



(11)

EP 4 566 501 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.06.2025 Bulletin 2025/24

(51) International Patent Classification (IPC):
A47L 11/283^(2006.01) A47L 11/40^(2006.01)

(21) Application number: **24216976.1**

(52) Cooperative Patent Classification (CPC):
A47L 11/283; A47L 11/4008; A47L 11/4011

(22) Date of filing: **03.12.2024**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **08.12.2023 CN 202323351544 U**

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(54) **A FLOOR BRUSH STRUCTURE AND A CLEANING DEVICE**

(57) Provided is a floor brush structure comprising a brush connector (100), a brush head (200), and a trigger control mechanism (300), the brush connector (100) being used for connecting with a main body of a cleaning device and rotatably connected with the brush head (200), the trigger control mechanism (300) comprising a trigger assembly (310) including a triggering element (311) and a triggered element (312), a receiving chamber (210) being arranged in the brush head (200), both the triggering element (311) and the triggered element (312) being located in the receiving chamber (210), the triggering element (311) being configured to, when the brush connector (100) rotates to an upright position relative to the brush head (200), be driven by the brush connector (100) to move relative to the brush head (200), so as to trigger the triggered element (312), an executing element of the cleaning device being stopped when the triggered element (312) is triggered.

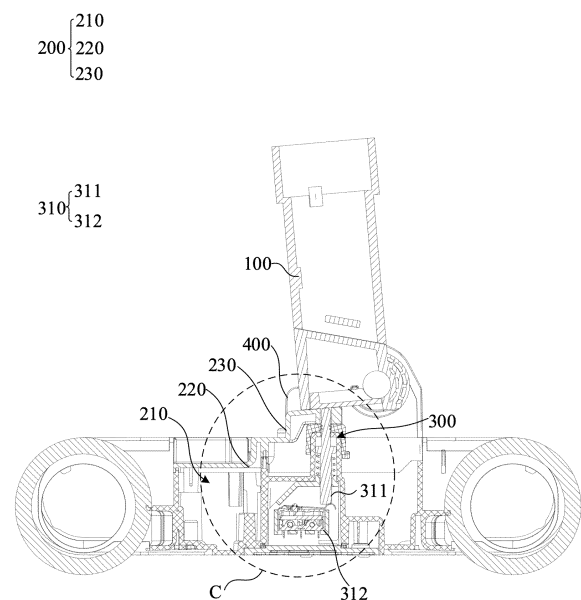


Figure 2

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Description

Field of the Invention

[0001] The present invention relates to the technical field of cleaning means, and in particular, to a floor brush structure and a cleaning device.

Background of the Invention

[0002] As people's quality of life keeps improving, floor cleaning devices such as vacuum cleaners, steam mops, and floor washers are in high demand. For example, a floor washer comprises a brush head and a rotary stick connected with the brush head and capable of rotating relative to the brush head. When the device stops operating, the rotary stick is generally maintained in an upright position.

[0003] In prior art, the top of the brush head has a support frame with which the rotary stick is rotatably connected. The support frame is provided with a control switch. When the rotary stick is in an upright position, the control switch can be touched to stop the cleaning device from operating.

[0004] However, the above-described control switch has a large size, so that the support frame also has a large structure and thus occupy a large space at the top of the brush head, resulting in a large height of the overall device.

Summary of the Invention

[0005] In view of this, the present invention provides a floor brush structure and a cleaning device, so as to solve the problem of large height of the overall device in the prior art.

[0006] According to one aspect, the present invention provides a floor brush structure comprising a brush connector, a brush head, and a trigger control mechanism, the brush connector being used for connecting with a main body of a cleaning device and rotatably connected with the brush head, the trigger control mechanism comprising a trigger assembly including a triggering element and a triggered element, a receiving chamber being arranged in the brush head, both the triggering element and the triggered element being located in the receiving chamber, the triggering element being configured to, when the brush connector rotates to an upright position relative to the brush head, be driven by the brush connector to move relative to the brush head to a trigger position, so as to trigger the triggered element, an executing element of the cleaning device being stopped when the triggered element is triggered.

[0007] With the floor brush structure provided by the present invention, by providing a brush connector, a brush head, and a trigger control mechanism, wherein, the brush connector is connected with the main body of the cleaning device and is rotatably connected with the

brush head, the brush connector can rotate relative to the brush head, thus causing the brush connector to drive the brush head to perform cleaning. By providing a receiving chamber in the brush head and mounting the triggering element and the triggered element of the trigger control mechanism in the receiving chamber, when the brush connector rotates to the upright position relative to the brush head, the brush connector abuts against the triggering element and drives the triggering element to move relative to the brush head, so that the triggering element triggers the triggered element, thereby causing the executing element of the cleaning device to stop operating. By arranging the trigger element and the triggered element in the receiving chamber of the brush head, the trigger assembly is operated by means of the rotation of the brush connector, so as to control the activation and stopping of the cleaning device. At the same time, the trigger assembly occupies a relatively small space. Thus, the space at the top of the brush head can be less occupied, thereby reducing the overall device height.

[0008] In a possible mode of realization, in the floor brush structure provided by the present invention, the trigger control mechanism further comprises a control element, both the triggered element and the executing element being electrically connected with the control element, the control element being configured to, when the triggered element is triggered, control the executing element to stop operating, and when the triggered element is released, control the executing element to operate.

[0009] Thus, when the triggered element is triggered, the executing element is immediately stopped from operating by automatic control of the control element.

[0010] In a possible mode of realization, the floor brush structure provided by the present invention further comprises a mounting base arranged on the brush head, the brush connector being articulated with the mounting base so as to rotate relative to the brush head.

[0011] Thus, by providing the mounting base, not only is the brush connector reliably and stably connected to the brush head, but also the brush connector is allowed to rotate relative to the brush head.

[0012] In a possible mode of realization, in the floor brush structure provided by the present invention, the brush head comprises a head body and a cover plate arranged to cover the head body, the triggering element being partially located outside the cover plate when not in the trigger position.

[0013] Thus, the triggering element can be easily assembled with the brush head and, with the triggering element located partially outside the cover plate, the brush connector can easily drive the triggering element to move relative to the head body.

[0014] In a possible mode of realization, the floor brush structure provided by the present invention further comprises a driving element connected with the triggering element and arranged in the brush head, the driving element being configured to, when the brush connector

rotates to a non-upright position relative to the brush head, drive the triggering element to move relative to the brush head, so as to release the triggered element; the brush connector being configured to, when in a horizontal position, detach from the triggering element.

[0015] Thus, the brush connector, the triggering element and the triggered element form a close linkage. When the brush connector detaches from the triggering element, the driving element can provide a driving force to the triggering element to automatically release the triggering of the triggered element, thereby causing the executing element to switch from pause to operating state.

[0016] In a possible mode of realization, the floor brush structure provided by the present invention further comprises a fixing support arranged in the receiving chamber and connected with the brush head, the triggered element being mounted in the fixing support.

[0017] Thus, as the triggered element is fixed in the head body by means of the fixing support, the triggered element is unlikely to swing or topple over, and is stable and reliable.

[0018] In a possible mode of realization, the floor brush structure provided by the present invention further comprises a mounting support arranged in the receiving chamber, the mounting support having a guiding chamber and a passage hole in communication with the guiding chamber, the fixing support having an insert part arranged to insert into the guiding chamber, the triggering element extending into the fixing support sequentially through the passage hole, the guiding chamber, and the insert part.

[0019] Thus, as the triggering element is guided by the guiding chamber, the passage hole and the insert part, the triggering element can move relative to the head body and thus triggering or releasing the triggered element.

[0020] In a possible mode of realization, in the floor brush structure provided by the present invention, the driving element is a spring, and the triggering element comprises a first rod, a support rod and a second rod that are arranged sequentially, the first rod being oriented towards the passage hole, projections of the first rod and the second rod towards the support rod being both located within the support rod, the spring being located in the guiding chamber and sleeved to the second rod, with the two ends of the spring abutting respectively against the support rod and the insert part.

[0021] Thus, by arranging the spring between the support rod and the insert part, when the support rod moves towards the insert part, the spring is compressed so that it tends to extend due to the restoring force. Thus, when the brush connector detaches from the triggering element, the triggering element can be driven by the restoring force of the spring to move towards the passage hole.

[0022] In a possible mode of realization, the floor brush structure provided by the present invention further comprises a sealing element sleeved to the triggering element and abutting between the cover plate and the

mounting support.

[0023] Thus, the seal between the cover plate and the mounting support can be ensured so as to prevent pollutants or foreign objects outside the cover plate from entering the head body and affecting the sensibility and service life of the triggering element and triggered element in the head body.

[0024] In a possible mode of realization, in the floor brush structure provided by the present invention, the triggered element is a micro switch.

[0025] Thus, rapid response and precise control of the triggered element can be realized by the micro switch. The triggering element exerts a relatively small force on a transmission reed arranged outside the micro switch, so that the contact point of the micro switch rapidly closes. In addition, the transmission reed outside the micro switch has a relatively small size, which can avoid occupying a large space in the head body and thus also renders the overall device structure compact.

[0026] In another aspect, the present invention provides a cleaning device comprising a device body and any above-described floor brush structure connected with the device body.

[0027] In addition to the technical problems solved by the embodiments of the present invention, the technical features that constitute the technical solutions, and the beneficial effects brought about by the technical features of these technical solutions that have been described above, other technical problems that can be solved by the floor brush structure and cleaning device provided by the present invention, other technical features included in the technical solutions, and the beneficial effects brought about by these technical features will be further described in detail in the detailed description of the invention.

Description of the Drawings

[0028] In order to more clearly illustrate the technical solutions of embodiments of the present invention or the prior art, the drawings to be used in describing the embodiments or the prior art will be briefly introduced below. Obviously, the drawings described below illustrate only some embodiments of the present invention. For those skilled in the art, other drawings can be obtained based on these drawings without involving any creative labor.

Fig. 1 is a schematic structural view of a floor brush structure provided by an embodiment of the present invention when the brush connector is in an upright position;

Fig. 2 is a sectional view in A-A direction in Fig. 1;

Fig. 3 is a partial enlarged view of part C in Fig. 2;

Fig. 4 is a schematic structural view of a floor brush structure provided by an embodiment of the present

invention when the brush connector is in a non-up-right position;

Fig. 5 is a sectional view in B-B direction in Fig. 4;

Fig. 6 is a partial enlarged view of part D in Fig. 5;

Fig. 7 is a schematic structural view of the fixing support in Fig. 6;

Fig. 8 is a schematic structural view of the triggering element in Fig. 6;

Fig. 9 is an exploded schematic view of a floor brush structure provided by an embodiment of the present invention.

[0029] Description of the numerical references:

100: brush connector;

200: brush head; 210: receiving chamber; 220: head body; 230: cover plate;

300: trigger control mechanism; 310: trigger assembly; 311: triggering element; 3111: first rod; 3112: support rod; 3113: second rod; 312: triggered element;

400: mounting base;

500: sealing element;

600: driving element;

700: fixing support; 710: insert part;

800: mounting support; 810: guiding chamber; 820: passage hole.

Detailed Description of the invention

[0030] In order to make the objectives, technical solutions and advantages of the present invention clearer, the technical solutions in the embodiments of the present invention will be described in more detail below in conjunction with the accompanying drawings of preferred embodiments of the present invention. Throughout the accompanying drawings, the same or similar references represent the same or similar parts or parts with the same or similar functions. The described embodiments are some of the embodiments of the present invention, not all of the embodiments. The embodiments described below with reference to the accompanying drawings are exemplary and are intended to explain the present invention, and should not be construed as limiting the present invention. Based on the embodiments in the present invention, all other embodiments obtained by a

person of ordinary skills in the art without creative labor are within the scope of protection of the present invention. Embodiments of the present invention are described in detail below in conjunction with the accompanying drawings.

[0031] It should be noted that in the description of the present invention, unless otherwise clearly specified and limited, the terms "mounted," "connected," and "connect" should be understood in a broad sense. For example, a connection can be a fixed connection, or an indirect connection through an intermediary, or an internal communication between two elements or an interaction relationship between two elements. For those skilled in the art, the specific meanings of the above terms in the present invention can be understood according to specific circumstances.

[0032] It should also be noted that, in the description of the present invention, the terms indicating an orientation or position relationship, such as "upper," "lower," "front," "back," "vertical," "horizontal," "top," "bottom," "inner," and "outside", should be understood based on the orientation or position relationships shown in the drawings, and are only for the convenience of describing the present invention and simplifying the description, instead of indicating or implying that the referred means or element must have a specific orientation, or constructed and operated in a specific orientation, and therefore cannot be understood as a limitation of the present invention.

[0033] The terms "first," "second," and "third" (if any) in the specification, claims, and the above-described accompanying drawings of the present invention are used for distinguishing similar objects and are not necessarily used for describing a particular order or sequence. It should be understood that items thus used can be interchanged in appropriate circumstances so that the embodiments of the present invention described herein can be realized in an order other than what is illustrated or described.

[0034] In addition, the terms "comprise" and "have" and any variations thereof are intended to cover a non-exclusive inclusion. For example, a process, method, system, product, or display comprising a series of steps or elements is not necessarily limited to those steps or elements explicitly listed, but may include other steps or elements not explicitly listed or inherent to such process, method, product, or display.

[0035] In relevant art, a support frame is provided on the brush head. A rotary stick is rotatably connected with the support frame, and the support frame is provided with a control switch. When the rotary stick is in an upright position, the control switch can be touched to stop the cleaning device.

[0036] However, the above-described control switch has a large size, and the support frame connected with it has to be relatively large. In addition, as the support frame is arranged at the top of the brush head, in order to avoid interfering with the brush head by the rotary stick when it rotates from an upright position to a horizontal

position, the height of the support frame needs to be increased so as to allow the rotation of the rotary stick. Thus, the support frame occupies a relatively large space at the top of the brush head, which results in a higher height of the overall device.

[0037] In view of the above-described problem, the present invention provides a floor brush structure and a cleaning device. The floor brush structure comprises a brush connector, a brush head and a trigger control mechanism. The brush connector is used for connecting with a main body of a cleaning device and rotatably connected with the brush head. The brush connector rotates relative to the brush head, thus driving the brush head to perform cleaning. A receiving chamber is provided in the brush head and a triggering element and a triggered element of the trigger control mechanism are mounted in the receiving chamber. When the brush connector rotates relative to the brush head to an upright position, the brush connector abuts against the triggering element and drives the triggering element to move relative to the brush head, so that the triggering element triggers the triggered element, thereby causing an executing element of the cleaning device to stop. By arranging the triggering element and the triggered element in the receiving chamber of the brush head, the trigger assembly is operated by means of the rotation of the brush connector, so as to control the activation and stopping of the cleaning device. At the same time, the trigger assembly occupies a relatively small space. Thus, the space at the top of the brush head can be less occupied, thereby reducing the overall device height.

[0038] Specific modes of realization of the floor brush structure and the cleaning device provided by embodiments of the present invention are described in detail in conjunction with the accompanying drawings.

[0039] In reference to Figs. 1, 2, and 9, a floor brush structure provided by an embodiment of the present invention comprises a brush connector 100, a brush head 200 and a trigger control mechanism 300. The brush connector 100 is used for connecting with a main body of a cleaning device and rotatably connected with the brush head 200. The trigger control mechanism 300 comprises a trigger assembly 310 comprising a triggering element 311 and a triggered element 312. A receiving chamber 210 is arranged in the brush head 200. The triggering element 311 and the triggered element 312 are both located in the receiving chamber 210. The triggering element 311 is configured to, when the brush connector 100 rotates relative to the brush head 200 to an upright position, be driven by the brush connector 100 to move relative to the brush head 200, so as to trigger the triggered element 312. An executing element of the cleaning device is stopped when the triggered element 312 is triggered.

[0040] In the present invention, by way of example, the body of the brush connector 100 is provided with a mounting slot matching a main body of a cleaning device. The main body is correspondingly provided with a mount-

ing element. The mounting element can be mounted into the mounting slot by means of a fastener so as to fixedly connect the main body to the brush connector 100. The top of the brush head 200 can be provided with at least one rotary element. The brush connector 100 is connected with the rotary element so as to allow the brush connector 100 to rotate relative to the brush head 200. In addition, the brush head 200 is provided with an executing element used for cleaning, such as a vacuum cleaner nozzle or a cleaning brush roller.

[0041] In actual use, a user drives the brush connector 100 to rotate relative to the brush head 200 by adjusting the brush connector 100, so as to push the brush head 200 via the brush connector 100 with less effort. In addition, it is ensured that the executing element of the brush head 200 keeps good contact with the floor to be cleaned during cleaning. When pausing the cleaning operation or stowing the device, the user can stand the brush connector 100 upright on the floor to be cleaned and ensure that the brush connector 100 extends substantially along the normal of the floor to be cleaned. At this moment, the executing element of the brush head 200 stops operating.

[0042] In a specific embodiment, the receiving chamber 210 is provided in the brush head 200 and the triggering element 311 and the triggered element 312 are disposed in the receiving chamber 210. The triggered element 312 is connected to a control circuit of the main body. By way of example, the triggering element 311 is located above the triggered element 312. When the brush connector 100 rotates relative to the brush head 200 to an upright position, the brush connector 100 abuts against a top end of the triggering element 311 and drives the triggering element 311 to move downward relative to the brush head 200, so that a bottom end of the triggering element 311 triggers the triggered element 312, thus stopping the executing element from operating.

[0043] Thus, during the brush connector 100's course of rotating from a non-upright position to an upright position, the triggering element 311 can be driven to move downward along the receiving chamber 210, so as to trigger the triggered element 312 and thus stopping the executing element of the cleaning device from operating.

[0044] With the floor brush structure provided by the embodiment of the present invention, by providing the brush head 200 and the brush connector 100 rotatably connected with the brush head 200, and arranging the trigger assembly 310 in the brush head 200, the position of rotation of the brush connector 100 can directly switch the triggering state of the trigger assembly 310 in the receiving chamber 210. Therefore, not only is the inner space of the brush head 200 effectively used, but also space outside the brush head 200 is saved, thereby reducing the overall device height.

[0045] In a possible mode of realization, the trigger control mechanism 300 further comprises a control element. The triggered element 312 and the executing ele-

ment are both electrically connected with the control element. The control element is configured to, when the triggered element 312 is triggered, control the executing element to stop operating, and when the triggered element 312 is released, control the executing element to operate.

[0046] Specifically, both the triggered element 312 and the executing element are electrically connected with the control element. When the brush connector 100 is in the upright position, the triggering element 311 is driven to move downward relative to the brush head 200, until the triggered element 312 is triggered. The control element receives a signal that the triggered element 312 is triggered at an input port, performs determination and processing according to a preset program to determine that an instruction of stop needs to be sent to the executing element, and thus controls the executing element to immediately stop operating via an output port.

[0047] Thus, the executing element can stop operating immediately by means of automatic control of the control element when the triggered element 312 is triggered.

[0048] In the present invention, the control element can be an embedded controller or a single-chip microcomputer controller. The control element can be arranged at the main body of the cleaning device or at the brush head 200, as long as the control element is electrically connected with the triggered element 312 and the executing element of the cleaning device. The type and positioning of the control element are not limited by embodiments of the present invention.

[0049] In some modes of realization, the floor brush structure further comprises a mounting base 400 arranged on the brush head 200. The brush connector 100 is articulated with the mounting base 400 so that the brush connector 100 rotates relative to the brush head 200.

[0050] In reference to Figs. 1 and 4, in an embodiment of the present invention, the top of the brush head 200 is provided with two mounting bases 400 facing each other, and each mounting bases 400 is provided with a mounting hole. Correspondingly, a rotary shaft is provided at two opposing sides of the brush connector 100. Each rotary shaft is respectively designed to be inserted into the mounting hole, so as to allow the brush connector 100 to rotate around the axis of the rotary shaft, thereby achieving the rotation of the brush connector 100 relative to the brush head 200.

[0051] It should be noted that the position of the mounting holes on the mounting bases 400 matches the height of the rotary shafts on the brush connector 100. The overall size of the mounting bases 400 should be reduced to avoid occupying a large space at the top of the brush head 200, while ensuring that when the brush connector 100 rotates to a horizontal position, it does not interfere with the brush head 200.

[0052] Thus, not only is the brush connector 100 reliably and stably connected with the brush head 200, but also the brush connector 100 is allowed to rotate relative

to the brush head 200.

[0053] In reference to Figs. 2 and 5, as the brush head 200 has the receiving chamber 210, and the triggering element 311 and the triggered element 312 are both located in the receiving chamber 210, in a possible mode of realization, the brush head 200 comprises a head body 220 and a cover plate 230 arranged to cover the head body 220. The triggering element 311 is inserted in the head body 220 through the cover plate 230 and partially located outside the cover plate 230, so as to move relative to the head body 220 when being driven by the brush connector 100.

[0054] In the present invention, for assembling the triggering element 311 and the triggered element 312 in the receiving chamber 210 of the brush head 200, first, the cover plate 230 can be opened to fix the triggered element 312. Then, the cover plate 230 is arranged to cover the head body 220. By way of example, the cover plate 230 is provided with an insertion hole facing the triggered element 312. The triggering element 311 can be easily inserted in the head body 220 and located above the triggered element 312 by means of the insertion hole. In addition, with the triggering element 311 partially located outside the cover plate 230, the brush connector 100 can abut against the triggering element 311 and drive the triggering element 311 to move relative to the head body 220, thereby triggering the triggered element 312.

[0055] Thus, the triggering element 311 can be easily assembled with the brush head 200 and with the triggering element 311 partially located outside the cover plate 230, the brush connector 100 can easily drive the triggering element 311 to move relative to the head body 200.

[0056] In reference to Figs. 4 to 6, a floor brush structure provided by an embodiment of the present invention further comprises a driving element 600 connected with the triggering element 311 and arranged in the brush head 200. The driving element 600 is configured to, when the brush connector 100 rotates relative to the brush head 200 to a non-upright position, drive the triggering element 311 to move relative to the brush head 200, so as to release the triggered element 312. The brush connector 100 is configured to, when in a horizontal position, detach from the triggering element 311.

[0057] In reference to Figs. 5 and 6, in a specific implementation, the driving element 600 is arranged in the head body 220 and connected with a part of the triggering element 311. When the brush connector 100 rotates relative to the brush head 200 to a horizontal position, the brush connector 100 detaches from the part of the triggering element 311 located outside the cover plate 230. At this moment, the driving element 600 can drive the triggering element 311 to move upward relative to the head body 220, so that the triggering element 311 releases the triggered element 312.

[0058] Thus, the brush connector 100, the triggering element 311, and the triggered element 312 form a close linkage. When the brush connector 100 detaches from the triggering element 311, the driving element 600 can

provide a driving force to the triggering element 311, to automatically release the triggered element 312, thereby causing the executing element to switch from pause state to operating state.

[0059] In reference to Figs. 2, 3, 5, 6, and 7, in a specific implementation, a floor brush structure provided by an embodiment of the present invention further comprises a fixing support 700 arranged in the receiving chamber 210 and connected with the brush head 200. The triggered element 312 is mounted in the fixing support 700.

[0060] By way of example, the triggered element 312 is mounted on the fixing support 700 by means of a fastener or adhesive bonding, etc. The fixing support 700 can be connected to the head body 220 by being integrally formed with it, or can be removably fixed to the bottom of the head body 220 by snap-fitting in a snap-fit hole. If it is fixed removably, a flexible sealing ring can be mounted in the snap-fit hole so as to improve the sealing of the head body 220, thereby preventing foreign objects or pollutants from entering the head body 220 via the snap-fit hole and thus affecting the sensibility and service life of the triggering element 311 and the triggered element 312.

[0061] Thus, by fixing the triggered element 312 in the head body 220 via the fixing support 700, the triggered element 312 is unlikely to swing or topple over, and is stable and reliable.

[0062] In reference to Figs. 2, 3, 5, and 6, in a possible mode of realization, a floor brush structure provided by an embodiment of the present invention further comprises a mounting support 800 arranged in the receiving chamber 210. The mounting support 800 has a guiding chamber 810 and a passage hole 820 in communication with the guiding chamber 810. The fixing support 700 has an insert part 710 arranged to insert into the guiding chamber 810. The triggering element 311 extends into the fixing support 700 sequentially through the passage hole 820, the guiding chamber 810, and the insert part 710.

[0063] Specifically, a mounting support 800 is provided inside the head body 220. The mounting support 800 is located between the cover plate 230 and the fixing support 700 and is provided with a guiding chamber 810 and a passage hole 820 in communication with the guiding chamber 810. Correspondingly, the fixing support 700 is provided with an insert part 710 arranged to insert into the guiding chamber 810 so that the cover plate 230 is in communication with the fixing support 700 via the mounting support 800 so as to form a movement passage of the triggering element 311. It should be noted that the passage hole 820 and the insert part 710 are both shaped to match the triggering element 311, which, by way of example, can be circular or rectangular. No limitation is implied by the present embodiment.

[0064] In other words, one end of the triggering element 311 extends out of the mounting support 800 via the passage hole 820 and extends outside the cover plate 230. The other end of the triggering element 311 extends into the fixing support 700 via the insert part 710 and is

located above the triggered element 312. The rest part of the triggering element 311 is located inside the guiding chamber 810.

[0065] Thus, by providing the mounting support 800, not only is it easy to realize the assembly of the triggering element 311 in the receiving chamber 210, but also the guiding chamber 810 and passage hole 820 at the mounting support 800 and the insert part 710 at the fixing support 700 can also limit the position of the triggering element 311 in a horizontal direction. Therefore, when being driven by the brush connector 100, the triggering element 311 can only move upwards or downwards relative to the guiding chamber 810 and will not shift horizontally, thus ensuring precise triggering of the triggered element 312 by the triggering element 311.

[0066] Thus, guided by the guiding chamber 810, the passage hole 820, and the insert part 710, the triggering element 311 can move relative to the head body 220 and thus triggering the triggered element 312 or releasing the triggered element 312.

[0067] In some modes of realization, the driving element 600 is a spring, and the triggering element 311 comprises a first rod 3111, a support rod 3112, and a second rod 3113 that are arranged sequentially. The first rod 3111 is oriented towards the passage hole 820. Projections of the first rod 3111 and the second rod 3113 towards the support rod 3112 are both located within the support rod 3112. The spring is located in the guiding chamber 810 and sleeved to the second rod 3113, with the two ends of the spring abutting respectively against the support rod 3112 and the insert part 710.

[0068] In reference to Figs. 2, 3, 5, 6, and 8, the triggering element 311 is partially located in the guiding chamber 810. The first rod 3111 of the triggering element 311 is oriented towards the passage hole 820. The second rod 3113 is oriented towards the insert part 710. The support rod 3112 is located between the first rod 3111 and the second rod 3113, and their projections towards the support rod 3112 are both located within the support rod 3112, so that the cross-sectional areas of the first rod 3111 and the second rod 3113 are both smaller than the cross-sectional area of the support rod 3112. Thus, when the triggering element 311 is driven by the driving element 600 to move upwards relative to the guiding chamber 810, the support rod 3112 can perform a position limiting function, so as to prevent the triggering element 311 from completely detaching from the mounting support 800 when moving upwards.

[0069] In the present invention, the driving element 600 is a spring sleeved to the second rod 3113 located in the guiding chamber 810, which can effectively make use of the inner space of the guiding chamber 810 to reliably connect the driving element 600 and the triggering element 311. In addition, with the two ends of the spring abutting respectively against a bottom end of the support rod 3112 and the insert part 710, the spring is limited in position between the support rod 3112 and the insert part

710 to be compressed or extend.

[0070] Specifically, in reference to Figs. 2 and 3, when the brush connector 100 is in an upright position relative to the brush head 200, i.e., when the brush connector 100 abuts against the first rod 3111 of the triggering element 311, one end of the spring moves downwards with the second rod 3113 so that the spring is compressed between the support rod 3112 and the insert part 710, until the second rod 3113 triggers the triggered element 312. Alternatively, in reference to Figs. 5 and 6, when the brush connector 100 is in a horizontal position relative to the brush head 200, i.e., the brush connector 100 detaches from the first rod 3111 of the triggering element 311, the spring extends so as to drive the second rod 3113 to move upwards. Thus, the second rod 3113 moves away from the triggered element 312, thereby releasing the triggered element 312.

[0071] Thus, by arranging the spring between the support rod 3112 and the insert part 710, when the support rod 3112 moves towards the insert part 710, the spring is compressed so that it tends to extend due to the restoring force. Thus, when the brush connector 100 detaches from the triggering element 311, the triggering element 311 can be driven by the restoring force of the spring to move towards the passage hole 820.

[0072] In reference to Figs. 2, 3, 5 and 6, in order to prevent foreign objects or dirt from entering into the head body 220, in a possible mode of realization, a floor brush structure provided by an embodiment of the present invention further comprises a sealing element 500 sleeved to the triggering element 311 and abutting between the cover plate 230 and the mounting support 800.

[0073] Thus, foreign objects or dirt outside the cover plate 230 can be blocked by the sealing element 500 and prevented from entering the head body 220, thereby ensuring the sensitivity and service life of the triggering element 311 and the triggered element 312.

[0074] To make it easy to trigger the triggered element 312, in a possible mode of realization, the triggered element 312 is a micro switch.

[0075] Thus, the triggering element 311 can exert a relatively small force on a transmission reed arranged outside the micro switch, so that the contact point of the micro switch rapidly closes, thereby achieving rapid response and precise control of the triggered element 312. In addition, as the transmission reed outside the micro switch is of a small size, it does not occupy a large space in the head body 200.

[0076] In another aspect, embodiments of the present invention further provide a cleaning device comprising a device body and any one of the above-described floor brush structures connected with the device body.

[0077] The structure and principle of the floor brush structure have been described in detail in the above-described embodiments, which are not described again here.

[0078] Specifically, the device body may have diverse functions such as vacuum cleaning, floor washing and

mopping. The executing element of the device body is designed to execute the functions of the device body. For example, for a device body having a floor washing function, the executing element may comprise at least a brush roller mounted at the bottom of the brush head 200, as well as an electric motor that powers the brush roller. It should be noted that, the description of the structure of the device body is made only by way of example. The present invention does not limit the specific structure of the device body.

[0079] When using the cleaning device provided by embodiments of the present invention, a user may incline the device body relative to a floor by adjusting the brush connector 100. Thus, pushing the brush head 200 forward is facilitated, while ensuring that the lower surface of the brush roller sticks to the floor to be cleaned. The brush roller may repeatedly wipe the dirty spots when being driven by the electric motor, thereby achieving cleaning. When cleaning is paused or the device is stored, the user can make the device body stand up on the floor, so that the trigger control mechanism 300 inside the floor brush structure controls the executing element so as to stop the cleaning device.

[0080] Thus, the user can easily and flexibly control the activation and stop of the cleaning device, and the height of the cleaning device is rendered relatively small, resulting in a simpler and more compact overall structure.

[0081] Finally, it should be noted that, the various embodiments above are merely used to describe the technical solutions of the present invention, instead of limiting it. Although the present invention has been described in detail with reference to the above-described embodiments, a person of ordinary skill in the art should understand that it is still possible to modify the technical solutions described in the above-described embodiments, or to make equivalent replacements for some or all of the technical features therein; and these modifications or replacements do not cause the essence of the corresponding technical solutions to deviate from the scope of the technical solutions of the embodiments of the present invention.

Claims

1. A floor brush structure, **characterized in that**, it comprises a brush connector (100), a brush head (200), and a trigger control mechanism (300), the brush connector (100) being used for connecting with a main body of a cleaning device and rotatably connected with the brush head (200), the trigger control mechanism (300) comprising a trigger assembly (310) including a triggering element (311) and a triggered element (312), a receiving chamber (210) being arranged in the brush head (200), both the triggering element (311) and the triggered element (312) being located in the receiving chamber (210), the triggering element (311) being configured

to, when the brush connector (100) rotates to an upright position relative to the brush head (200), be driven by the brush connector (100) to move relative to the brush head (200) to a trigger position, so as to trigger the triggered element (312), an executing element of the cleaning device being stopped when the triggered element (312) is triggered.

2. The floor brush structure according to claim 1, **characterized in that**, the trigger control mechanism (300) further comprises a control element, both the triggered element (312) and the executing element being electrically connected with the control element, the control element being configured to, when the triggered element (312) is triggered, control the executing element to stop operating, and when the triggered element (312) is released, control the executing element to operate.
3. The floor brush structure according to claim 1 or 2, **characterized in that**, it further comprises a mounting base (400) arranged on the brush head (200), the brush connector (100) being articulated with the mounting base (400) so as to rotate relative to the brush head (200).
4. The floor brush structure according to any one of claims 1 to 3, **characterized in that**, the brush head (200) further comprises a head body (220) and a cover plate (230) arranged to cover the head body (220), the triggering element (311) being partially located outside the cover plate (230) when not in the trigger position.
5. The floor brush structure according to any one of claims 1 to 4, **characterized in that**, it further comprises a driving element (600) connected with the triggering element (311) and arranged in the brush head (200), the driving element (600) being configured to, when the brush connector (100) rotates to a non-upright position relative to the brush head (200), drive the triggering element (311) to move relative to the brush head (200), so as to release the triggered element (312); the floor brush structure (100) being configured to, when in a horizontal position, detach from the triggering element (311).
6. The floor brush structure according to any one of claims 1 to 5, **characterized in that**, it further comprises a fixing support (700) arranged in the receiving chamber (210) and connected with the brush head (200), the triggered element (312) being mounted in the fixing support (700).
7. The floor brush structure according to claim 6, **characterized in that**, it further comprises a mounting support (800) arranged in the receiving chamber

(210), the mounting support (800) having a guiding chamber (810) and a passage hole (820) in communication with the guiding chamber (810), the fixing support (700) having an insert part (710) arranged to insert into the guiding chamber (810), the triggering element (311) extending into the fixing support (700) sequentially through the passage hole (820), the guiding chamber (810), and the insert part (710).

8. The floor brush structure according to claim 7, **characterized in that**, the driving element (600) is a spring, and the triggering element (311) comprises a first rod (3111), a support rod (3112), and a second rod (3113) that are arranged sequentially, the first rod (3111) being oriented towards the passage hole (820), projections of the first rod (3111) and the second rod (3113) towards the support rod (3112) being both located within the support rod (3112), the spring being located in the guiding chamber (810) and sleeved to the second rod (3113) with the two ends of the spring abutting respectively against the support rod (3112) and the insert part (710).
9. The floor brush structure according to claim 7 or 8, **characterized in that**, it further comprises a sealing element (500) sleeved to the triggering element (311) and abutting between the cover plate (230) and the mounting support (800).
10. The floor brush structure according to any one of claims 1 to 9, **characterized in that**, the triggered element (312) is a micro switch.
11. A cleaning device, **characterized in that**, it comprises a device body and the floor brush structure according to any one of claims 1 to 10 connected with the device body.

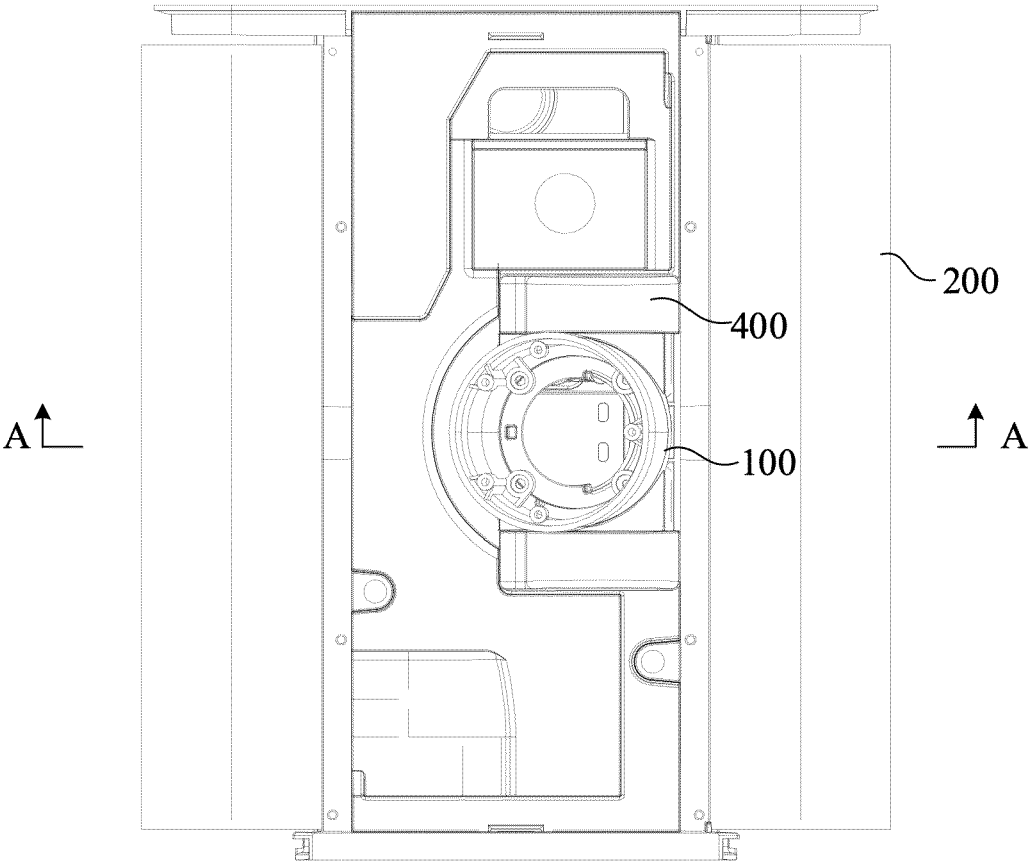


Figure 1

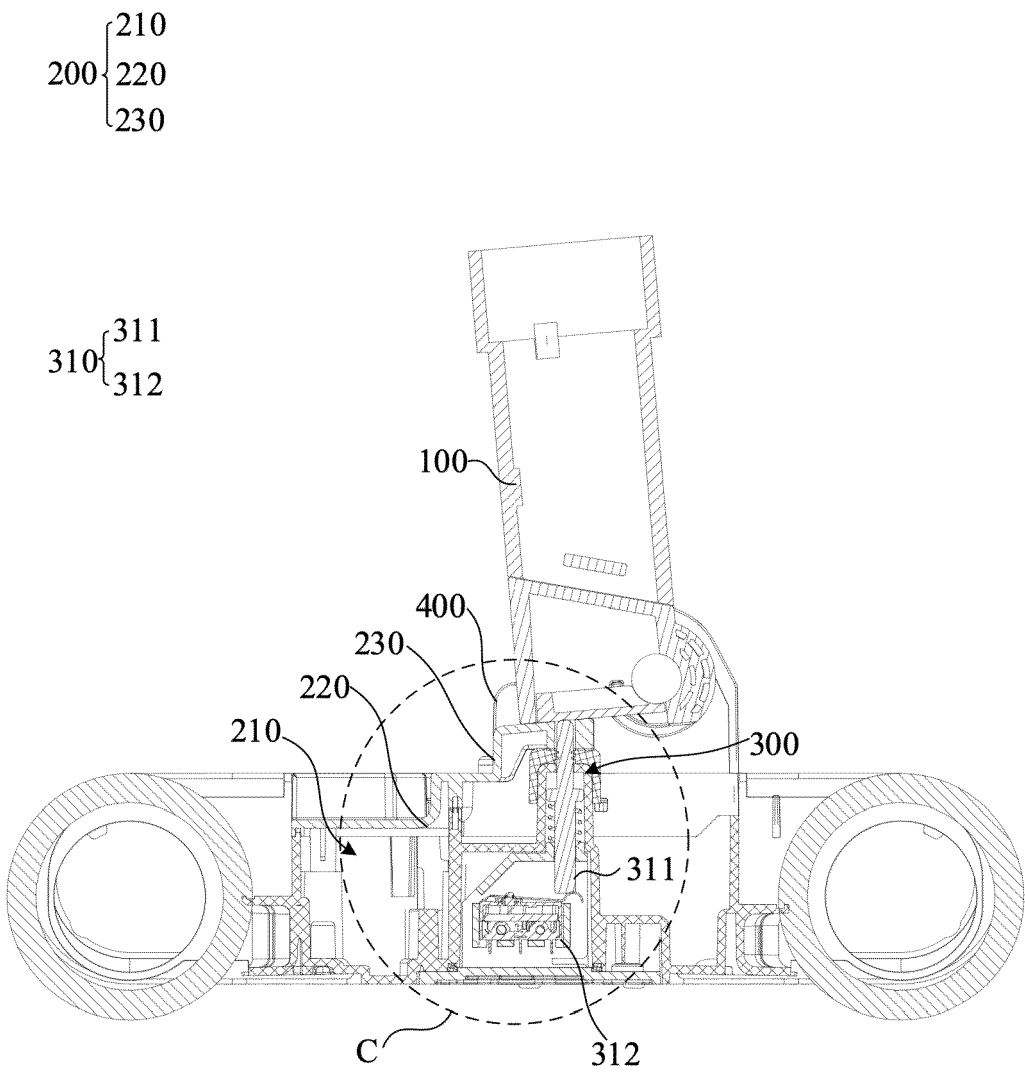


Figure 2

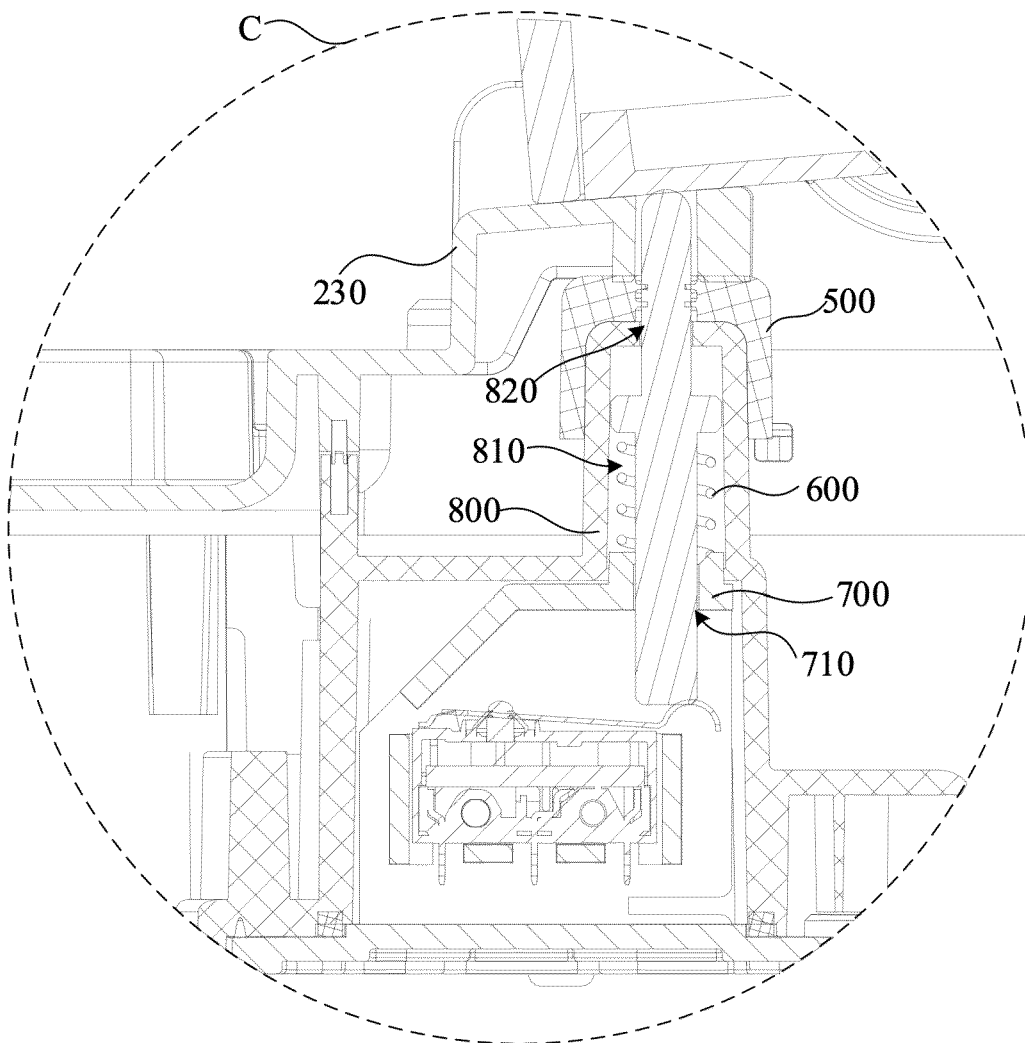


Figure 3

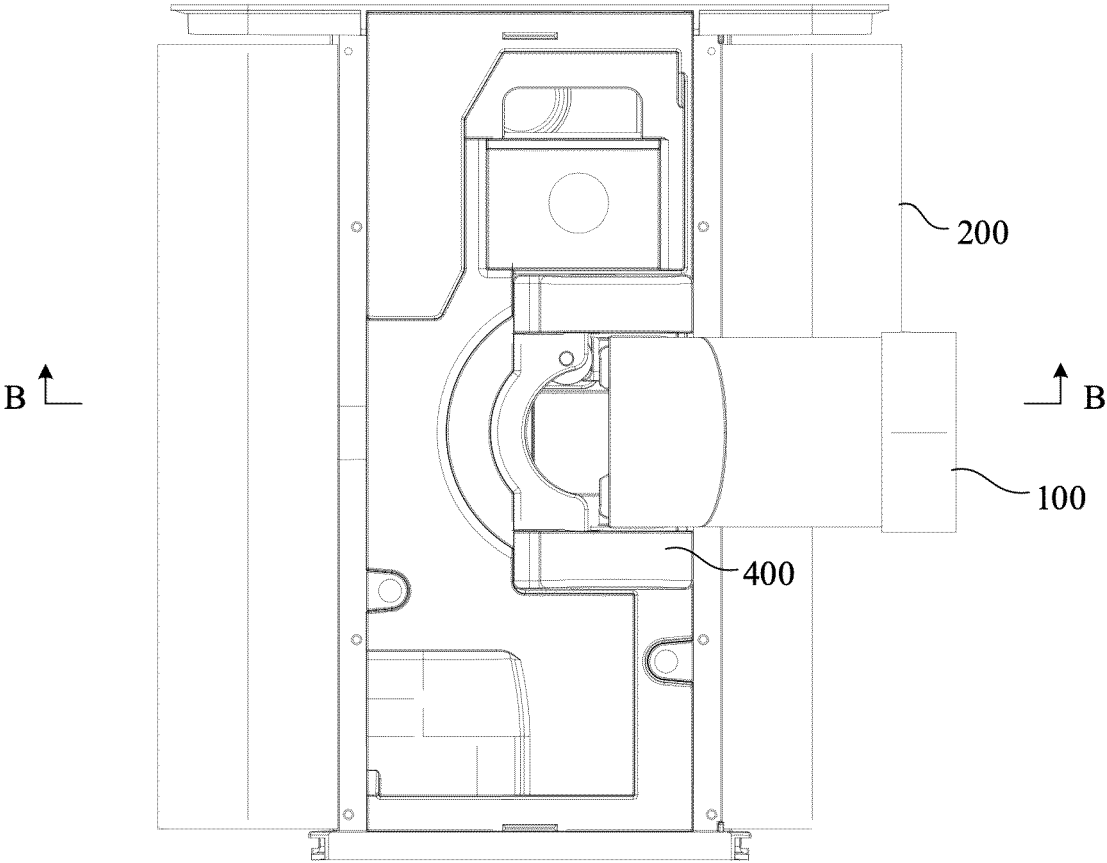


Figure 4

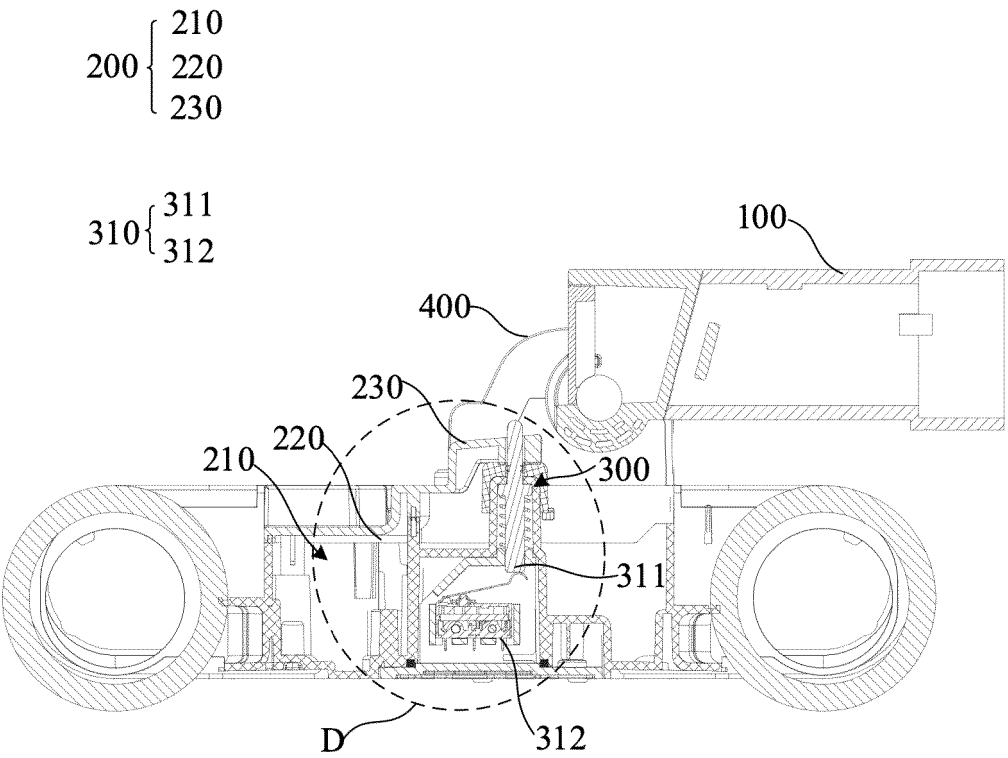


Figure 5

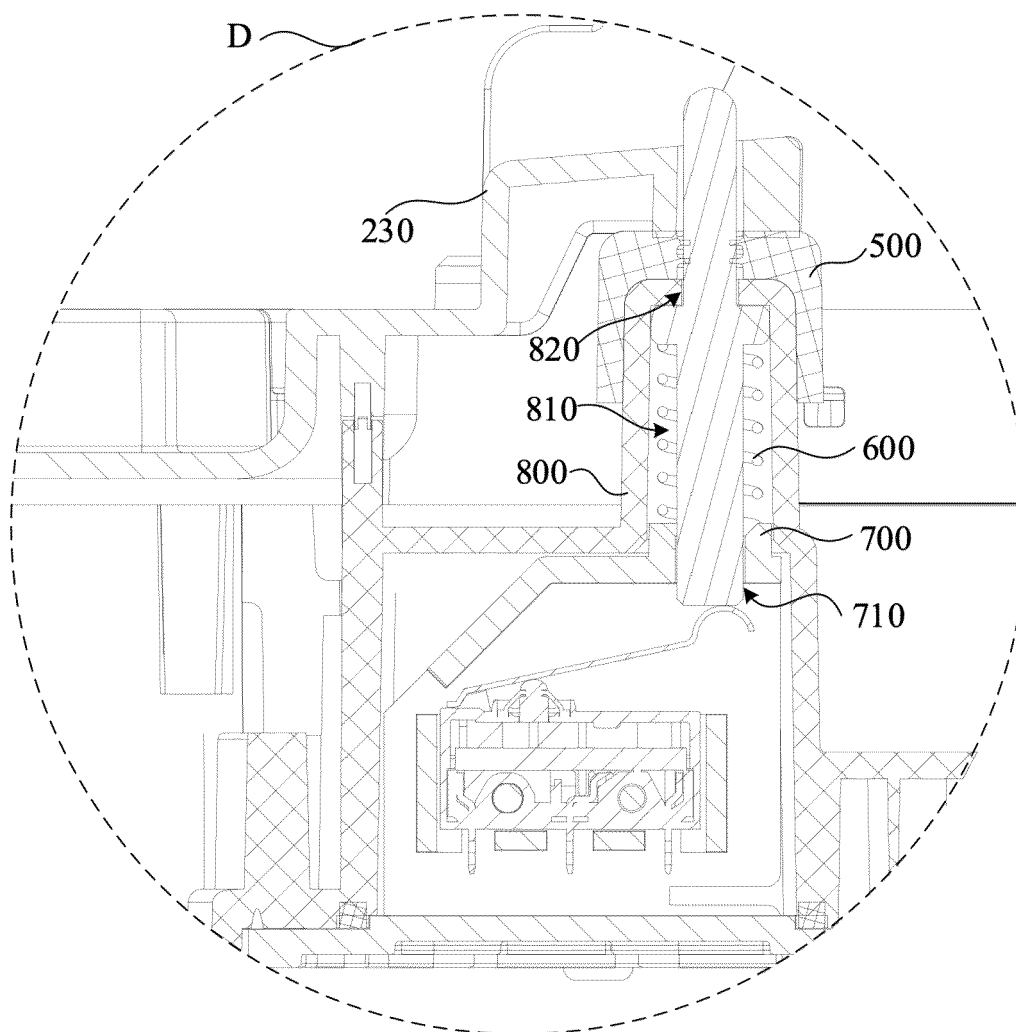


Figure 6

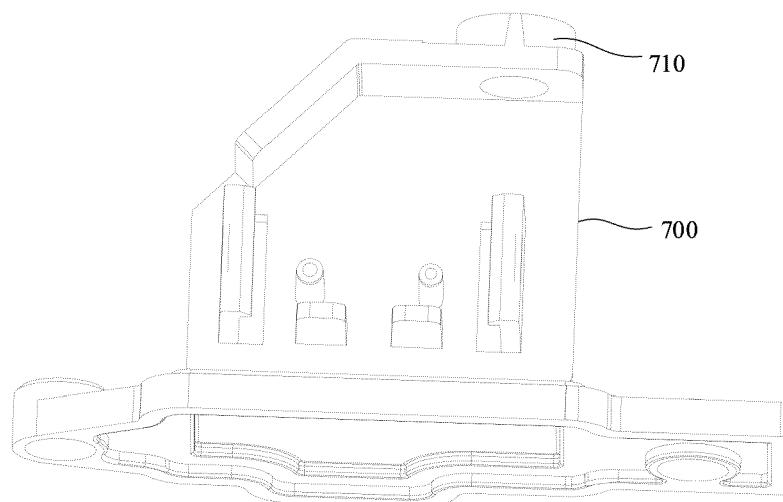


Figure 7

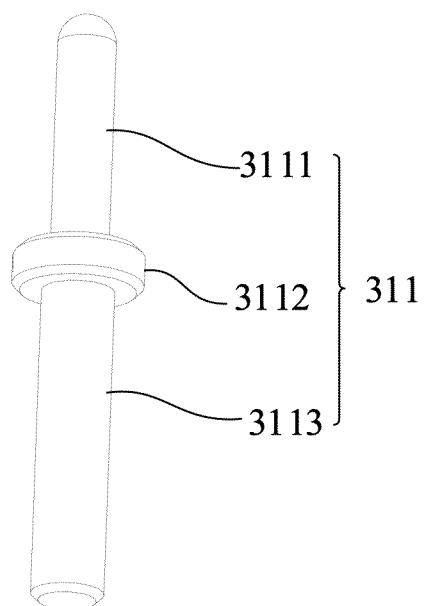


Figure 8

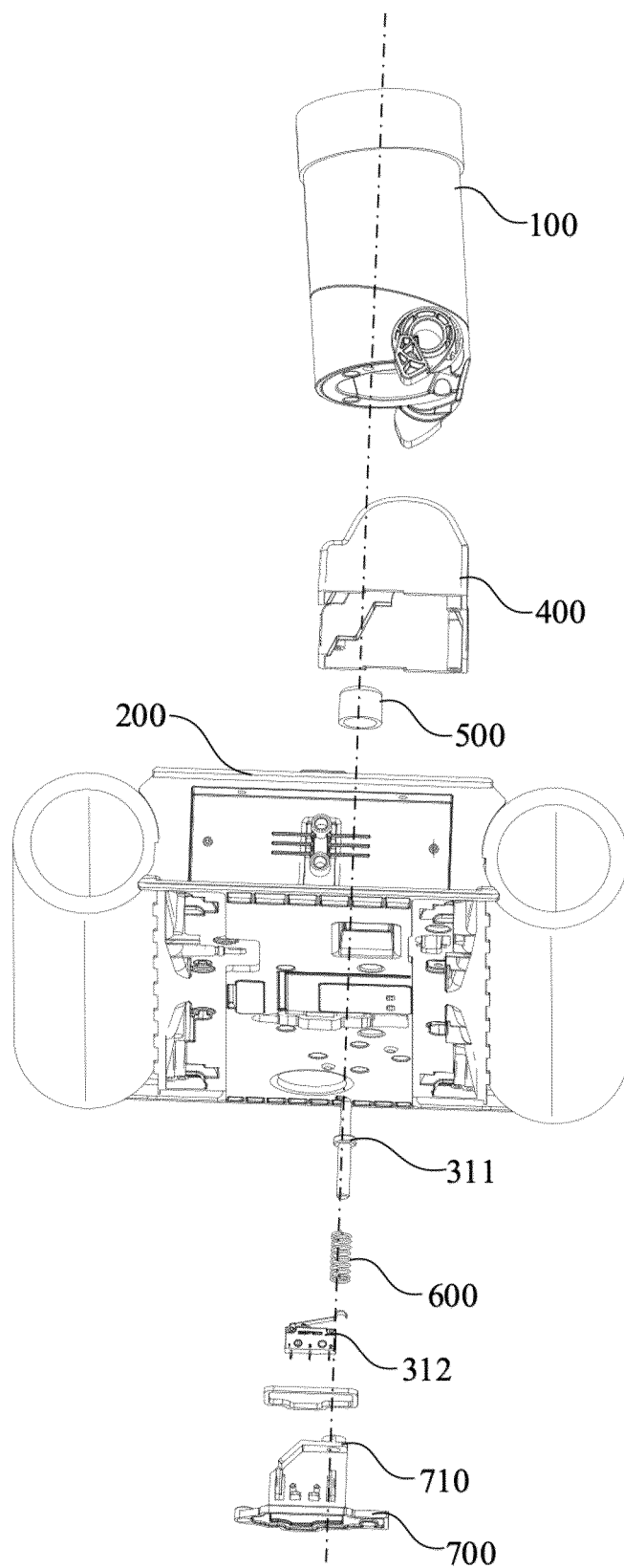


Figure 9



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Place of search Munich		Date of completion of the search 25 April 2025	Examiner Lopez Vega, Javier
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