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(54) **TRANSFER SWITCH APPLIANCE**

ÜBERTRAGUNGSSCHALTERANWENDUNG

APPAREIL DE COMMUTATEUR DE TRANSFERT AUTOMATIQUE

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to low voltage electrical apparatus, more particularly, to a transfer switch appliance with automatic transfer ability.

2. The Related Art

[0002] In most existing integrated automatic transfer switching appliances, electromagnets, linear electric motors or manual operations are commonly used to rotate a primary power supply side main shaft or a backup power supply side main shaft. The primary power supply side main shaft or the backup power supply side main shaft rotates to drive the contact system to transfer to a closed position. However, the operation force generated by the electromagnet is limited by the volume of the electromagnet, it is also very difficult to generate a large operation force through manual operation. Therefore, the capacity of the transfer switching appliance is limited. If large capacity integrated automatic transfer switching appliances still use electromagnets, linear electric motors or manual operations, the volume of the transfer switching appliance will be very large, and the reliability will be poor. CN101826403A discloses a dual energy storage operation mechanism with a single operation shaft.

[0003] EP 2 284 851 A2 discloses an automatic transfer switch including a case having an accommodation space partitioned into upper and lower spaces for accommodating a regular air circuit breaker, an emergency air circuit breaker and also a transfer device for alternately closing or tripping both the air circuit breakers.

SUMMARY

[0004] The present invention provides a large capacity transfer switch appliance having three work positions and automatic operation ability.

[0005] According to the invention, a transfer switch appliance is provided. The transfer switch appliance is installed between a primary side power supply and a backup side power supply. The transfer switch appliance comprises a front base and a rear base, a contact system and an operation system. The front base and the rear base combines to define a space. The contact system is installed within the space, the contact system closes or disconnects a circuit. The contact system comprises a moving contact and a static contact, the moving contact has three work positions, namely a primary side position, an intermediate position and a backup side position. The operation system is installed on the front base, the operation system is an energy storage mechanism implementing disconnecting/closing operations. The operation system is connected to the moving contact via a con-

necting rod. The operation system comprises a primary side operation mechanism and a backup side operation mechanism connected by a gear group. The primary side operation mechanism and the backup side operation mechanism are installed respectively on an upper side and a lower side of the front base, the primary side operation mechanism and the backup side operation mechanism are connected to a handle or an electric motor via a common shaft. The handle or the electric motor completes an energy storage operation with respect to both the primary side operation mechanism and the backup side operation mechanism within one circle. An interlocking device is disposed between the primary side operation mechanism and the backup side operation mechanism. The interlocking device ensures that the backup side power supply is open while the primary side power supply is closed, and the primary side power supply is open while the backup side power supply is closed. The interlocking device comprises a first interlocking member and a second interlocking member which are disposed symmetrically.

[0006] The first interlocking member comprises a first bracket, a first lever, a first shaft and a first connector. The first bracket is welded to a main shaft of the primary side operation mechanism. The first bracket is connected to one end of the first lever via the first shaft, and the other end of the first lever is connected to the first connector. The first connector is installed on a side plate of the backup side operation mechanism. The second interlocking member comprises a second bracket, a second lever, a second shaft and a second connector. The second bracket is welded to a main shaft of the backup side operation mechanism. The second bracket is connected to one end of the second lever via the second shaft, and the other end of the second lever is connected to the second connector. The second connector is installed on a side plate of the primary side operation mechanism. When the primary side operation mechanism is closed, the main shaft of the primary side operation mechanism rotates to a closed position, the first bracket also rotates and drives the first connector to rotate via the first lever, the first connector presses a disconnecting shaft of the backup side operation mechanism so that the backup side operation mechanism is open. When the backup side operation mechanism is closed, the main shaft of the backup side operation mechanism rotates to a closed position, the second bracket also rotates and drives the second connector to rotate via the second lever, the second connector presses a disconnecting shaft of the primary side operation mechanism so that the primary side operation mechanism is open.

[0007] According to one embodiment, the transfer switch appliance further comprises a controller to achieve automatic operation. The controller collects voltage signals of the primary side power supply and the backup side power supply and switches between the primary side power supply and the backup side power supply based on the collected voltage signals.

[0008] According to one embodiment, the contact system has an arc extinguishing chamber installed on the outside of a contact point of the moving contact and the static contact. The arc extinguishing chamber comprises an arc striking sheet, a plurality of arc chutes and a plurality of hole containing press plates. The plurality of arc chutes are disposed in vertical arrangement and cross to each other. The arc striking sheet is installed on the bottom of the arc chutes. The plurality of hole containing press plates are disposed above the arc chutes, the plurality of hole containing press plates are disposed in stacked arrangement and the positions of the holes on the different hole containing press plates interleave.

[0009] According to one embodiment, the contact system has a busbar, the busbar is connected to a common end of the primary side power supply and the backup side power supply. The busbar is connected to a plurality of parallel connected contact plates via soft connections. The moving contact is installed on the contact plates, the moving contact has a prominent contact point, the static contact is convex.

[0010] According to one embodiment, the handle or the electric motor performs the energy storage operation with respect to the primary side operation mechanism via a primary side cam, and performs the energy storage operation with respect to the backup side operation mechanism via a backup side cam. The primary side operation mechanism and the backup side operation mechanism are crosswise assembled on the front base. The front base and the rear base are insulation bases.

[0011] According to one embodiment, the transfer switch appliance further comprises an auxiliary contact, terminal rows, a closing electromagnet, a shunt release and contactors. The auxiliary contact and the terminal rows are connected to corresponding functional components respectively, including the closing electromagnet, the shunt release, the contactors, the electric motors and the controller. The terminal rows are also connected to external components so that remote controls and communications may be achieved.

[0012] The transfer switch appliance of the present invention uses an energy storage type operation system, so that the transfer switch appliance may have the characteristics such as small volume, large capacity, full functions and high reliability.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The above and other features, natures, and advantages of the invention will be apparent by the following description of the embodiments incorporating the drawings, wherein,

FIG. 1a and FIG. 1b disclose the structure of a transfer switch appliance according to an embodiment of the present invention.

FIG. 2 discloses the internal structure of a transfer

switch appliance according to an embodiment of the present invention.

FIG. 3 discloses the structure of an operation system according to an embodiment of the present invention.

FIG. 4 discloses the structure of a gear group within the operation system of the transfer switch appliance according to an embodiment of the present invention.

FIG. 5 discloses the structure of an interlocking device within the operation system of the transfer switch appliance according to an embodiment of the present invention.

FIG. 6 discloses the structure of a contact system of the transfer switch appliance according to an embodiment of the present invention.

FIG. 7 discloses the structure of an arc extinguishing chamber of the transfer switch appliance according to an embodiment of the present invention.

FIG. 8 discloses the structure of a controller of the transfer switch appliance according to an embodiment of the present invention.

FIG. 9a, FIG. 9b and FIG. 9c disclose the structure of an auxiliary contact, terminal rows and a closing electromagnet of the transfer switch appliance according to an embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0014] Referring to Figs 1-9, Figs 1-9 disclose the structure of a transfer switch appliance according to an embodiment of the present invention, including diagrams of the overall structure and diagrams of different components.

[0015] As shown in the drawings, the transfer switch appliance 100 is installed between a primary side power supply and a backup side power supply. The transfer switch appliance 100 comprises a front base 102 and a rear base 103, a contact system and an operation system 101.

[0016] The front base 102 and the rear base 103 combines together to define a space. In one embodiment, the front base 102 and the rear base 103 are insulation bases. The combined front base 102 and the rear base 103 are divided into four phases. The contact system is installed within the space combined by the front base 102 and the rear base 103. The contact system closes or disconnects a circuit. The contact system comprises moving contacts 105 and static contacts 106. A pair of a moving contact 105 and a static contact 106 is included in each phase, and an arc extinguishing chamber 104 is

also included in each phase. A primary side busbar 107, a common side busbar 108 and a backup side busbar 109 are disposed on the combined base. These busbars are respectively connected to corresponding power supply inlet and outlet terminals. The moving contact 105 has three work positions, namely a primary side position, an intermediate position and a backup side position. The operation system 101 is installed on the front base. The operation system 101 is an energy storage mechanism implementing disconnecting/closing operations. Operation mechanisms are connected to the moving contact 105 via a connecting rod 131. The operation system 101 comprises a primary side operation mechanism and a backup side operation mechanism connected by a gear group 113. The primary side operation mechanism and the backup side operation mechanism are installed respectively on an upper side and a lower side of the front base. In one embodiment, the primary side operation mechanism and the backup side operation mechanism are crosswise assembled on the front base. The primary side operation mechanism and the backup side operation mechanism are connected to a handle or an electric motor 124 via a common shaft 114. The handle or the electric motor 124 completes an energy storage operation with respect to both the primary side operation mechanism and the backup side operation mechanism within one circle, which means a rotation of 360°. In one embodiment, the handle or the electric motor 124 performs the energy storage operation with respect to the primary side operation mechanism via a primary side cam 115, and performs the energy storage operation with respect to the backup side operation mechanism via a backup side cam 116.

[0017] The primary side operation mechanism and the backup side operation mechanism are disposed in an upper-lower crosswise arrangement, so that the longitudinal dimension of the product may be reduced. As the handle or the electric motor completes an energy storage operation with respect to both the primary side operation mechanism and the backup side operation mechanism within a 360° rotation, the lateral dimension of the product may be reduced.

[0018] To ensure the operation safety of the primary side operation mechanism and the backup side operation mechanism, and to prevent the primary side operation mechanism and the backup side operation mechanism from closing simultaneously, an interlocking device is disposed between the primary side operation mechanism and the backup side operation mechanism. The interlocking device ensures that the backup side power supply is open while the primary side power supply is closed, or the primary side power supply is open while the backup side power supply is closed. As shown in the drawings, the interlocking device comprises a first interlocking member and a second interlocking member which are disposed symmetrically. The first interlocking member comprises a first bracket 125, a first lever 130, a first shaft 128 and a first connector 129. The first bracket 125 is

welded to a main shaft 126 of the primary side operation mechanism. The first bracket 125 is connected to one end of the first lever 130 via the first shaft 128, and the other end of the first lever 130 is connected to the first connector 129. The first connector 129 is installed on a side plate of the backup side operation mechanism. When the primary side operation mechanism is closed, the main shaft 126 of the primary side operation mechanism rotates to a closed position, the first bracket 125 also rotates and drives the first connector 129 to rotate via the first lever 130, the first connector 129 presses a disconnecting shaft of the backup side operation mechanism so that the backup side operation mechanism is open. The second interlocking member comprises a second bracket 225, a second lever 230, a second shaft 228 and a second connector 229. The second bracket 225 is welded to a main shaft 226 of the backup side operation mechanism. The second bracket 225 is connected to one end of the second lever 230 via the second shaft 228, and the other end of the second lever 230 is connected to the second connector 229. The second connector 229 is installed on a side plate of the primary side operation mechanism. When the backup side operation mechanism is closed, the main shaft 226 of the backup side operation mechanism rotates to a closed position, the second bracket 225 also rotates and drives the second connector 229 to rotate via the second lever 230, the second connector 229 presses a disconnecting shaft of the primary side operation mechanism so that the primary side operation mechanism is open.

[0019] To achieve automatic transfer between the primary side power supply and the backup side power supply, in one embodiment, the transfer switch appliance 100 further comprises a controller 110. The controller 110 collects voltage signals of the primary side power supply and the backup side power supply, and further switches between the primary side power supply and the backup side power supply based on the collected voltage signals. In one embodiment, the controller 110 is composed of electronic circuits. The controller 110 makes a real time logical determination based on the signals collected from the primary power supply side and the backup power supply side respectively. If a fault is detected on the primary side power supply, a signal is automatically sent to disconnect the primary side power supply and close the backup side power supply. Similarly, if a fault is detected on the backup side power supply, a signal is automatically sent to disconnect the backup side power supply and close the primary side power supply. The controller 110 is able to achieve automatic transfer between the power supplies.

[0020] Without using the controller 110, the transfer switch appliance 100 may also accomplish the transfer of the power supply via manual operations. When a fault on the primary side power supply is detected, the primary side contact point of the contact system will disconnect the connection with the primary side power supply if a disconnecting button of the primary side operation mechanism

anism is pressed. By closing the backup side operation mechanism, the contact point of the contact system will close the connection with the backup side power supply and achieve the transfer of the power supply. When a fault on the backup side power supply is detected, similar operations will be performed.

[0021] The initial position of the transfer switch appliance of the present invention is an intermediate position (the Zero position). The transfer switch appliance 100 is installed into a circuit with two power supply systems, namely a primary side power supply and a backup side power supply. Under normal conditions, the primary side power supply supplies power. A handle is manually operated to rotate one circle, or an electric motor is remotely controlled to rotate one circle so as to perform an energy storage operation with respect to both the primary side cam 115 and the backup side cam 116. By manually pressing a closing button of the primary side operation mechanism, or pressing the primary side operation mechanism via remote control of a closing electromagnet, the primary side contact point of the operation system is closed and the connection with the primary side power supply is closed, then power is supplied.

[0022] Continue with the embodiments shown in the drawings, the contact system has an arc extinguishing chamber 104 installed on the outside of a contact point of the moving contact 105 and the static contact 106. The arc extinguishing chamber 104 comprises an arc striking sheet 118, a plurality of arc chutes 119 and a plurality of hole containing press plates 120. The plurality of arc chutes 119 are disposed in vertical arrangement and cross with each other. Such an arrangement of the arc chutes is good for striking the arc. The arc chutes 119 are disposed in the middle of the arc extinguishing chamber 104. The arc striking sheet 118 is installed on the bottom of the arc chutes 119. The plurality of hole containing press plates 120 are disposed above the arc chutes 119, that is, above the arc extinguishing chamber 104. The plurality of hole containing press plates 120 are disposed in stacked arrangement and the positions of the holes on the different hole containing press plates interleave with each other. Such an arrangement is good for elimination of free gas and may avoid arcing. Arc may be generated during closing/disconnecting procedures of the switch. The arc is introduced into the arc extinguishing chamber by the arc striking sheet and is extinguished by the crosswise arc chutes. Multiple layers of hole containing press plates are installed on the top of the arc extinguishing chamber. The hole containing press plates eliminate free gas generated by the arc so as to avoid arcing.

[0023] Continue with the drawings, the contact system has a busbar connected with a common end of the primary side power supply and the backup side power supply. The busbar may be a common side busbar 108. The busbar may further comprise a primary side busbar 107 and a backup side busbar 109. The busbar is connected to a plurality of parallel connected contact plates 117 via

soft connections. The moving contact 105 is installed on the contact plates 117. The contact plates 117 and the moving contact 105 perform closing or disconnecting operations so as to close or disconnect the connection with the corresponding power supply sides. The moving contact 105 may have three prominent contact points, which are thicker than other contact points so that a larger contact press force is obtained. The static contact matching the moving contact is convex so as to facilitate arc introduction. The contact system with a plurality of parallel connected contact plates may operate a large capacity switch with a relatively small operation force, so that a large capacity and small volume design may be realized.

[0024] The transfer switch appliance also has remote control and communication functions, which are implemented by the following components: an auxiliary contact 111 and terminal rows 112. The auxiliary contact 111 and the terminal rows 112 are respectively connected to corresponding functional components including a closing electromagnet 121, a shunt release 122, contactors 123, an electric motor 124 and the controller 110. The terminal rows 112 are also connected to external components so that the remote control and communication functions may be implemented.

[0025] The transfer switch appliance of the present invention uses an energy storage type operation system, so that the transfer switch appliance may have the characteristics such as small volume, large capacity, full functions and high reliability.

[0026] The above embodiments are provided to those skilled in the art to realize or use the invention, under the condition that various modifications or changes being made by those skilled in the art without departing from the scope of protection defined by the appended claims.

Claims

1. A transfer switch appliance (100) installed between a primary side power supply and a backup side power supply, comprising:

a front base (102) and a rear base (103), the front base (102) and the rear base (103) combining to define a space;

a contact system installed within the space, the contact system closing or disconnecting a circuit, the contact system comprising a moving contact (105) and a static contact (106), the moving contact having three work positions, namely a primary side position, an intermediate position and a backup side position;

an operation system (101) installed on the front base (102), the operation system (101) being an energy storage mechanism implementing disconnecting/closing operations, wherein the operation system is connected to the moving contact (105) via a connecting rod (131), wherein

the operation system (101) comprises a primary side operation mechanism and a backup side operation mechanism connected by a gear group (113), wherein the primary side operation mechanism and the backup side operation mechanism are installed respectively on an upper side and a lower side of the front base, the primary side operation mechanism and the backup side operation mechanism being connected to a handle or an electric motor (124) via a common shaft (114);

wherein an interlocking device is disposed between the primary side operation mechanism and the backup side operation mechanism, the interlocking device ensuring that the backup side power supply is open while the primary side power supply is closed, and the primary side power supply is open while the backup side power supply is closed;

wherein the interlocking device comprises a first interlocking member and a second interlocking member which are disposed symmetrically to each other;

wherein the handle or the electric motor (124) completes an energy storage operation with respect to both the primary side operation mechanism and the backup side operation mechanism within one circle, which means a rotation of 360° of the common shaft (114);

wherein the first interlocking member comprises a first bracket (125), a first lever (130), a first shaft (128) and a first connector (129), the first bracket (125) being welded to a main shaft (126) of the primary side operation mechanism, the first bracket (125) being connected to one end of the first lever (130) via the first shaft (128), the other end of the first lever (130) being connected to the first connector (129), the first connector (129) being installed on a side plate of the backup side operation mechanism; and

wherein the second interlocking member comprises a second bracket (225), a second lever (230), a second shaft (228) and a second connector (229), the second bracket (225) being welded to a main shaft (226) of the backup side operation mechanism, the second bracket (225) being connected with one end of the second lever (230) via the second shaft (228), the other end of the second lever (230) being connected to the second connector (229), the second connector (229) being installed on a side plate of the primary side operation mechanism, wherein, when the primary side operation mechanism is closed, the main shaft (126) of the primary side operation mechanism rotates to a closed position, the first bracket (125) also rotates and drives the first connector (129) to rotate via the first lever (130), the first connector

(129) presses a disconnecting shaft of the backup side operation mechanism so that the backup side operation mechanism is open; and wherein, when the backup side operation mechanism is closed, the main shaft (226) of the backup side operation mechanism rotates to a closed position, the second bracket (225) also rotates and drives the second connector (229) to rotate via the second lever (230), the second connector (229) presses a disconnecting shaft of the primary side operation mechanism so that the primary side operation mechanism is open.

2. The transfer switch appliance according to claim 1, further comprising:
a controller (110) for collecting voltage signals of the primary side power supply and the backup side power supply and switching between the primary side power supply and the backup side power supply based on the collected voltage signals.
3. The transfer switch appliance according to claim 1, wherein the contact system has an arc extinguishing chamber (104) installed on the outside of a contact point of the moving contact (105) and the static contact (106), the arc extinguishing chamber comprising an arc striking sheet (118), a plurality of arc chutes (119) and a plurality of hole containing press plates (120), the plurality of arc chutes (119) being disposed in vertical arrangement and cross to each other, the arc striking sheet (118) being installed on the bottom of the arc chutes (119), the plurality of hole containing press plates (120) being disposed above the arc chutes (119), the plurality of hole containing press plates (120) being disposed in stacked arrangement and the positions of the holes on the different hole containing press plates interleave.
4. The transfer switch appliance according to claim 1, wherein the contact system has a busbar, the busbar being connected with a common end of the primary side power supply and the backup side power supply, the busbar being connected to a plurality of parallel connected contact plates (117) via soft connections, the moving contact being installed on the contact plates (117), the moving contact (105) having a prominent contact point, the static contact (106) being convex.
5. The transfer switch appliance according to claim 1, wherein the handle or the electric motor performs the energy storage operation with respect to the primary side operation mechanism via a primary side cam (115), and performs the energy storage operation with respect to the backup side operation mechanism via a backup side cam (116), the primary side operation mechanism and the backup side operation mechanism being crosswise assembled on the front

base.

6. The transfer switch appliance according to claim 1, wherein the front base and the rear base are insulation bases. 5
7. The transfer switch appliance according to claim 1, further comprising an auxiliary contact (111), terminal rows (112), a closing electromagnet (121), a shunt release (122) and contactors (123). 10

Patentansprüche

1. Eine Transferschaltervorrichtung (100), die zwischen einer primärseitigen Energieversorgung und einer ersatzseitigen Energieversorgung eingebaut ist, aufweisend: 15
 - eine vordere Basis (102) und eine hintere Basis (103), wobei die vordere Basis (102) und die hintere Basis (103) zusammen einen Raum definieren; 20
 - ein in dem Raum eingebautes Kontaktsystem, wobei das Kontaktsystem einen Stromkreis schließt oder unterbricht, wobei das Kontaktsystem einen beweglichen Kontakt (105) und einen statischen Kontakt (106) aufweist, wobei der bewegliche Kontakt drei Arbeitspositionen hat, nämlich eine primärseitige Position, eine Zwischenposition und eine ersatzseitige Position; 25
 - ein auf der vorderen Basis (102) installiertes System (101), wobei das System (101) ein Energiespeichermechanismus ist, der Trenn-/Schließvorgänge durchführt, wobei das System mit dem beweglichen Kontakt (105) über eine Verbindungsstange (131) verbunden ist, wobei das System (101) einen primärseitigen Betätigungsmechanismus und einen ersatzseitigen Betätigungsmechanismus aufweist, die durch eine Getriebegruppe (113) verbunden sind, wobei der primärseitige Betätigungsmechanismus und der ersatzseitige Betätigungsmechanismus jeweils auf einer oberen Seite und einer unteren Seite der vorderen Basis eingebaut sind, wobei der primärseitige Betätigungsmechanismus und der ersatzseitige Betätigungsmechanismus über eine gemeinsame Welle (114) mit einem Griff oder einem Elektromotor (124) verbunden sind; 30 35 40 45 50
 - wobei eine Verriegelungsvorrichtung zwischen dem primärseitigen Betriebsmechanismus und dem ersatzseitigen Betriebsmechanismus angeordnet ist, wobei die Verriegelungsvorrichtung sicherstellt, dass die ersatzseitige Energieversorgung offen ist, während die primärseitige Energieversorgung geschlossen ist, und die primärseitige Energieversorgung offen ist, wäh-

rend die ersatzseitige Energieversorgung geschlossen ist;

wobei die Verriegelungsvorrichtung ein erstes Verriegelungselement und ein zweites Verriegelungselement aufweist, die symmetrisch zueinander angeordnet sind;

wobei der Griff oder der Elektromotor (124) einen Energiespeicherbetrieb in Bezug auf sowohl den primärseitigen Betriebsmechanismus als auch den ersatzseitigen Betriebsmechanismus innerhalb einer Umdrehung durchführt, was eine Drehung der gemeinsamen Welle (114) um 360° bedeutet;

wobei das erste Verriegelungselement einen ersten Bügel (125), einen ersten Hebel (130), eine erste Welle (128) und ein erstes Verbindungselement (129) aufweist, wobei der erste Bügel (125) mit einer Hauptwelle (126) des primärseitigen Betriebsmechanismus verschweißt ist, wobei der erste Bügel (125) mit einem Ende des ersten Hebels (130) über die erste Welle (128) verbunden ist, wobei das andere Ende des ersten Hebels (130) mit dem ersten Verbindungselement (129) verbunden ist, wobei das erste Verbindungselement (129) an einer Seitenplatte des ersatzseitigen Betriebsmechanismus eingebaut ist; und

wobei das zweite Verriegelungselement einen zweiten Bügel (225), einen zweiten Hebel (230), eine zweite Welle (228) und ein zweites Verbindungselement (229) aufweist, wobei der zweite Bügel (225) an eine Hauptwelle (226) des ersatzseitigen Betriebsmechanismus geschweißt ist, wobei der zweite Bügel (225) mit einem Endabschnitt des zweiten Hebels (230) über die zweite Welle (228) verbunden ist, wobei das andere Ende des zweiten Hebels (230) mit dem zweiten Verbindungselement (229) verbunden ist, wobei das zweite Verbindungselement (229) auf einer Seitenplatte des primärseitigen Betriebsmechanismus eingebaut ist,

wobei, wenn der primärseitige Betätigungsmechanismus geschlossen ist, die Hauptwelle (126) des primärseitigen Betätigungsmechanismus sich in eine geschlossene Position dreht, die erste Halterung (125) sich ebenfalls dreht und das erste Verbindungselement (129) antreibt, um sich über den ersten Hebel (130) zu drehen, das erste Verbindungselement (129) eine Trennwelle des ersatzseitigen Betätigungsmechanismus drückt, so dass der ersatzseitige Betätigungsmechanismus offen ist; und

wobei, wenn der ersatzseitige Betätigungsmechanismus geschlossen ist, die Hauptwelle (226) des ersatzseitigen Betätigungsmechanismus sich in eine geschlossene Position dreht, die zweite Halterung (225) sich ebenfalls dreht und das zweite Verbindungselement (229) an-

- treibt, um sich über den zweiten Hebel (230) zu drehen, wobei das zweite Verbindungselement (229) eine Trennwelle des primärseitigen Betätigungsmechanismus drückt, so dass der primärseitige Betätigungsmechanismus offen ist. 5
2. Die Transferschaltervorrichtung nach Anspruch 1, ferner aufweisend:
eine Steuerungseinheit (110) zum Sammeln von Spannungssignalen der primärseitigen Energieversorgung und der ersatzseitigen Energieversorgung und zum Umschalten zwischen der primärseitigen Energieversorgung und der ersatzseitigen Energieversorgung basierend auf den gesammelten Spannungssignalen. 10
3. Die Transferschaltervorrichtung nach Anspruch 1, wobei das Kontaktsystem eine Lichtbogenlöschkammer (104) aufweist, die an der Außenseite einer Kontaktstelle des beweglichen Kontakts (105) und des statischen Kontakts (106) eingebaut ist, wobei die Lichtbogenlöschkammer ein Lichtbogenschlagblech (118), eine Vielzahl von Lichtbogenschächten (119) und eine Vielzahl von lochhaltigen Pressplatten (120) aufweist, wobei die Vielzahl von Lichtbogenschächten (119) in vertikaler Anordnung und kreuzweise zueinander angeordnet sind, wobei das Lichtbogenschlagblech (118) am Boden der Lichtbogenschächte (119) eingebaut ist, wobei die Vielzahl von lochenthaltenden Pressplatten (120) oberhalb der Lichtbogenschächte (119) angeordnet ist, wobei die Vielzahl von lochenthaltenden Pressplatten (120) in gestapelter Anordnung angeordnet ist und die Positionen der Löcher auf den verschiedenen lochenthaltenden Pressplatten sich überlappen. 20 25 30 35
4. Transferschaltervorrichtung nach Anspruch 1, wobei das Kontaktsystem eine Sammelschiene aufweist, wobei die Sammelschiene mit einem gemeinsamen Endabschnitt der primärseitigen Energieversorgung und der ersatzseitigen Energieversorgung verbunden ist, wobei die Sammelschiene mit einer Vielzahl von parallel geschalteten Kontaktplatten (117) über weiche Verbindungen verbunden ist, wobei der bewegliche Kontakt auf den Kontaktplatten (117) installiert ist, wobei der bewegliche Kontakt (105) einen hervorstehenden Kontaktpunkt aufweist, wobei der statische Kontakt (106) konvex ist. 40 45
5. Die Transferschaltervorrichtung gemäß Anspruch 1, wobei der Griff oder der Elektromotor den Energiespeicherbetrieb in Bezug auf den primärseitigen Betriebsmechanismus über einen primärseitigen Nocken (115) durchführt und den Energiespeicherbetrieb in Bezug auf den ersatzseitigen Betriebsmechanismus über einen ersatzseitigen Nocken (116) durchführt, wobei der primärseitige Betriebsmechanismus und der ersatzseitige Betriebsmechanismus 50 55

kreuzweise auf der vorderen Basis montiert sind.

6. Die Transferschaltervorrichtung nach Anspruch 1, wobei die vordere Basis und die hintere Basis Isolationsbasen sind.
7. Die Transferschaltervorrichtung nach Anspruch 1, ferner aufweisend einen Hilfskontakt (111), Klemmenreihen (112), einen schließenden Elektromagneten (121), einen Arbeitsstromauslöser (122) und Schützen (123).

Revendications

1. Appareil de commutation de transfert (100) installé entre une alimentation électrique côté primaire et une alimentation électrique côté auxiliaire, comprenant :

une base avant (102) et une base arrière (103), la base avant (102) et la base arrière (103) se combinant pour définir un espace ;

un système de contact installé dans l'espace, le système de contact fermant ou déconnectant un circuit, le système de contact comprenant un contact mobile (105) et un contact statique (106), le contact mobile ayant trois positions de travail, à savoir une position côté primaire, une position intermédiaire et une position côté auxiliaire ;

un système de fonctionnement (101) installé sur la base avant (102), le système de fonctionnement (101) étant un mécanisme de stockage d'énergie mettant en oeuvre des opérations de déconnexion/fermeture, dans lequel le système de fonctionnement est connecté au contact mobile (105) par l'intermédiaire d'une tige de connexion (131), dans lequel le système de fonctionnement (101) comprend un mécanisme de fonctionnement côté primaire et un mécanisme de fonctionnement côté auxiliaire connectés par un groupe d'engrenages (113), dans lequel le mécanisme de fonctionnement côté primaire et le mécanisme de fonctionnement côté auxiliaire sont installés respectivement sur un côté supérieur et un côté inférieur de la base avant, le mécanisme de fonctionnement côté primaire et le mécanisme de fonctionnement côté auxiliaire étant reliés à une poignée ou à un moteur électrique (124) par l'intermédiaire d'un arbre commun (114) ;

dans lequel un dispositif de verrouillage est disposé entre le mécanisme de fonctionnement côté primaire et le mécanisme de fonctionnement côté auxiliaire, le dispositif de verrouillage garantissant que l'alimentation électrique côté auxiliaire est ouverte lorsque l'alimentation élec-

trique côté primaire est fermée, et que l'alimentation électrique côté primaire est ouverte lorsque l'alimentation électrique côté auxiliaire est fermée ;

dans lequel le dispositif de verrouillage comprend un premier élément de verrouillage et un second élément de verrouillage qui sont disposés de manière symétrique l'un par rapport à l'autre ;

dans lequel la poignée ou le moteur électrique (124) effectue une opération de stockage d'énergie à la fois pour le mécanisme de fonctionnement côté primaire et le mécanisme de fonctionnement côté auxiliaire en un tour, ce qui signifie une rotation de 360° de l'arbre commun (114) ;

dans lequel le premier élément de verrouillage comprend un premier support (125), un premier levier (130), un premier arbre (128) et un premier connecteur (129), le premier support (125) étant soudé à un arbre principal (126) du mécanisme de fonctionnement côté primaire, le premier support (125) étant connecté à une extrémité du premier levier (130) par l'intermédiaire du premier arbre (128), l'autre extrémité du premier levier (130) étant connectée au premier connecteur (129), le premier connecteur (129) étant installé sur une plaque latérale du mécanisme de fonctionnement côté auxiliaire ; et

dans lequel le second élément de verrouillage comprend un second support (225), un second levier (230), un second arbre (228) et un second connecteur (229), le second support (225) étant soudé à un arbre principal (226) du mécanisme de fonctionnement côté auxiliaire, le second support (225) étant connecté à une extrémité du second levier (230) par l'intermédiaire du second arbre (228), l'autre extrémité du second levier (230) étant connectée au second connecteur (229), le second connecteur (229) étant installé sur une plaque latérale du mécanisme de fonctionnement côté primaire,

dans lequel, lorsque le mécanisme de fonctionnement côté primaire est fermé, l'arbre principal (126) du mécanisme de fonctionnement côté primaire tourne jusqu'à une position fermée, le premier support (125) tourne également et entraîne le premier connecteur (129) à tourner par l'intermédiaire du premier levier (130), le premier connecteur (129) appuie sur un arbre de déconnexion du mécanisme de fonctionnement côté auxiliaire de sorte que le mécanisme de fonctionnement côté auxiliaire est ouvert ; et dans lequel, lorsque le mécanisme de fonctionnement côté auxiliaire est fermé, l'arbre principal (226) du mécanisme de fonctionnement côté auxiliaire tourne jusqu'à une position fermée, le second support (225) tourne également et en-

traîne le second connecteur (229) à tourner par l'intermédiaire du second levier (230), le second connecteur (229) appuie sur un arbre de déconnexion du mécanisme de fonctionnement côté primaire de sorte que le mécanisme de fonctionnement côté primaire est ouvert.

2. Appareil de commutation de transfert selon la revendication 1, comprenant en outre :

un contrôleur (110) pour collecter des signaux de tension de l'alimentation électrique côté primaire et de l'alimentation électrique côté auxiliaire et commuter entre l'alimentation électrique côté primaire et l'alimentation électrique côté auxiliaire sur la base des signaux de tension collectés.

3. Appareil de commutation de transfert selon la revendication 1, dans lequel le système de contact a une chambre d'extinction d'arc (104) installée à l'extérieur d'un point de contact du contact mobile (105) et du contact statique (106), la chambre d'extinction d'arc comprenant une feuille d'amorçage d'arc (118), une pluralité de boîtiers de soufflage (119) et une pluralité de plaques de presse contenant des trous (120), la pluralité de boîtiers de soufflage (119) étant disposés verticalement et se croisant, la feuille d'amorçage d'arc (118) étant installée au fond des boîtiers de soufflage (119), la pluralité de plaques de presse contenant des trous (120) étant disposées au-dessus des boîtiers de soufflage (119), la pluralité de plaques de presse contenant des trous (120) étant disposées en pile et les positions des trous sur les différentes plaques de presse contenant des trous s'imbriquant les unes dans les autres.

4. Appareil de commutation de transfert selon la revendication 1, dans lequel le système de contact a une barre omnibus, la barre omnibus étant connectée à une extrémité commune de l'alimentation électrique côté primaire et de l'alimentation électrique côté auxiliaire, la barre omnibus étant connectée à une pluralité de plaques de contact connectées en parallèle (117) par l'intermédiaire de connexions souples, le contact mobile étant installé sur les plaques de contact (117), le contact mobile (105) ayant un point de contact proéminent, le contact statique (106) étant convexe.

5. Appareil de commutation de transfert selon la revendication 1, dans lequel la poignée ou le moteur électrique effectue l'opération de stockage d'énergie par rapport au mécanisme de fonctionnement côté primaire par l'intermédiaire d'une came côté primaire (115), et effectue l'opération de stockage d'énergie par rapport au mécanisme de fonctionnement côté auxiliaire par l'intermédiaire d'une came côté auxiliaire (116), le mécanisme de fonctionnement côté primaire et le mécanisme de fonctionnement côté

auxiliaire étant assemblés transversalement sur la base avant.

6. Appareil de commutation de transfert selon la revendication 1, dans lequel la base avant et la base arrière sont des bases d'isolation. 5
7. Appareil de commutation de transfert selon la revendication 1, comprenant en outre un contact auxiliaire (111), des barrettes de bornes (112), un électroaimant de fermeture (121), un déclencheur de shunt (122) et des contacteurs (123). 10

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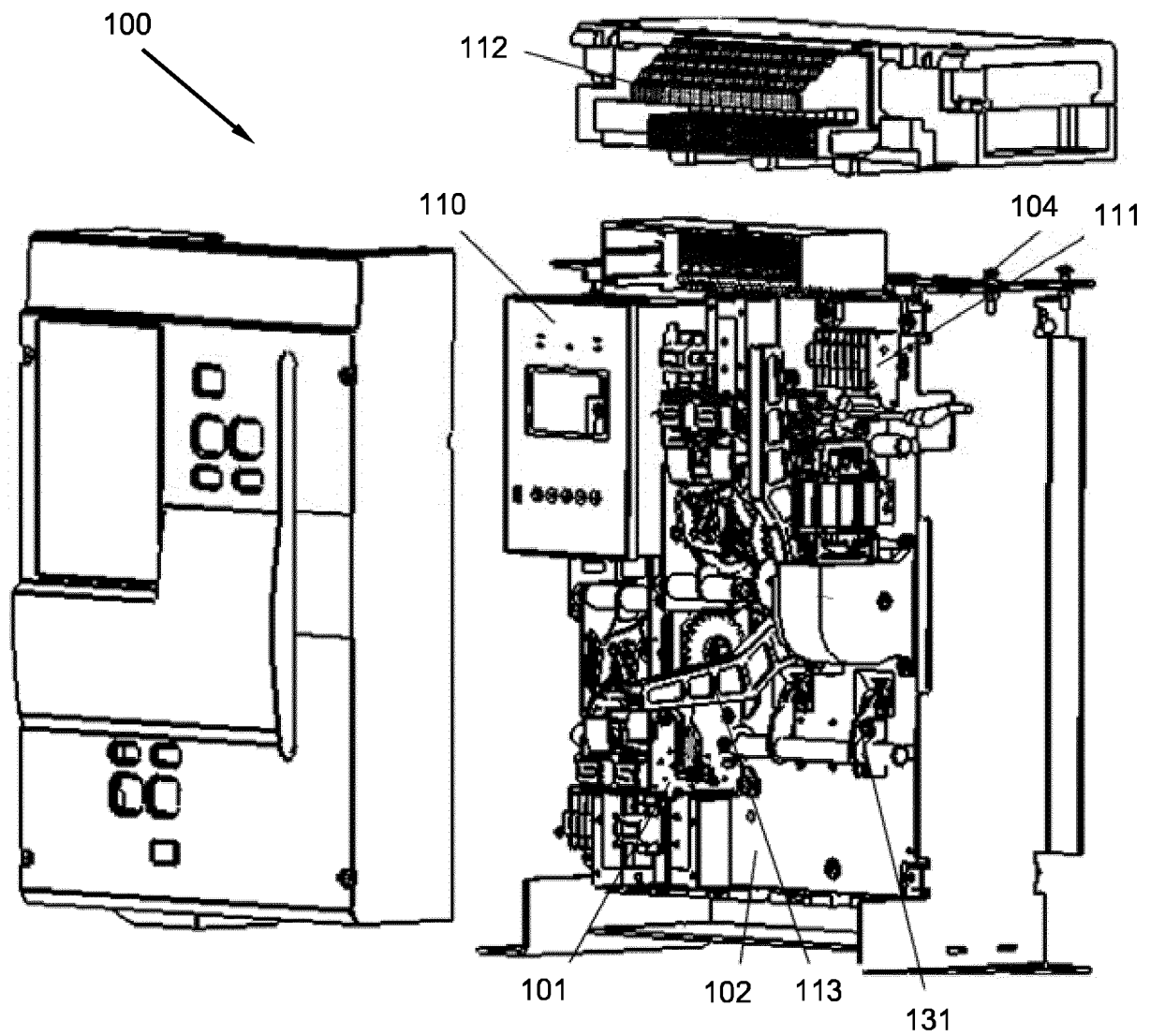


FIG 1a

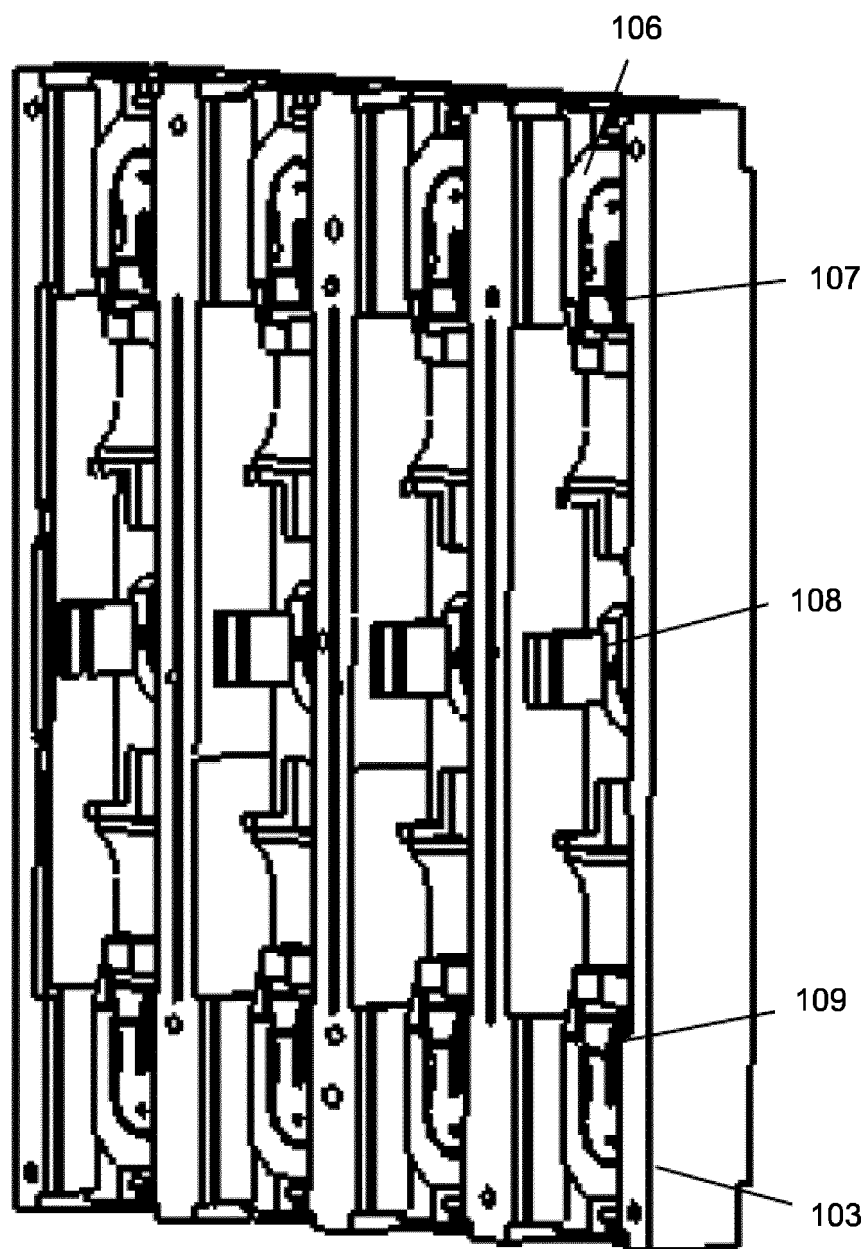


FIG 1b

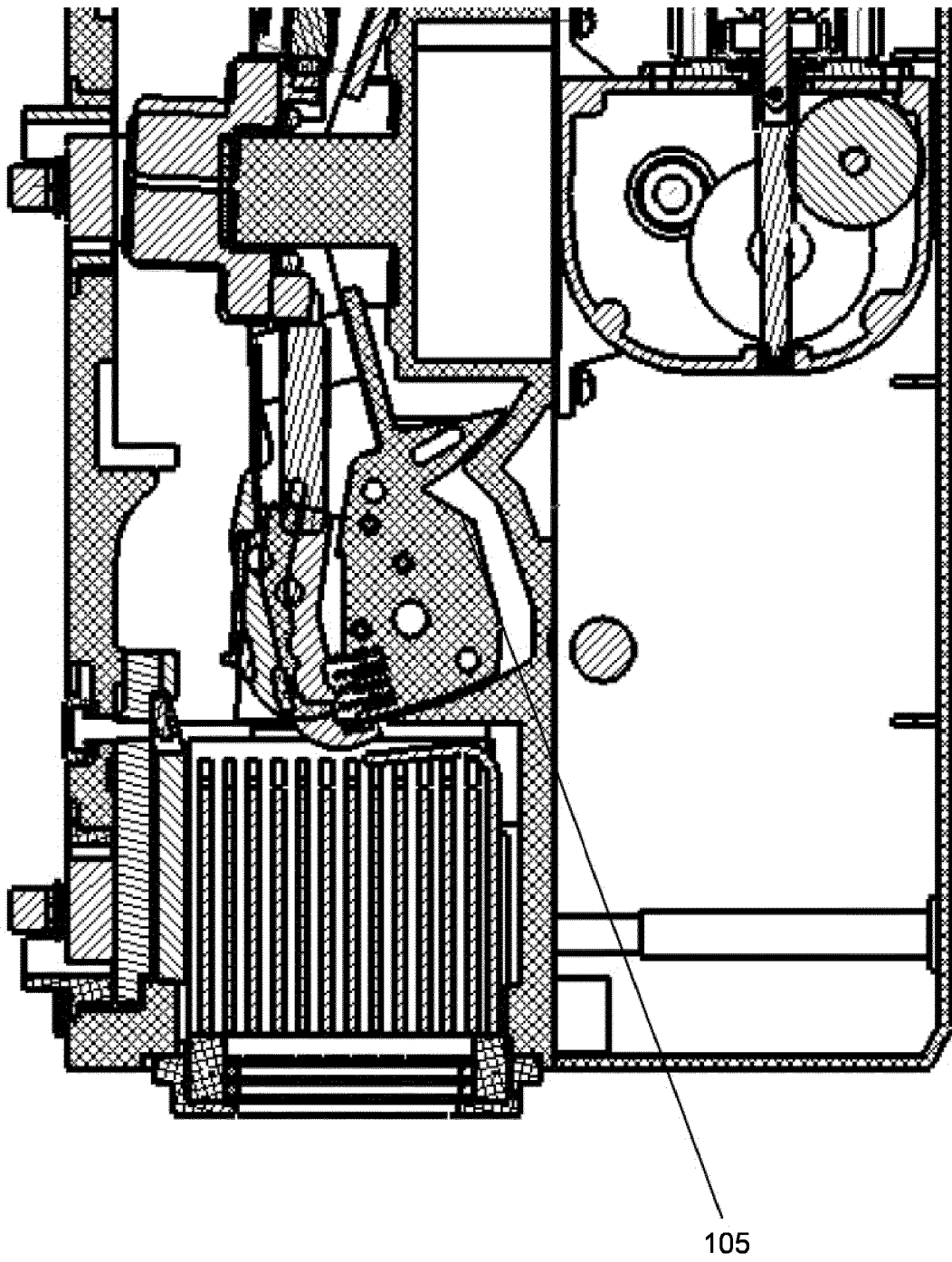


FIG 2

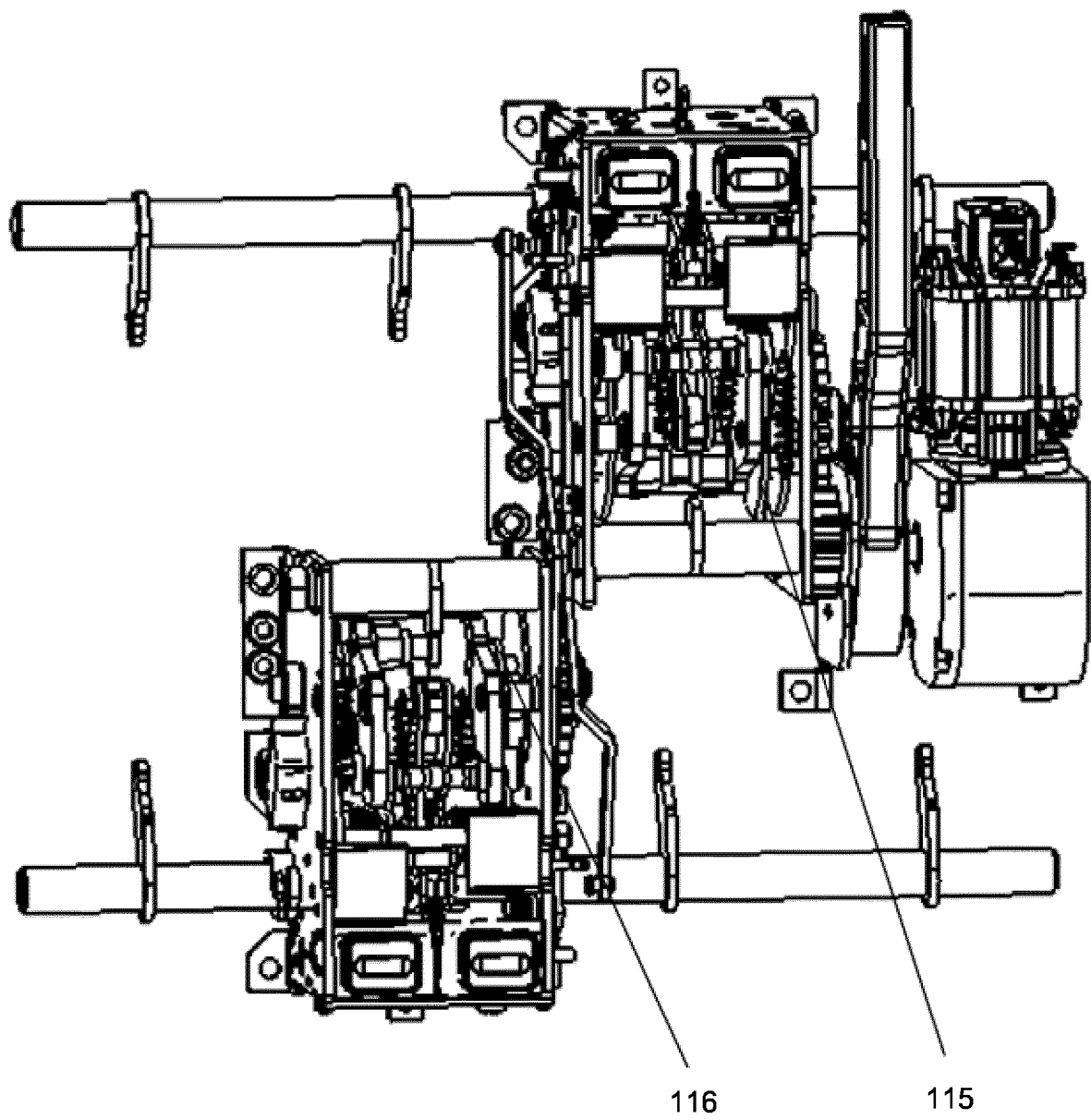


FIG 3

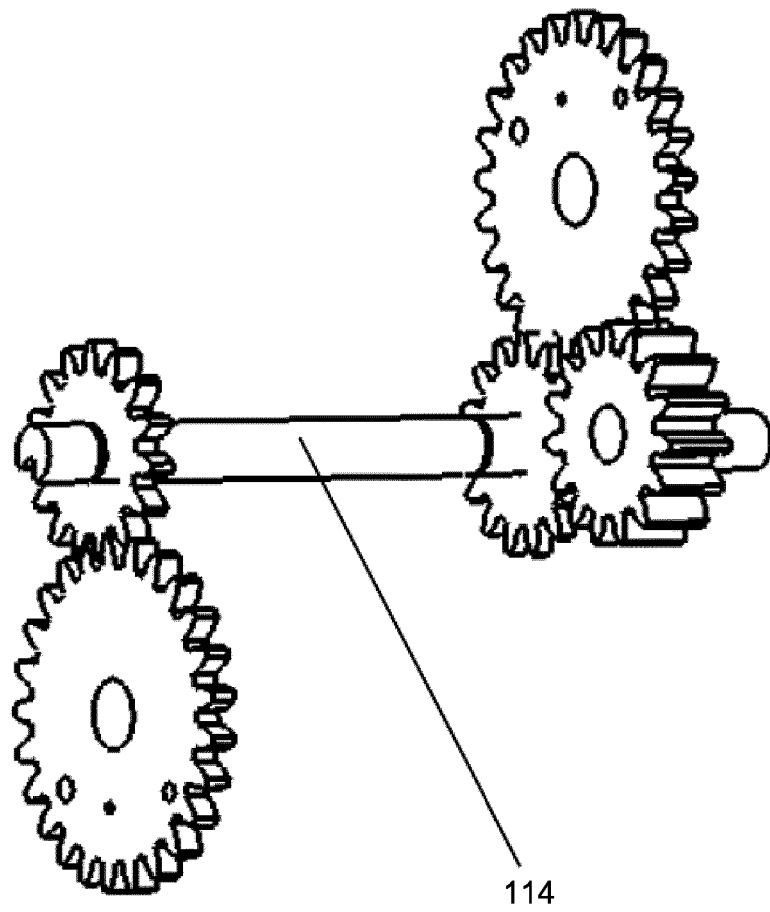


FIG 4

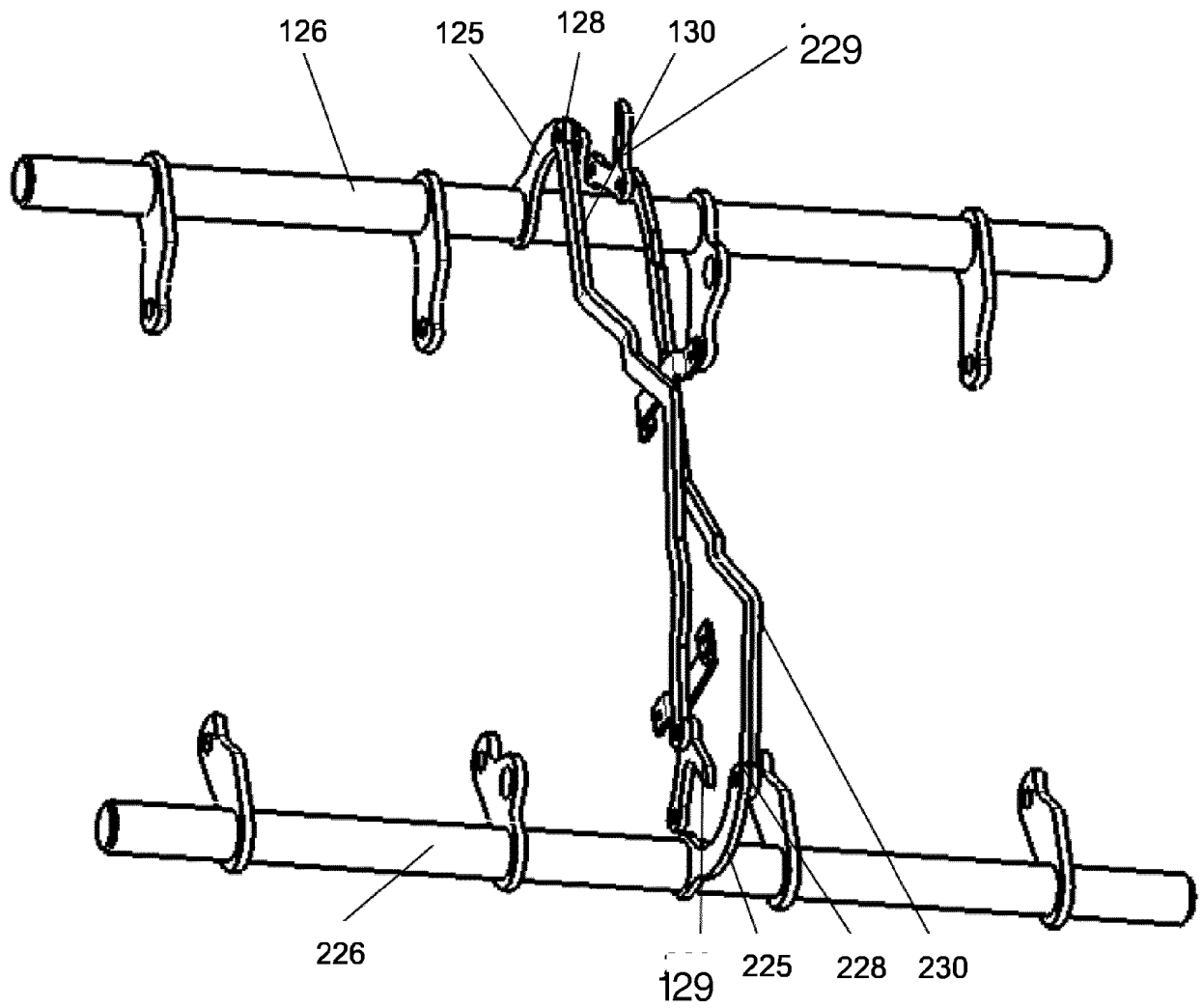


FIG 5

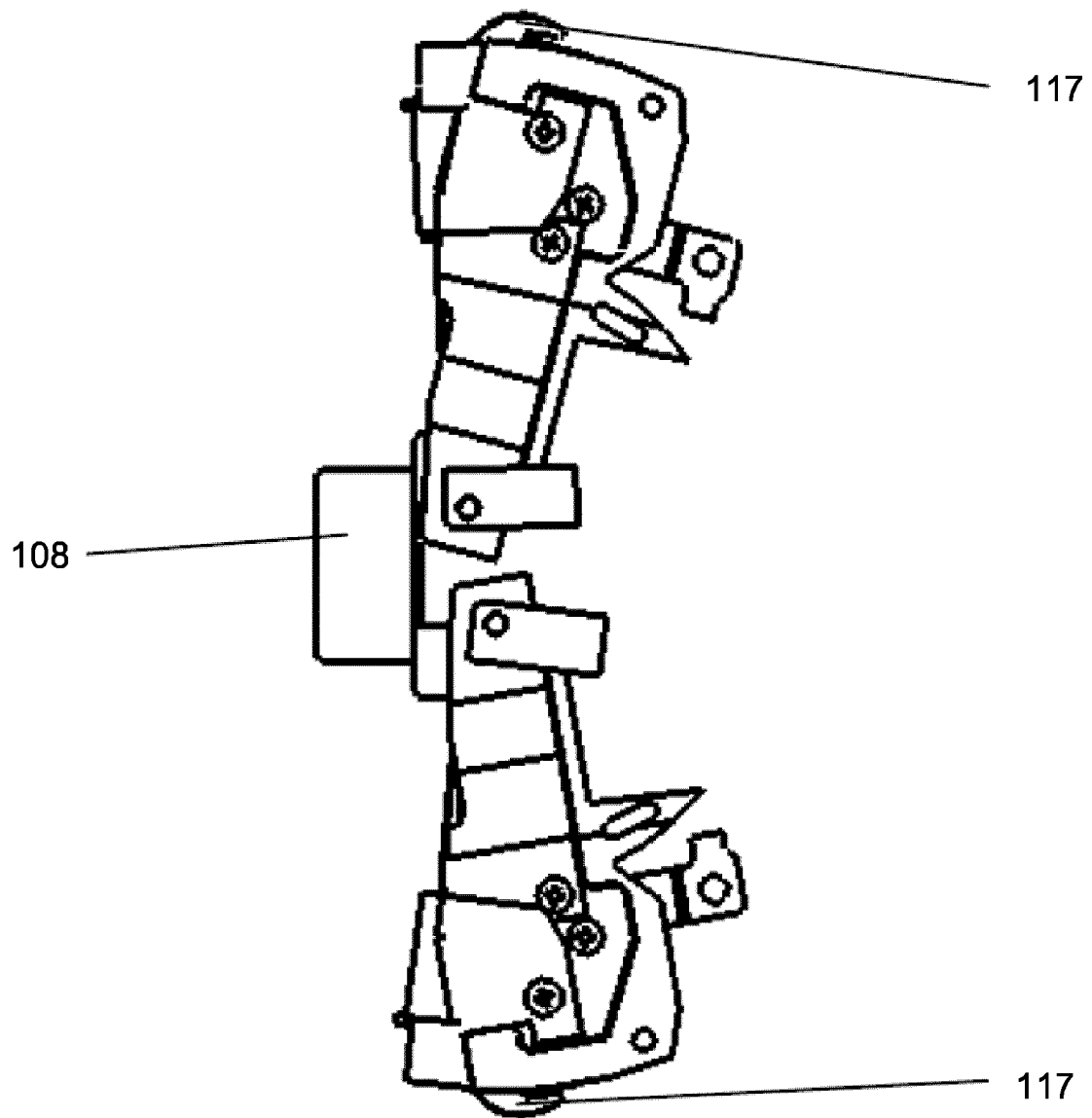


FIG 6

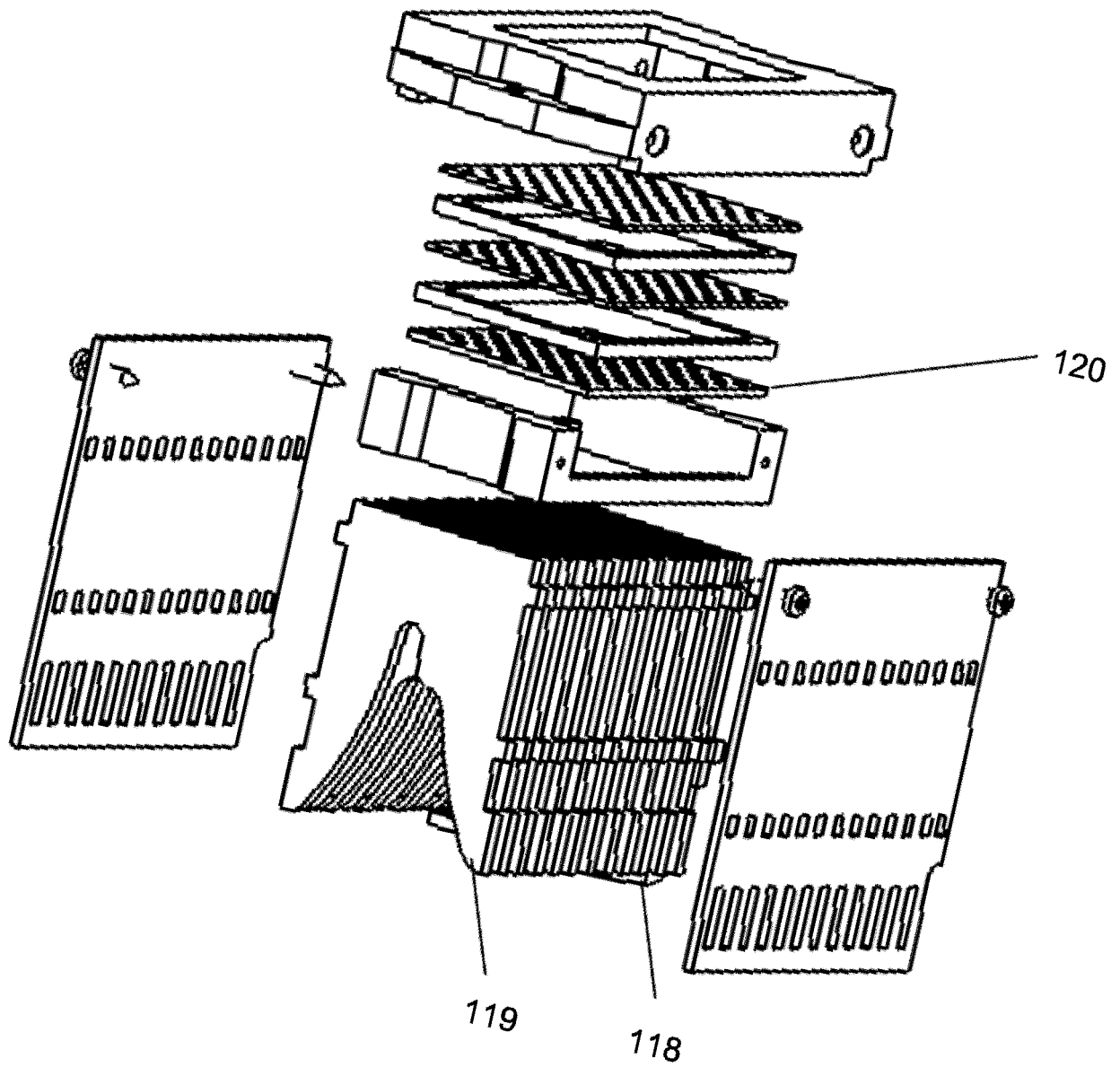


FIG 7

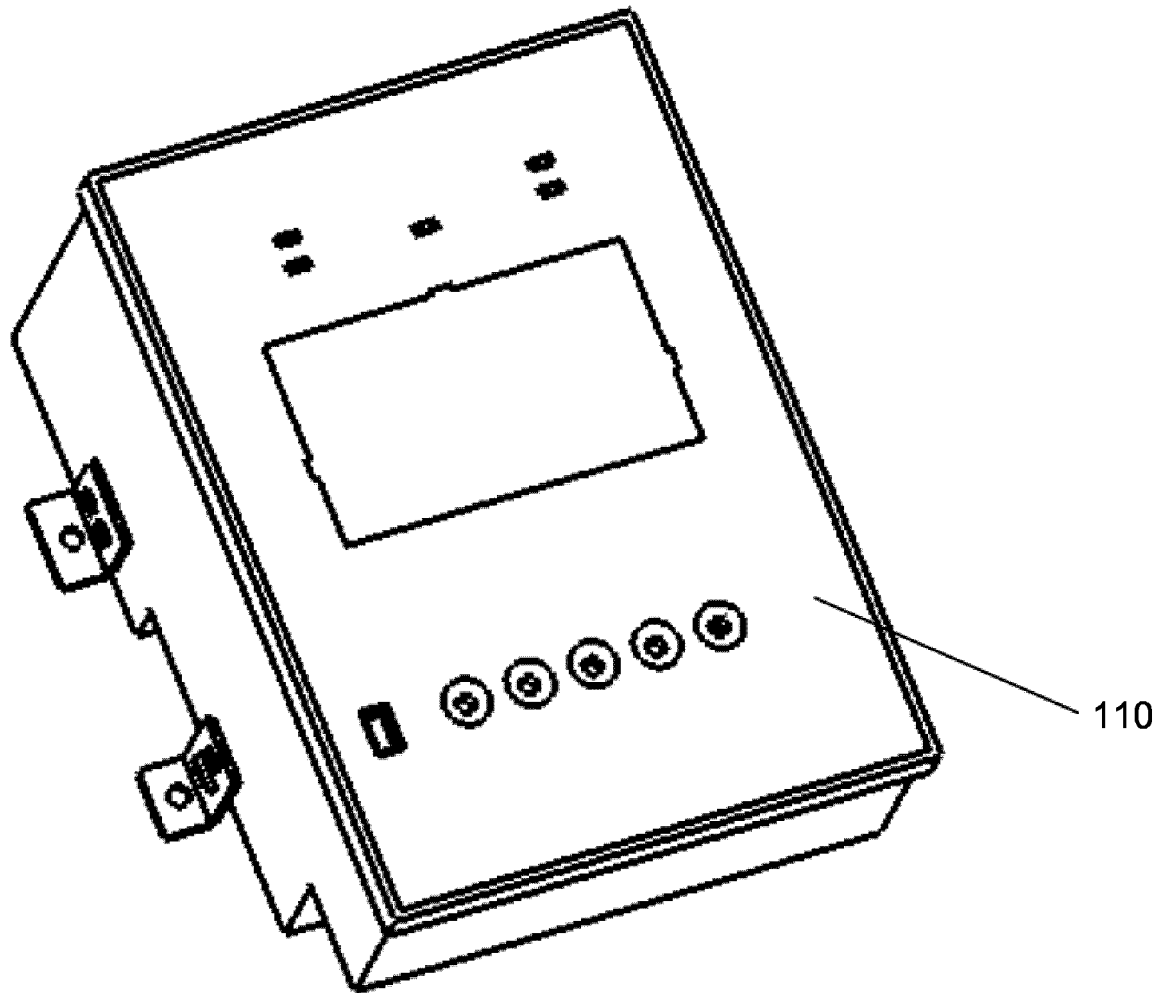


FIG 8

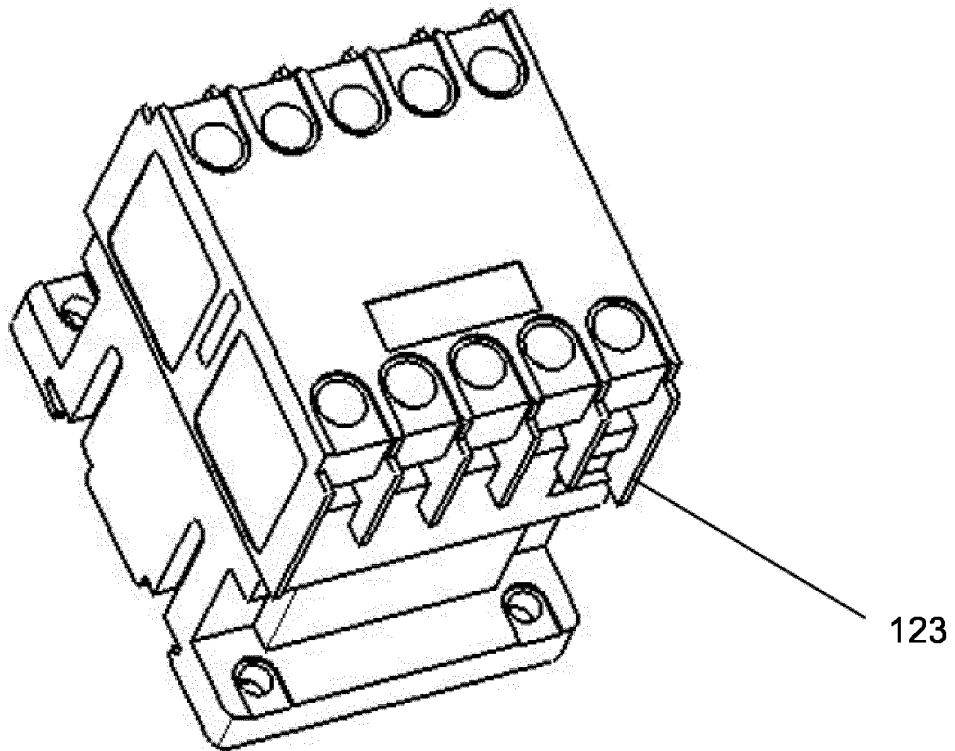


FIG 9a

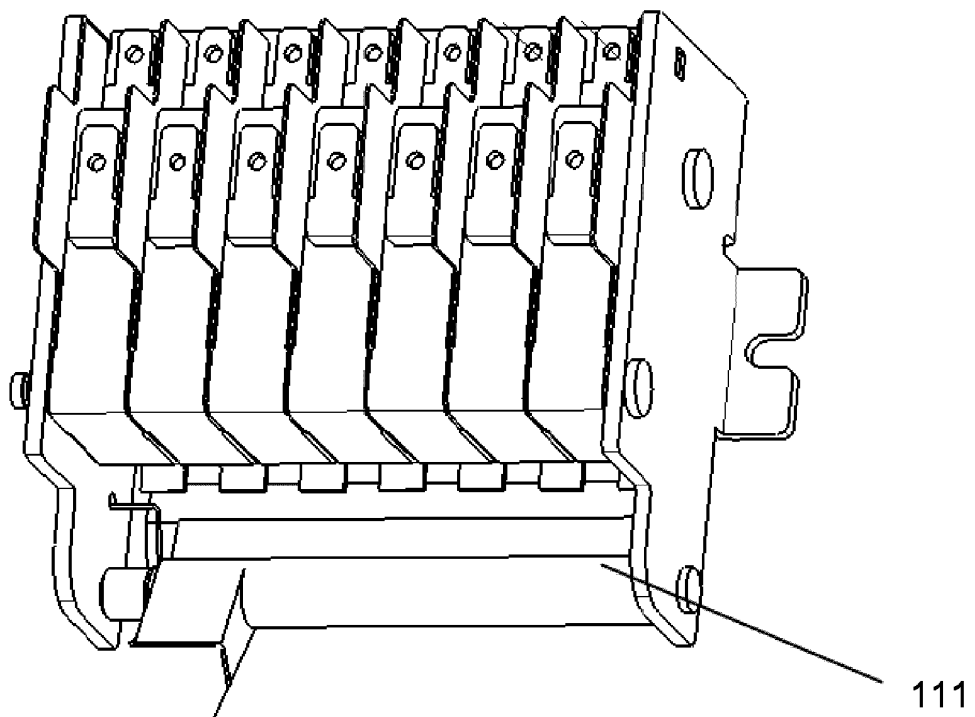


FIG 9b

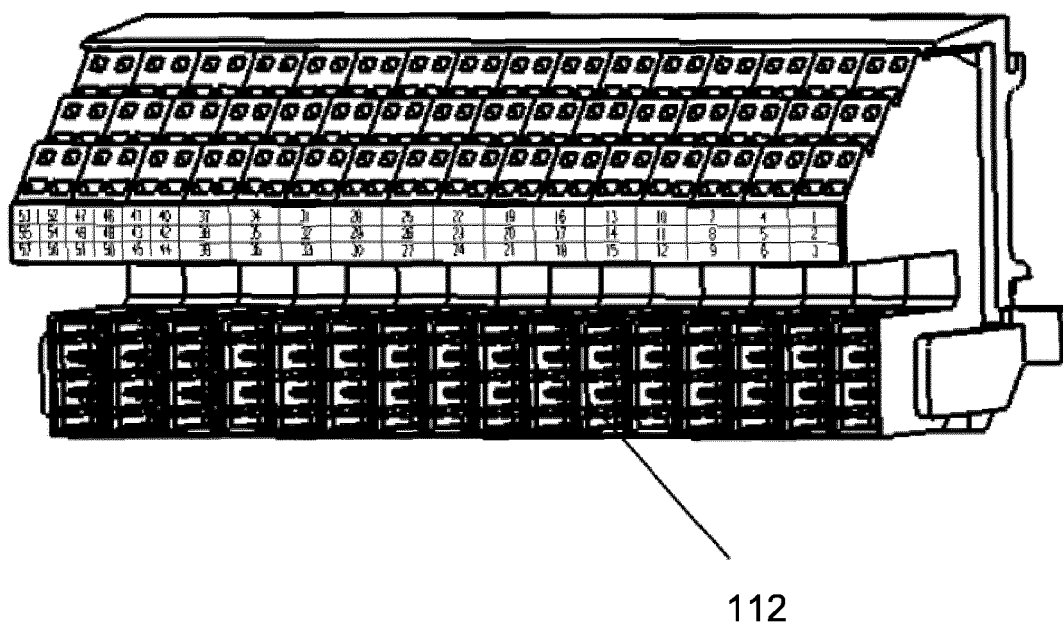


FIG 9c

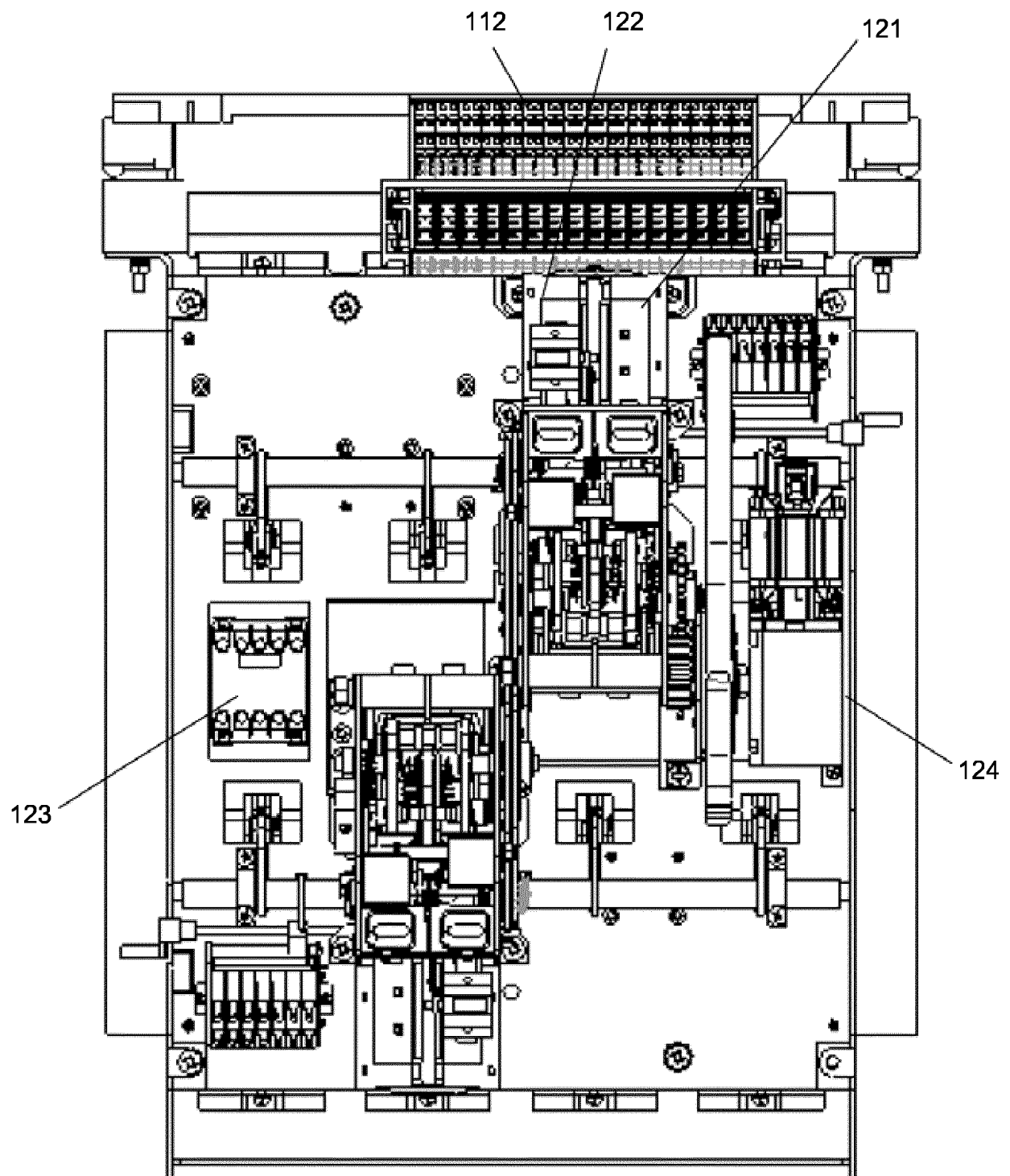


FIG 9d

REFERENCES CITED IN THE DESCRIPTION

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