

ARC EXTINGUISHING STRUCTURE OF CIRCUIT BREAKER AND CIRCUIT BREAKER

[0001] The present application claims priority to Chinese Patent Application CN 202311788422.5 filed on December 25, 2023, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates to the field of low-voltage electrical appliances, and more particularly, to a circuit breaker and an arc extinguishing structure thereof, which may be applied to DC distribution protection in new energy fields such as solar energy, wind energy, and nuclear energy.

BACKGROUND

[0003] In frame circuit breakers, due to the absence of zero-crossing points in DC and the fact that a DC low current is difficult to enter an arc extinguishing chamber when the DC is very low, a continuous arcing phenomenon occurs between moving and static contacts during a switch-off process of the product. Moreover, some of electric arcs point toward the moving contact, which affects the service life of the moving contact.

[0004] In addition, the existing technical solutions for arc extinguishing of DC low current generally cause the product to have polarity, and two magnets are generally installed symmetrically at the lower end of the arc extinguishing chamber. When the current is forward, the electric arcs move into the arc extinguishing chamber under the influence of a magnetic field of the magnets, such that the electric arcs are extinguished. However, when the current is reversed, the electric arcs move out of the arc extinguishing chamber but cannot be extinguished, still leading to a problem of continuous arcing.

SUMMARY

[0005] An object of the present invention is to overcome at least one defect of the prior art and provide an arc extinguishing structure of circuit breaker and circuit breaker.

[0006] In order to fulfill the above object, the present invention adopts the following technical solutions:

[0007] an arc extinguishing structure of a circuit breaker includes a moving contact, a static contact and a second arc extinguishing device, in which the second arc extinguishing device is

arranged opposite to the moving contact and comprises a plurality of second arc extinguishing grids; the circuit breaker further comprises a first arc extinguishing device arranged on the moving contact; the first arc extinguishing device moves along with the moving contact; and the first arc extinguishing device comprises a plurality of first arc extinguishing grids and is
5 used for extinguishing part of electric arcs facing the moving contact; and contact portions of the moving contact and the static contact are located between the first arc extinguishing device and the second arc extinguishing device.

[0008] Preferably, further includes at least one magnet group, in which the magnet group comprises two magnets; the contact portions of the moving contact and the static contact are
10 located between the two magnets in the same group.

[0009] Preferably, the two magnets in the magnet group are arranged in the same straight line, the magnetic poles of the two magnets on opposite surfaces are opposite or identical, and a connecting line between the two magnets is perpendicular to a connecting line between the first arc extinguishing device and the second arc extinguishing device.

15 [0010] Preferably, the magnet group is fixed on the first arc extinguishing device.

[0011] Preferably, the first arc extinguishing device comprises an arc barrier; first arc extinguishing grids are fixed in the middle of the arc barrier; mounting portions are arranged at both ends of the arc barrier; the two magnets in the same group are respectively fixed on the two mounting portions of the arc barrier; and the mounting portions are closer to the contact portions
20 of the moving contact and the static contact than the first arc extinguishing grids.

[0012] Preferably, the magnets are clamped and fixed with the mounting portions of the arc barrier, the mounting portion is provided with a magnet groove, and the magnet is clamped into the magnet groove of the arc barrier.

[0013] Preferably, both ends of the arc barrier extend upward to form two extension plates
25 located on both sides of the first arc extinguishing grid, the mounting portion is attached to a blocky structure on the extension plate in an integral connection manner, and the magnet groove is provided on the top end of the blocky mounting portion.

[0014] Preferably, a plurality of arc extinguishing grid grooves is arranged in the middle of the arc barrier, and the first arc extinguishing grids are inserted into the arc extinguishing grid
30 grooves and in interference fit with the arc extinguishing grid grooves.

[0015] Preferably, the magnets are permanent magnets.

[0016] Preferably, the arc barrier of the first arc extinguishing device is fixedly connected to the moving contact through a fixing screw 6; both ends of the arc barrier extend to one side to form two fixed lugs; and the fixed lugs are provided with screw holes cooperating with the
35 fixing screws.

[0017] Preferably, the moving contact comprises a contact support and a plurality of moving contact sheets arranged in the contact support; the contact support is provided with a mounting cavity; the plurality of moving contact sheets is rotatably mounted side by side on a rotating shaft, and pre-tightened in the mounting cavity of the contact support through a spring; one end of the moving contact sheet is provided with a moving contact point and extends out of the mounting cavity, and the other end of the moving contact sheet is electrically connected through a flexible conductor; and the contact support is in transmission connection with an operating mechanism through a connecting rod.

[0018] Preferably, an arrangement direction of the plurality of first arc extinguishing grids is the same as that of the plurality of moving contact sheets.

[0019] The present invention further provides a circuit breaker, comprising the arc extinguishing structure of the circuit breaker as above-mentioned.

[0020] The present invention provides a circuit breaker and an arc extinguishing structure thereof. The arc extinguishing structure is provided with a first arc extinguishing device which is in linkage with a moving contact and used to extinguish part of electric arcs facing the moving contact, thereby improving the arc extinguishing efficiency and prolonging the service life of the product. The first arc extinguishing device is fixed on the moving contact as an additional arc extinguishing device, without changing the original structure and layout of the circuit breaker, achieving strong versatility and compact and reasonable layout.

[0021] In addition, two magnets with opposite or identical magnetic poles on opposite surfaces are arranged between two arc extinguishing devices to guide the electric arcs into the arc extinguishing device, such that forward and reverse low currents can be broken to achieve arc extinguishing of non-polar low current, thereby enhancing an arc extinguishing effect of the circuit breaker, and improving the safety and reliability in use.

[0022] In addition, the magnets are arranged horizontally or vertically in a direction of NS poles, and the electric arcs between the moving contact and the static contact can be well guided into the two arc extinguishing devices above and below under the influence of the magnetic field of the magnets, achieving a better arc extinguishing effect.

[0023] In addition, the magnet group keeps relatively stationary with the first arc extinguishing device and the moving contact, which is convenient for better introducing the electric arcs into the first arc extinguishing device for arc extinguishing, achieving a good arc extinguishing effect.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a schematic diagram showing an electric arc trend at the beginning of

separating a moving contact from a static contact when a current is reversed according to the present invention;

[0025] FIG. 2 is a schematic diagram showing an electric arc trend at the end of separating the moving contact from the static contact when the current is reversed according to the present invention;

[0026] FIG. 3 is a schematic diagram showing an electric arc trend at the beginning of separating the moving contact from the static contact when a current is forward according to the present invention;

[0027] FIG. 4 is a schematic diagram showing an electric arc trend at the end of separating the moving contact from the static contact when the current is forward according to the present invention;

[0028] FIG. 5 is a schematic structural diagram of a first arc extinguishing device, a magnet group, a moving contact and a static contact according to the present invention;

[0029] FIG. 6 is a three-dimensional diagram of the first arc extinguishing device, the magnet group and the moving contact according to the present invention;

[0030] FIG. 7 is a schematic diagram of magnetic poles of magnet groups with opposite magnetic poles in an exploded state according to the present invention;

[0031] FIG. 8 is a schematic diagram of magnetic poles of magnet groups with the same magnetic pole in an exploded state according to the present invention;

[0032] FIG. 9 is an exploded view of the first arc extinguishing device and the magnet group according to the present invention; and

[0033] FIG. 10 is a schematic structural diagram of an arc barrier according to the present invention.

[0034] Reference symbols represent the following components: 1-first arc extinguishing device; 11-arc barrier; 111-mounting portion; 112-arc extinguishing grid groove; 113-magnet groove; 114-extension plate; 115-fixed lug; 12-first arc extinguishing grid; 2-second arc extinguishing device; 21-second arc extinguishing grid; 22-arc striking sheet; 3-magnet; 4-moving contact; 41-moving contact sheet; 42-rotating shaft; 43-contact support; 44-connecting rod; 45-flexible conductor; 5-static contact; 6-fixing screw; and 61-screw hole.

DETAILED DESCRIPTION

[0035] The specific implementation of a circuit breaker and an arc extinguishing structure thereof according to the present invention will be further described below with reference to the embodiments given in accompanying drawings. The circuit breaker and the arc extinguishing structure thereof according to the present invention are not limited to the description of the

following embodiments.

[0036] As shown in FIGS. 1 to 4, the circuit breaker in the present embodiment includes a moving contact 4, a static contact 5 and an arc extinguishing structure. The moving contact 4 contacts the static contact 5, such that the circuit breaker is switched on or off so as to disconnect the circuit breaker. The moving contact 4 in the present embodiment includes a plurality of moving contact sheets 41. The plurality of moving contact sheets 44 is mounted rotatably side by side. A side edge on one side of each moving contact sheet 41 is provided with a raised moving contact point for being in contact with the static contact 5. The static contact 5 in the present embodiment is of a blocky structure provided with a static contact point matching the moving contact point. The moving contact point and the static contact point serve as contact portions of the moving contact 4 and the static contact 5. Of course, the moving contact 4 may also be a single piece of integrated structure, and the static contact 5 may also be a plurality of assembled structures.

[0037] The arc extinguishing structure includes a second arc extinguishing device 2, which is used to eliminate electric arcs generated by the separation of the moving contact 4 and the static contact 5 of the circuit breaker after being in contact and energized. When the circuit breaker is switched off, most of the electric arcs will enter the second arc extinguishing device 2. The second arc extinguishing device 2 is usually arranged close to the static contact 5, and opposite to the moving contact 4. The second arc extinguishing device 2 includes a plurality of arc extinguishing grids 21, an arc striking sheet 22 for introducing the electric arcs into the second arc extinguishing device 2, etc. The second arc extinguishing device 2 is arranged to basically correspond to a movement trajectory of the moving contact 4. A plurality of groups of second arc extinguishing devices 2 may be arranged to correspond to the movement trajectory of the moving contact 4, or as many second arc extinguishing grids 21 as possible may be arranged in a group of second arc extinguishing devices 2. The second arc extinguishing grids 21 may be neatly arranged, or may also form a certain arc shape corresponding to the movement trajectory of the movable contact 4 to improve an arc extinguishing effect, all of which are the prior art and will not be described again.

[0038] As shown in FIGS. 1 to 4, an improvement point of the arc extinguishing structure in the present embodiment lies in that: the arc extinguishing structure further includes a first arc extinguishing device 1 arranged on the moving contact 4; the first arc extinguishing device 1 includes a plurality of first extinguishing grids 12; the first arc extinguishing device 1 is fixed on the moving contact 4; and the first arc extinguishing device 1 moves along with the moving contact 4 to extinguish part of the electric arcs facing the moving contact 4, thereby further improving the arc extinguishing efficiency and prolonging the service life of the circuit breaker,

especially a circuit breaker with high rated current. Of course, the arc extinguishing structure in the present embodiment may not only be used for the circuit breaker, but also for other switching electrical appliances. As shown in FIGS. 1 to 4, the first arc extinguishing device 1 in the present embodiment is fixed on the moving contact 4 and linked with the moving contact 4; contact portions between the moving contact 4 and the static contact 5 are located between the first arc extinguishing device 1 and the second arc extinguishing device 2; the second arc extinguishing device 2 extinguishes most of the electric arcs; and the first arc extinguishing device 1 extinguishes the electric arcs floating to the moving contact 4.

[0039] Another improvement point of the present embodiment lies in that: the arc extinguishing structure further includes at least one magnet group; the magnet group includes two magnets 3; the contact portions of the moving contact 4 and the static contact 5 are located between the two magnets 3 in the same group; and the magnet group is used to move the electric arcs into the first arc extinguishing device 1 or the second arc extinguishing device 2. Preferably, the magnet group is located between the first arc extinguishing device 1 and the second arc extinguishing device 2, and is close to the first arc extinguishing device 1 and away from the second arc extinguishing device 2. As a further improved embodiment, the magnet group in the present embodiment is also linked with the moving contact 4, fixed on the first arc extinguishing device 1, and fixed on the moving contact 4 through the first arc extinguishing device 1. Of course, the magnet group may also be fixed independently to the moving contact 4.

[0040] As shown in conjunction with FIGS. 1 to 8, the arc extinguishing structure of the present embodiment is further introduced in detail.

[0041] The circuit breaker of the present embodiment is a frame circuit breaker, which is used for a circuit with a higher rated current. The rated current may reach 1000 A and above, which may be applied to the protection of conventional power distribution systems, and may also be used for the protection of DC distribution systems of new energy resources such as solar energy, wind energy, hydrogen energy, and nuclear energy. In the present embodiment, the moving contact 4 include a contact support 43 and a plurality of moving contact sheets 41 arranged in the contact support 43. The contact support 43 is provided with a mounting cavity. The plurality of moving contact sheets 41 is rotatably mounted side by side on a rotating shaft 42, and pre-tightened in the mounting cavity of the contact support 43 through a spring. One end of the moving contact sheet 41 is provided with a moving contact point, and extends out of the mounting cavity for cooperating with the static contact 5. The other end of the moving contact sheet 41 is electrically connected through a flexible conductor 45. The contact support 43 is in transmission connection with an operating mechanism through a connecting rod 44. The operating mechanism can drive the contact support 43 to swing, so as to drive the moving

contact point of the moving contact sheet 41 to be in contact with the static contact 5, such that the circuit breaker is switched on or off so as to disconnect the circuit breaker.

[0042] The arc extinguishing structure of the present embodiment is used to eliminate electric arcs generated by the separation of the moving contact 4 from the static contact 5, and includes a first arc extinguishing device 1, a second arc extinguishing device 2 and at least one magnet group. The contact portions of the moving contact 4 and the static contact 5 of the circuit breaker, and the magnet group are located between the first arc extinguishing device 1 and the second arc extinguishing device 2. The first arc extinguishing device 1 is arranged on the moving contact 4 as an additional arc extinguishing device, and moves along with the moving contact 4 for extinguishing part of the electric arcs facing the moving contact 4. In the present embodiment, the first arc extinguishing device 1 is fixed on the moving contact 4, and the moving contact point located on the moving contact 4 is arranged away from one side of the second arc extinguishing device 2. That is, the moving contact point of the moving contact 4 is located between the first arc extinguishing device 1 and the second arc extinguishing device 2, the overall structure is simple, the layout is compact and reasonable, and there is no need to change the original structure and layout of the circuit breaker, achieving strong versatility.

[0043] The magnet group in the present embodiment includes two magnets 3 arranged in the same straight line for moving the electric arcs into the first arc extinguishing device 1. The two magnets 3 have opposite or identical magnetic poles on opposite surfaces, wherein if the magnetic poles are opposite, as shown in FIG. 7, the two magnets 3 are placed in NS and NS or SN and SN; and if the magnetic poles are identical, as shown in FIG. 8, the two magnets 3 are placed in NS and SN or SN and NS. As shown in FIG. 1 and FIG. 2, the first arc extinguishing device 1 and the second arc extinguishing device 2 are each provided with arc extinguishing grids. When the circuit breaker is broken and the reverse current is low, after the moving contact 4 is separated from the static contact 5, electric arcs are generated between the moving contact and the static contact, and part of the electric arcs facing the moving contact will accelerate the movement to the first arc extinguishing device 1 under the action of an electromagnetic force F of the magnets 3, so that the first arc extinguishing device 1 extinguishes the electric arcs to achieve current breaking. As shown in FIG. 3 and FIG. 4, the circuit breaker is broken and a forward current is low, after the moving contact 4 is separated from the static contact 5, electric arcs are generated between the moving contact and the static contact, and the electric arcs will accelerate the movement to the second arc extinguishing device 2 under the action of the electromagnetic force F of the magnets 3, so that the second arc extinguishing device 1 extinguishes the electric arcs to achieve current breaking.

[0044] According to the circuit breaker and the arc extinguishing structure thereof, two

magnets 3 with opposite or identical magnetic poles on opposite surfaces are arranged between the two arc extinguishing devices to guide the electric arcs into the arc extinguishing devices, such that forward and reverse low currents can be broken to achieve arc extinguishing of non-polar low current, thereby enhancing an arc extinguishing effect of the circuit breaker, and improving the safety and reliability in use.

[0045] As shown in FIGS. 1 to 8, as a preferred scheme for a position relationship between the magnet group and the first arc extinguishing device 1, the second arc extinguishing device 2 and the contact portions of the moving contact 4 and the static contact 5, the magnet group is located above the first arc extinguishing device 1 and below the second arc extinguishing device 2, and is close to the first arc extinguishing device 1 and away from the second arc extinguishing device 2. The contact portions of the moving contact 4 and the static contact 5 are located between the two magnets 3 in the same group, and a connecting line between the two magnets 3 in the magnet group is basically perpendicular to a connecting line between the first arc extinguishing device 1 and the second arc extinguishing device 2. Preferably, a connecting line direction of NS or NN or SS poles of the magnet 3 are a horizontal direction or a vertical direction, wherein a connecting line direction of the NN or SS poles of the magnet 3 is a horizontal direction, that is, a connecting line direction of the NS poles of the magnet 3 is a vertical direction (not shown). The magnets 3 in the present embodiment are preferably permanent magnets, and of course, may also be electromagnets as other embodiments. The overall structure is simple, the layout is compact and reasonable, the magnets are arranged horizontally or vertically in a direction of NS poles, and the electric arcs between the moving contact and the static contact can be well guided into the two arc extinguishing devices above and below under the influence of the magnetic field of the magnets 3, achieving a better arc extinguishing effect. Of course, the magnet group may also be arranged in a tilted manner.

[0046] As shown in FIGS. 1 to 8, as a preferred scheme for a connection relationship between the magnet group and the first arc extinguishing device 1 as well as the moving contact 4, the magnet group and the first arc extinguishing device 1 are linked with the moving contact 4, the magnets 3 in the magnet group are fixed on the first arc extinguishing device 1, and the first arc extinguishing device 1 is fixed on the moving contact 4. The magnet group keeps relatively stationary with the first arc extinguishing device 1 and the moving contact 4, which is convenient for better introducing the electric arcs into the first arc extinguishing device 1 for arc extinguishing, achieving a good arc extinguishing effect. The magnet group is linked with the first arc extinguishing device 1 and the moving contact 4 in a fixed manner, such that the structure is simple and stable.

[0047] As shown in FIG. 9 and FIG. 10, the first arc extinguishing device 1 in the present

embodiment includes an arc barrier 11 and a plurality of first arc extinguishing grids 12. Preferably, the arc barrier 11 is of an integrated molding structure made of a gas-producing material. Mounting portions 111 which are located above the first arc extinguishing grids 12 are arranged at both ends of the arc barrier 11. The two magnets 3 in the same group are respectively
5 fixed on the two mounting portions 111 of the arc barrier 11. In the present embodiment, the magnets 3 are fixed inside the mounting portions 111, and the plurality of first arc extinguishing grids 12 is arranged in rows and fixed in the middle of the arc barrier 11. The mounting portions 111 are closer to the contact portions of the moving contact 4 and the static contact 5 than the first arc extinguishing grids 12, and are also closer to the second arc extinguishing device 2. The
10 first arc extinguishing device 1, the magnets 3 and the moving contact 4 are fixed together, which achieves a simple structure and easy installation in the circuit breaker, without interfering with other parts. An arrangement direction of the plurality of first extinguishing grids 12 in the present embodiment is the same as that of the plurality of moving contact sheets 41, and a plane where the first extinguishing grids 12 are located is parallel to a plane where the moving contact
15 sheets 41 are located. Of course, the arrangement direction of the moving contact sheets 41 includes, but is not limited to, the arrangement direction of the first arc extinguishing grids 12, and other set angles are also possible. The arc barrier 11 may also be made of a gas-producing material. The structural design of the present embodiment facilitates the orderly and reasonable layout of each mechanism in the circuit breaker, and is compact in structure and space-saving.

[0048] As shown in FIG. 9 and FIG. 10, in the present embodiment, according to a fixed structure between the arc barrier 11 and the first arc extinguishing grids 12, a plurality of arc extinguishing grid grooves 112 in which the plurality of first arc extinguishing grids 12 is mounted is arranged in the middle of the arc barrier 11, and the first arc extinguishing grids 12 are inserted into the arc extinguishing grid grooves 112 and are in interference fit with the arc
25 extinguishing grid grooves 112, such that the first arc extinguishing grids 12 are fixed on the arc barrier 11. The interference plug-in structure is convenient and reliable in installation. Of course, the arc barrier 11 and the first arc extinguishing grids 12 may also be fixed by means of injection molding, clamping, riveting and other fixed connection methods.

[0049] As shown in FIG. 9 and FIG. 10, in the fixed structure between the arc barrier 11 and the magnets 3 in the present embodiment, the magnets 3 are clamped and fixed with the
30 mounting portions 111 of the arc barrier 11, the mounting portion 111 is provided with a magnet groove 113, and the magnet 3 is clamped into the magnet groove 113 of the arc barrier 11. Specifically, both ends of the arc barrier 11 extend upward to form two extension plates 114 located on both sides of the first arc extinguishing grid 12, the mounting portion 111 is attached
35 to a blocky structure on the extension plate 114 in an integral connection manner, and the magnet

groove 113 is provided on the top end of the blocky mounting portion 111. The clamped-type fixed structure is convenient to install. Of course, the arc barrier 11 and the magnets 3 may also be fixedly connected by means of gluing.

[0050] As shown in FIGS. 6 to 10, according to the fixed structure between the first arc
5 extinguishing device 1 and the moving contact 4 in the present embodiment, the first arc
extinguishing device 1 is mounted on a side of the moving contact 4 where the moving contact
point is arranged; the arc barrier 11 of the first arc extinguishing device 1 is fixedly connected
to the contact support 43 of the moving contact 4 in a fixing screw 6; both ends of the arc barrier
11 extend to one side to form two fixed lugs 115; the contact support 43 of the moving contact
10 4 is clamped between the two fixed lugs 115 of the arc barrier 11; and the fixed lugs 114 and the
contact support 43 of the moving contact 115 are provided with screw holes 61 cooperating with
the fixing screws 6. The structure is simple, compact and reasonable, easy to install and space-
saving.

[0051] As shown in FIGS. 1 to 4, the second arc extinguishing device 2 in the present
15 embodiment is an arc extinguishing chamber structure, which includes a plurality of second arc
extinguishing grids 21 which is arranged in rows, arc striking sheets 22 for arc striking, and a
mounting mechanism for mounting the second arc extinguishing grids 21 and the arc striking
sheets 22. An arrangement direction of the second arc extinguishing grids 21 and an arrangement
direction of the first extinguishing grids 12 in the present embodiment are horizontal directions
20 and perpendicular to each other. That is, the plurality of second arc extinguishing grids 21 as
shown in FIG. 1 is arranged sequentially in the left and right directions, and the plurality of first
extinguishing grids 12 is arranged sequentially in the front and rear directions. Of course, the
arrangement direction of the second arc extinguishing grids 21 and the second arc extinguishing
grids 12 includes, but is not limited to, a vertical relationship, and other set angles or a parallel
25 relationship are also possible. The structural design of the present embodiment facilitates the
orderly and reasonable layout of each mechanism in the circuit breaker, and is compact in
structure and space-saving. The structure of the second arc extinguishing device 2 in the present
embodiment is the prior art, which will not be repeated here.

[0052] It should be explained that, in the description of the present invention, the terms
30 such as "up", "down", "left", "right", "inner" and "outer" indicating the directional or positional
relations on the basis of the directional or positional relations shown in the drawings are only
used for conveniently describing the present invention and simplifying the description, not
indicate or imply that the referred devices or elements must have a specific orientation and be
configured and operated in a specific direction; therefore, they cannot be construed as a
35 limitation on the present invention.

[0053] We have made further detailed description of the present invention mentioned above in combination with specific preferred embodiments, but it is not deemed that the specific embodiments of the present invention is only limited to these descriptions. A person skilled in the art can also, without departing from the concept of the present invention, make several
5 simple deductions or substitutions, which all be deemed to fall within the protection scope of the present invention.

CLAIMS

1. An arc extinguishing structure of a circuit breaker, comprising a moving contact (4), a static contact (5) and a second arc extinguishing device (2), wherein the second arc extinguishing device (2) is arranged opposite to the moving contact (4) and comprises a plurality of second arc extinguishing grids (21); characterized in that the circuit breaker further comprises a first arc extinguishing device (1) arranged on the moving contact (4); the first arc extinguishing device (1) moves along with the moving contact (4); and the first arc extinguishing device (1) comprises a plurality of first arc extinguishing grids (12) and is used for extinguishing part of electric arcs facing the moving contact (4); and

contact portions of the moving contact (4) and the static contact (5) are located between the first arc extinguishing device (1) and the second arc extinguishing device (2).

2. The arc extinguishing structure of the circuit breaker according to claim 1, characterized in that it further comprising at least one magnet group, the magnet group comprises two magnets (3); the contact portions of the moving contact (4) and the static contact (5) are located between the two magnets (3) in the same group; and the magnet group is used to move the electric arcs into the first arc extinguishing device (1) or the second arc extinguishing device (2).

3. The arc extinguishing structure of the circuit breaker according to claim 2, characterized in that the two magnets in the magnet group are arranged in the same straight line, the magnetic poles of the two magnets (3) on opposite surfaces are opposite or identical, and a connecting line between the two magnets (3) is perpendicular to a connecting line between the first arc extinguishing device (1) and the second arc extinguishing device (2).

4. The arc extinguishing structure according to claim 2 or 3, characterized in that the magnet group is fixed on the first arc extinguishing device (1).

5. The arc extinguishing structure of the circuit breaker according to 4, characterized in that the first arc extinguishing device (1) comprises an arc barrier (11); first arc extinguishing grids (12) are fixed in the middle of the arc barrier (11); mounting portions (111) are arranged at both ends of the arc barrier (11); the two magnets (3) in the same group are respectively fixed on the two mounting portions (111) of the arc barrier (11); and the mounting portions (111) are closer to the contact portions of the moving contact (4) and the static contact (5) than the first

arc extinguishing grids (12).

6. The arc extinguishing structure according to claim 5, characterized in that the magnets (3) are clamped and fixed with the mounting portions (111) of the arc barrier (11), the mounting portion (111) is provided with a magnet groove (113), and the magnet (3) is clamped into the magnet groove (113) of the arc barrier (11).

7. The arc extinguishing structure according to claim 6, characterized in that both ends of the arc barrier (11) extend upward to form two extension plates (114) located on both sides of the first arc extinguishing grid (12), the mounting portion (111) is attached to a blocky structure on the extension plate (114) in an integral connection manner, and the magnet groove (113) is provided on the top end of the blocky mounting portion (111).

8. The arc extinguishing structure of the circuit breaker according to claim 5, characterized in that a plurality of arc extinguishing grid grooves (112) is arranged in the middle of the arc barrier (11), and the first arc extinguishing grids (12) are inserted into the arc extinguishing grid grooves (112) and in interference fit with the arc extinguishing grid grooves (112).

9. The arc extinguishing structure of the circuit breaker according to claim 2, characterized in that the magnets (3) are permanent magnets.

10. The arc extinguishing structure of the circuit breaker according to claim 5, characterized in that the arc barrier (11) of the first arc extinguishing device (1) is fixedly connected to the moving contact (4) through a fixing screw 6; both ends of the arc barrier (11) extend to one side to form two fixed lugs (115); and the fixed lugs (115) are provided with screw holes (61) cooperating with the fixing screws (6).

11. The arc extinguishing structure of the circuit breaker according to claim 1, characterized in that the moving contact (4) comprises a contact support (43) and a plurality of moving contact sheets (41) arranged in the contact support (43); the contact support (43) is provided with a mounting cavity; the plurality of moving contact sheets (41) is rotatably mounted side by side on a rotating shaft (42), and pre-tightened in the mounting cavity of the contact support (43) through a spring; one end of the moving contact sheet (41) is provided with a moving contact point and extends out of the mounting cavity, and the other end of the moving contact sheet (41)

is electrically connected through a flexible conductor (45); and the contact support (43) is in transmission connection with an operating mechanism through a connecting rod (44).

12. The arc extinguishing structure of the circuit breaker according to claim 11, characterized in that an arrangement direction of the plurality of first arc extinguishing grids (12) is the same as that of the plurality of moving contact sheets (41).

13. A circuit breaker, characterized in that comprising the arc extinguishing structure of the circuit breaker according to any one of claims 1 to 12.