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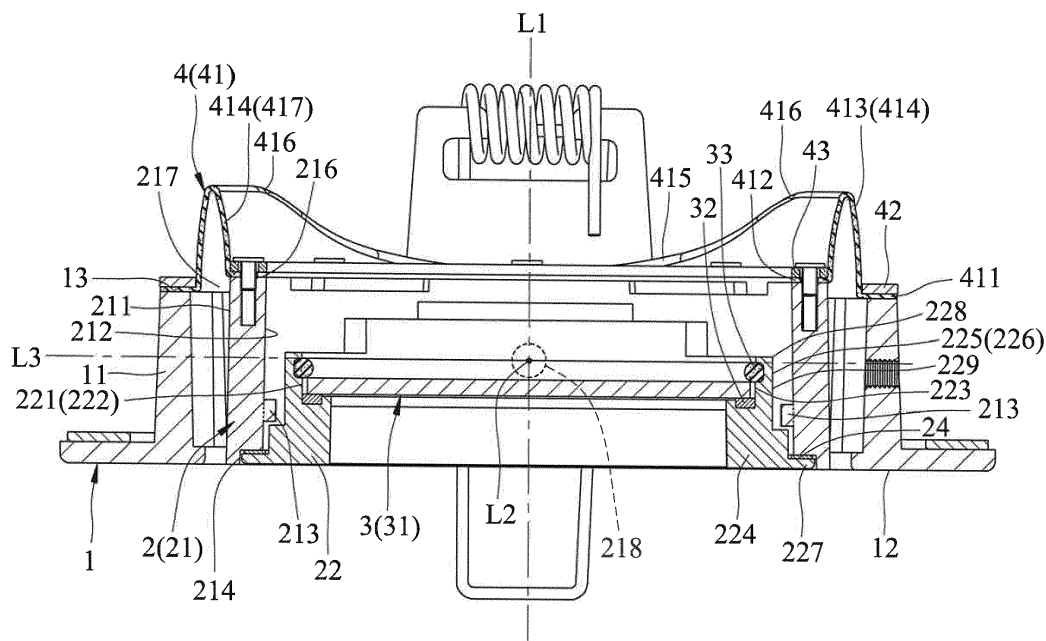
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**(54) LAMP HOLDER**

(57) A lamp holder includes a frame seat (1), a rotatable seat (2), a lens unit (3) and a watertight elastic unit (4). The frame seat (1) includes a barrel wall (11) surrounding a first axis (L1) and defining a rotating space (111). The rotatable seat (2) is disposed in the rotating space (111), and has an outer surrounding surface (211), a connecting end (216) cooperating with an installing end (13) of the barrel wall (11) to define a gap (217) therebetween,

and two rotating studs (218) extending from the outer surrounding surface (211) to the barrel wall (11) such that the rotatable seat (2) is rotatable about a second axis (L2) relative to the frame seat (1). The lens unit (3) is in watertight connection with the rotatable seat (2). The watertight elastic unit (4) is made of an elastic material, and interconnects the installing end (13) and the connecting end (216) to completely block the gap (217).

**FIG.4**

## Description

**[0001]** The disclosure relates to a lamp holder, more particularly to a waterproof lamp holder.

**[0002]** A conventional waterproof lamp is generally equipped with washers or seal tapes to block or fill gaps or holes in a housing thereof, thereby achieving the goal of waterproofing.

**[0003]** However, for a conventional lamp including a frame and a lamp seat that is rotatably mounted in the frame, since the shape of a gap between the frame and the lamp seat changes continuously during the rotation of the lamp seat relative to the frame, the abovementioned washers and seal tapes cannot be utilized to fulfill the waterproofing function.

**[0004]** Therefore, the object of the disclosure is to provide a rotatable and waterproof lamp holder.

**[0005]** According to the disclosure, a lamp holder is adapted to be mounted with a lamp, and includes a frame seat, a rotatable seat, and a lens unit. The frame seat includes a barrel wall that surrounds a first axis, that defines a rotating space, and that has opposite lighting end and installing end along the first axis. The rotatable seat is disposed in the rotating space, and has an inner surface that surrounds the first axis and that defines a mounting space adapted for receiving the lamp, an outer surrounding surface that is opposite to the inner surface, a connecting end that cooperates with the installing end of the barrel wall to define a gap therebetween, and two rotating studs that are spaced apart from each other along a second axis perpendicular to the first axis, and that extend from the outer surrounding surface to barrel wall such that the rotatable seat is rotatable about the second axis relative to the frame seat. The lens unit is disposed in the rotating space and is in watertight connection with the rotatable seat. The lamp holder further includes a watertight elastic unit made of an elastic material, and interconnecting the installing end of the barrel wall of the frame seat and the connecting end of the rotatable seat to completely block the gap.

**[0006]** Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiments with reference to the accompanying drawings, of which:

Fig. 1 is an exploded perspective view illustrating an embodiment of a lamp holder according to the disclosure;

Fig. 2 is a perspective view of the embodiment mounted with a lamp and fastened on a wall structure;

Fig. 3 is an assembled perspective view of the embodiment;

Fig. 4 is a sectional view of the embodiment taken along line IV-IV in Fig. 3, illustrating a rotatable seat at a normal state;

Fig. 5 is another sectional view of the embodiment, illustrating the rotatable seat at a rotated state;

Fig. 6 is an exploded perspective view of the rotatable seat, a lens unit and a watertight elastic unit of the embodiment;

Fig. 7 is a top view of the rotatable seat, illustrating a mounting seat member at a separating position;

Fig. 8 is a sectional view of the rotatable seat taken along line VIII-VIII in Fig. 7;

Fig. 9 is a view similar to Fig. 7, but illustrating the mounting seat member at an engaging position; and

Fig. 10 is a sectional view of the rotatable seat taken along line X-X in Fig. 9.

**[0007]** Referring to Figs. 1 and 2, an embodiment of a lamp holder according to the present disclosure is illustrated. The lamp holder is adapted to be mounted with a lamp 8 and fastened on a wall structure 9. The wall structure 9 is formed with a mounting slot 92 defined between two wall segments 91. The lamp holder includes a frame seat 1, a rotatable seat 2, a lens unit 3, a watertight elastic unit 4, and a clip member 5.

**[0008]** The frame seat 1 includes a barrel wall 11 that surrounds a first axis (L1), that defines a rotating space 111, and that has opposite lighting end 12 and installing end 13 along the first axis (L1). The frame seat 1 further includes a rim wall 14 (see Fig. 4) that extends outwardly from the installing end 13 of the barrel wall 11, a watertight seat washer 15 that surrounds the barrel wall 11 and that is coupled to the rim wall 14, and two springs 16 that are disposed at opposite sides of the first axis (L1) and that are connected to the barrel wall 11. In this embodiment, the springs 16 are torsion springs and are adapted to cooperate with the rim wall 14 to clamp the wall segments 91 of the wall structure 9 thereamong when the lamp holder is disposed in the mounting slot 92 so as to abut the rim wall 14 tightly against the wall segments 91 and to fasten the lamp holder on the wall structure 9.

**[0009]** Further referring to Figs. 3 to 5, the rotatable seat 2 is disposed in the rotating space 111 of the barrel wall 11, and includes a rotatable seat member 21, a mounting seat member 22, and a watertight member washer 24.

**[0010]** In this embodiment, the rotatable seat member 21 has an outer surrounding surface 211, an inner surrounding surface 212 opposite to the outer surrounding surface 211, two stop parts 213 protruding from the inner surrounding surface 212, a connecting end 216 cooperating with the installing end 13 of the barrel wall 11 to define a gap 217 (see Fig. 4) therebetween, and a coupling part 214 formed in an end of the inner surrounding surface 212 that is opposite to the connecting end 216 along the first axis (L1). In this embodiment, the coupling part 214 is formed as an annular groove. The rotatable seat member 21 further has two rotating studs 218 spaced apart from each other along a second axis (L2) that is perpendicular to the first axis (L1), and extending from the outer surrounding surface 211 to the barrel wall 11, such that the rotatable seat 2 is rotatable about the second axis (L2) relative to the frame seat 1 between a

normal state (see Fig. 4), where the connecting end 216 is adjacent and parallel to the installing end 13 of barrel wall 11, and a rotated state (see Fig. 5), where the connecting end 216 is turned and shifted away from the installing end 13.

**[0011]** The mounting seat member 22 has an inner surface 221 surrounded by the outer surrounding surface 211 of the rotatable seat member 21 (i.e., the inner surface 221 is opposite to the outer surrounding surface 211 with respect to the first axis (L1)). The inner surface 221 surrounds the first axis (L1) and defines a mounting space 222 that is adapted for receiving the lamp 8. In this embodiment, the mounting seat member 22 further has an annular support wall 224 extending from the inner surface 221 and cooperating with the inner surface 221 to define an annular mounting groove 223, an outer surface 225 opposite to the inner surface 221, two engaging parts 226 formed in the outer surface 225 and engaged respectively with the stop parts 213 of the rotatable seat member 21, and a rib part 227 extending from the outer surrounding surface 211 and engaging the coupling part 214 of the rotatable seat member 21.

**[0012]** Referring to Fig. 6, each of the engaging parts 226 has an opening 228 opposite to the rib part 227 along the first axis (L1), a track portion 229 being in spatial communication with the opening 228 and extending circumferentially, and a limit portion 230 formed at an end of the track portion 229 that is distal from the opening 228. The track portion 229 of each of the engaging parts 226 has an inclined edge 231 and a non-inclined edge 232 that are respectively proximate to and distal from the opening portion 228 along the first axis (L1), such that a width 233 between the inclined edge 231 and the non-inclined edge 232 gradually increases from the limit portion 230 to the opening 228, and gradually decreases from the opening 228 to the limit portion 230.

**[0013]** Referring further to Figs. 7 to 10, the mounting seat member 22 is rotatable about the first axis (L1) relative to the rotatable seat member 21 between a separating position (see Fig. 7), where each of the stop parts 213 is registered with the opening 228 of a respective one of the engaging parts 226 so as to permit separation of the stop parts 213 from the engaging parts 226, and an engaging position (see Fig. 9), where each of the stop parts 213 is disposed at the limiting portion 230 of the respective one of the engaging parts 226 to thereby limit the rotation of the mounting seat member 22 relative to the rotatable seat member 21.

**[0014]** The watertight member washer 24 is clamped between the coupling part 214 of the rotatable seat member 21 and the rib part 227 of the mounting seat member 22.

**[0015]** Referring back to Figs. 1 to 4, the lens unit 3 is disposed in the rotating space 111, and in watertight connection with the rotatable seat 2. Specifically, the lens unit 3 includes a lens 31 disposed in the mounting space 222 and engaging the mounting groove 223, and a watertight lens washer 32 disposed in the mounting space

222 and clamped between the lens 31 and the support wall 224 of the rotatable seat 2. The lens unit 3 further includes a circlip 33 disposed in the mounting groove 223 and at a side of the lens 31 opposite to the watertight lens washer 32 along the first axis (L1). The watertight lens washer 32, the lens 31, and the circlip 33 are arranged along the first axis (L1).

**[0016]** The watertight elastic unit 4 is made of an elastic material, interconnects the installing end 13 of the barrel wall 11 of the frame seat 1 and the connecting end 216 of the rotatable seat member 21 to completely block the gap 217, and includes an elastic member 41, a first fastening ring 42, and a second fastening ring 43.

**[0017]** The elastic member 41 has an outer rim 411 connected to the installing end 13 of the barrel wall 11, an inner rim 412 connected to the connecting end 216 of the rotatable seat member 21, and a connecting portion 413 interconnecting the outer and inner rims 411, 412 and completely blocking said gap 217.

**[0018]** The connecting portion 413 has an inverted U-shaped cross-section when the rotatable seat 2 is at the normal state, and includes two large elastic segments 414 that are spaced apart from each other along a third axis (L3) (see Fig. 4) perpendicular to the first and second axes (L1, L2), and two small elastic segments 415 that are arranged alternately with the large elastic segments 414. Each of the large elastic segments 414 has two end sections 416 that are circumferentially spaced apart from each other, and an intermediate section 417 that is disposed between the end sections 416 and that has a height along the first axis (L1) not smaller than that of the end sections 416. Each of the small elastic segments 415 interconnects a respective one of the end sections 416 of one of the large elastic segments 414 and a respective one of the end sections 416 of the other one of the large elastic segments 414, and has a middle section 418 disposed between the respective one of the end sections 416 of one of the large elastic segments 414 and the respective one of the end sections 416 of the other one of the large elastic segments 414. A height of each of the small elastic segments 415 gradually decreases from opposite circumferential ends thereof toward the middle section 418 thereof.

**[0019]** The first fastening ring 42 is secured fixedly to the outer rim 411 and is fastened threadedly to the installing end 13 of the barrel wall 11. The second fastening ring 43 is secured fixedly to the inner rim 412 and is fastened threadedly to the connecting end 216 of the rotatable seat member 21.

**[0020]** As shown in Figs. 1 and 2, the clip member 5 has a fastening end portion 51 that is fastened fixedly on the connecting end 216 of the rotatable seat member 21, and a free end portion 52 that is opposite to the fastening end portion 51 and that is formed with a retaining groove 53 adapted to be engaged with the lamp 8.

**[0021]** Therefore, by virtue of the rotation of the rotatable seat 2 between the normal state and the rotated state, a light direction of the lamp 8 can be adjusted.

Moreover, with the presence of the watertight elastic unit 4, the gap 217 can be properly blocked during the rotation of the rotatable seat 2 even with the shape of the gap 217 changing continuously.

[0022] Moreover, as shown in Fig. 4, by virtue of the watertight member washer 24 that is clamped between the rotatable seat member 21 and the mounting seat member 22, and the watertight lens washer 32 and the circlip 33 that are disposed in the mounting groove 223 of the mounting seat member 22, water can be blocked from entering the lamp holder from an end opposite to the watertight elastic unit 4.

[0023] Furthermore, as shown in Fig. 2, the watertight seat washer 15 serves to prevent passage of the water through a gap between the frame seat 1 and the wall structure 9.

## Claims

1. A lamp holder adapted to be mounted with a lamp (8), and including  
a frame seat (1) including a barrel wall (11) that surrounds a first axis (L1), that defines a rotating space (111), and that has opposite lighting end (12) and installing end (13) along the first axis (L1),  
a rotatable seat (2) disposed in said rotating space (111), and having  
an inner surface (221) that surrounds the first axis (L1) and that defines amounting space (222) adapted for receiving the lamp (8),  
an outer surrounding surface (211) that is opposite to said inner surface (221),  
a connecting end (216) that cooperates with said installing end (13) of said barrel wall (11) to define a gap (217) therebetween, and  
two rotating studs (218) that are spaced apart from each other along a second axis (L2) perpendicular to the first axis (L1), and that extend from said outer surrounding surface (211) to said barrel wall (11) such that said rotatable seat (2) is rotatable about the second axis (L2) relative to said frame seat (1), and  
a lens unit (3) disposed in said rotating space (111) and being in watertight connection with said rotatable seat (2),  
**characterized in that** said lamp holder further includes a watertight elastic unit (4) made of an elastic material, and interconnecting said installing end (13) of said barrel wall (11) of said frame seat (1) and said connecting end (216) of said rotatable seat (2) to completely block said gap (217).

2. The lamp holder as claimed in Claim 1, **characterized in that:**

said rotatable seat (2) further has an annular support wall (224) extending from said inner sur-

face (221) and cooperating with said inner surface (221) to define a mounting groove (223); and

said lens unit (3) includes a lens (31) disposed in said mounting space (222) and engaging said mounting groove (223), and a watertight lens washer (32) disposed in said mounting space (222) and clamped between said lens (31) and said support wall (224) of said rotatable seat (2), said lens (31) and said watertight lens washer (32) being arranged along the first axis (L1).

3. The lamp holder as claimed in claim 2, further **characterized in that** said lens unit (3) further includes a circlip (33) disposed in said mounting groove (223) and at a side of said lens (31) opposite to said watertight lens washer (32) along the first axis (L1).

4. The lamp holder as claimed in any one of claims 1 to 3, further **characterized in that** said rotatable seat (2) includes:

a rotatable seat member (21) having said outer surrounding surface (211), said connecting end (216) and said rotating studs (218); and  
a mounting seat member (22) having said inner surface (221).

5. The lamp holder as claimed in claim 4, further **characterized in that:**

said rotatable seat member (21) further has an inner surrounding surface (212) opposite to said outer surrounding surface (211),  
a plurality of stop parts (213) protruding from said inner surrounding surface (212), and  
a coupling part (214) formed in an end of said inner surrounding surface (212) that is opposite to said connecting end (216) along the first axis (L1);

said mounting seat member (22) further has an outer surface (225) opposite to said inner surface (221),

a plurality of engaging parts (226) formed in said outer surface (225) and engaged respectively with said stop parts (213) of said rotatable seat member (21), and

a rib part (227) extending from said outer surrounding surface (211) and engaging said coupling part (214) of said rotatable seat member (21); and

said rotatable seat (2) further includes a watertight member washer (24) clamped between said coupling part (214) of said rotatable seat member (21) and said rib part (227) of said mounting seat member (22).

6. The lamp holder as claimed in claim 5, further **char-**

**acterized in that** each of said engaging parts (226) has an opening (228) opposite to said rib part (227) along the first axis (L1), a track portion (229) being in spatial communication with said opening (228) and extending circumferentially, and a limit portion (230) formed at an end of said track portion (229) that is distal from said opening (228), said mounting seat member (22) being rotatable about the first axis (L1) relative to said rotatable seat member (21) between a separating position, where each of said stop parts (213) is registered with said opening (228) of a respective one of said engaging parts (226) so as to permit separation of said stop parts (213) from said engaging parts (226), and an engaging position, where each of said stop parts (213) is disposed at said limiting portion (230) of the respective one of said engaging parts (226) to thereby limit the rotation of said mounting seat member (22) relative to said rotatable seat member (21).

7. The lamp holder as claimed in claim 6, further **characterized in that** said track portion (229) of each of said engaging parts (226) has an inclined edge (231) and a non-inclined edge (232) that are respectively proximate to and distal from said opening (228) along the first axis (L1), a width (233) between said inclined edge (231) and said non-inclined edge (232) gradually increasing from said limit portion (230) to said opening (228).

8. The lamp holder as claimed in any one of claims 1 to 7, further **characterized in that** said watertight elastic unit (4) includes:

an elastic member (41) having  
an outer rim (411) that is connected to said installing end (13) of said barrel wall (11) of said frame seat (1), and  
an inner rim (412) that is connected to said connecting end (216) of said rotatable seat member (21);  
a first fastening ring (42) secured fixedly to said outer rim (411) and fastened threadedly to said installing end (13) of said barrel wall (11) of said frame seat (1); and  
a second fastening ring (43) secured fixedly to said inner rim (412) and fastened threadedly to said connecting end (216) of said rotatable seat member (21).

9. The lamp holder as claimed in claim 8, further **characterized in that**:

said rotatable seat (2) is rotatable about the second axis (L2) relative to said frame seat (1) between a normal state, where said connecting end (216) of said rotatable seat member (21) is adjacent to said installing end (13) of said barrel

wall (11) of said frame seat (1), and a rotated state, where said connecting end (216) is away from said installing end (13) of said barrel wall (11) of said frame seat (1); and

said elastic member (41) further has a connecting portion (413) interconnecting said outer and inner rims (411, 412) and completely blocking said gap (217);

said connecting portion (413) has an inverted U-shaped cross-section when said rotatable seat (2) is at the normal state, and includes two large elastic segments (414) that are spaced apart from each other along a third axis (L3) perpendicular to the first and second axes (L1, L2), each of said large elastic segments (414) having two end sections (416) that are circumferentially spaced apart from each other, and an intermediate section (417) that is disposed between said end sections (416), and that has a height along the first axis (L1) not smaller than that of said end sections (416), and

two small elastic segments (415) that are arranged alternately with said large elastic segments (414), each of said small elastic segments (415) interconnecting a respective one of said end sections (416) of one of said large elastic segments (414) and a respective one of said end sections (416) of the other one of said large elastic segments (414), and having a middle section (418) disposed between the respective one of said end sections (416) of one of said large elastic segments (414) and the respective one of said end sections (416) of the other one of said large elastic segments (414), a height of each of said small elastic segments (415) gradually decreasing from opposite circumferential ends thereof toward said middle section (418) thereof.

10. The lamp holder as claimed in any one of claims 1 to 9, further **characterized in that** said frame seat (1) further includes:

a rim wall (14) extending outwardly from said installing end (13) of said barrel wall (11);  
a watertight seat washer (15) surrounding said barrel wall (11) and coupled to said rim wall (14); and

two springs (16) disposed at opposite sides of the first axis (L1), connected to said barrel wall (11), and adapted to cooperate with said rim wall (14) to clamp a wall structure (9) thereamong so as to fasten said lamp holder on the wall structure (9).

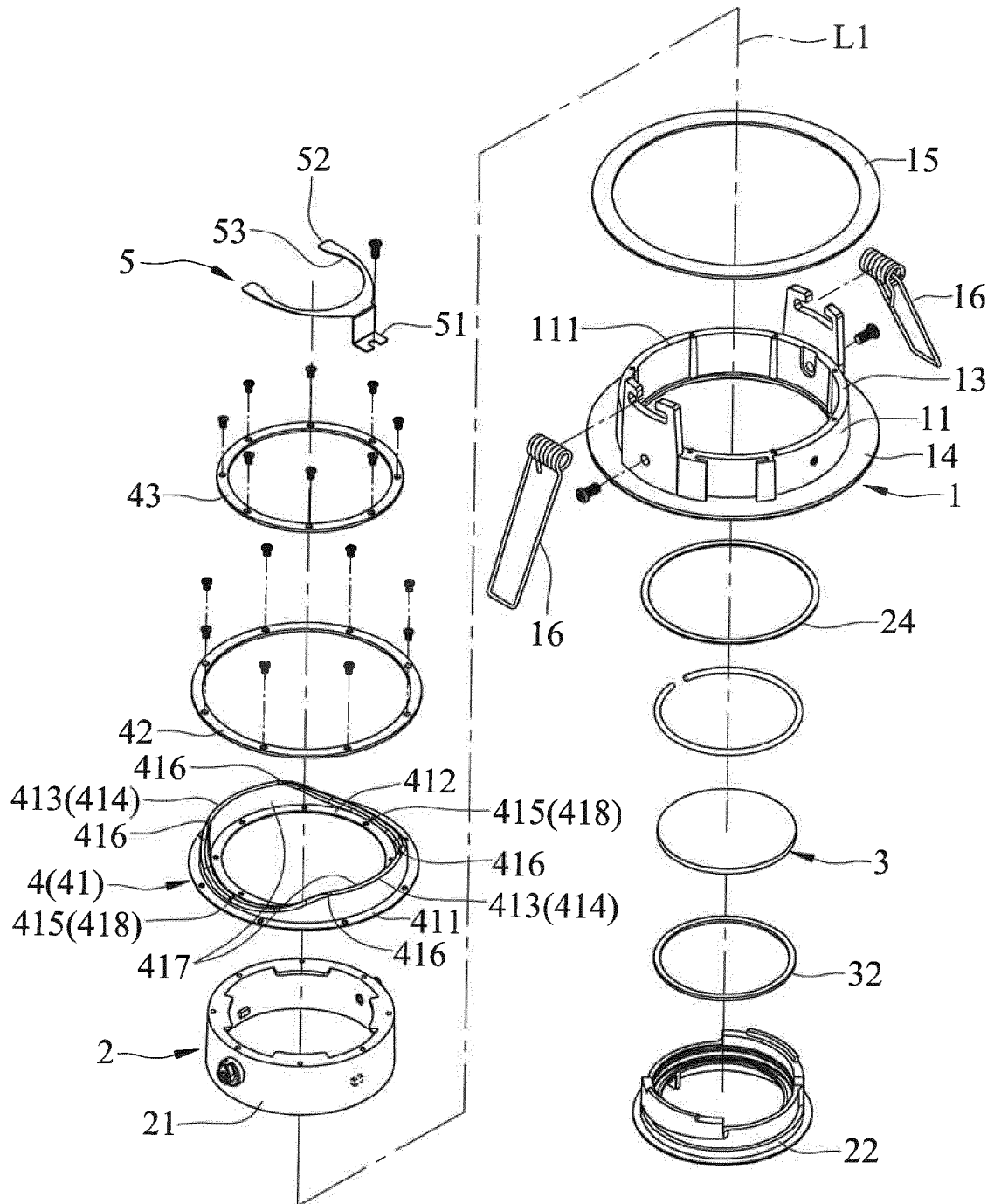


FIG.1

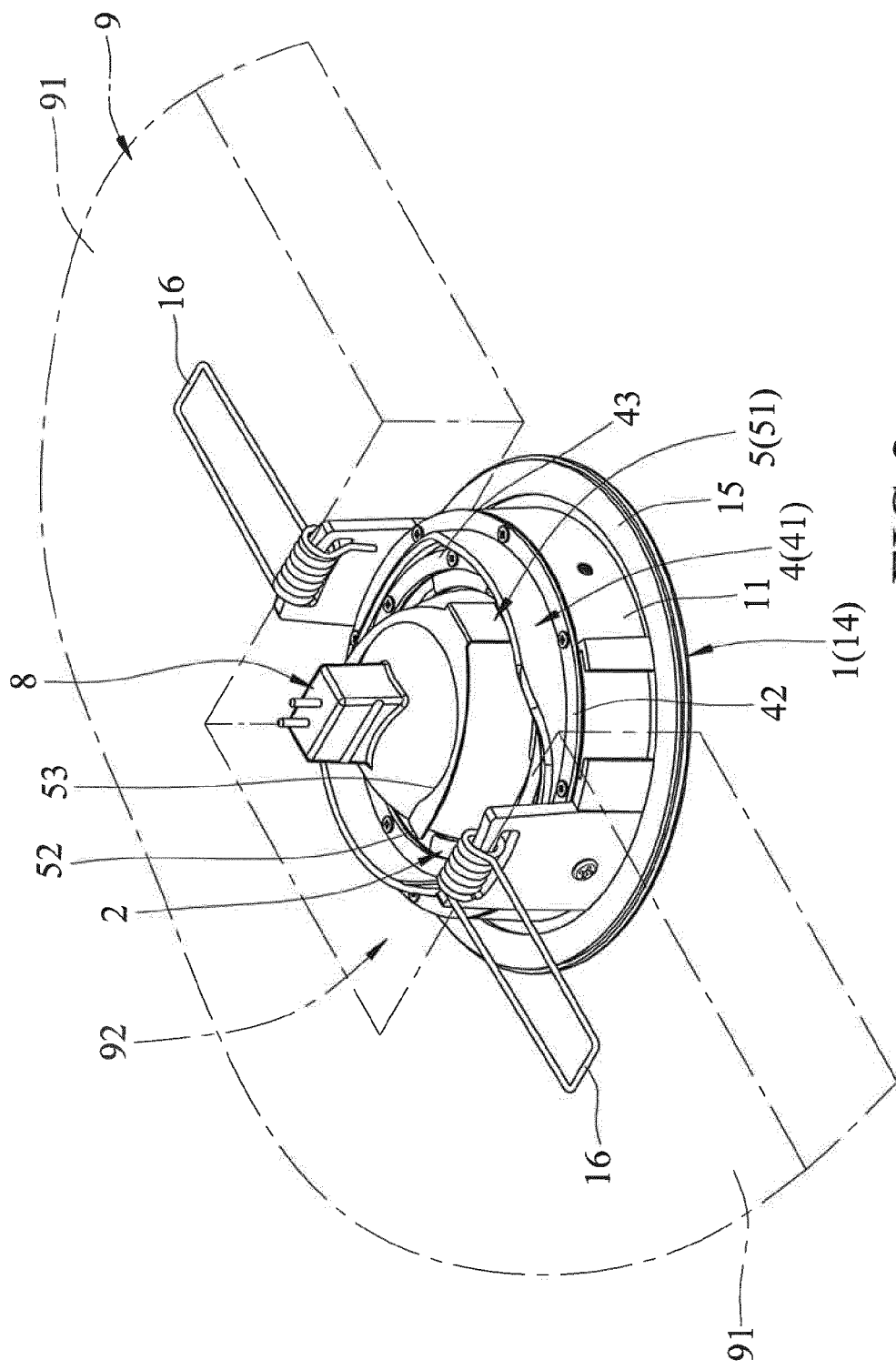


FIG.2

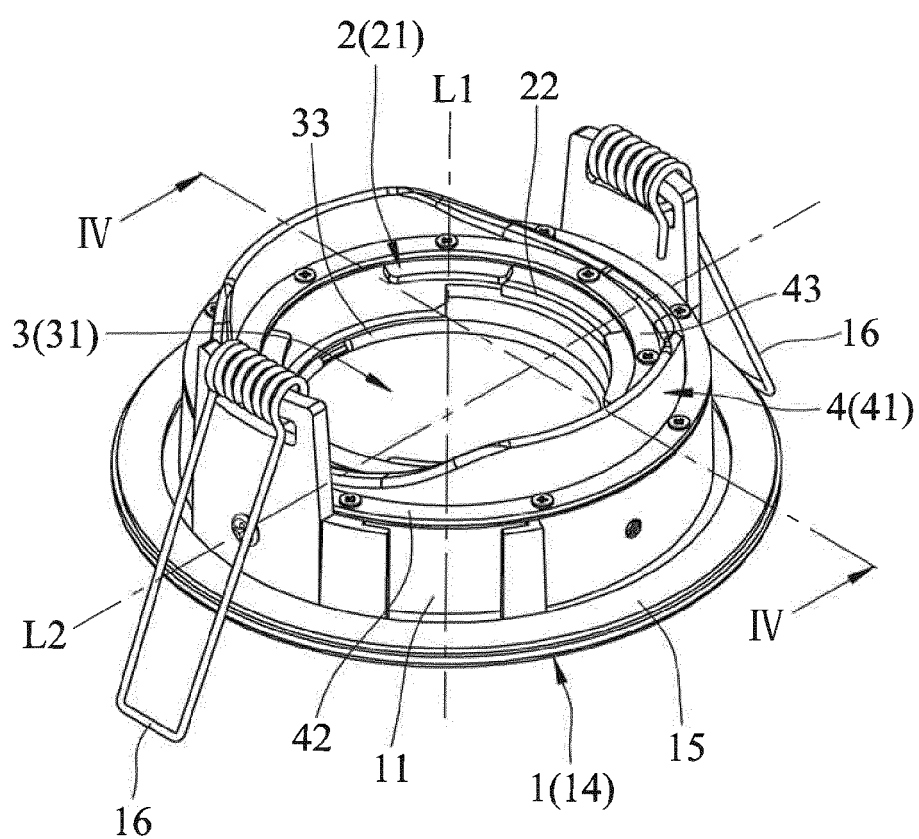


FIG.3

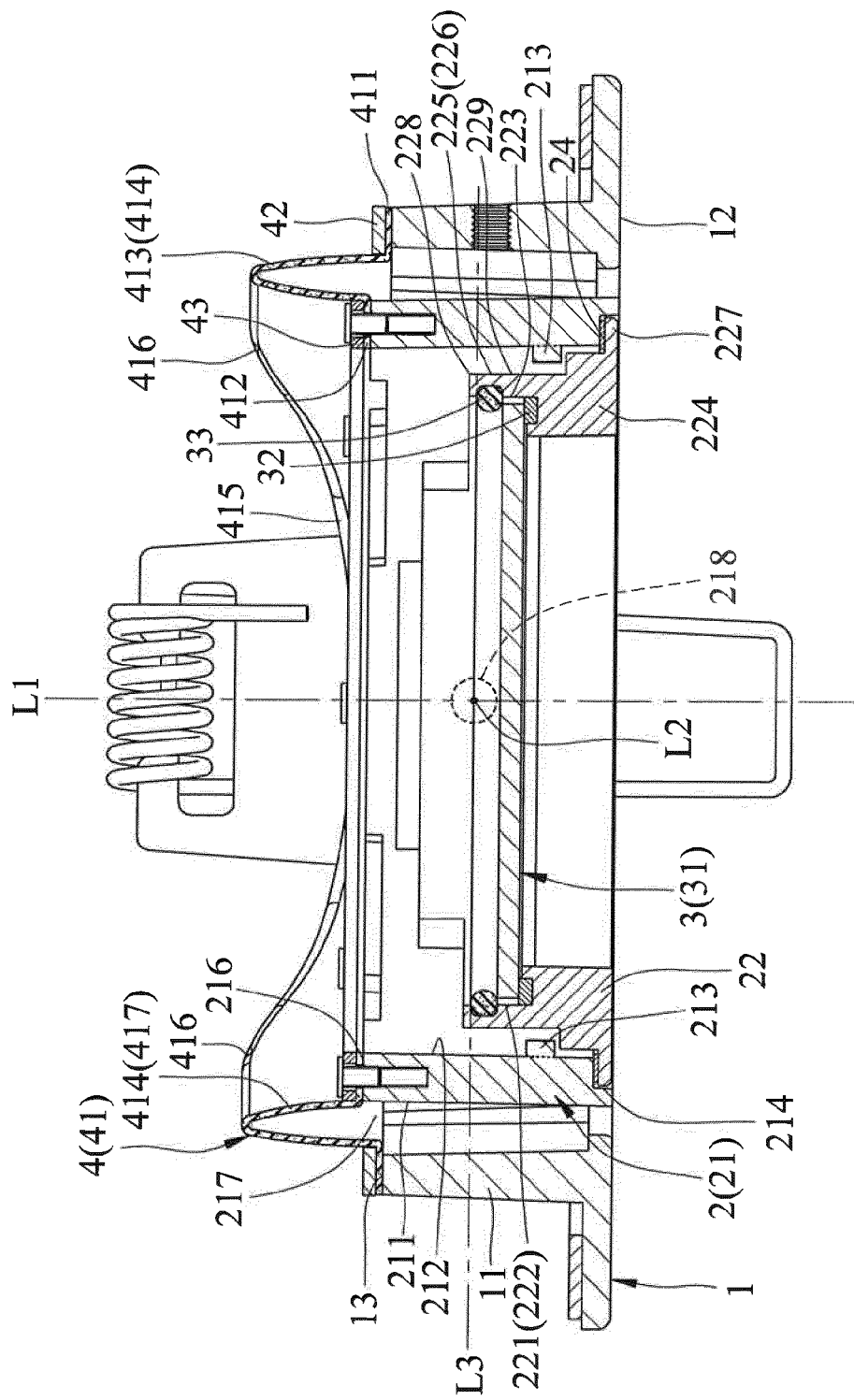


FIG.4

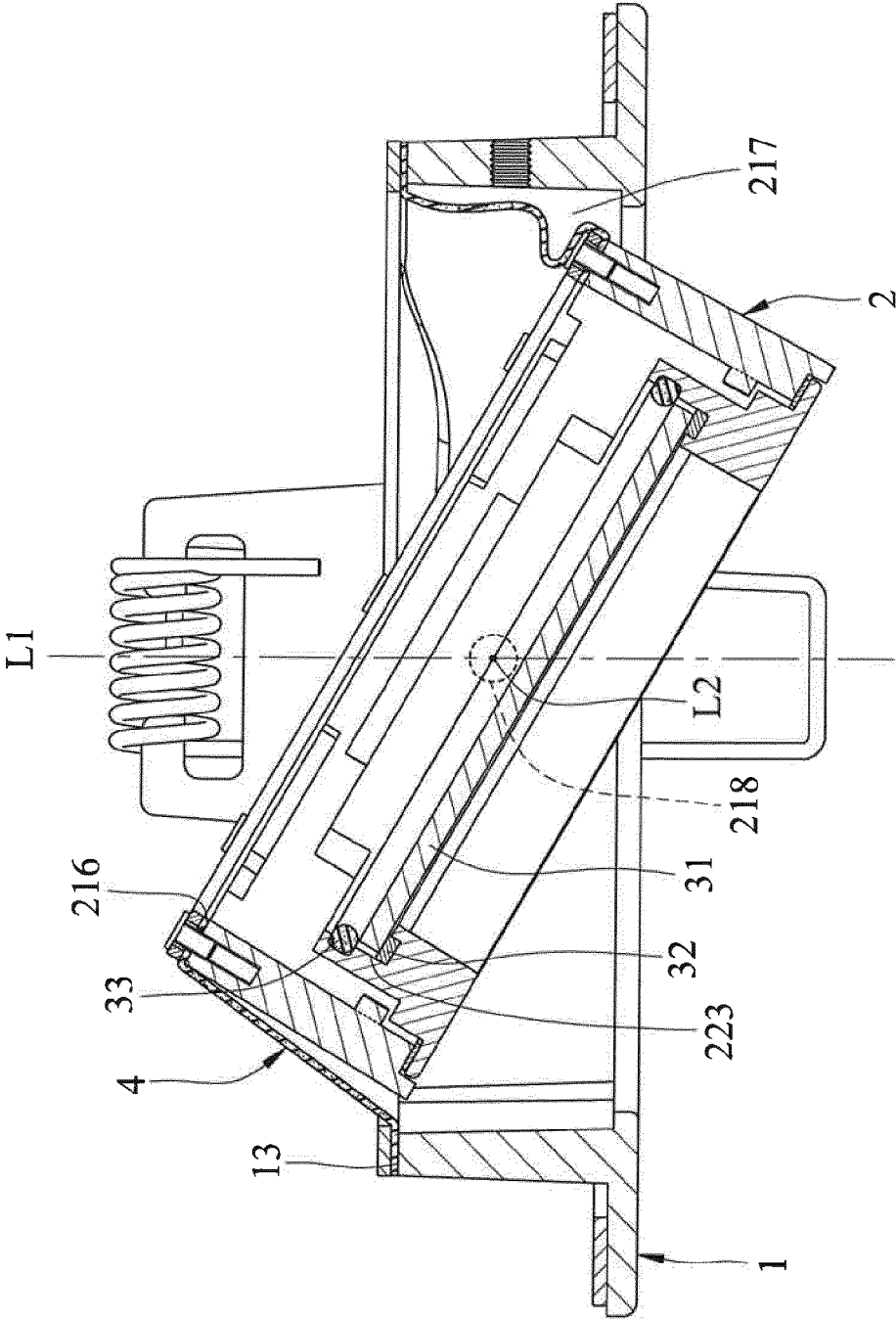


FIG.5

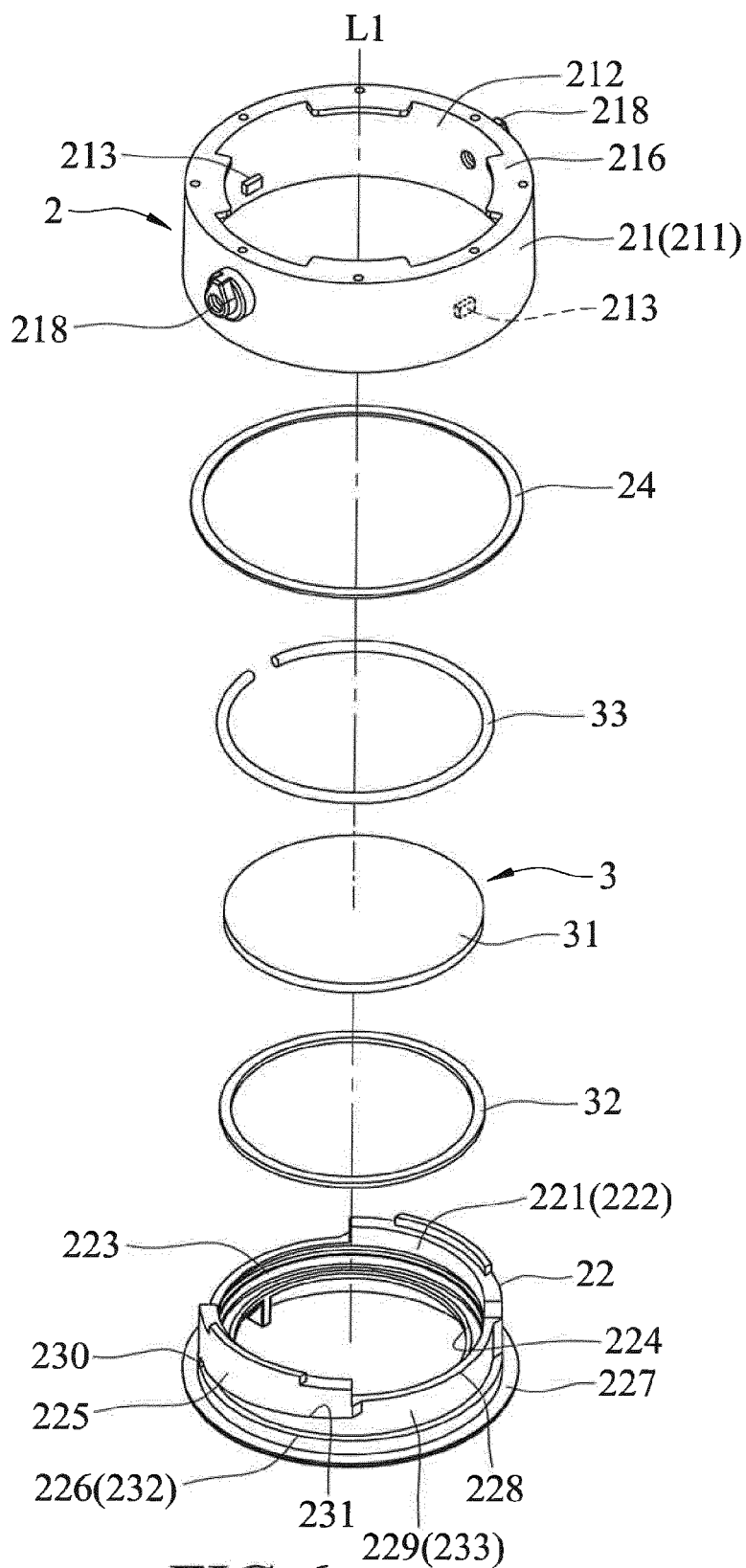


FIG.6

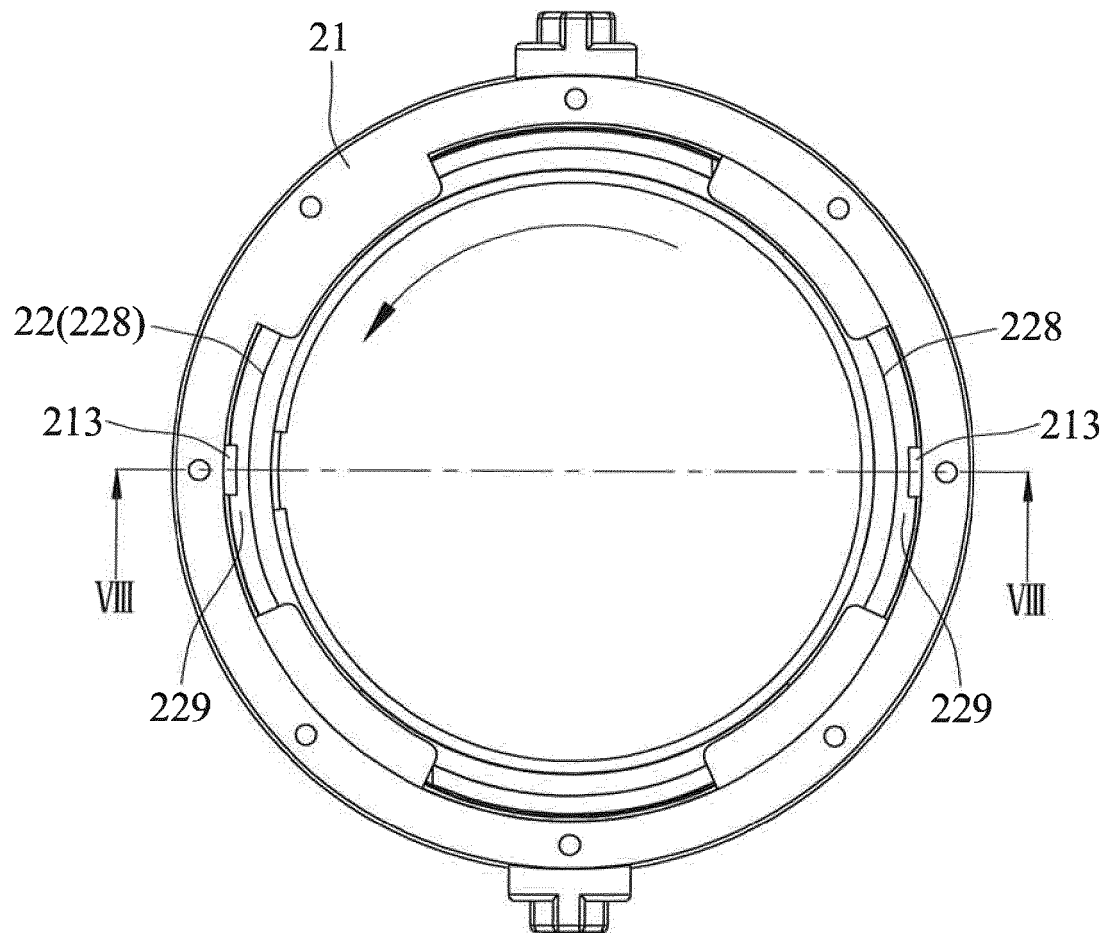


FIG.7

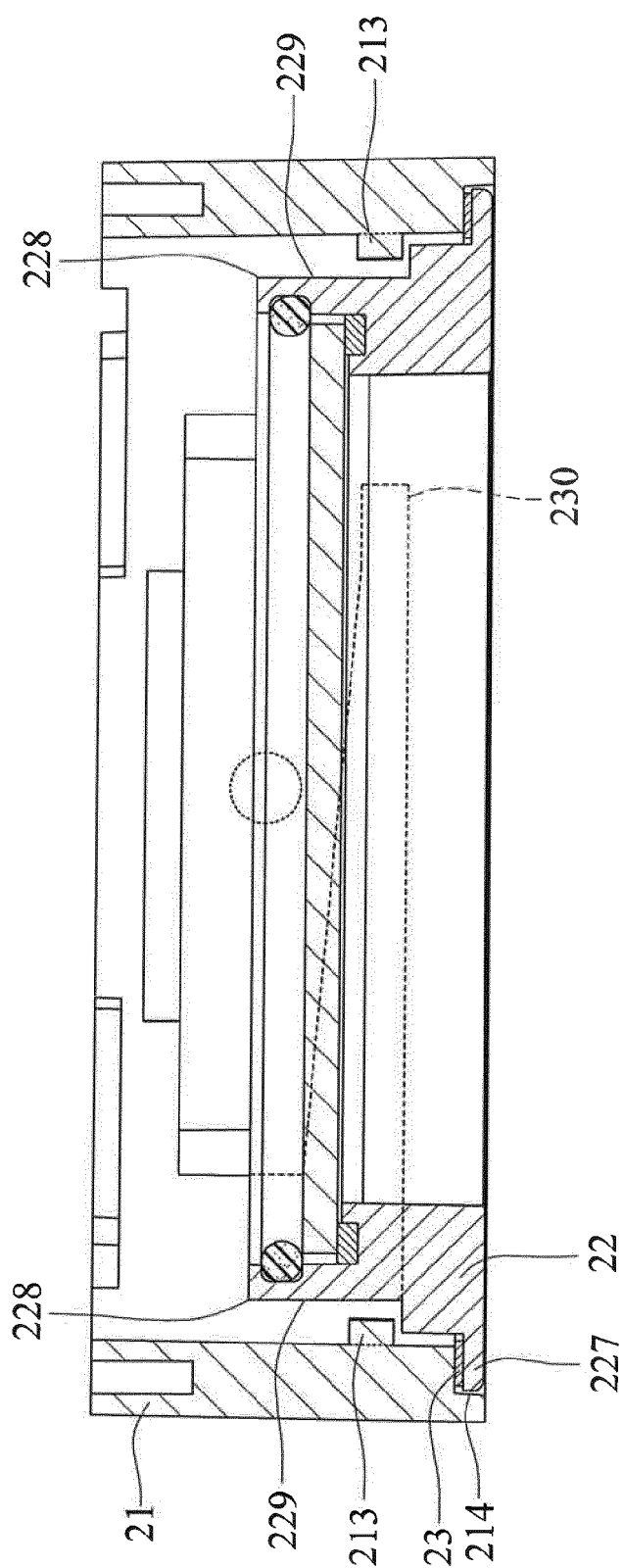


FIG. 8

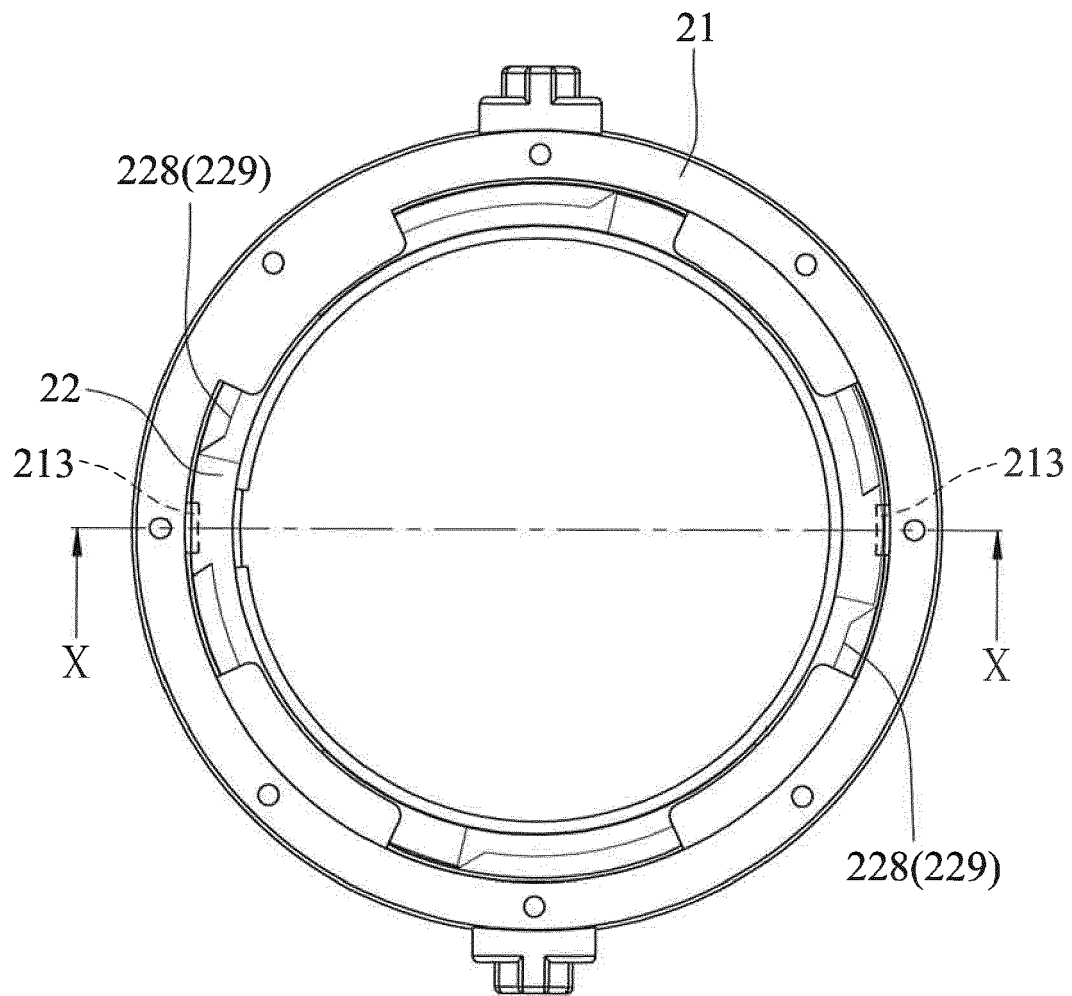


FIG.9

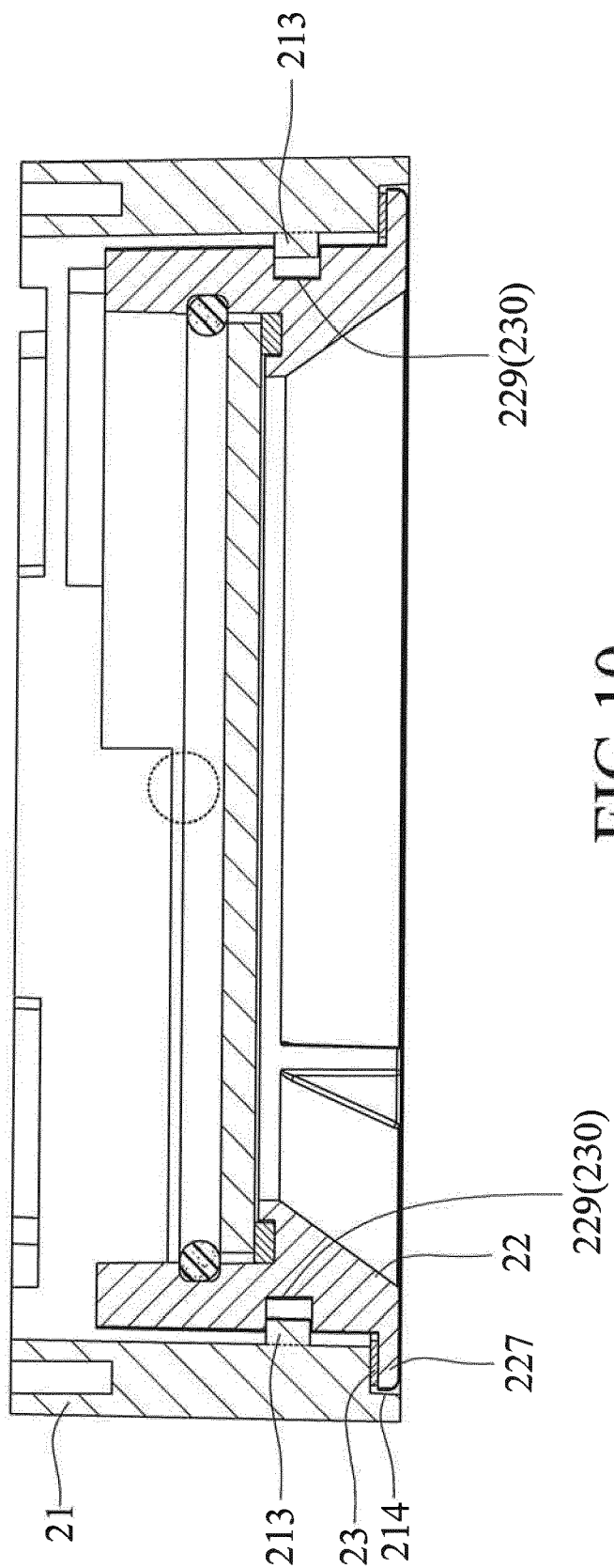


FIG. 10



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Application Number  
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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                               |                                                                                                                                                                                                                                                                                       |                                            |
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| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                    |                                                                                               | Date of completion of the search<br><b>29 February 2016</b>                                                                                                                                                                                                                           | Examiner<br><b>Demirel, Mehmet</b>         |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                               | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                            |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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