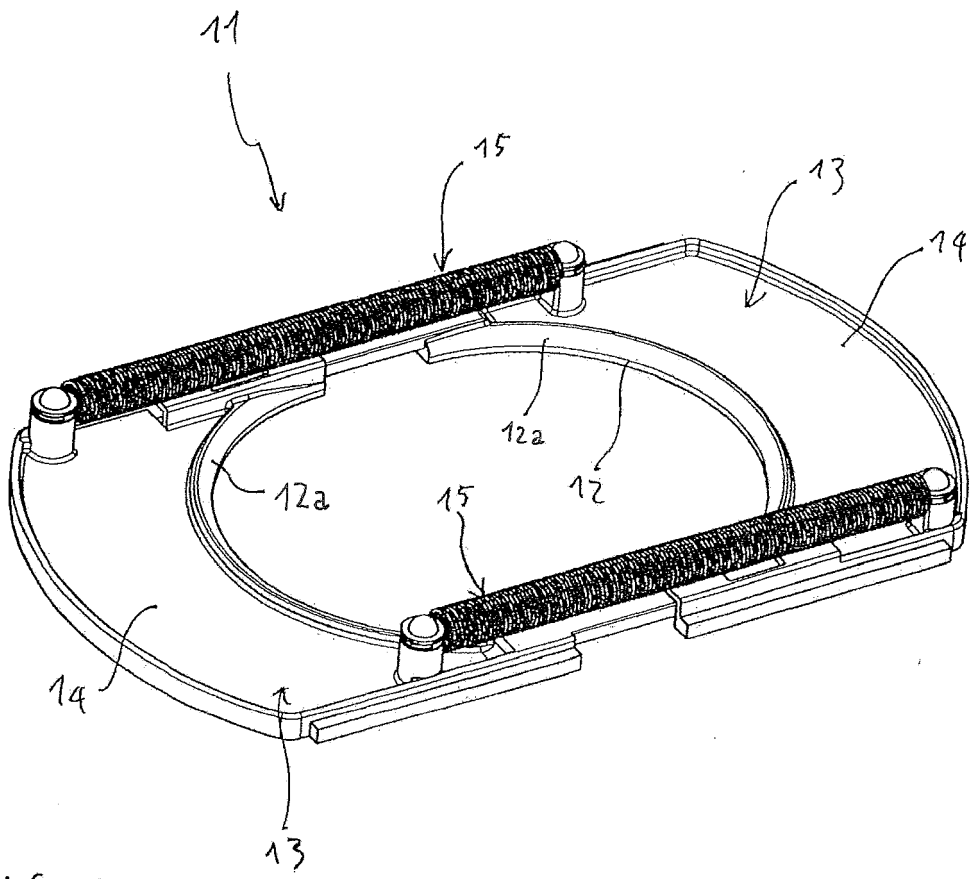


FIG. 4

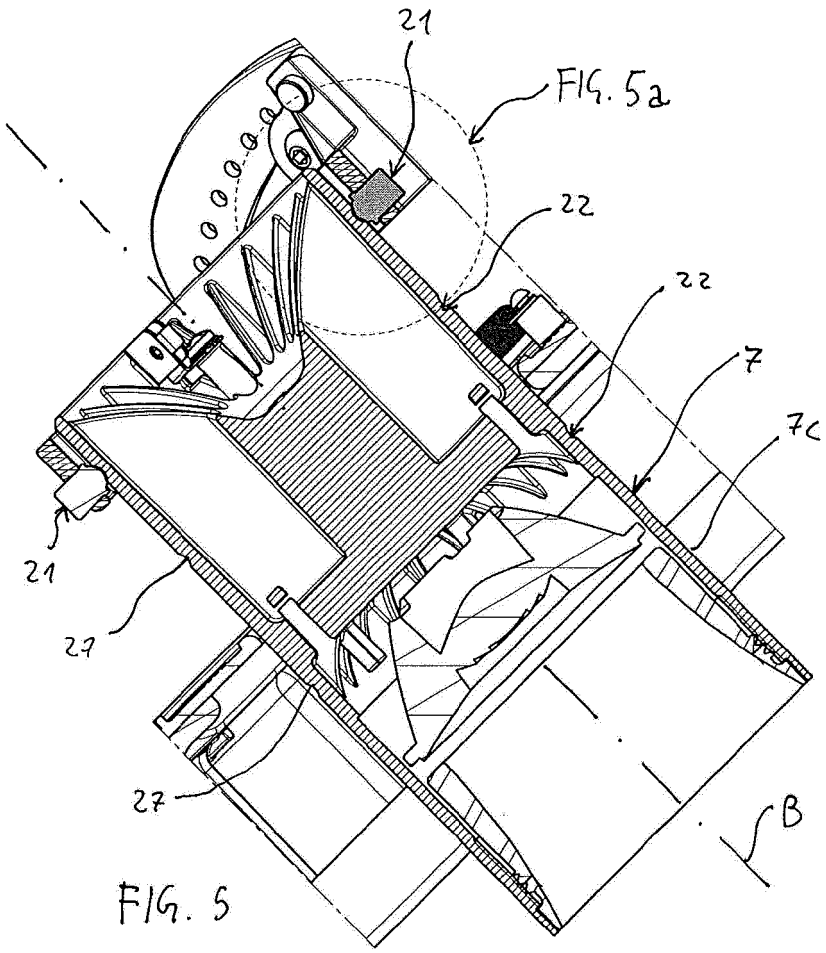


FIG. 5

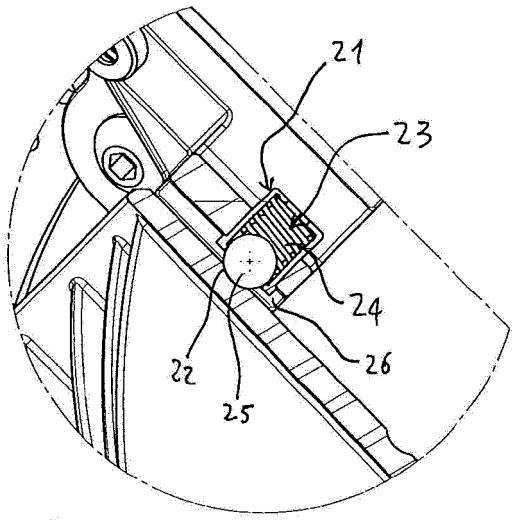


FIG. 5a

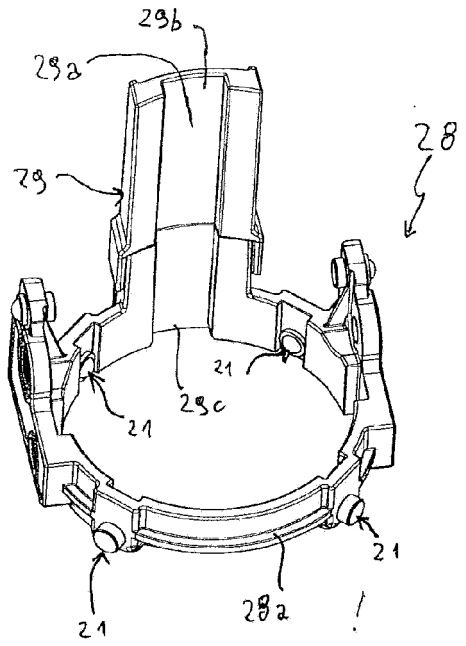


FIG. 6

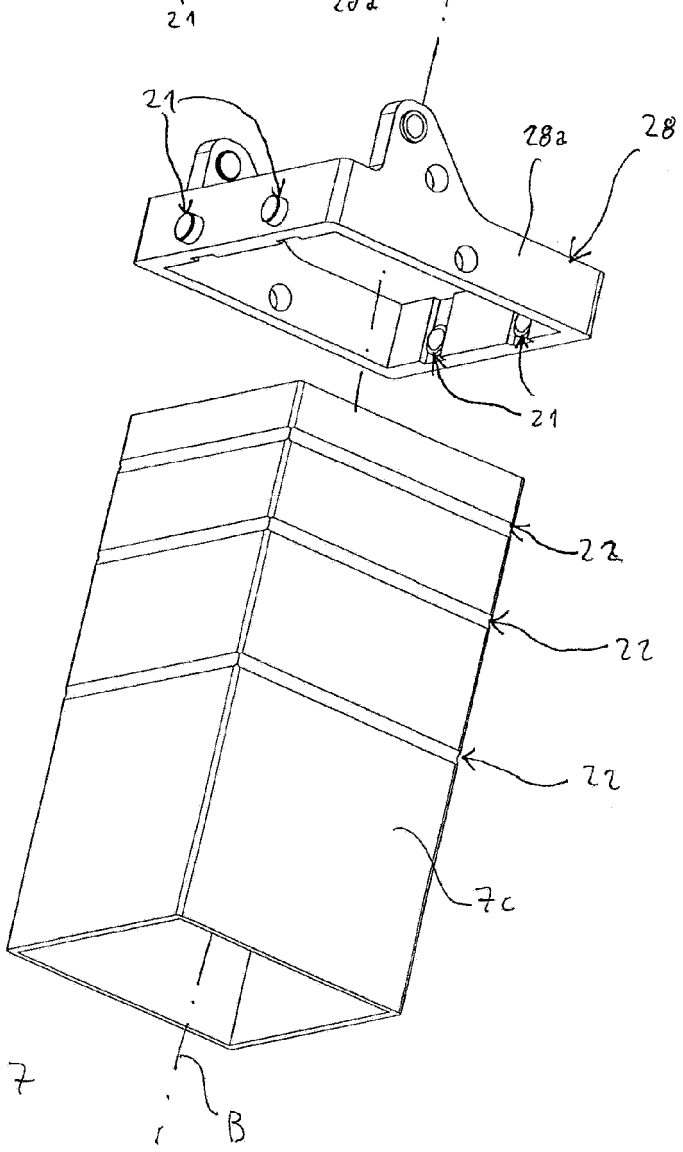


FIG. 7

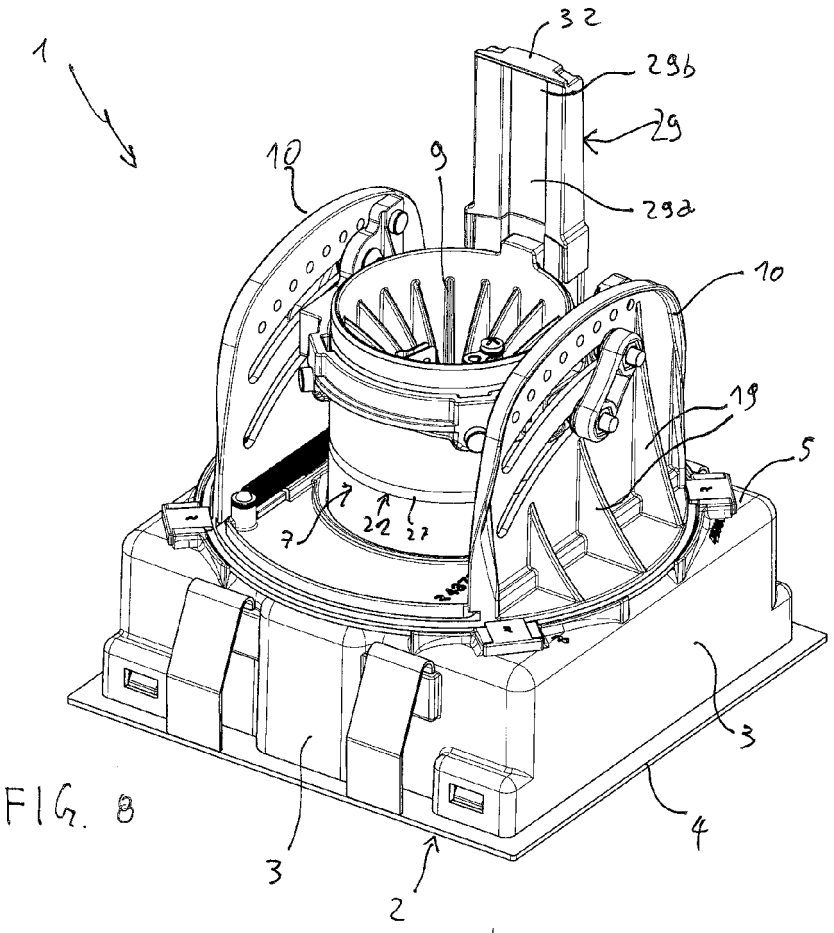


FIG. 8

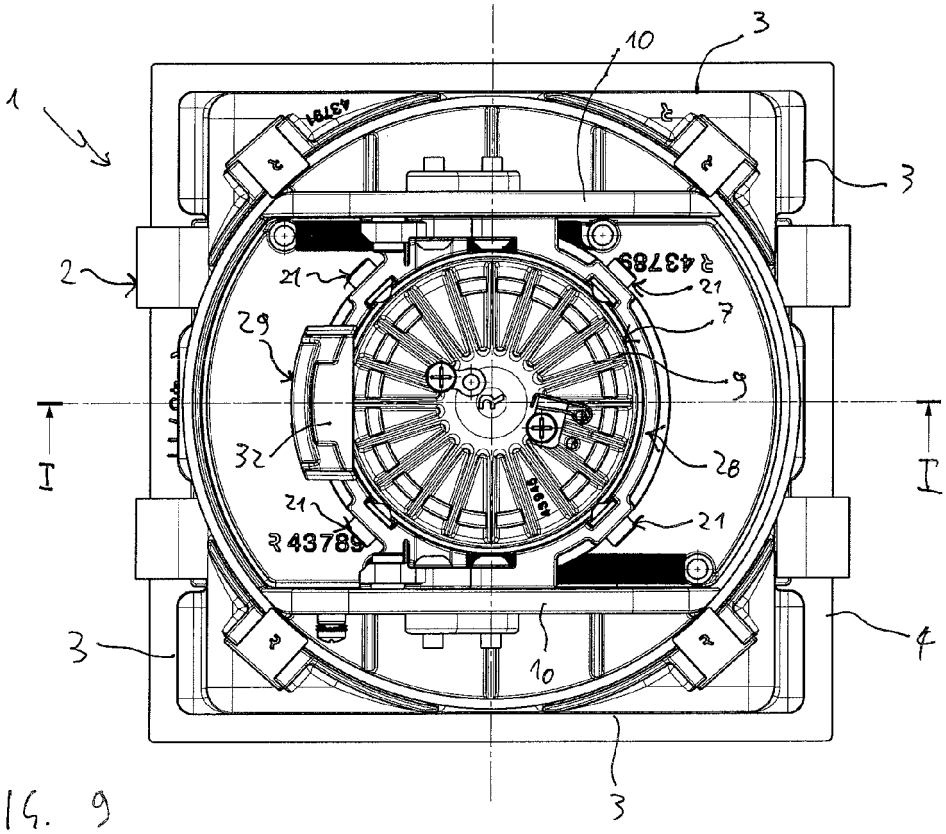


FIG. 9

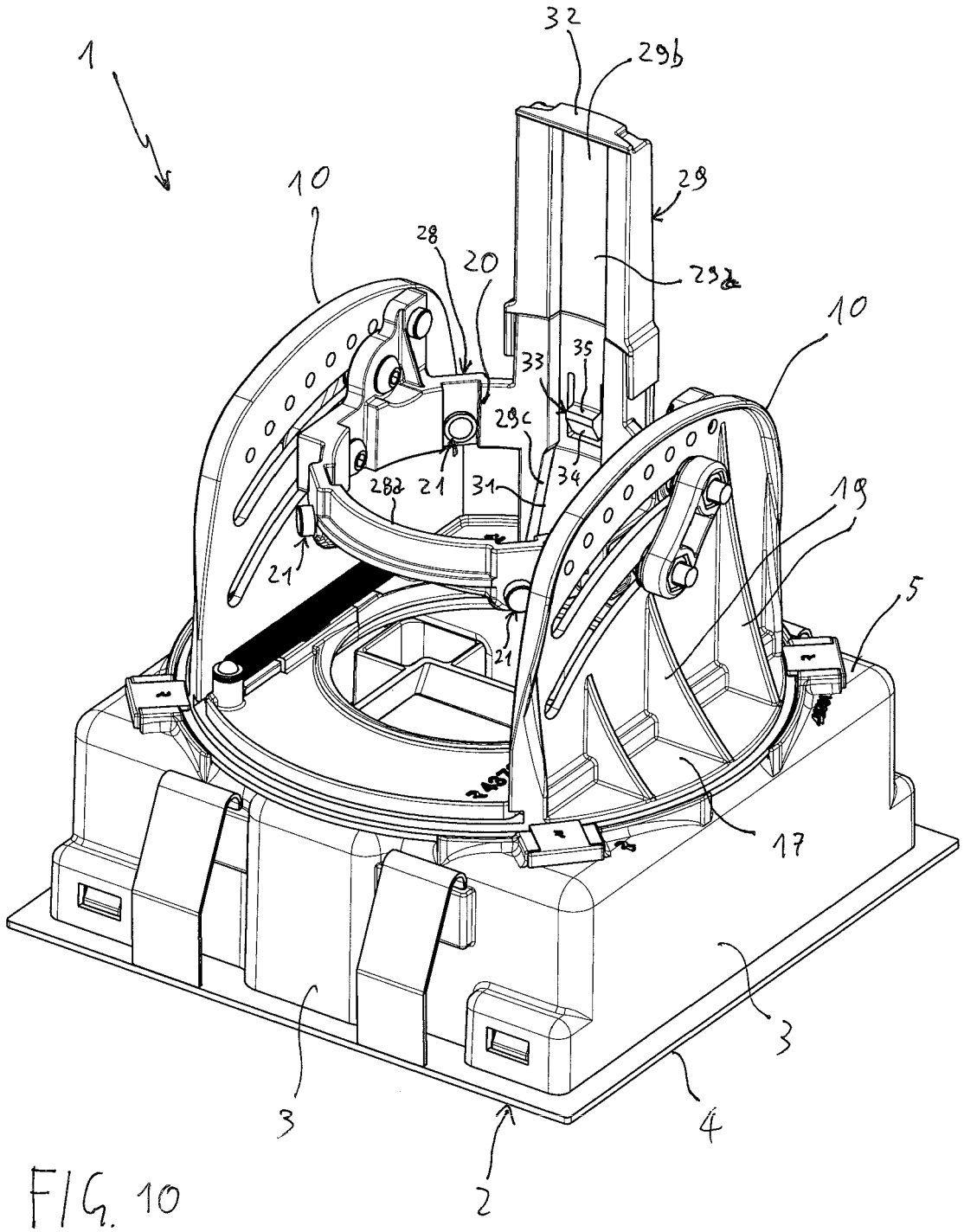


FIG. 10

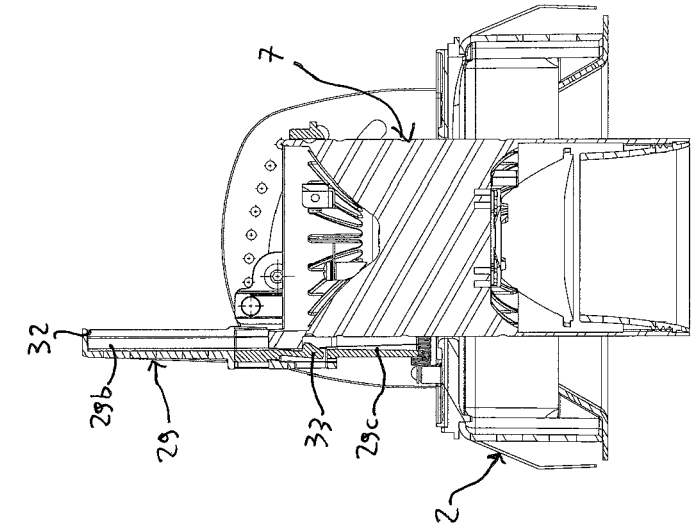


FIG. 11c

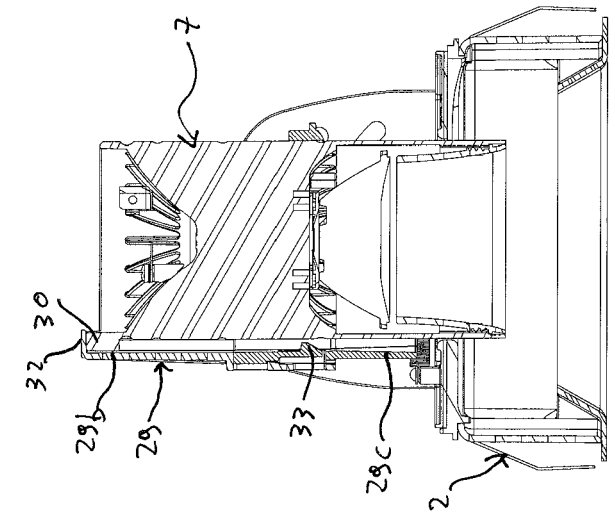


FIG. 11b

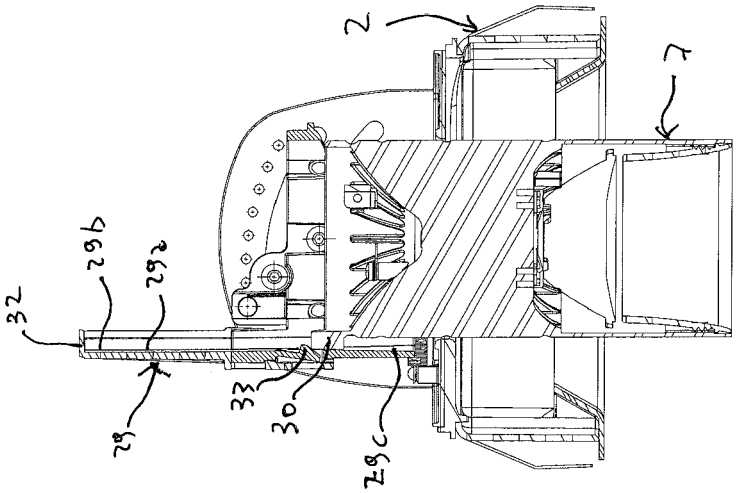


FIG. 11a

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# EUROPEAN SEARCH REPORT

Application Number
EP 18 17 5132

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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 13 September 2018 | Soto Salvador, Jesús |

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