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Description

TECHNICAL FIELD

[0001] The present invention relates to the field of sockets, and in particular, to an auto-reset wiring switch.

BACKGROUND

[0002] In today's world, electricity is absolutely main energy indispensable in human life and production, and power transmission is particularly important. To facilitate flexible control over circuit closing or opening, a switch is essential. Therefore, how to quickly connect a wire to a switch has become the direction of efforts for various switches. In a conventional switch, to stably and securely connect wires to conductive terminals in the switch, the wires are usually pressed and fixed in the terminals by using screws. However, this method requires people to fix each wire to the corresponding conductive terminal by using a tool, which is particularly inconvenient. Therefore, the Chinese patent No. CN201911423016.2 discloses a switch using a lever handle to fix a terminal. In the switch of this patent, before a wire is inserted, the lever handle is first rotated to 90° to abut against the conductive terminal for elastic deformation to reserve a wire insertion space, then the wire is inserted, and finally the lever handle is rotated to an initial position to remove its abutting force against the conductive terminal, so that the conductive terminal elastically resets, and abuts against and fixes the wire. However, although this switch with the lever handle avoids inconvenience of screws, the switch requires an operator to apply an external force to rotate the lever handle to the initial position, which leads to complex operations. The wire may be driven to withdraw from the conductive terminal if the operation is improper.

[0003] Therefore, it is quite necessary to develop an auto-reset wiring switch in which a lever handle can be reset automatically and a wire is in stable contact with a switch terminal.

SUMMARY

[0004] To overcome the disadvantages of the prior art, an objective of the present invention is to provide an auto-reset wiring switch, which makes a maximum rotation angle of a lever handle less than 55° by making an inclination angle of a first inclined plane not exceed 55°, so that the lever handle can be automatically reset by an elastic restoring force of an elastic sheet, and the objective of automatic reset during the wiring of the switch can be achieved.

[0005] The present invention is implementing by using the following technical solution: Disclosed is an auto-reset wiring switch, which enables a wire to be inserted and electrically connected, including: a switch button; an insulating body, where the insulating body is pivotally con-

nected below the switch button, so that the switch button is pressed and rotated to control a circuit to be closed or opened; and at least one wire insertion hole is formed by penetrating the insulating body and is each provided with a first inclined plane and a second inclined plane, an inclination angle of the first inclined plane is less than 55°, and when the wire is inserted into the wire insertion hole, the wire is located between the first inclined plane and the second inclined plane; at least one lever handle, where one lever handle is correspondingly and pivotally connected in one wire insertion hole, and the lever handle abuts against the first inclined plane when rotating to a maximum angle; at least one stationary terminal, where one stationary terminal is correspondingly installed in one wire insertion hole, each stationary terminal includes a copper sheet and an elastic sheet abutting against the copper sheet, the elastic sheet and the copper sheet clamp the wire, and the lever handle abuts against the elastic sheet; and the lever handle abuts against the elastic sheet to produce a maximum elastic deformation when an operator rotates the lever handle to abut against the first inclined plane, and the lever handle is restored to an initial position by an elastic restoring force of the elastic sheet when an external force is removed; and at least one movable terminal installed on the insulating body, where the movable terminal is rotatably connected to or separated from the stationary terminal by the switch button.

[0006] Further, the second inclined plane is parallel to the first inclined plane.

[0007] Further, the copper sheet is provided with a first plate, a second plate formed by bending and extending from the first plate, and a third plate formed by bending and extending from the second plate, the first plate abuts against the second inclined plane, and the third plate and the elastic sheet jointly clamp the wire.

[0008] Further, a convex sheet is formed by tearing the third plate and bending in a direction close to the first plate, and the convex sheet abuts against the wire.

[0009] Further, a through groove is formed by penetrating a surface of the second plate, and the wire runs through the through groove and reaches contact with the convex sheet.

[0010] Further, the through groove extends to the first plate, the elastic sheet is provided with a contact part and a positioning part, the contact part is located in the through groove corresponding to the second plate, and the positioning part is located in the through groove corresponding to the first plate.

[0011] Further, the elastic sheet is provided with a mounting part attached to the first plate, an elastic part is formed by bending and extending from the mounting part, the elastic part is bent and extends in a direction close to the second plate to form a contact part, and the contact part abuts against the wire.

[0012] Further, an included angle between the mounting part and the elastic part is an acute angle, and the mounting part is bent to form a positioning part to clamp

the insulating body.

[0013] Further, the lever handle is provided with an operating part and an abutting part, the operating part is located outside the wire insertion hole for the operator to apply an acting force, and the abutting part is accommodated in the wire insertion hole to abut against the elastic part.

[0014] Further, the insulating body is provided with a plurality of wire insertion holes arranged in two rows, each of the wire insertion holes accommodates one lever handle and one stationary terminal, and a row of movable terminals is located between the two rows of wire insertion holes.

[0015] Compared with the prior art, the present invention may achieve the following beneficial effects:

The inclination angle of the first inclined plane does not exceed 55°, and the lever handle abuts against the first inclined plane when rotating to the maximum angle. Therefore, a rotation angle of the lever handle does not exceed 55°, so that the lever handle can be automatically reset to the initial position by the elastic restoring force of the elastic sheet. Therefore, after the wire is inserted into the wire insertion hole of the auto-reset wiring switch, the lever handle is automatically reset, and the elastic sheet clamps the wire terminal, which is simple in operation. This prevents the wire terminal from being withdrawn from the wire insertion hole when the lever handle is reset, and a risk of poor contact between the auto-reset wiring switch and the wire is reduced.

BRIEF DESCRIPTION OF DRAWINGS

[0016]

FIG. 1 is a three-dimensional diagram of an auto-reset wiring switch according to Embodiment 1 of the present invention;

FIG. 2 is three-dimensional diagram of the auto-reset wiring switch according to Embodiment 1 of the present invention when a switch button is not installed;

FIG. 3 is a three-dimensional schematic diagram of the auto-reset wiring switch according to Embodiment 1 of the present invention after a wire is inserted;

FIG. 4 is a three-dimensional schematic diagram of the auto-reset wiring switch according to Embodiment 1 of the present invention when a lever handle rotates to a maximum angle;

FIG. 5 is a schematic plan view of the auto-reset wiring switch according to Embodiment 1 of the present invention when the lever handle is in an initial position;

FIG. 6 is a schematic plan view of the auto-reset wiring switch according to Embodiment 1 of the present invention when the lever handle rotates to a position at the maximum angle; and

FIG. 7 is a three-dimensional diagram of an auto-reset wiring switch according to Embodiment 2 of the present invention.

[0017] In the figures: 100. auto-reset wiring switch; 1. switch button; 2. insulating body; 21. wire insertion hole; 22. first inclined plane; 23. second inclined plane; 3. lever handle; 31. operating part; 32. abutting part; 4. stationary terminal; 41. copper sheet; 411. first plate; 412. second plate; 4121. through groove; 413. third plate; 4131. convex sheet; 42. elastic sheet; 421. mounting part; 422. elastic part; 423. positioning part; 424. contact part; 5. wire; 6. movable terminal.

DESCRIPTION OF EMBODIMENTS

[0018] The present invention is further described below with reference to the accompanying drawings and specific implementations. It should be noted that, the embodiments or technical features described below can be randomly combined to form new embodiments, provided that no conflict occurs.

Embodiment 1

[0019] As shown in FIG. 1 to FIG. 3, the present invention discloses an auto-reset wiring switch 100, including a switch button 1, an insulating body 2 pivotally connected below the switch button 1, a plurality of lever handles 3, a plurality of stationary terminals 4, and a plurality of movable terminals 6 that are installed on the insulating body 2. A plurality of wires 5 are inserted into the insulating body 2 and connected to the stationary terminals 4.

[0020] As shown in FIG. 2 to FIG. 6, the switch button 1 covers a surface of the insulating body 2, and when the switch button 1 rotates, the movable terminals 6 are driven to reach rotatable contact with the stationary terminals 4 or become separated from the stationary terminals 4. In this embodiment, a plurality of wire insertion holes 21 are formed by penetrating the insulating body 2 and are arranged in two rows, each of the wire insertion holes 21 accommodates one lever handle 3 and one stationary terminal 4, and a row of movable terminals 6 is located between the two rows of wire insertion holes 21. The switch button 1 drives the movable terminals 6 to switch a connection between the two rows of stationary terminals 4, to achieve a double control function of the auto-reset wiring switch 100. Certainly, in other embodiments, only one row of stationary terminals 4 may be provided, so that single control of the auto-reset wiring switch 100 is achieved. No limitation is imposed herein.

[0021] Each of the wire insertion holes 21 is provided with a first inclined plane 22 and a second inclined plane

23 that are parallel to each other, and an inclination angle of the first inclined plane 22 is less than 55°. Preferably, in this embodiment, the inclination angle of the first inclined plane 22 is 45°, and when the wire 5 is inserted in the wire insertion hole 21, the wire 5 is located between the first inclined plane 22 and the second inclined plane 23.

[0022] One lever handle 3 is correspondingly and pivotally connected in one wire insertion hole 21, and the lever handle 3 abuts against the first inclined plane 22 when rotating to a maximum angle, so that the first inclined plane 22 limits excessive rotation of the lever handle 3. Specifically, the lever handle 3 is provided with an operating part 31 and an abutting part 32, the operating part 31 is located outside the wire insertion hole 21 for the operator to apply an acting force, and the abutting part 32 is accommodated in the wire insertion hole 21 to abut against the stationary terminal 4.

[0023] Each stationary terminal 4 includes a copper sheet 41 and an elastic sheet 42 that match each other. The copper sheet 41 is provided with a first plate 411, a second plate 412 formed by bending and extending from the first plate 411, and a third plate 413 formed by bending and extending from the second plate 412. The first plate 411 abuts against the second inclined plane 23. Further, a convex sheet 4131 is formed by tearing the third plate 413 and bending in a direction close to the first plate 411, and the convex sheet 4131 abuts against the wire 5, so as to increase an elastic force of the convex sheet 4131 abutting against the wire 5 and improving abutting stability of the convex sheet 4131. A through groove 4121 is formed by penetrating a surface of the second plate 412. The through groove 4121 extends to the first plate 411. The elastic sheet 42 is provided with a mounting part 421 attached to the first plate 411, and an elastic part 422 is formed by bending and extending from the mounting part 421. The elastic part 422 abuts against the abutting part 32, and extends in a direction close to the second plate 412 to form a contact part 424, and the contact part 424 is located in the through groove 4121 corresponding to the second plate 412, so that the contact part 424 and the convex sheet 4131 jointly clamp the wire 5. The mounting part 421 is bent to form a positioning part 423, and the positioning part 423 is located in the through groove 4121 corresponding to the first plate 411 and clamps the insulating body 2 to prevent the elastic sheet 42 from shaking in the insulating body 2. Preferably, an included angle between the mounting part 421 and the elastic part 422 is an acute angle, to increase an elastic restoring force of the elastic sheet 42.

[0024] As shown in FIG. 1, FIG. 5 and FIG. 6, a process of connecting the wire 5 to the auto-reset wiring switch 100 is as follows: The operator first presses the operating part 31 to make the lever handle 3 rotate until the abutting part 32 abuts against the elastic sheet 42 to produce a maximum elastic deformation when the lever handle 3 abuts against the first inclined plane 22. In this case, the elastic part 422 experiences a maximum displacement,

and at this time, the wire 5 can be inserted into the wire insertion hole 21 without resistance and run through the through groove 4121. When an external force applied to the operating part 31 is removed, an elastic restoring force of the elastic sheet 42 drives the elastic part 422 to restore from the displacement, and then abut against the abutting part 32 to drive the lever handle 3 to return to an initial position. In addition, the contact part 424 and the convex sheet 4131 jointly clamp the wire 5. Because the elastic part 422 and the convex sheet 4131 have relatively high elasticity, the elastic part 422 and the convex sheet 4131 can stably clamp the wire 5, reducing a risk of poor contact between the wire 5 and the stationary terminal 4. It should be noted that, if the wire 5 is a hard wire 5, the wire 5 can be directly inserted into the wire insertion hole 21 to squeeze the elastic part 422 for a deformation and displacement without pulling the lever handle 3. In this case, wiring of the auto-reset wiring switch 100 in the present invention becomes easier.

[0025] Similarly, when the wire 5 needs to be withdrawn from the auto-reset wiring switch 100, the operator flips the operating part 31 to rotate the lever handle 3, so that the abutting part 32 abuts against the elastic part 422 to stay away from the wire 5 until the wire 5 is separated. In this case, the wire 5 can be withdrawn from the wire insertion hole 21 without resistance, to achieve the objective of separating the wire 5 from the auto-reset wiring switch 100. When the wire 5 is removed from the wire insertion hole 21, the lever handle 3 can still return to the initial position by the elastic restoring force of the elastic sheet 42.

Embodiment 2

[0026] As shown in FIG. 7, Embodiment 2 has the same wiring structure as Embodiment 1. The only difference lies that an upper portion of one insulating body 2 is covered with two switch buttons 1, and details are no longer described herein.

[0027] The foregoing implementations are only preferred implementations of the present invention, and cannot be used to limit the protection scope of the present invention. Any insubstantial changes and replacements made by a person skilled in the art on the basis of the present invention shall fall within the protection scope claimed by the present invention.

Claims

1. An auto-reset wiring switch, which enables a wire to be inserted and electrically connected, comprising:
 - a switch button;
 - an insulating body, wherein the insulating body is pivotally connected below the switch button, so that the switch button is pressed and rotated to control a circuit to be closed or opened; and

- at least one wire insertion hole is formed in the insulating body and is each provided with a first inclined plane and a second inclined plane, an inclination angle of the first inclined plane is less than 55°, and when the wire is inserted into the wire insertion hole, the wire is located between the first inclined plane and the second inclined plane;
- at least one lever handle, wherein one lever handle is correspondingly and pivotally connected in at least one wire insertion hole, and the lever handle abuts against the first inclined plane when rotating to a maximum angle;
- at least one stationary terminal, wherein one stationary terminal is correspondingly installed in at least one wire insertion hole, each stationary terminal comprises a copper sheet and an elastic sheet abutting against the copper sheet; and, the elastic sheet and the copper sheet clamp the wire, and the lever handle abuts against the elastic sheet; and the lever handle abuts against the elastic sheet to produce a maximum elastic deformation when an operator rotates the lever handle to abut against the first inclined plane, and the lever handle rotates toward an initial position by an elastic restoring force of the elastic sheet when an external force is removed; and at least one movable terminal installed on the insulating body, wherein the movable terminal is rotatably connected to or separated from the stationary terminal by the switch button.
2. The auto-reset wiring switch according to claim 1, wherein the second inclined plane is parallel to the first inclined plane.
 3. The auto-reset wiring switch according to claim 1, wherein the copper sheet is provided with a first plate, a second plate formed by bending and extending from the first plate, and a third plate formed by bending and extending from the second plate, the first plate abuts against the second inclined plane, and the third plate and the elastic sheet jointly clamp the wire.
 4. The auto-reset wiring switch according to claim 3, wherein a convex sheet is formed by tearing the third plate and bending in a direction close to the first plate, and the convex sheet abuts against the wire.
 5. The auto-reset wiring switch according to claim 4, wherein a through groove is formed by penetrating a surface of the second plate, and the wire runs through the through groove and reaches contact with the convex sheet.
 6. The auto-reset wiring switch according to claim 5, wherein the through groove extends to the first plate,
- the elastic sheet is provided with a contact part and a positioning part, the contact part is located in the through groove corresponding to the second plate, and the positioning part is located in the through groove corresponding to the first plate.
7. The auto-reset wiring switch according to claim 3, wherein the elastic sheet is provided with a mounting part attached to the first plate, an elastic part is formed by bending and extending from the mounting part, the elastic part is bent and extends in a direction close to the second plate to form a contact part, and the contact part abuts against the wire.
 8. The auto-reset wiring switch according to claim 7, wherein an included angle between the mounting part and the elastic part is an acute angle, and the mounting part is bent to form a positioning part to clamp the insulating body.
 9. The auto-reset wiring switch according to claim 8, wherein the lever handle is provided with an operating part and an abutting part, the operating part is located outside the wire insertion hole for the operator to apply an acting force, and the abutting part is accommodated in the wire insertion hole to abut against the elastic part.
 10. The auto-reset wiring switch according to claim 1, wherein the insulating body is provided with a plurality of wire insertion holes arranged in two rows, each of the wire insertion holes accommodates one lever handle and one stationary terminal, and a row of movable terminals is located between the two rows of wire insertion holes.

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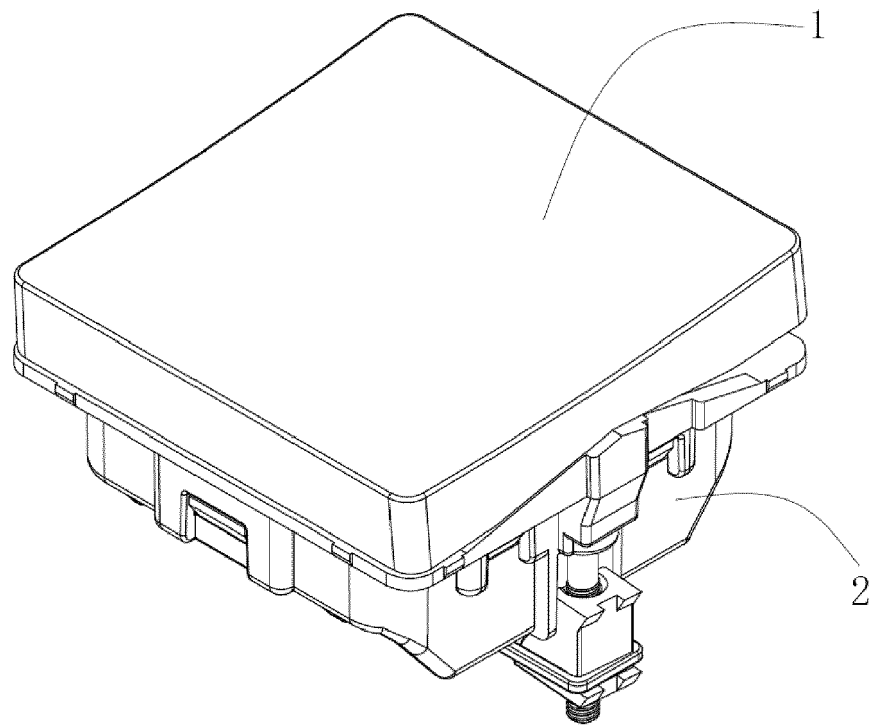


FIG. 1

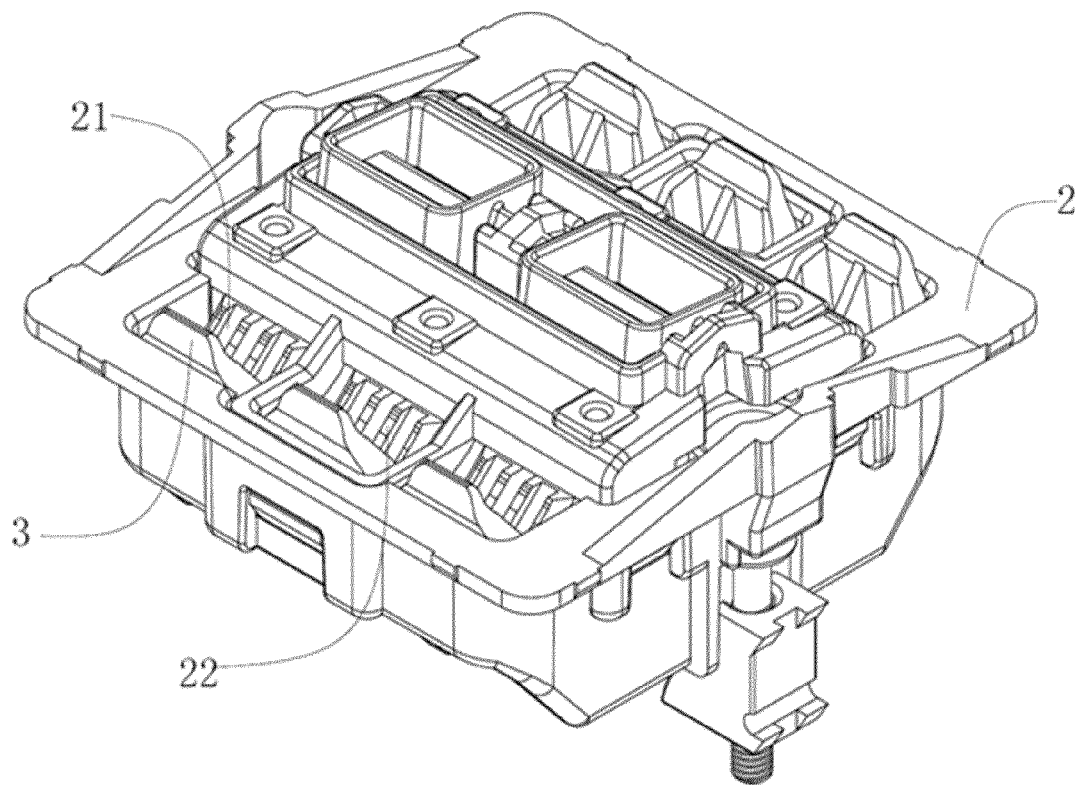


FIG. 2

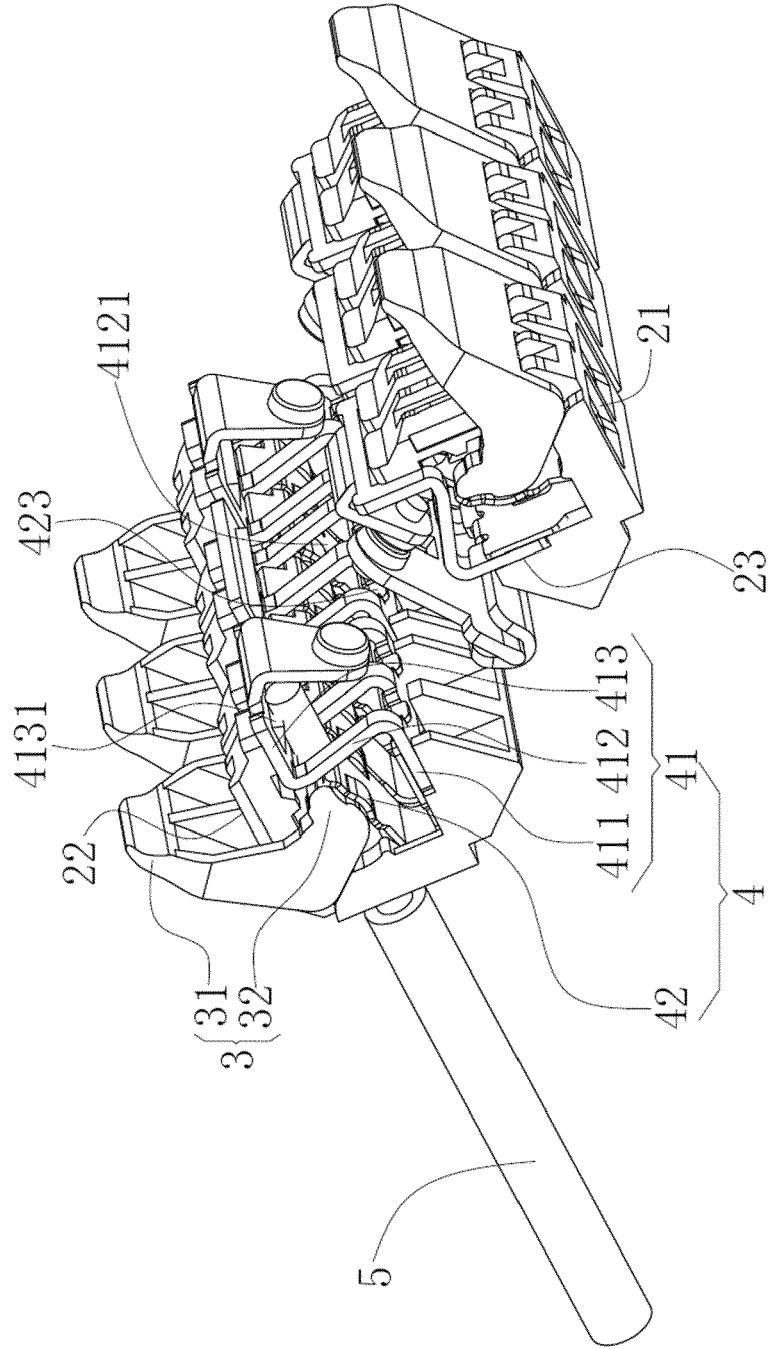


FIG.3

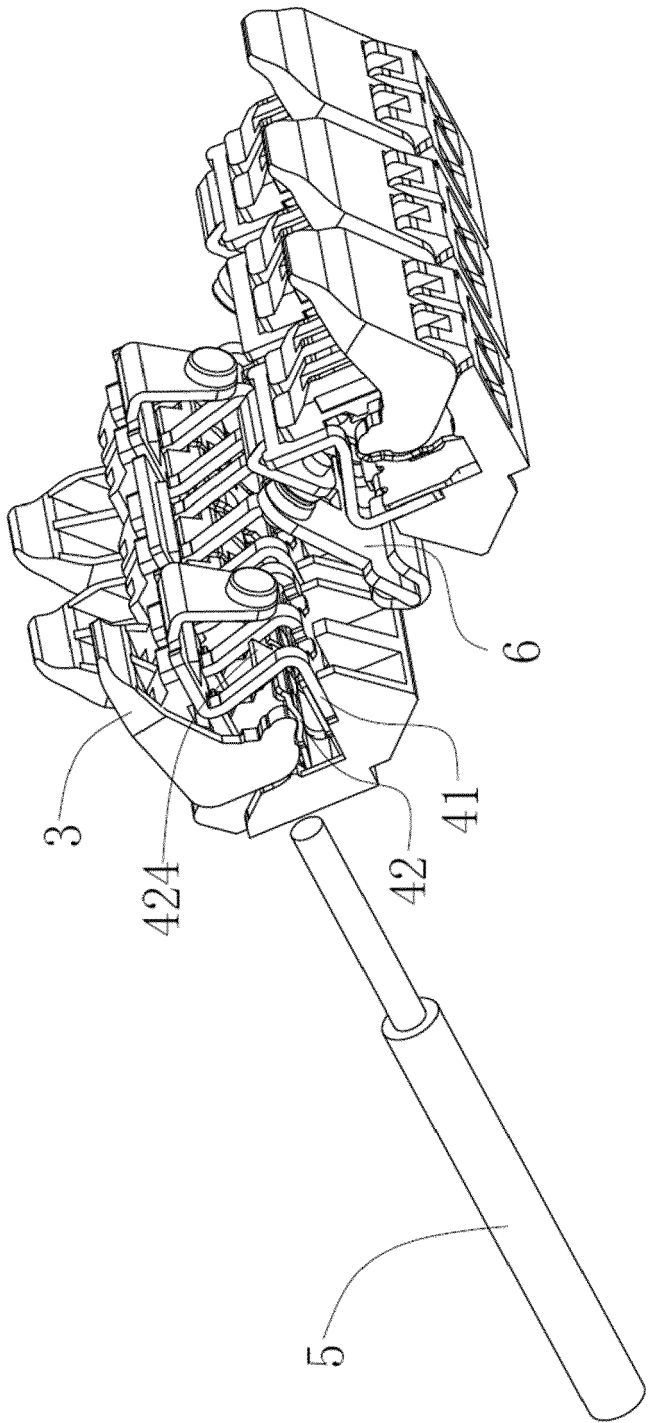


FIG. 4

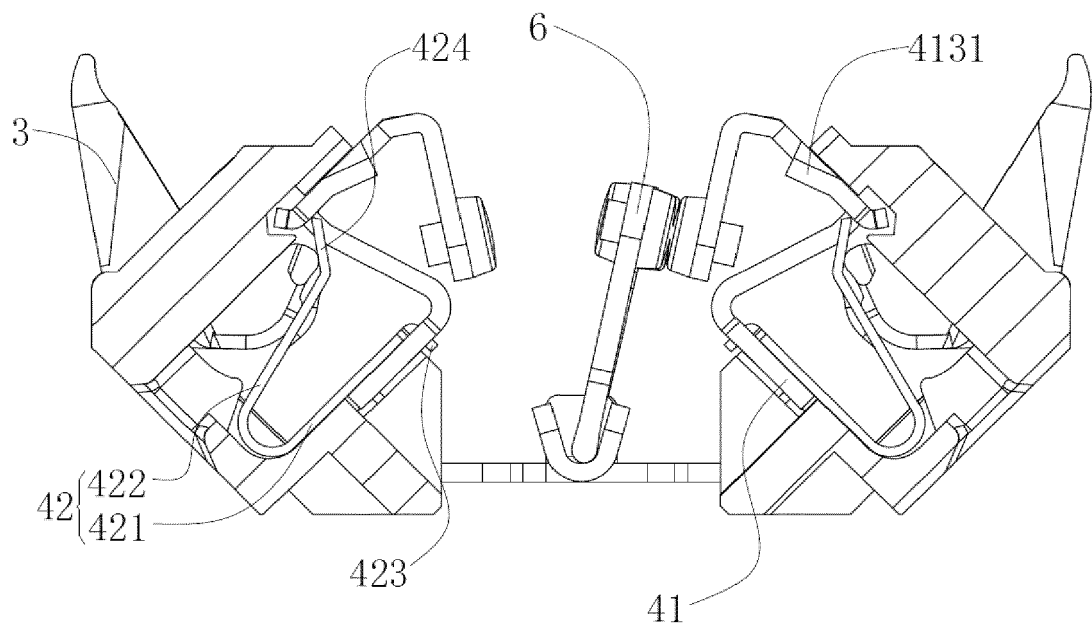


FIG. 5

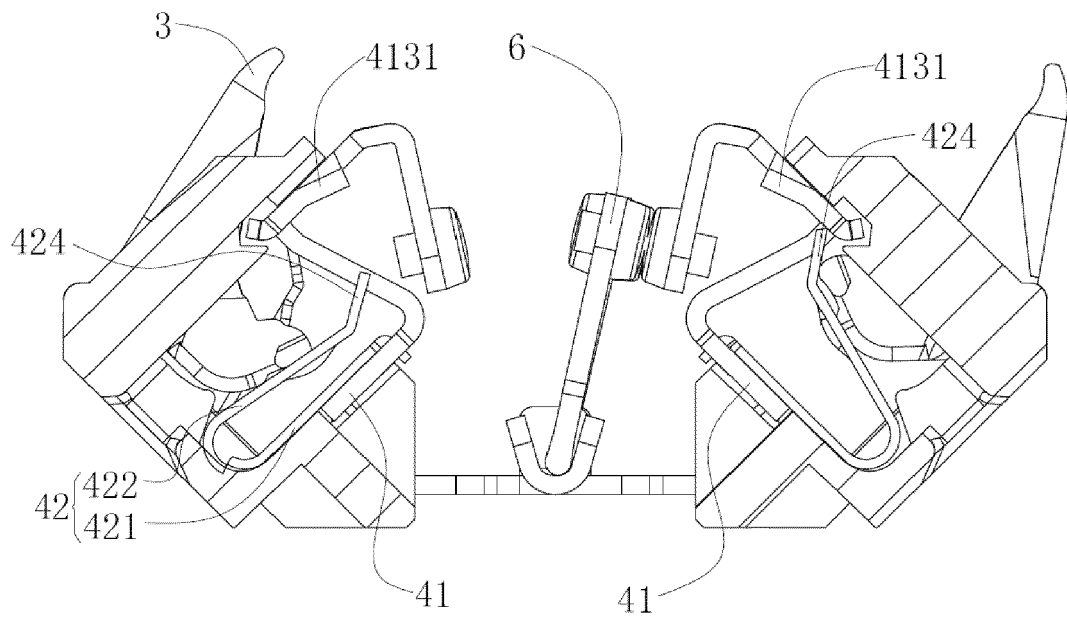


FIG. 6

100

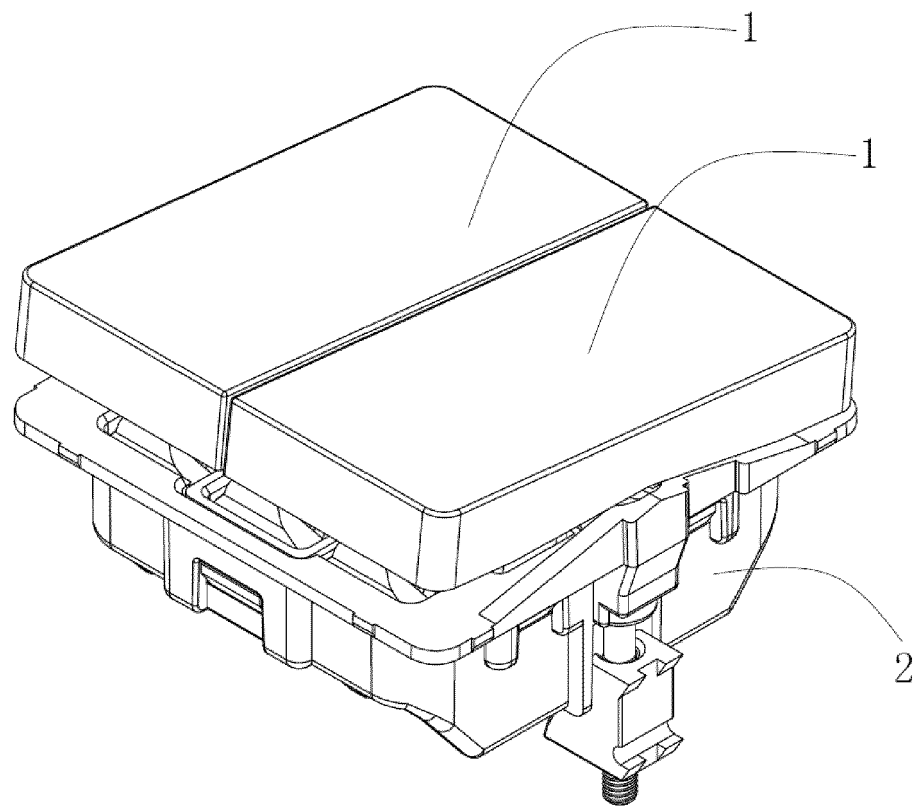


FIG. 7



EUROPEAN SEARCH REPORT

Application Number

EP 22 15 9315

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 111 092 311 A (GUANGDONG FUTINA ELECTRICAL CO LTD; YASHIJI LIGHTING CO LTD) 1 May 2020 (2020-05-01)	1-10	INV. H01R4/48
Y	* paragraph [0001] - paragraph [0003]; figures 1-8 *	1-10	ADD. H01H23/02 H01H1/58
Y	GB 2 298 973 A (MATSUSHITA ELECTRIC WORKS LTD [JP]) 18 September 1996 (1996-09-18) * figures 1,2,6-8 *	1-10	
Y	DE 27 48 273 A1 (KOPP GMBH & CO KG HEINRICH) 10 May 1979 (1979-05-10) * figure 1 *	1-10	
			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 5 August 2022	Examiner Arenz, Rainer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 22 15 9315

5 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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05-08-2022

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REFERENCES CITED IN THE DESCRIPTION

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