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(54) **LAMP**

(57) Lamp (L) which comprises a cylindrical structure (1) to flush mount the same in a face of a wall (P), a piston (2) with a light source (21) mounted to slide in the cylindrical structure (1), such that the configuration of the lighting of the lamp (L) can be adjusted by the piston (2) moving through the cylindrical structure (1).

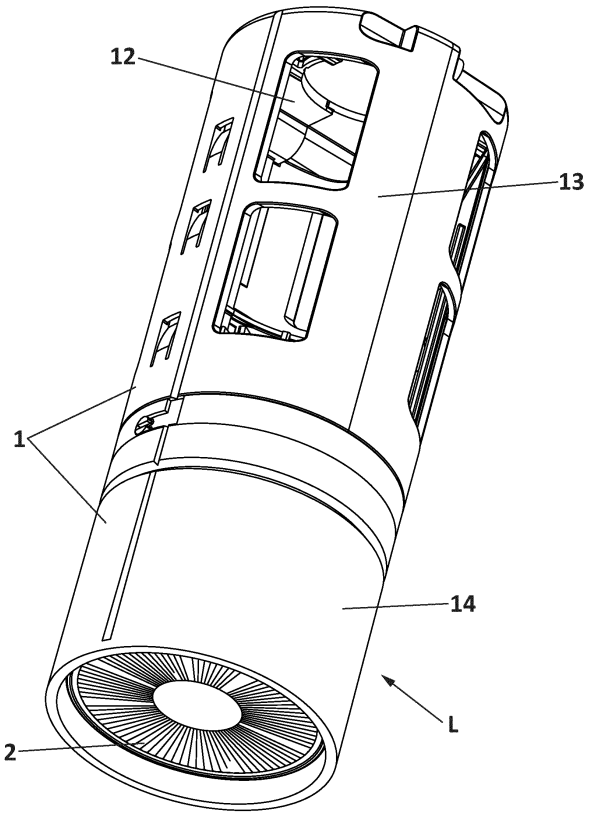

FIG. 1

EP 3 540 291 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a flush-mountable lamp, of the type intended to be flush-mounted in a false ceiling, although the use thereof can also be envisaged for vertical walls.

BACKGROUND

[0002] Lamps that comprise a cylindrical structure intended to be fixed to a face of a wall provided with a hole and on an inner side of the same, such that a proximal part and a distal part of the cylindrical structure are defined with respect to the face of the wall, the cylindrical structure being open on the part proximal to the face of the wall, in order to allow light to pass through, are known.

[0003] These lamps have a drawback in that the lighting profile cannot easily be adjusted.

[0004] Lanterns that have a sliding light source with respect to the parabolic mirror, such that the lighting profile of the light projected can be adjusted, are also known.

DESCRIPTION OF THE INVENTION

[0005] In order to overcome the drawbacks of the state of the art, the following invention proposes a lamp that comprises:

- a cylindrical structure intended to be fixed to a face of a wall provided with a hole and on an inner side of the face of a wall, such that a proximal part and a distal part of the cylindrical structure are defined with respect to the face of the wall, the cylindrical structure being open on the part proximal to the face of the wall. The lamp of the invention is especially convenient to be situated in a false ceiling, in which case a cylindrical hole is made in the face of said false ceiling, the cylindrical structure is inserted in the hole of the face of the ceiling, first inserting the distal part and then the part proximal of the cylindrical structure, which is the part from which light is projected, such that the distal part is separated from the face of the ceiling at the height corresponding to the cylindrical structure body while the proximal part is in the hole made in the face of the ceiling and concentric to the same. This known arrangement facilitates the installation of electric current cables that are in the false ceiling.

[0006] The lamp of the invention is the type that is flush-mounted in a ceiling or wall, such that essentially only the light source is visible and on occasions the outer most part of a frame.

[0007] The lamp comprises a sliding piston mounted in the cylindrical structure that comprises a light source. The piston with the light source is designed to slide through the cylindrical structure such that the light source can be situated in different positions between the distal part and the proximal part of the cylindrical structure.

[0008] When the light source is situated close to the proximal part of the cylindrical structure, the projection of the light emitted by the light source will occupy a greater area, while when the light source is situated close to the distal part of the cylindrical structure, the projection area of the light emitted by the light source will be smaller. The possibility of adjusting the position of the light source in relation to the cylindrical structure allows different environments to be created where the lamp is arranged, the cutoff or comfort angle of the lighting (the angle between the vertical and first line at which the light source is not visible), photometry and intensity able to be adjusted depending on the needs of each moment: when the light source is positioned close to the distal part, one obtains a type of focused light providing greater visual comfort when looking at the light source, while when the same is situated at the proximal part, a greater cutoff angle is achieved, lighting up a greater area.

[0009] The cylindrical structure, on the inner surface thereof, or as an alternative the piston on the side surface thereof, comprises at least one guide with a closed route, such that an upwards path and a downwards path are defined connected by the upper and lower ends thereof, the upwards path being provided with elastic tabs that protrude from the inner surface of the cylindrical structure, or from the side surface, respectively, the piston, or cylindrical surface, respectively, being provided with at least one retaining projection, the retaining projection being arranged to slide on the guide, the elastic tabs being arranged to bend and not retain the piston when the same moves from the proximal part to the distal part, but to retain it when moving in the opposite direction, the upper end of the guide being configured to take the retaining projection from the upper end of the upwards path to the upper end of the downwards path when the piston reaches a maximum height and the lower end of the guide being configured to take the retaining projection from the lower end of the downwards path to the lower end of the upwards path when the piston reaches a minimum height, such that the configuration of the lighting of the lamp can be adjusted by the piston moving through the cylindrical structure.

[0010] Thus, when the retaining projection of the piston is pressed upwards, the same continues along the trajectory marked by upwards path until reaching the upper end of the guide that has a curved profile which forces it to rotate slightly on the axis thereof until reaching a position in which the retaining projection fits in the rail of the downwards path and makes the downward trajectory. The same happens on the lower end of the guide.

[0011] This configuration allows the piston to be fixed at different heights within the cylindrical structure, making it only necessary to push the piston from below. No mechanism is required, with only retention tabs being necessary, which can be molded with cylindrical structure itself.

[0012] In other words, the trajectory of the retaining projection of the piston from the proximal part to the distal part intersects the elastic tabs, the geometry of which makes it easy for them to bend when pressed in that direction. Thanks to this system of flexible tabs in one direction, it is possible to situate the piston with the light source at different heights without needing to use screws or additional elements: to situate the piston at a distance with respect to the proximal part corresponding to the position of the first tab, it is only necessary to move it to the intersection with the first tab, applying a small force there that makes the tab bend and allows the retaining projection to pass. Once the retaining projection has passed the tab, this prevents the same from falling while on the opposite trajectory. To leave the piston situated at a distance with respect to the proximal part corresponding to the second tab, the previous step is repeated successively.

[0013] To situate the piston with the light source close to the proximal part, it is only necessary to continue pushing in the same direction of motion such that the projection of the piston reaches the upper part of the guide, the curved form of which forces the piston to slightly rotate on the axis thereof until the projection is arranged on the vertical of the downwards path and by its own weight, or, if necessary in the absence of sufficient vertical projection due to gravity, by means of a spring, thus making the trajectory on the downward path.

[0014] The elastic tabs are easily moldable, either in a plastic piece or in any other material resistant enough to support the weight of the light sources.

[0015] The elastic tabs alone of this invention make up the mechanism that supports the weight of the light source when the same rests against said tabs, such that it is not necessary to use additional pieces, such as connectors, screws, nuts or other pieces that fix the light source to the piston of the cylindrical structure.

[0016] In some embodiments, the cylindrical structure comprises a partial cover, such that it is practically open at the distal end thereof, or comprises radial ribs for rigidity on the distal end thereof.

[0017] In some embodiments the cylindrical structure is open at the distal end thereof.

[0018] In some embodiments, the piston, on the upper portion thereof, comprises a heat sink and, on the lower portion thereof, the light source.

[0019] In some embodiments, the piston comprises on the lower portion thereof an optical assembly arranged in front of the slight source.

[0020] In some embodiments the cylindrical structure comprises an upper cylindrical body and a lower cylindrical body.

[0021] In some embodiments the upper cylindrical body comprises the guide.

[0022] In some embodiments the upper cylindrical body comprises openings for ventilation on the cylindrical cross section thereof.

[0023] In some embodiments the upper cylindrical body is made of two identical semi-cylindrical parts, such that the lamp comprises two guides.

[0024] In some embodiments, the lower cylindrical body comprises on the lower end thereof a frame for the fastening thereof to the face of the wall.

[0025] In some embodiments, the lamp comprises joining means between the upper cylindrical body and the lower cylindrical body, the joining means being bayonet type joining means.

[0026] In some embodiments the lamp comprises two or more guides angularly distributed around the axis of the lamp.

[0027] In some embodiments the lamp comprises two guides situated across from each other.

[0028] In some embodiments, the space between the piston and the cylindrical structure is comprised between 0.5 and 0.8 mm.

[0029] In some embodiments, the space between the piston and the cylindrical structure is comprised between 0.6 and 0.7 mm and more preferably between 0.65 and 0.67 mm.

[0030] Lastly, in some embodiments the lamp comprises an elastic element arranged to exert a force on the piston that has a direction from the distal part to the proximal part.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] As a complement to the description, and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with various practical embodiments of the lamp, said description is accompanied by a set of figures constituting an integral part thereof, which by way of illustration and not limitation represent the following:

Figure 1 shows a perspective view of the lamp according to the invention.

Figure 2 shows a cross section according to a mid-axial plane of the lamp.

Figure 3 shows an elevation view of the lamp.

Figure 4 shows a perspective view of the upper cylindrical body.

Figure 5 shows a perspective view of one of the semi-cylindrical parts that make up the upper cylindrical body.

Figure 6 shows a semi-cylindrical part from the inside, in particular showing the details of the guide provided with projections.

Figure 7 is a view according to the axial direction of a semi-cylindrical part.

Figure 8 is a view according to the axial direction of the piston, from the upper part, which allows the retaining projections and a heat sink to be seen.

Figure 9 is a side elevation view of the piston.

Figure 10 is a perspective view of the piston.

Figure 11 shows the lamp of the invention fixed to a face of a wall.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0032] As illustrated for example in figure 1, the invention relates to a lamp L comprising two parts:

- a cylindrical structure 1 intended to be fixed to a face of a wall P, which is provided with a hole, and on the lower side of the same. As such, a proximal part and a distal part of the cylindrical structure 1 are defined with respect to the face of the wall P. The cylindrical structure is open at the part proximal to the face of the wall P;
- a sliding piston 2 mounted in the cylindrical structure 1, the piston 2 comprising a light source 21, which will preferably be a LED type light.

[0033] As shown in figure 6, the cylindrical structure 1 comprises two guides for a closed route G on the inner surface thereof, such that for each guide an upwards path GS and a downwards path GB are defined, connected by the upper and lower ends thereof.

[0034] The upwards path GS is provided with elastic tabs 11 which project from the inner surface of the cylindrical structure 1. In the illustrated embodiment, each guide has three retention tabs 11.

[0035] The piston 2 is provided with two retaining projections 22, each one for guiding the piston within the cylindrical structure 1. The retaining projections 22 are arranged to slide on the guide G, the elastic tabs 11 being arranged to bend and not retain the piston 2 when the same moves from the proximal part towards the distal part, but to retain it in the opposite direction.

[0036] This way, as many stable positions as tabs on each guide are defined.

[0037] The upper end of the guide G is configured to take the retaining projection 22 from the upper end of the upwards path GS to the upper end of the downwards path GB when the piston reaches a maximum height, the lower end of the guide G being configured to take the retaining projection 22 from the lower end of the downwards path GB to the lower end of the upwards path GS when the piston reaches a minimum height.

[0038] In other words, the curved edges of the guide, as shown in figure 6, allow the piston to be pushed upwards, to take the retaining projections 22 to the vertical of the guide section on which it will slide to return to the position close to the proximal end of the cylindrical structure 1.

[0039] This configuration therefore allows the configuration of lighting of the lamp L to be adjusted, moving the piston 2 through the cylindrical structure 1, making it only necessary to push the piston from below to achieve the result.

[0040] As can be seen in figure 1 or 7, for example, the cylindrical structure 1 comprises a partial cover 12 such that it is partially open at the distal end thereof.

[0041] This way, the heat dissipation generated in the heat sink 23 of the piston 2 is facilitated.

[0042] As shown in figures 8 to 10, on the upper portion thereof the piston 2 comprises a heat sink 23 and on the lower portion thereof the light source 21, which in this case is a LED.

[0043] As shown in figure 2, the piston 2, on the lower portion thereof, completes an optical assembly 24 arranged in front of the light source 21.

[0044] As can be seen in figures 1, 2, 3 and 11, the cylindrical structure 1 is made up in turn of an upper cylindrical body 13 and a lower cylindrical body 14 which facilitate the assembly thereof.

[0045] The upper cylindrical body 13 comprises the guide G, while the lower cylindrical body 14, on the lower end thereof, comprises a frame 15 to be fastened to the face of the wall P, which can be an integral part of the lower cylindrical body or an added piece.

[0046] It is also envisaged that the upper cylindrical body 13 comprises openings for ventilation 131 on the cylindrical cross section thereof, as shown in figures 4 and 5.

[0047] The upper cylindrical body 13 is made of two identical semi-cylindrical parts, such that the lamp L comprises two guides G.

[0048] As can be seen for example in figure 3, joining means between the upper cylindrical body 13 and the lower cylindrical body 14 are envisaged.

[0049] The joining means can be threaded, or coupled using projections and recesses. In the embodiment illustrated, these joining means B are of a bayonet type, meaning the lower cylindrical body has an L-shaped guide formed in a frame, with a vertical entrance section and a horizontal fastening section, while the upper cylindrical part has a lower strip intended to be coupled in the frame and which is provided with a projection, in this case formed by two half circles, which couple in the bayonet type guide B.

[0050] In the embodiment illustrated, two guides G, arranged at 180° to one another around the axial axis of the lamp L are envisaged. In figure 11, the three elastic tabs of the guide can be seen from the outside, while through the two windows on the left one can partially see the facing tabs and the upwards GS and downwards GB sections of the guide G.

[0051] In the embodiment illustrated, the space between the piston 2 and the cylindrical structure 1 is 0.67 mm, which is the result of an optimal compromise between the need of a certain space to avoid jamming due to a lack of alignment or dilation and the need for guiding the piston 2 in the cylindrical body 1.

[0052] In this text, the word "comprises" and its variants (such as "comprising", etc.) should not be understood in an exclusive sense, i.e. they do not exclude the possibility of that which is described including other elements, steps, etc.

[0053] Also, the invention is not limited to the specific embodiments described herein, but rather encompasses the variations that one skilled in the art could make (e.g.

in terms of choice of materials, dimensions, components, design, etc.), within the scope of what may be deduced from the claims.

Claims

1. A lamp (L) comprising:

- a cylindrical structure (1) intended to be fixed to a face of a wall (P) provided with a hole and on an inner side of the face of a wall (P), such that a proximal part and a distal part of the cylindrical structure (1) are defined with respect to the face of the wall (P), the cylindrical structure (1) being opened at the part proximal to the face of the wall (P); and
- a light source (21);

characterized in that it comprises a sliding piston (2) mounted in the cylindrical structure (1), the piston (2) comprising the light source (21) such that the configuration of the lighting of the lamp (L) can be adjusted by moving the piston (2) through the cylindrical structure (1).

2. The lamp according to claim 1, wherein the cylindrical structure (1) comprises on the inner surface thereof, or the piston (2) on the side surface thereof, at least one guide with a closed route (G), such that an upwards path (GS) and a downwards path (GB) are defined, connected by the upper and lower ends thereof, the upwards path (GS) being provided with elastic tabs (11) that protrude from the inner surface of the cylindrical structure (1), or, from the side surface of the piston, respectively, the piston (2) or the cylindrical surface (1), respectively, being provided with at least one retaining projection (22), the retaining projection (22) being arranged to slide on the guide (G), the elastic tabs (11) being arranged to bend and not retain the piston (2) when the same moves from the proximal part to the distal part, but to retain it when moving in the opposite direction, the upper end of the guide (G) being configured to take the retaining projection (22) from the upper end of the upwards path (GS) to the upper end of the downwards path (GB) when the piston reaches a maximum height and the lower end of the guide (G) being configured to take the retaining projection (22) from the lower end of the downwards path (GB) to the lower end of the upwards path (GS) when the piston reaches a minimum height.

3. The lamp (L) according to any of the preceding claims, wherein the cylindrical structure (1) comprises a partial cover (12) such that it is partially opened at the distal end thereof, or comprises radial ribs for rigidity on the distal end thereof.

4. The lamp (L) according to claim 1, wherein the cylindrical structure (1) is opened at the distal end thereof.

5. The lamp (L) according to any of the preceding claims, wherein the piston (2) comprises on the upper portion thereof a heat sink (23) and on the lower portion thereof the light source (21).

6. The lamp (L) according to claim 5, wherein the piston (2) comprises on the lower portion thereof an optical assembly (24) arranged in front of the light source (21).

7. The lamp (L) according to any of the preceding claims, wherein the cylindrical structure (1) comprises an upper cylindrical body (13) and a lower cylindrical body (14).

8. The lamp (L) according to claim 7, wherein the upper cylindrical body (13) comprises the guide (G).

9. The lamp (L) according to claim 7 or claim 8, wherein the upper cylindrical body (13) comprises openings for ventilation (131) on the cylindrical cross section thereof.

10. The lamp (L) according to claims 7 to 9, wherein the upper cylindrical body (13) is made of two identical semi-cylindrical parts, such that the lamp (L) comprises two guides (G).

11. The lamp (L) according to claims 7 to 10, wherein the lower cylindrical body (14) comprises on the lower end thereof a frame (15) to be fastened to the face of the wall (P).

12. The lamp according to claim 7, which comprises joining means between the upper cylindrical body (13) and the lower cylindrical body (14), the joining means being bayonet type (B).

13. The lamp according to claim 2, which comprises two or more guides (G) angularly distributed around the axis (Γ) of the lamp (L).

14. The lamp according to any of the preceding claims, wherein the space between the piston (2) and the cylindrical structure (1) is comprised between 0.5 and 0.8 mm, more preferably between 0.6 and 0.7 mm, and even more preferably between 0.65 and 0.67 mm.

15. The lamp according to claim 2 or any dependent claim thereof, which comprises an elastic element arranged to exert a force on the piston (2) that has a direction from the distal part to the proximal part.

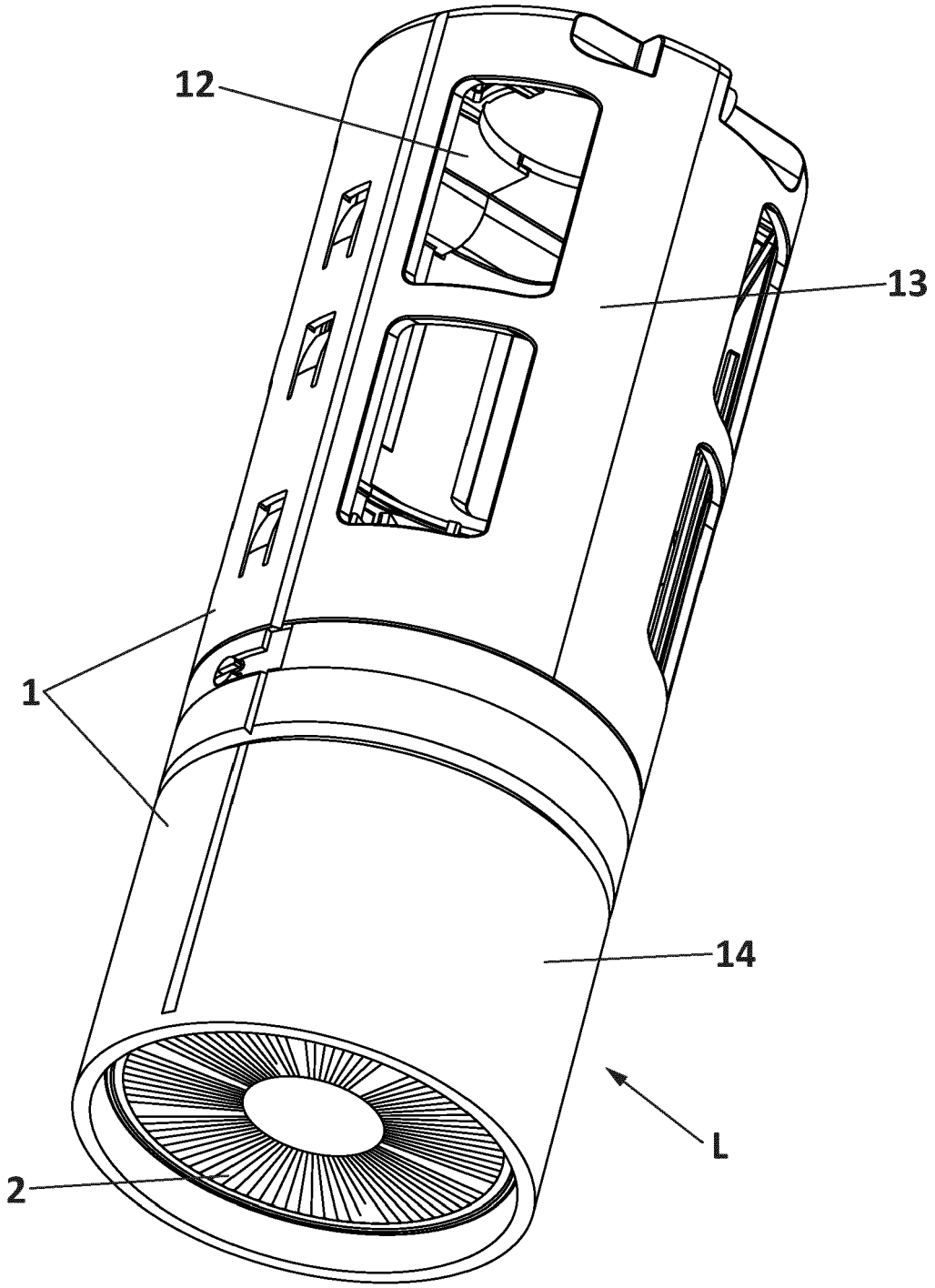

FIG. 1

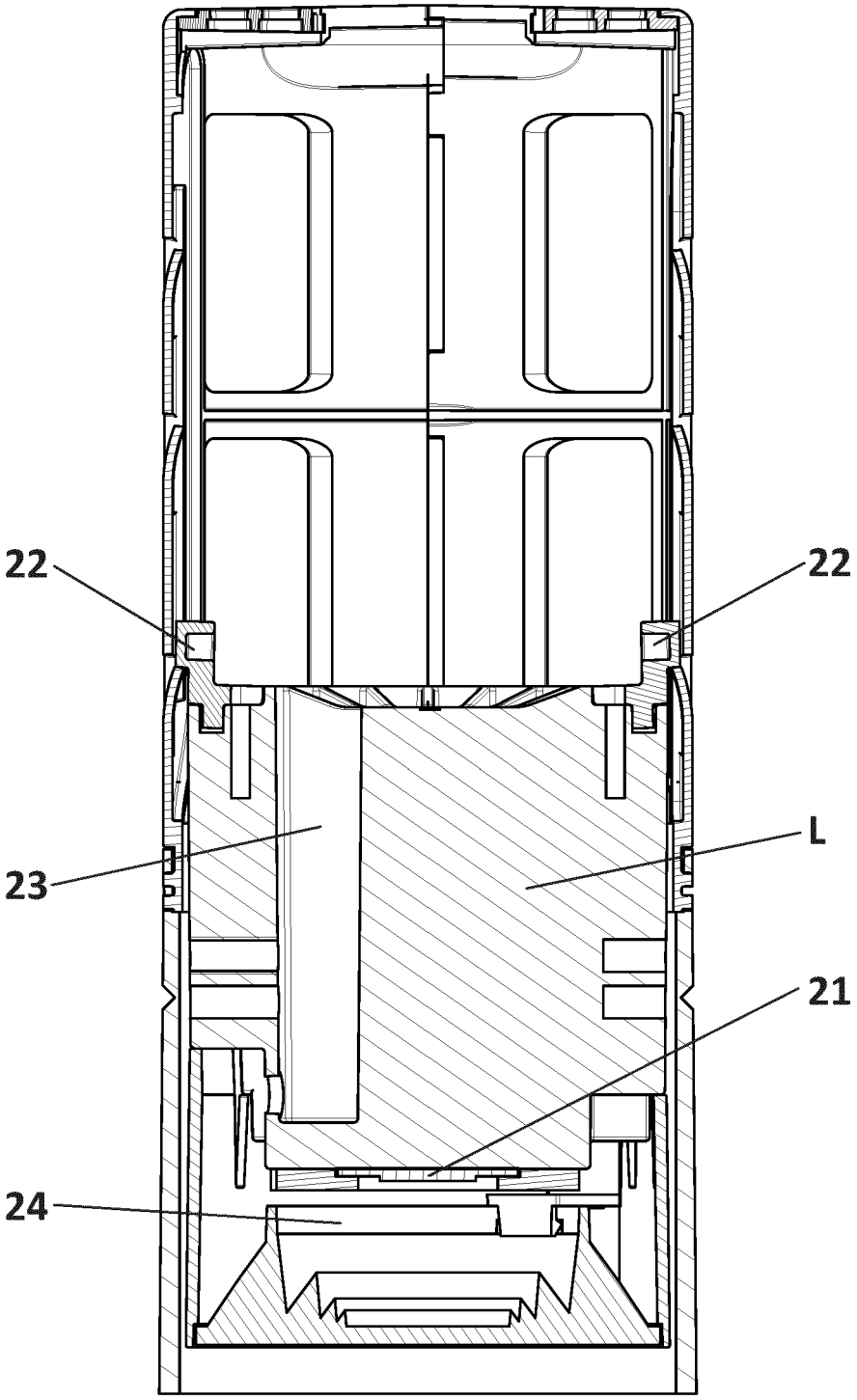

FIG. 2

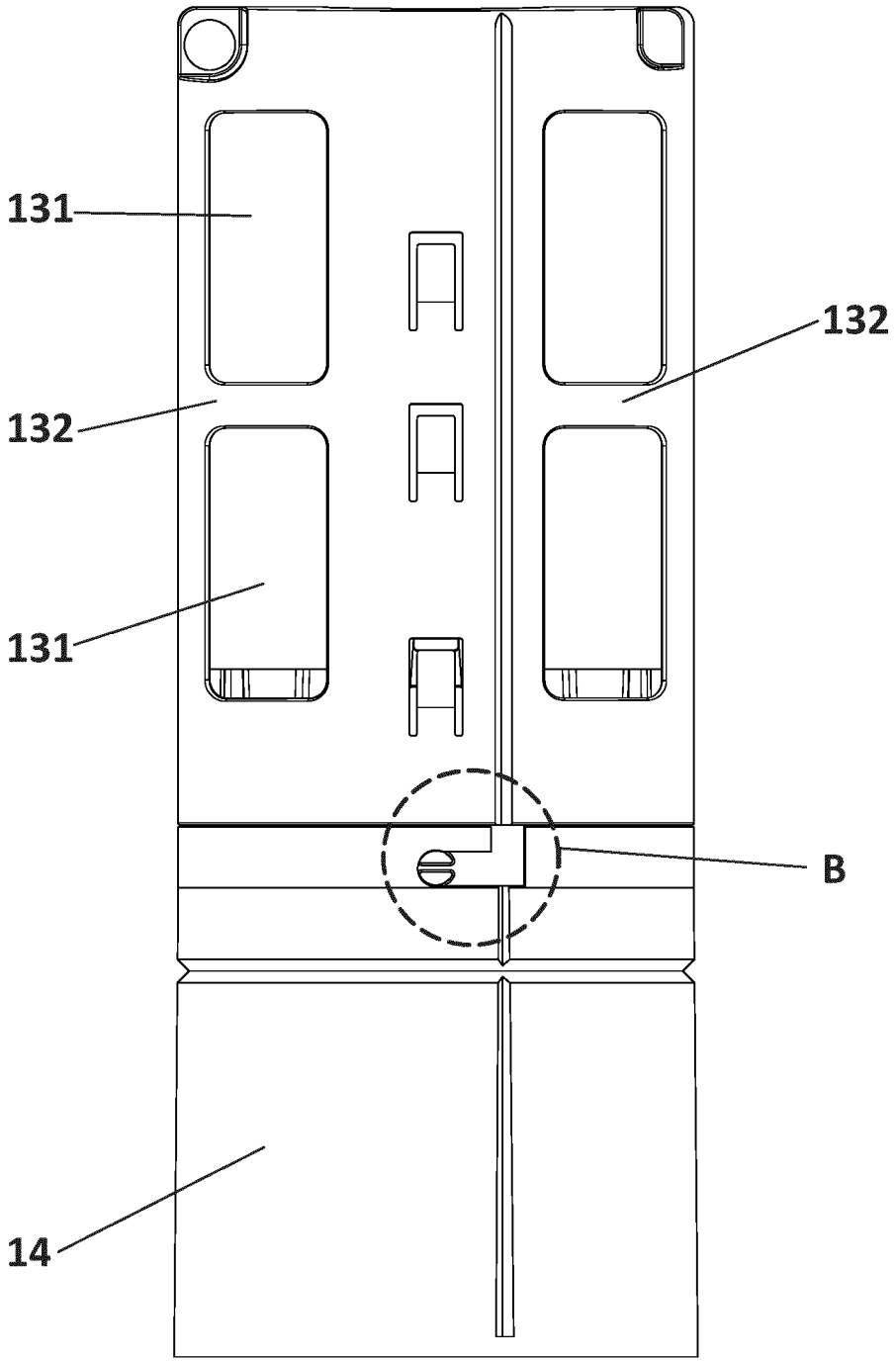

FIG. 3

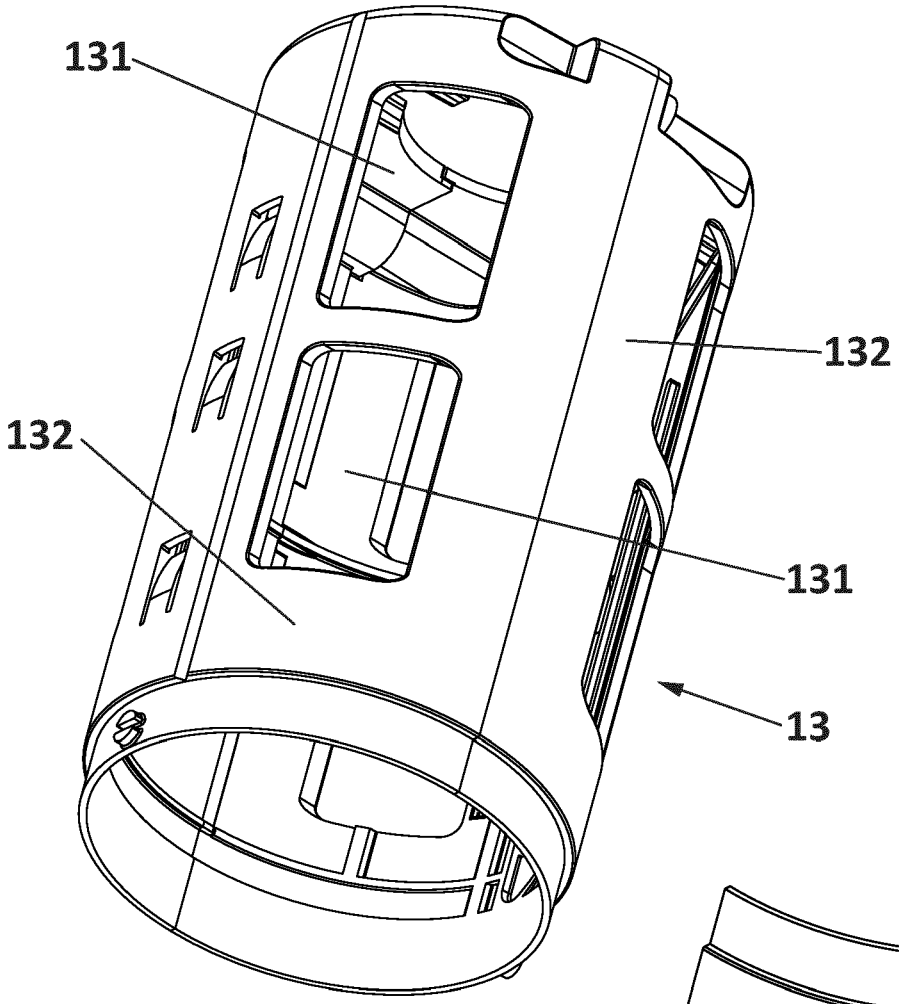

FIG. 4

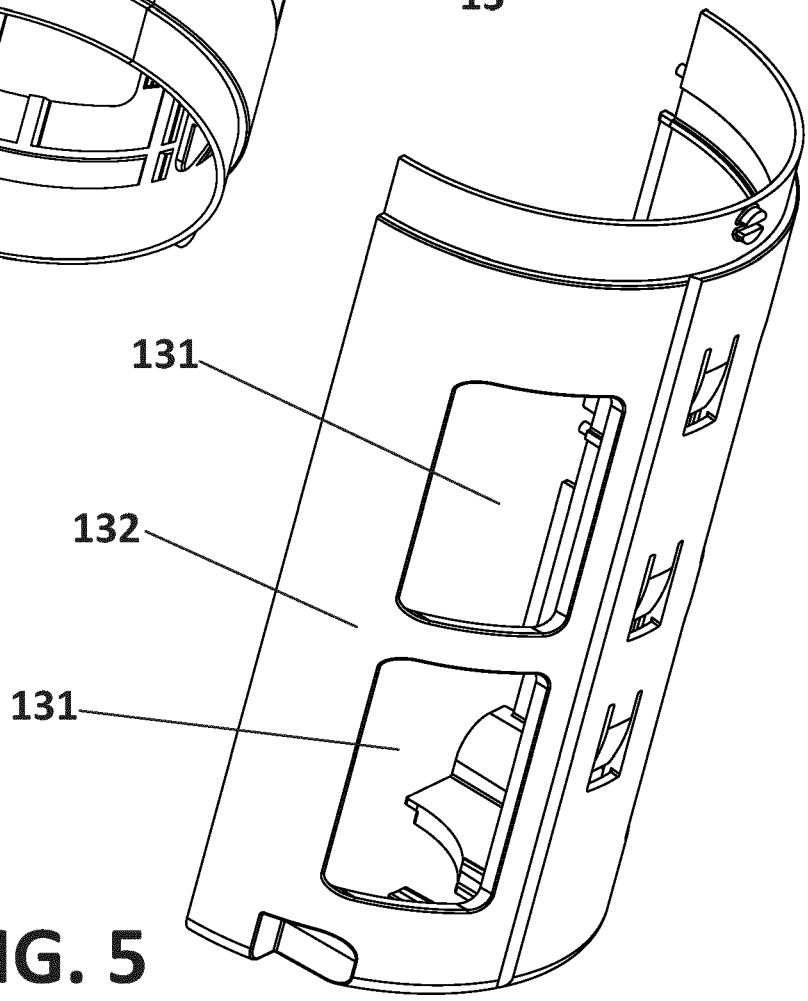

FIG. 5

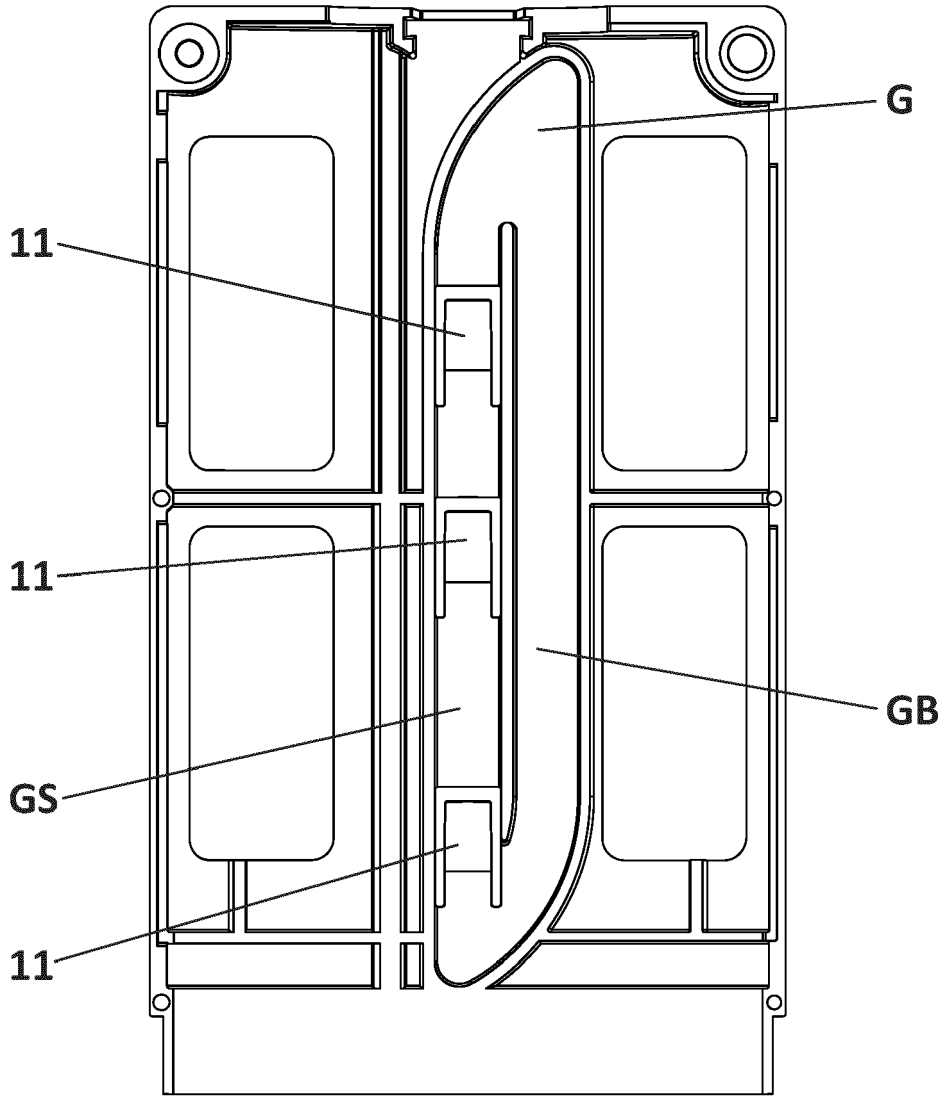

FIG. 6

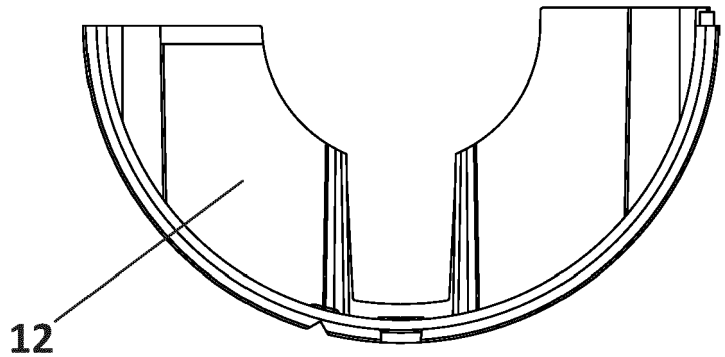

FIG. 7

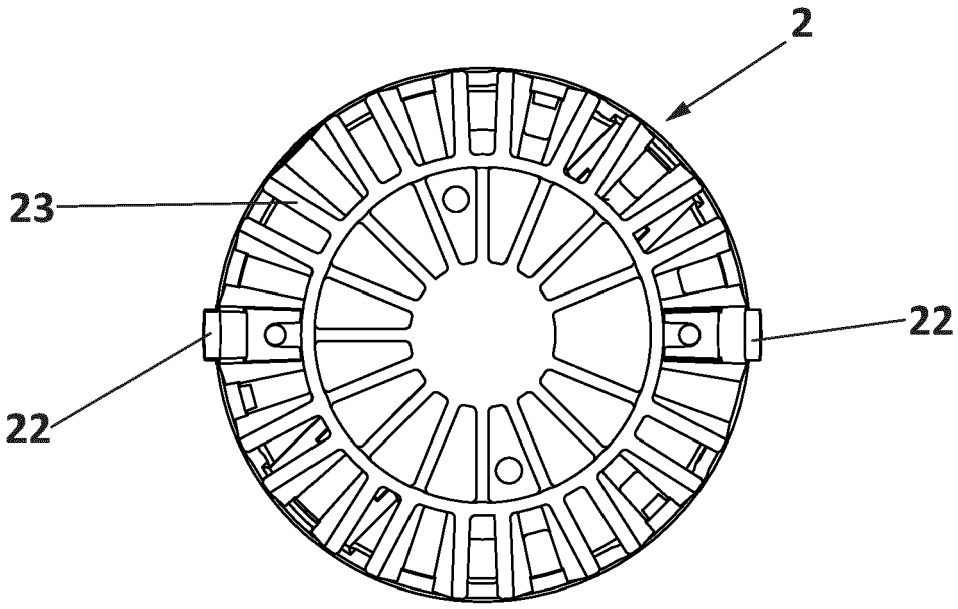

FIG. 8

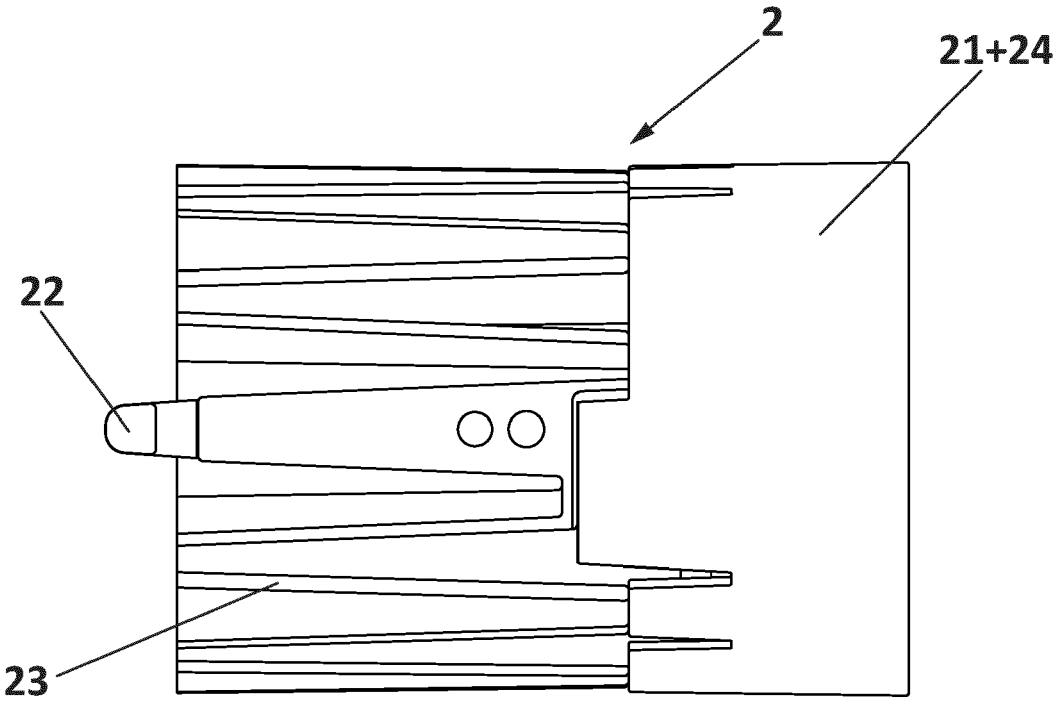

FIG. 9

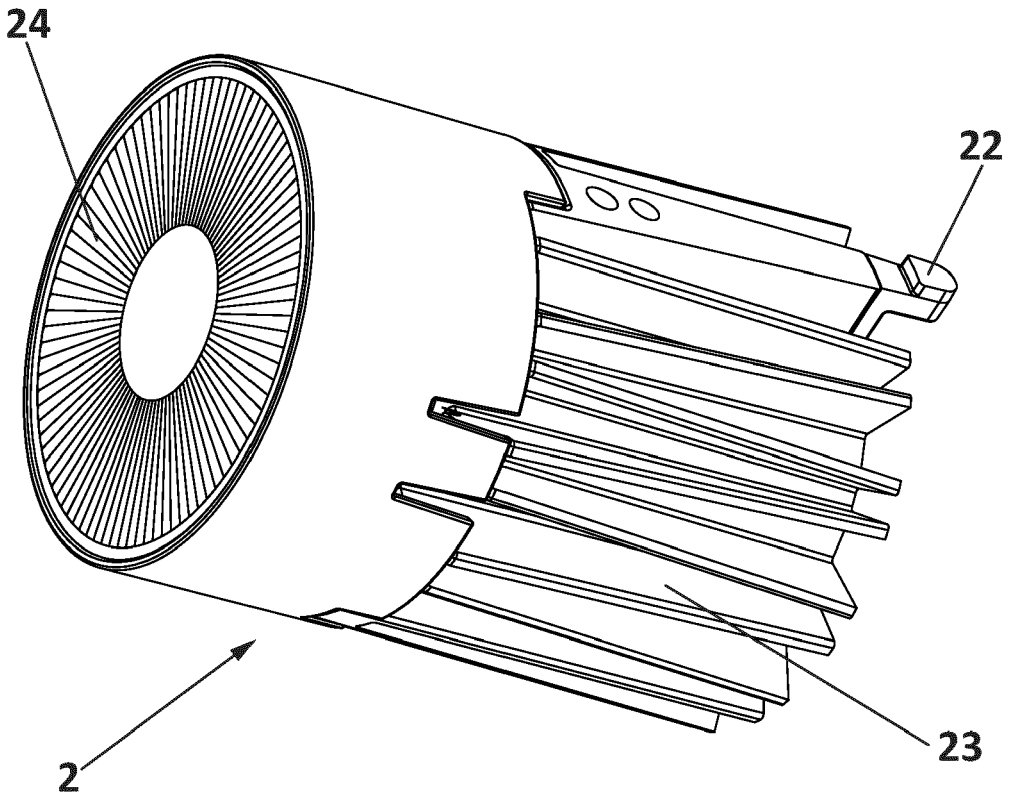

FIG. 10

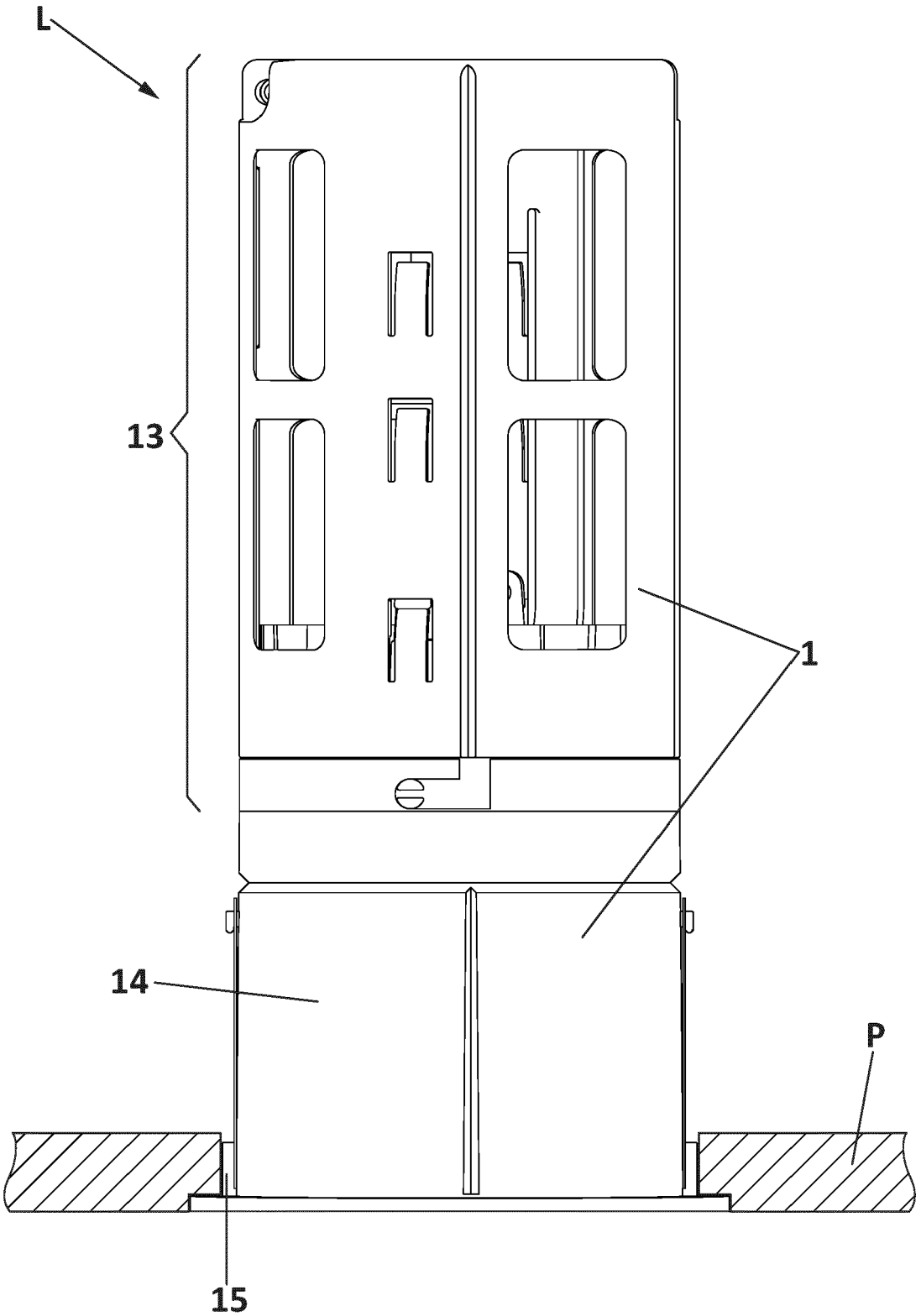

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 18 38 2178

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F21S
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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	12 June 2018	Allen, Katie

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 38 2178

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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