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(54) **FIXED CONTACT WITH INTEGRAL STRUCTURE USED FOR CAM SWITCH AND CAM SWITCH**

(57) A fixed contact with integral structure used for a cam switch, characterized in that the fixed contact comprises a contact part, a connecting part, and a solder pin that are integrally formed; the contact part can contact or disconnect with a movable contact of the cam switch; the connecting part is connected between the contact part and the solder pin; the solder pin can be electrically connected to a printed circuit board. According to another aspect of the present disclosure, a cam switch having the mentioned fixed contact is provided.

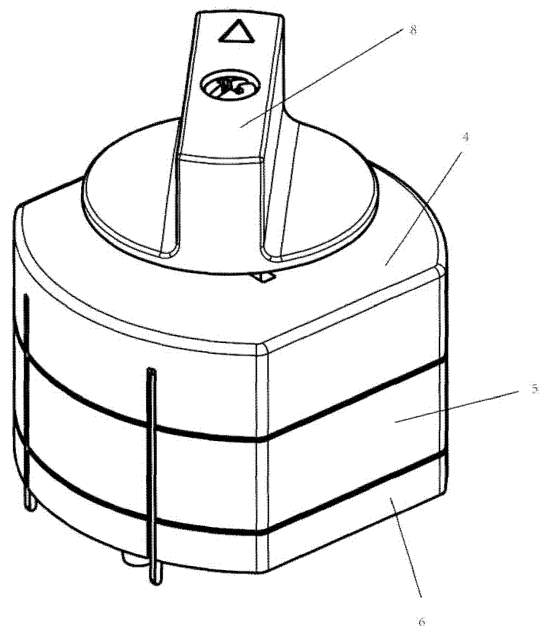


FIG. 6

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Description

TECHNICAL FIELD

[0001] The present disclosure particularly relates to a fixed contact with integral structure used for a cam switch, wherein a solder pin is integrally formed with the fixed contact. The cam switch can be welded to a printed circuit board by the solder pin. The present disclosure further relates to a cam switch.

BACKGROUND ART

[0002] As is known, cam switches have switching cams on a rotating shaft. The switching cams are made of conductive materials. By rotating the shaft, the switching cam can realize the connection and disconnection between the fixed contact and the movable contact.

[0003] Traditional cam switches are not meant to be soldered to a printing circuit board but they have screw terminals for external conductor cables. This kind of cam switches are not always very space-efficient. In elevator application, cam switches are intended to be used in remote control of battery-powered emergency rescue drive device. Therefore, they will be mounted on a remote control board, thus they have to be space efficient.

[0004] Document EP3104386B1 discloses the closest prior art. It still has screw terminals, but the cam switch can be connected to a printed circuit board by solder pins, i.e., it does not require external conductor cables. To enable this, solder pins have an extension that can be fixed to the contact elements of the switch through the screw terminals. Problem with this solution is that screw terminals may be unreliable, e.g., loosened.

SUMMARY

[0005] The present disclosure solves said technical problem by eliminating the screw terminals totally.

[0006] In order to remove said defect in the prior art, the present disclosure provides a fixed contact with integral structure used for a cam switch.

[0007] The fixed contact comprises a contact part, a connecting part, and a solder pin that are integrally formed.

[0008] The contact part can contact or disconnect with a movable contact of the cam switch. The connecting part is connected between the contact part and the solder pin.

[0009] The solder pin can be electrically connected to a printed circuit board.

[0010] According to one aspect of the present disclosure, the fixed contact is made of conductive metal materials.

[0011] According to the aforementioned aspect of the present disclosure, the contact part is bent at an angle relative to the connecting part.

[0012] The solder pin is elongated and extend from the

connecting part.

[0013] According to each of aforementioned aspects of the present disclosure, the angle is a right angle.

[0014] According to each of aforementioned aspects of the present disclosure, the connecting part is L-shaped.

[0015] A shorter first part of the connecting part is connected to the contact part.

[0016] A longer second part of the connecting part is connected to the solder pin.

[0017] According to each of aforementioned aspects of the present disclosure, the solder pin is provided with a pin step.

[0018] According to another aspect of the present disclosure, a cam switch having the mentioned fixed contact is provided.

[0019] According to the present disclosure, the switch contact elements of the prior art EP3104386B1 are integral with the solder pins (i.e., the fixed contact comprises a contact part, a connecting part, and a solder pin that are integrally formed in the present disclosure), and therefore screw terminals are not required. Therefore, the reliability of the switch can be improved while the contact with the solder pin is achieved.

[0020] So far, in order that the detailed description of this disclosure can be better understood and the contribution of this disclosure to the prior art can be better recognized, this disclosure has summarized the content of this disclosure quite broadly. Of course, embodiments of the present disclosure will be described below and will form the subject matter of the appended claims.

[0021] Likewise, those skilled in the art will recognize that the concepts on which this disclosure is based can be easily used as a basis for designing other structures, methods and systems for carrying out several purposes of this disclosure. Therefore, it is important that the appended claims should be considered to include such equivalent structures as long as they do not go beyond the spirit and scope of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The present disclosure will be better understood by those skilled in the art with reference to the following accompanying drawings, and the advantages of the present disclosure will be more clearly reflected. The accompanying drawings are given hereinafter by way of illustration only, which do not include all possible embodiments and are not intended as limiting the scope of the present disclosure.

- Figure 1 shows a first case part of the cam switch according to the present disclosure;

- Figure 2 shows a second case part of the cam switch according to the present disclosure, wherein a fixed contact according to the present disclosure is provided;

- Figure 3 shows a third case part of the cam switch according to the present disclosure, wherein a fixed contact according to the present disclosure is provided;
- Figure 4 shows a cam according to the present disclosure;
- Figure 5 shows a cam knob according to the present disclosure;
- Figure 6 shows an assembly drawing of the cam switch according to the present disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] With reference to Figures 1-6, the embodiments of the present disclosure are described in detail.

[0024] The present disclosure integrates the switch contact elements of the prior art EP3104386B1 with solder pins (i.e., the fixed contact comprises a contact part, a connecting part, and a solder pin that are integrally formed in the present disclosure), and therefore screw terminals are not required. Comparing the present disclosure with the prior art EP3104386B1, they are similar or identical to each other in the operation and principle of the movable contact, i.e., the movable contact is driven by the rotation of the cam to overcome the elastic force of the spring so as to realize the connection and disconnection with the fixed contact.

[0025] One embodiment of the present disclosure provides a fixed contact with integral structure used for a cam switch.

[0026] The fixed contact comprises a contact part 1, a connecting part 2, and a solder pin 3 that are integrally formed.

[0027] The contact part 1 can contact (connect) or disconnect a movable contact (not shown) of the cam switch, i.e., the movable contact is driven by the rotation of the cam to overcome the elastic force of the spring so as to realize the connection and disconnection with the fixed contact.

[0028] The connecting part 2 is connected between the contact part 1 and the solder pin 3.

[0029] The solder pin 3 can be electrically connected to a printed circuit board (not shown).

[0030] According to said embodiment of the present disclosure, the fixed contact is made of conductive metal materials.

[0031] According to said embodiment of the present disclosure, the contact part 1 is bent at an angle relative to the connecting part 2.

[0032] The solder pin 3 is elongated and extend from the connecting part 2.

[0033] According to said embodiment of the present disclosure, the angle is a right angle.

[0034] According to said embodiment of the present

disclosure, the connecting part 2 is L-shaped.

[0035] A shorter first part 2-1 of the connecting part 2 is connected to the contact part.

[0036] A longer second part 2-2 of the connecting part 2 is connected to the solder pin 3.

[0037] According to said embodiment of the present disclosure, the solder pin 3 is provided with a pin step 3-1.

[0038] According to another embodiment of the present disclosure, a cam switch having the mentioned fixed contact is provided.

[0039] The cam switch comprises a first case part 4, a second case part 5 and a third case part 6 that are assembled together, as shown in Fig. 6.

[0040] As shown in Figs. 4-5, the cam switch further comprises a cam 7 and a cam knob 8, the cam 7 being connected to the cam knob 8 by a fastener such as a screw.

[0041] The cam 7 is mounted in coaxial holes 4-1, 5-1, and 6-1 of the first case part 4, the second case part 5 and the third case part 6.

[0042] The first case part 4, the second case part 5 and the third case part 6 are used for holding a fixed contact with a first length (as shown in Fig. 2), wherein the third case part 6 is further used for holding a fixed contact with a second length (as shown in Fig. 3), the second length being smaller than the first length.

[0043] With reference to specific embodiments, although the present disclosure has been described in the specification and drawings, it should be understood that various changes can be made by those skilled in the art without departing from the scope of the disclosure as defined in the claims, and various equivalents can be substituted for various elements therein. Furthermore, the combination and collocation of technical features, elements, and/or functions among specific embodiments in this paper are clear, so according to these disclosures, those skilled in the art can appreciate that the technical features, elements, and/or functions of an embodiment can be combined into another specific embodiment as appropriate, unless otherwise described above. In addition, according to the teaching of this disclosure, many changes can be made to adapt to special situations or materials without departing from the scope of the essence of this disclosure. Therefore, the present disclosure is not limited to the specific embodiments illustrated in the drawings and the specific embodiments described in the specification as the best mode presently contemplated for carrying out the present disclosure, but the present disclosure is intended to include all embodiments falling within the scope of the above description and the appended claims.

Claims

1. A fixed contact with integral structure used for a cam switch, **characterized in that** the fixed contact comprises a contact part, a con-

necting part, and a solder pin that are integrally formed;
 the contact part can contact or disconnect with a movable contact of the cam switch;
 the connecting part is connected between the contact part and the solder pin;
 the solder pin can be electrically connected to a printed circuit board.

2. The fixed contact according to claim 1, **characterized in that** the fixed contact is made of conductive metal materials. 10
3. The fixed contact according to claim 1, **characterized in that** the contact part is bent at an angle relative to the connecting part;
 the solder pin is elongated and extend from the connecting part. 15
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4. The fixed contact according to claim 3, **characterized in that** the angle is a right angle. 25
5. The fixed contact according to claim 1, **characterized in that** the connecting part is L-shaped;
 a shorter first part of the connecting part is connected to the contact part;
 a longer second part of the connecting part is connected to the solder pin. 30
6. The fixed contact according to claim 3, **characterized in that** the solder pin is provided with a pin step. 35
7. A cam switch, **characterized in that** the cam switch has the fixed contact according to any one of claims 1 to 6. 40

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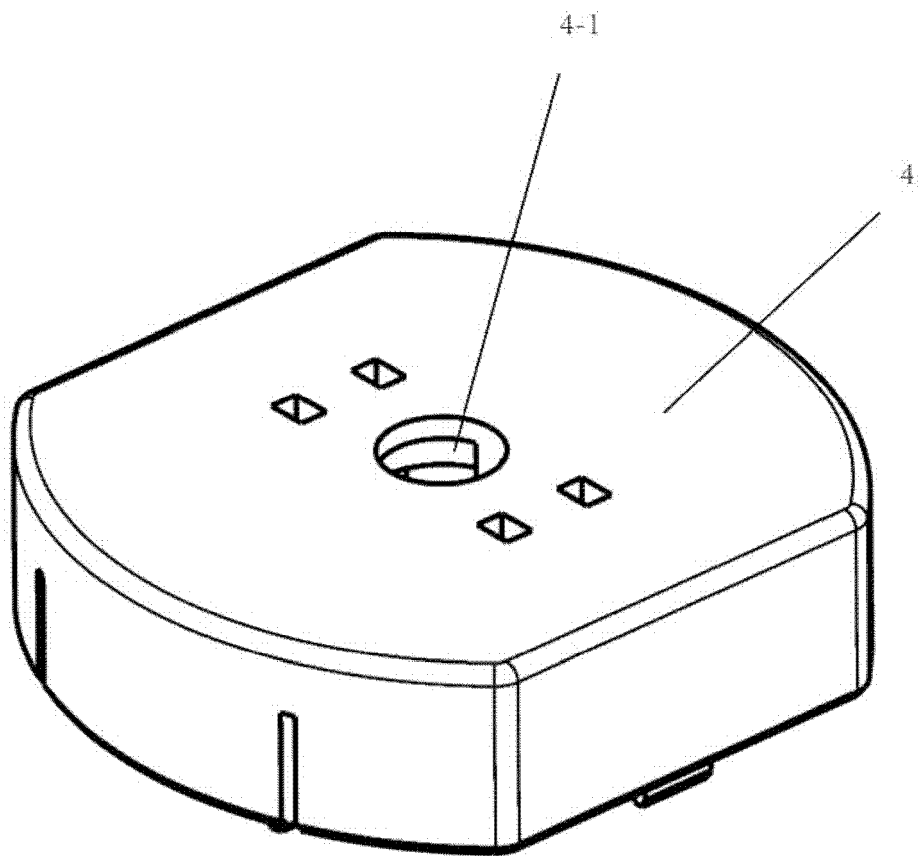


FIG. 1

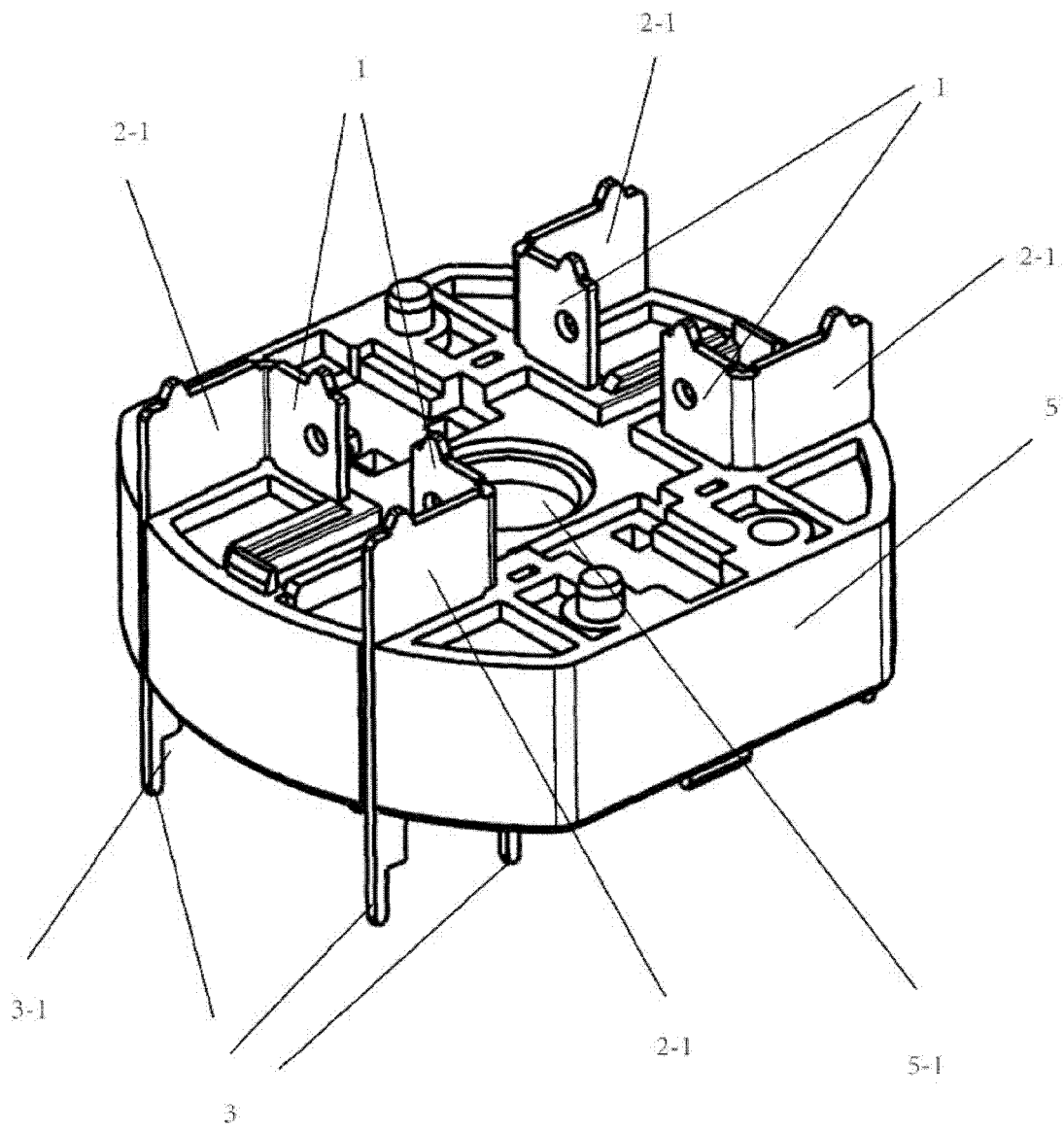


FIG. 2

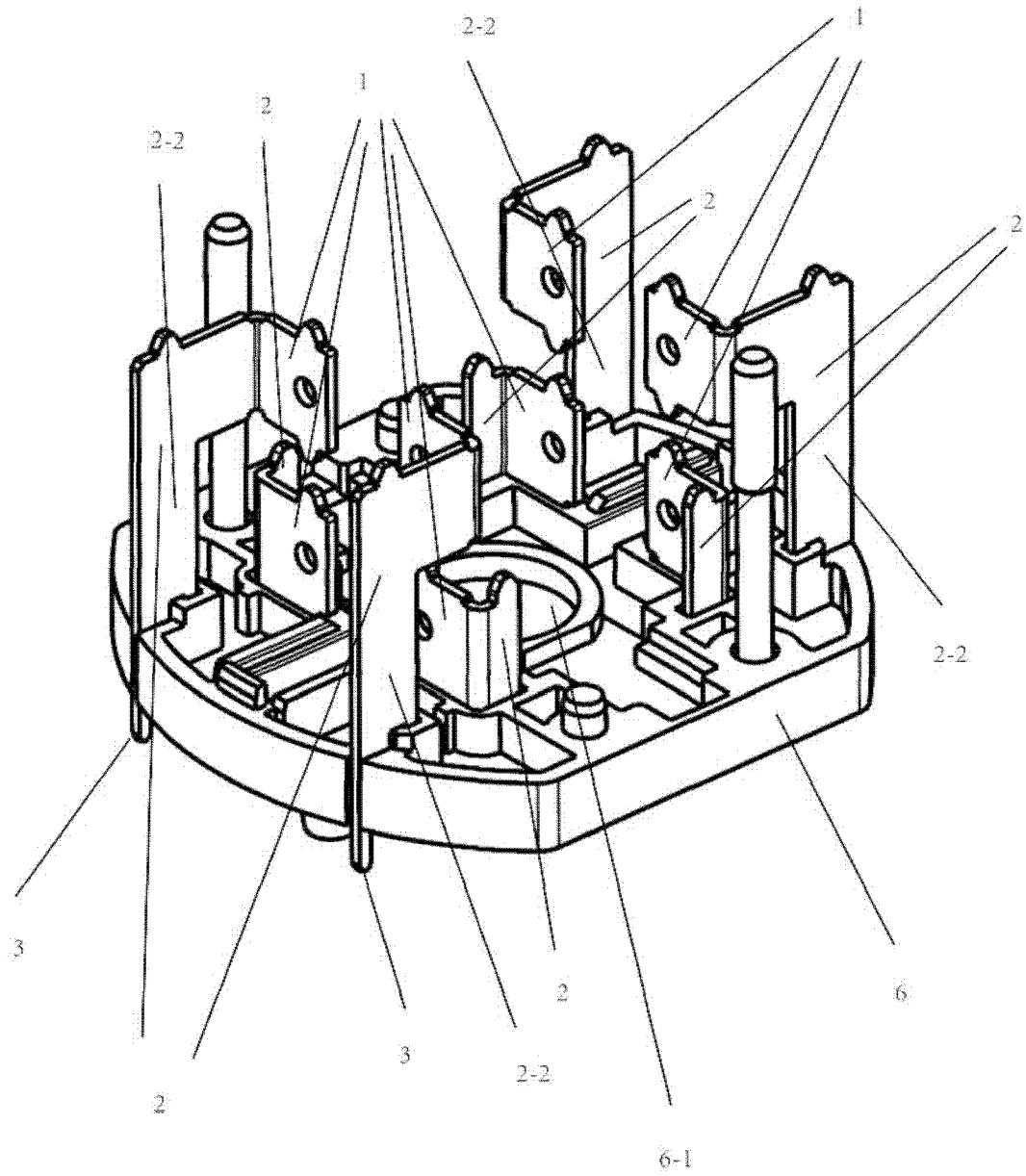


FIG. 3

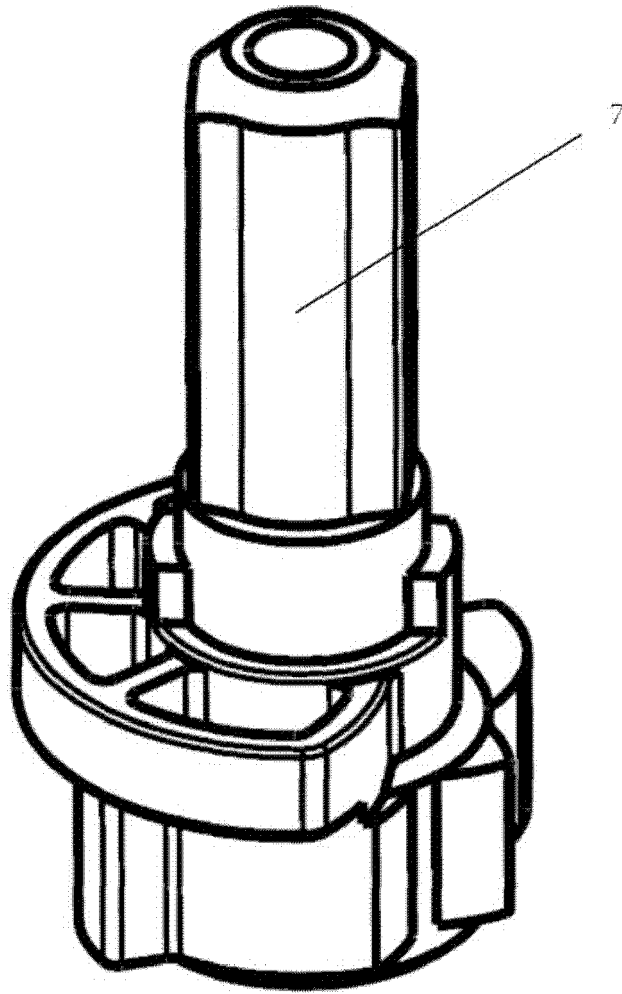
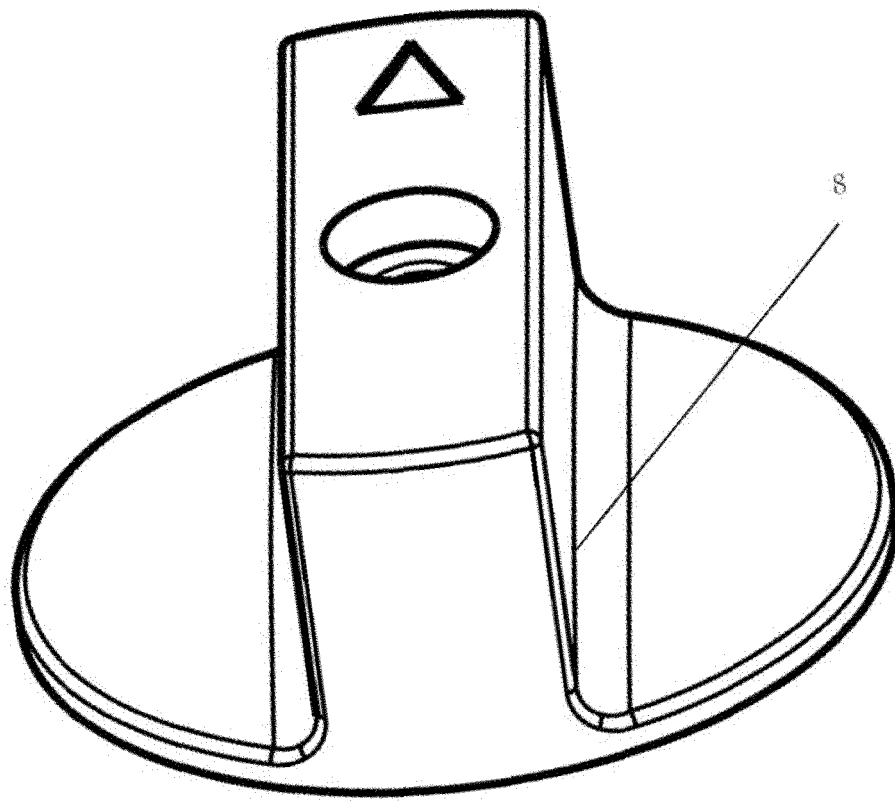


FIG. 4



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FIG. 5

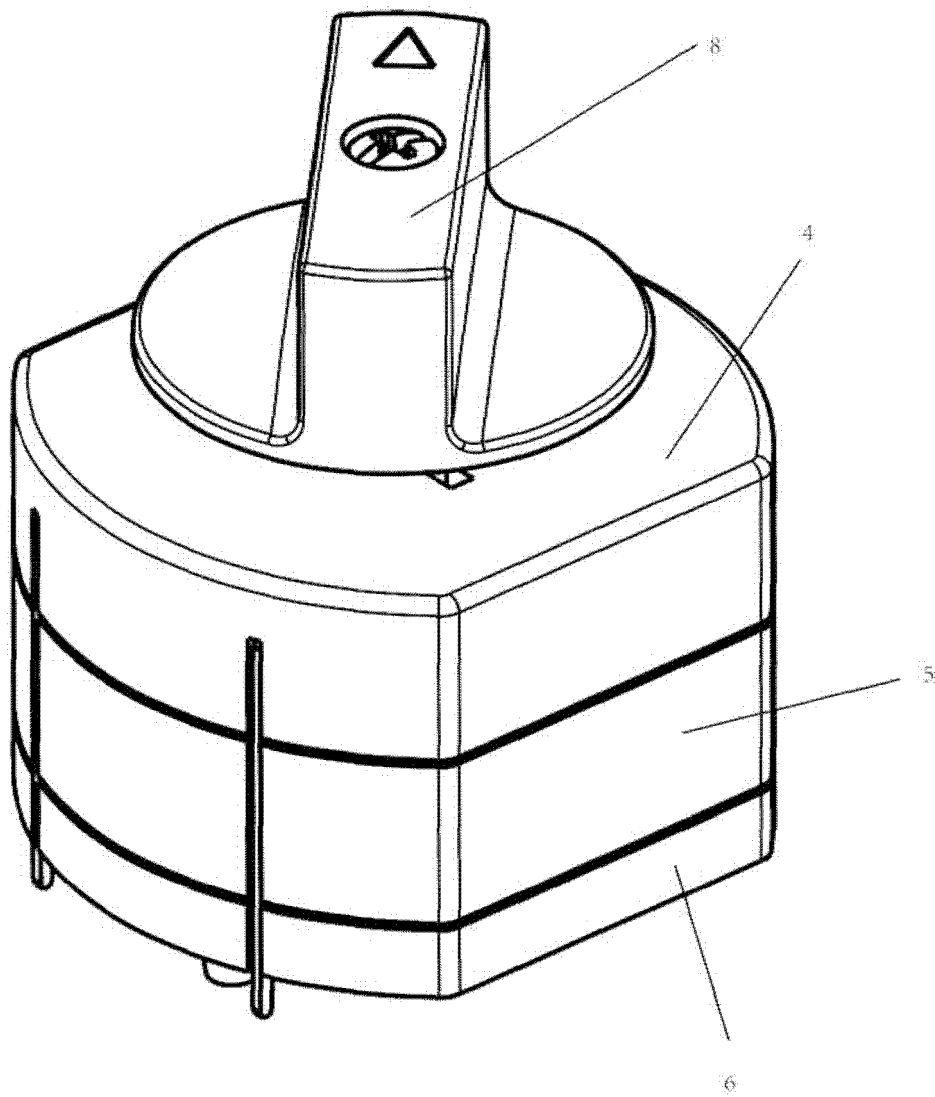


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 20 21 0967

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			TECHNICAL FIELDS SEARCHED (IPC)
			H01H H01R
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 May 2021	Examiner Ramírez Fueyo, M
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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