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(54) **POWER TOOL**

(57) Disclosed is a power tool, which overcomes technical problems of existing power tools such as unintentional touch of a position due to lack of a position limit and no feedback to position shift. The power tool disclosed includes a housing and a switch assembly, the switch assembly including a position shifter, the position shifter being movable relative to the housing to shift between a plurality of positions, the switch assembly being correspondingly disposed in one of a normal-OFF state, a selective ON/OFF state, and a normal-ON state when the position shifter is shifted to one of the plurality of positions; a snap-in convex rib is arranged on the housing; a snap groove is formed on the position shifter; when the switch assembly is in the selective ON/OFF state, the snap-in convex rib is snapped into the snap groove. Furthermore, two stop convex ribs are arranged on the position shifter, the snap groove being formed between the two stop convex ribs; when the snap-in convex rib abuts against the external side of a corresponding one of the two stop convex ribs, the switch assembly is disposed in the normal-OFF state or in the normal-ON state.

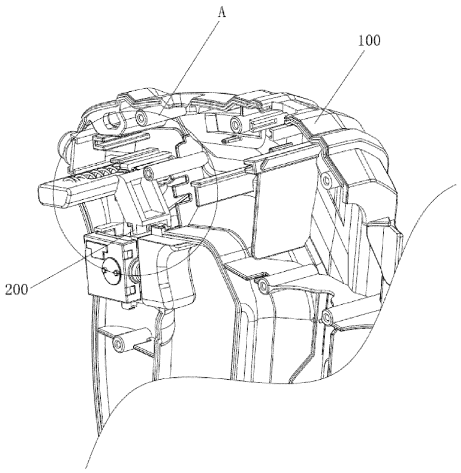

Fig. 1

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Description

FIELD

[0001] The subject matter described herein relates to a power tool, and more particularly relates to a power tool with an improved switch assembly.

BACKGROUND

[0002] Advancements in power tool technology have offered more types and models of power tools with increasingly versatile features. Now, power tools are commonly used in manufacturing and household scenarios. Users also have higher demands on the power tools in use, expecting that they have improved performance, operability, and user experience.

[0003] A power tool is usually provided with a trigger for activating/deactivating the power tool; when the trigger is pressed, a switch is closed to energize the power tool, while when the trigger is released, the switch is open to deenergize the power tool.

[0004] Many existing power tools have a three-position switch assembly: Lock Position, at which position the power tool cannot be activated; Operation Position, at which position the power tool may be activated/deactivated at any time; and ON-Hold Position, at which position the power tool maintains continuously active. However, there lacks a limit between the positions, so that position shift easily occurs when the user unintentionally touches a position shift button; there lacks noticeable shift feedback to position shift so that the user is usually unaware of whether the position shift succeeds; in addition, a position shifting member easily shakes when the power tool is operating.

SUMMARY

[0005] A power tool is disclosed herein to overcome at least one of the drawbacks in conventional technologies.

[0006] A power tool according to the disclosure comprises: a housing and a switch assembly, the switch assembly comprising a position shifter, the position shifter being movable relative to the housing to shift between a plurality of positions, the switch assembly being disposed in one of a normal-OFF state, a selective ON/OFF state, and a normal-ON state when the position shifter is shifted to one of the plurality of positions, wherein a snap-in convex rib is arranged on the housing; a snap groove is formed on the position shifter; when the snap-in convex rib is snapped into the snap groove, the switch assembly is disposed in the selective ON/OFF state.

[0007] In some implementations of the disclosure, two stop convex ribs are arranged on the position shifter, the snap groove is formed between the two stop convex ribs, a snap-in arm is arranged on the housing, the snap-in convex rib is arranged on the snap-in arm, and when the snap-in convex rib abuts against an external side of a corresponding one of the two stop convex ribs, the switch assembly is disposed in the normal-OFF state or in the normal-ON state.

[0008] In some implementations of the disclosure, the position shifter is further provided with a first reset unit, the first reset unit being operable to provide a reset force for resetting the switch assembly to the selective ON/OFF state.

[0009] In some implementations of the disclosure, the switch assembly comprises a switch and a trigger, the trigger being operable for controlling closing or opening of the switch; a first limit column and a second limit column are provided on the position shifter, a guide passage being formed between the first limit column and the second limit column, a guide portion being provided on the trigger;

wherein the plurality of positions include:

a normal-OFF position, at which position the guide portion is limited by the first limit column and the switch assembly is in the normal-OFF state;

a selective ON/OFF position, at which position the guide portion is movable in the guide passage and the switch assembly is in the selective ON/OFF state;

a normal-ON position, at which position the guide portion is limited by the second limit column and the switch assembly is in the normal-ON state.

[0010] In some implementations of the disclosure, a guide wall is arranged at a side of the first limit column proximal to the second limit column, the guide passage being formed between the second limit column and the guide wall.

[0011] In some implementations of the disclosure, the guide wall comprises a first stop rib extending in a direction towards the trigger; in the normal-OFF state with the trigger being pressed, the first stop rib and the guide portion interact to limit the position shifter from being disengaged from the normal-OFF position.

[0012] In some implementations of the disclosure, the second limit column comprises a second stop rib extending towards the trigger; in the selective ON/OFF state with the switch being open, the second stop rib and the guide portion interact to limit the position shifter from moving towards the normal-ON position.

[0013] In some implementations, the second limit column comprises a third stop rib extending in a direction towards the switch; in the normal-ON state with the trigger being not pressed, the third stop rib and the guide portion interact to limit the position shifter from being disengaged from the normal-ON position in a direction towards the selective ON/OFF position.

[0014] In some implementations, the second limit column comprises a limit wall; the limit wall limits the position shifter from being disengaged from the normal-ON position in a direction opposite the selective ON/OFF position.

[0015] In some implementations, the trigger and the switch are movably connected via a connector, a second

reset unit being sleeved on the connector, the second reset unit being operable to reset the trigger.

[0016] With the technical solutions described supra, the disclosure offers the following benefits:

1. The power tool according to the disclosure comprises a housing and a switch assembly, the switch assembly having a normal-OFF state, a selective ON/OFF state, and a normal-ON state, the switch assembly comprising a position shifter; by arranging the snap-in convex rib on the housing and forming the snap groove on the position shifter, interaction between the snap-in convex rib and the snap groove offers shift feedback when the user shifts the switch assembly to the selective ON/OFF state, which also contributes a certain touch rejection feature and enhances user experience.

2. By arranging two stop convex ribs and forming the snap groove between the two stop convex ribs, the position shifter may provide switched-in-place feedback to the user when the switch assembly switches between the normal-OFF state, the selective ON/OFF state, and the normal-ON state, whereby user experience of the product is enhanced; moreover, interaction between the snap-in convex rib and the two stop convex ribs contributes a touch rejection capability to the switch assembly in any of the normal-OFF state, the selective ON/OFF state, and the normal-ON state, further enhancing user experience of the product.

3. By providing the first reset unit which interacts with the snap-in convex rib and the stop convex ribs, the position shifter can always be limited without shaking irrespective of whether the switch assembly is in normal-OFF state, the selective ON/OFF state, or the normal-ON state; the power tool can also have a touch rejection feature irrespective of which state the switch assembly is in; moreover, the first reset unit may provide a reset force facilitating the position shifter to shift back to the selective ON/OFF position, which eases the shift action.

4. By providing the position shifter, arranging a first limit column and a second limit column on the position shifter, forming the guide passage between the first limit column and the second limit column, and arranging the guide portion on the trigger, the switch assembly is contributed with three different operating states: normal-OFF, selective ON/OFF, and normal-ON. When the switch assembly is in the normal-OFF state, unintentional touch of the trigger does not induce activation of the power pool; when the switch assembly is in the normal-ON state, the power tool can still operate without pressing the trigger; when the switch assembly is in the selective ON/OFF state, the user may operate the power tool as he/she usually does. The user may select a corresponding operational state as needed, which reduces odds of accidents when operating the power tool, reduces fatigue when operating the power tool, and further enhances user experience of the product.

5. The guide wall is arranged at a side of the first limit column proximal to the second limit column, and the guide passage is formed between the second limit column and the guide wall. When the position shifter is at the selective ON/OFF position and the user presses or releases the trigger, the guide portion of the trigger may move within the guide passage to thereby close or open the switch. When the guide portion moves in the guide passage, the guide wall plays a role of guiding, as well as limiting the movable extent of the guide portion, so that the position shifter at the selective ON/OFF position cannot move to the normal-OFF position, whereby the normal-OFF position and the normal-ON position are noticeably distinguished. When the user operates the power tool, the noticeable distinguishing between modes of shifting to the normal-ON position and shifting to the normal-OFF position helps the user cultivate a good habit, preventing faulty operation due to indiscrimination between the modes of shifting.

6. The first stop rib as provided may limit unexpected shift of the position shifter at the normal-OFF position to the selective ON/OFF position once the user presses the trigger, which avoids unexpected activation of the power tool and thusly reduces odds of accidents.

7. By arranging the second stop rib, when the position shifter is at the normal-ON position and the switch is open, the guide portion and the second stop rib create an interference when the position shifter moves in a direction towards the normal-ON position to thereby limit the position shifter from moving to the normal-ON position, which prevents the position shifter from being shifted to a wrong position failing to trigger a corresponding function and prevents deterioration of user experience of the product.

8. The third stop rib and the guide portion create an interference when the position shifter moves in a direction towards the selective ON/OFF position to thereby limit the position shifter from moving towards the selective ON/OFF position, which prevents unintentional touch-induced functional failure when the user uses the normal-ON function of the power tool, whereby user experience is enhanced.

9. By providing the limit wall on the second limit column, the limit wall interferes with the guide portion in a direction opposite the selective ON/OFF position, further preventing unintentional touch-induced

functional failure when the user uses the normal-ON function of the power tool, further enhancing user experience.

10. By movably connecting the trigger and the switch via a connector and arranging a first reset unit between the trigger and the switch, when the user presses the trigger, the switch is closed, and when the trigger is released, the first reset unit automatically resets to push the trigger to move away to thereby open the switch.

[0017] These features and advantages of the disclosure will be described in detail through specific implementations with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a local view of a power tool according to an embodiment of the disclosure;

Fig. 2 is an enlarged view of part A in Fig. 1;

Fig. 3 is a bottom view of a position shifter according to an embodiment of the disclosure;

Fig. 4 is a top view of a position shifter according to an embodiment of the disclosure;

Fig. 5 is a schematic diagram of a trigger according to an embodiment of the disclosure;

Fig. 6 is a schematic diagram of a switch assembly of the power tool in a normal-OFF state according to an embodiment of the disclosure;

Fig. 7 is a schematic diagram of the switch assembly of the power tool in a selective ON/OFF state according to an embodiment of the disclosure;

Fig. 8 is a schematic diagram of the switch assembly of the power tool in a normal-ON state according to an embodiment of the disclosure.

Reference Numerals:

[0019]

100 housing, 101 snap-in arm, 102 snap-in convex rib;

200 switch assembly, 210 switch, 220 trigger, 221 guide portion, 222 connector, 230 position shifter, 231 first limit column, 2311 guide wall, 2312 first stop rib, 232 second limit column, 2321 second stop rib, 2322 third stop rib, 2323 limit wall, 233 guide passage, 234 stop convex rib, 235 mounting site, 236 first reset unit, 237 snap groove.

DETAILED DESCRIPTION OF EMBODIMENTS

[0020] Hereinafter, the technical solutions of the disclosure will be explained and illustrated through embodiments with reference to the accompanying drawings. However, the embodiments are only example embodiments of the disclosure, not all of them. Other embodiments derived by those skilled in the art without exercise of inventive work based on the examples in the embodiments all fall within the protection scope of the disclosure.

[0021] In the description of the disclosure, it needs to be understood that the orientational or positional relationships indicated by the terms "center," "longitudinal," "transverse," "length," "width," "thickness," "upper," "lower," "front," "rear," "left," "right," "vertical," "horizontal," "top," "bottom," "inner," "clockwise," and "counterclockwise" refer to those orientational and positional relationships illustrated in the drawings, which are intended only for facilitating description of the disclosure and simplifying relevant depictions, but not for indicating or implying that the devices or elements compulsorily possess such specific orientations or are compulsorily configured and operated with these specific orientations; therefore, such terms should not be construed as limitations to the disclosure.

[0022] Besides, the terms "first" and "second" are only used for descriptive purposes, which shall not be construed as indicating or implying relative importance or implicitly indicating the number of a referred to technical feature. Therefore, the features limited by "first" and "second" may explicitly or implicitly include one or more of such features. In the description of the present disclosure, unless otherwise indicated, "plurality" indicates two or above.

[0023] Figs. 1 to 3 illustrate a power tool according to an embodiment of the disclosure, comprising a housing 100, an operating mechanism, and a switch assembly 200, the operating mechanism being electrically connected to the switch assembly 200, the switch assembly comprising a switch 210, a trigger 220, and a position shifter 230, the trigger 220 controlling closing or opening of the switch 210, where when the switch 210 is closed, the operating mechanism is activated, while when the switch 210 is opened, the operating mechanism is deactivated.

[0024] With a grease gun as an example, its operating mechanism comprises an electric motor, a transmission mechanism, and a plunger pump, the plunger pump being connected to the electric motor via the transmission mechanism; a power source of the grease gun may be a battery or a mains supply; the switch assembly 200, which is connected to the power source and the operating mechanism, is operable to control activation or deactivation of the electric motor, thereby controlling operation of

the grease gun.

[0025] In addition to the grease gun, the power tool may also be a power drill, a power hammer, an electric screw driver, or a heat gun, etc.

[0026] A first hole site for mounting the trigger 220 and a second hole site for mounting the position shifter 230 are provided on the housing 100, the trigger 220 being movable in the first hole site, the position shifter 230 being movable in the second hole site.

[0027] The position shifter 230 is movable left and right relative to the housing 100 to shift between a plurality of positions; when the position shifter 230 is shifted to one of the positions, the switch assembly 200 may be sequentially disposed in one of the following states: normal-OFF, selective ON/OFF, and normal-ON. Exemplarily, the position shifter 230 may be disposed at three positions relative to the housing 100: left, middle, right, where the middle position is the selective ON/OFF position, and the left and right positions correspond to the normal-OFF and normal-ON positions, respectively; when the position shifter 230 is disposed at one of the left, middle, and right positions, the switch assembly 200 may be correspondingly in the normal-OFF state, the selective ON/OFF state, or the normal-ON state. When the switch assembly 200 is in the normal-OFF state, the operating mechanism cannot be activated; when the switch assembly 200 is in the selective ON/OFF state, a user may control activation or deactivation of the operating mechanism by pressing or releasing the trigger; when the switch assembly 200 is in the normal-ON state, the operating mechanism maintains active.

[0028] In some other implementations, a first limit column 231 and a second limit column 232 protruding towards the trigger 220 are arranged on the position shifter 230, a guide passage 233 being formed between the first limit column 231 and the second limit column 232, a guide portion 221 being provided on the trigger 220. When the position shifter 230 moves to the normal-OFF position, the guide portion 221 is blocked by the first limit column 231 so that the trigger 220 cannot approach the switch 210, and the switch 210 is open and cannot be closed, whereby the switch assembly 200 is in the normal-OFF state. When the position shifter 230 moves to the selective ON/OFF position, the guide portion 221 is movable within the guide passage 233; now, the user may press or release the trigger 220 to close or open the switch 210, in which case the switch assembly 200 is in the selective ON/OFF state. After the user presses the trigger 220, the position shifter 230 at the selective ON/OFF position shifts to the normal-ON position; now, the trigger 220, if released, is blocked by the second limit column 232 from moving further away from the switch 210, so that the switch 210 maintains closed and the switch assembly is in the normal-ON state.

[0029] By providing the position shifter 230, arranging the first limit column 231 and the second limit column 232 on the position shifter 230, forming the guide passage 233 between the first limit column 231 and the second limit column 232, arranging the guide portion 221 on the trigger 220, and configuring the position shifter 230 to be movable relative to the housing 100, the switch assembly 200 is contributed with three different operational states via interaction between the position shifter 230 and the guide portion 221, i.e., the normal-OFF state, the selective ON/OFF state, and the normal-ON state. In the normal-OFF state, unintentional touch of the trigger 220 may be prevented from activating the power tool, which reduces the odds of accidents when operating the power tool. In the normal-ON state, the power tool can still operate without pressing the trigger 220, which reduces fatigue when the user operates the power tool. In the selective ON/OFF state, the user may operate the power tool as he or she usually does, i.e., the user may freely select an operational state of the switch assembly 200 as needed, whereby user experience is enhanced.

[0030] A snap-in arm 101 is arranged on the housing 100, a snap-in convex rib 102 is arranged on the snap-in arm 101, and a snap groove 237 is formed on the position shifter 230. When the user urges the position shifter 230 so that the switch assembly 200 is disposed in the selective ON/OFF state, the snap-in convex rib 102 is snapped into the snap groove 237. When the user urges the position shifter 230 so that the switch assembly 200 is disposed in the normal-OFF state or the normal-ON state, the snap-in convex rib 102 is disengaged from the snap groove 237. When the snap-in convex rib 102 is snapped into the snap groove 237, snap-in-place feedback may be provided to the user, so that the user may know whether the switch assembly 200 has been shifted to the selective ON/OFF state; in this case, the snap-in convex rib 102 does not easily escape from the snap groove 237; as such, the switch assembly 200 in the selective ON/OFF state is touch-rejection enabled. By arranging the snap-in convex rib 102 on the housing and arranging the snap groove 237 on the position shifter, interaction between the snap-in convex rib 102 and the snap groove 237 provides shift feedback when the switch assembly 200 is shifted to the selective ON/OFF state; in this case, the switch assembly 200 is also contributed with a touch-rejection feature, whereby user experience is enhanced.

[0031] In some implementations, two stop convex ribs 234 are arranged on the position shifter, and the snap groove 237 is formed between the two stop convex ribs. When the snap-in convex rib 102 is disengaged from the snap groove 237 and moved to the external side of a corresponding one of the two stop convex ribs 234, the switch assembly 200 is disposed in the normal-OFF state or the normal-ON state. When the user urges the position shifter 230 so that the snap-in convex rib 102 is disengaged from the snap groove 237, the snap-in convex rib 102 and a surface of one of the stop convex ribs 234 are pressed against each other, whereby the snap-in arm 101 is stressed to be deformed upward, and the snap-in convex rib 102 slides over the surface of the stop convex rib 234 and then falls down. When the user urges the

position shifter 230 so that the snap-in convex rib 102 is snapped into the snap groove 237, the snap-in convex rib 102 and a surface of one of the stop convex ribs 234 are pressed against each other, whereby the snap-in arm 101 is stressed to be deformed and uplifted, and the snap-fit convex 102 slides over the surface of the stop convex rib 234 and then falls into the snap groove 237. By arranging the two stop convex ribs 234 and forming the snap groove 237 between the two stop convex ribs 234, the position shifter 230 can provide shifted-in-place feedback to the user irrespective of whether the switch assembly 200 is switched to the normal-OFF state, the selective ON/OFF state, or the normal-ON state, whereby user experience is enhanced. Moreover, when the switch assembly 200 is in the normal-OFF state or the normal-ON state, an external force is needed to drive the snap-in convex rib 102 to cross the stop convex rib 234 so that the switch assembly 200 can be switched to the selective ON/OFF state. Therefore, by arranging the snap-in convex rib 102 and the two stop convex ribs 234, the switch assembly 200 is touch-rejection enabled irrespective of being in the normal-OFF state, the selective ON/OFF state, or the normal-ON state, whereby user experience is further enhanced.

[0032] In some other implementations, the position shifter 230 is further provided with a first reset unit 236, a mounting site 235 is provided on the position shifter 230, and the first reset unit 236 is mounted at the mounting site 235. The first reset unit 236 at least partially extends beyond the position shifter 230 but not beyond the second hole site, so that the first reset unit 236 is limited within the housing 100. When the user urges the position shifter 230 to move left or right within the housing 100, the first reset unit 236 is pressed against by the housing 100 to accumulate energy in the course of the position shifter 230 shifting from the selective ON/OFF position to the normal-OFF position or normal-ON position, so that the first reset unit 236 interacts with the snap-in convex rib 102 and the stop convex ribs 234 to hold the snap-in convex rib 102 against a corresponding one of the stop convex rib 234. Now, the position shifter 230 is limited to the normal-OFF position or normal-ON position due to the reset force applied by the first reset unit 236, so that the position shifter 230 does not shake when the power tool is operating normally. In addition, without a large external force applied against the position shifter 230, the small reset force provided by the first reset unit 236 does not suffice for the snap-in convex rib 102 to cross the stop convex rib 234 into the snap groove 237; now, the switch assembly 200 is still touch-rejection enabled. By providing the first reset unit 236 which interacts with the snap-in convex rib 102 and the stop convex rib 234, the snap-in convex rib 102 is stressed to abut against the stop convex rib 234 so that shaking does not easily occur, and the position shifter 230 can always be limited irrespective of whether the switch assembly 200 is in the normal-OFF state, the selective ON/OFF state, or the normal-ON state. When the user urges the position shifter 230 to the selective ON/OFF position, the first reset unit 236 provides a reset force for facilitating the position shifter 230 to shift back to the selective ON/OFF position, which eases the user's shifting effort.

[0033] In some other implementations, a connector 222 is secured on the trigger 220, the trigger 220 and the switch 210 are movably connected via the connector 222, the connector 222 is slidable relative to the switch 210, and a second reset unit (not shown) is provided between the trigger 220 and the switch 210, the second reset unit being sleeved on the connector 222, the second reset unit being operable to reset the trigger 220 to move away from the switch 210. When the user presses the trigger 220 to activate the switch 210, the trigger 220 moves closer to the switch 210 so that the second reset unit is stressed to accumulate energy; when the user releases the trigger 220, the second reset unit resets to push the trigger 200 to reset and move away from the switch 210, whereby the switch 210 is opened. In some implementations, the second reset unit is a spring. It may be understood that, the second reset unit may also adopt another element or structure with equivalent physical properties. By movably connecting the trigger 220 and the switch 210 via the connector 222 and providing the second reset unit between the trigger 220 and the switch 210, when the user presses the trigger 220, the switch 210 may be closed; and when the trigger 220 is released, the second reset unit automatically resets to push the trigger 220 away to thereby open the switch 210.

[0034] It may be understood that, in some implementations, a different transmission mechanism may also be adopted to drive the trigger away from the switch to thereby close the switch, or to drive the trigger closer to the switch to thereby open the switch.

[0035] Figs. 3 to 8 illustrate a power tool according to an embodiment of the disclosure. Different from the preceding embodiment, a guide wall 2311 is arranged at a side of the first limit column 231 proximal to the second limit column 232, and the guide passage 233 is formed between the second limit column 232 and the guide wall 2311. When the position shifter 230 is at the selective ON/OFF position and the user presses or releases the trigger 220, the guide portion 221 of the trigger 220 may move within the guide passage 233 to thereby close or open the switch 210. When the guide portion 221 moves within the guide passage 233, the guide wall 2311 plays a role of guiding, as well as limiting the movable extent of the guide portion 221, so that the position shifter 230 at the selective ON/OFF position cannot move to the normal-OFF position, whereby the normal-OFF position and the normal-ON position are noticeably distinguished. When the user operates the power tool, the noticeable distinguishing between modes of shifting to the normal-ON position and shifting to the normal-OFF position helps the user cultivate a good habit, preventing faulty operation due to indiscrimination between the modes of shifting.

[0036] In some implementations, the guide wall 2311

comprises a first stop rib 2312 extending in a direction towards the trigger 220; when the position shifter 230 is at the normal-OFF position and the user presses the trigger 220, the trigger 220 abuts against the first limit column 231; now, the first stop rib 2312 interferes with the guide portion 221 when the position shifter 230 moves in the direction towards the selective ON/OFF position, so that the position shifter 230 cannot leave the normal-OFF position, whereby the switch assembly 200 is disposed in the normal-OFF state. Without the first stop rib 2312, when the user pushes the trigger but the power tool fails to operate, if the position shifter is unintentionally urged to shift to the selective ON/OFF position, the power tool will be unexpectedly activated; in this case, the finger pressing the trigger has not been released yet and the trigger pressed by the finger would activate the power tool, a consequence of which is that the power tool is unexpectedly activated, which likely causes an accident. With the first stop rib 2312, the position shifter 230 at the normal-OFF position is limited from unexpectedly shifting to the selective ON/OFF position after the user presses the trigger 220, thereby preventing unexpected activation of the power tool and reducing occurrence of accidents.

[0037] Figs. 3 to 8 illustrate a power tool according to an embodiment of the disclosure. Different from the preceding embodiments, in this embodiment, the second limit column 232 comprises a second stop rib 2321 extending towards the trigger 220; when the position shifter 230 is at the selective ON/OFF position with the switch 210 being open, the second stop rib 2321 interacts with the guide portion 221 to limit the position shifter 230 from moving towards the normal-ON position. To shift the position shifter 230 to the normal-ON position, the switch 210 needs to be activated before moving the position shifter 230; to prevent the position shifter 230 from shifting to the normal-ON position while the switch 210 is open so that the normal-ON state of the switch assembly 200 cannot be activated, the second stop rib 2321 is provided; as such, the guide portion 221 and the second stop rib 2321 form an interference when the position shifter 230, which is at the normal-ON position with the switch 210 being open, moves towards the normal-ON position, thereby limiting the position shifter 230 from moving towards the normal-ON position, preventing occurrence of a circumstance where the corresponding function cannot be activated when the position shifter 230 is at a wrong position and thusly preventing deterioration of the product's user experience.

[0038] Fig. 4 illustrates a power tool according to an embodiment of the disclosure. Different from the preceding embodiments, the second limit column 232 comprises a third stop rib 2322 extending in a direction towards the switch 210; when the position shifter 230 is at the normal-ON position and the guide portion 221 contacts with the third stop rib 2322, the third stop rib 2322 interacts with the guide portion 221 to limit the position shifter 230 from leaving the normal-ON position in the direction towards the selective ON/OFF position. When the position shifter 230 is at the normal-ON position, to prevent unintentional touch causing normal-ON function failure of the switch assembly 200, the third stop rib 2322 interferes with the guide portion 221 when the position shifter 230 moves in the direction towards the selective ON/OFF position, limiting the position shifter 230 from moving towards the selective ON/OFF position, thereby preventing unintentional touch-induced functional failure when the user uses the normal-ON function of the power tool, which enhances user experience.

[0039] In some implementations, the second limit column 232 further comprises a limit wall 2323, the limit wall 2323 limiting the position shifter 230 from being disengaged from the normal-ON position in a direction opposite the selective ON/OFF position. To further prevent failure of the unintentional touch-induced normal-ON function, the limit wall 2323 is arranged on the second limit column 232, so that the limit wall 2323 interferes with the guide portion 221 in the direction opposite the selective ON/OFF position to prevent the position shifter 230 from being disengaged from the normal-ON position, which further prevents unintentional touch-induced functional failure when the user uses the normal-ON function of the power tool, whereby user experience is further enhanced.

[0040] What have been described above are only example embodiments of the disclosure; however, the protection scope of the disclosure is not limited thereto. A person skilled in the art should understand that the disclosure includes, but is not limited to, the contents described in the drawings and the embodiments. Any modifications without departing from the functions and structural principles of the disclosure will be included within the scope of the claims.

Claims

1. A power tool, comprising a housing and a switch assembly, the switch assembly comprising a position shifter, the position shifter being movable relative to the housing to shift between a plurality of positions, the switch assembly being correspondingly disposed in one of a normal-OFF state, a selective ON/OFF state, and a normal-ON state when the position shifter is shifted to one of the plurality of positions, wherein a snap-in convex rib is arranged on the housing; a snap groove is formed on the position shifter; when the snap-in convex rib is snapped into the snap groove, the switch assembly is disposed in the selective ON/OFF state; when the snap-in convex rib is disengaged from the snap groove, the switch assembly is disposed in the normal-OFF or in the normal-ON state.

2. The power tool of claim 1, wherein two stop convex ribs are arranged on the position shifter, the snap groove is formed between the two stop convex ribs,

a snap-in arm is arranged on the housing, the snap-in convex rib is arranged on the snap-in arm, and when the snap-in convex rib abuts against an external side of a corresponding one of the two stop convex ribs, the switch assembly is disposed in the normal-OFF state or in the normal-ON state.

3. The power tool of claim 2, wherein the position shifter is further provided with a first reset unit, the first reset unit being operable to provide a reset force for resetting the switch assembly to the selective ON/OFF state.

4. The power tool of claim 1, wherein the switch assembly comprises a switch and a trigger, the trigger being operable for controlling closing or opening of the switch; a first limit column and a second limit column are provided on the position shifter, a guide passage being formed between the first limit column and the second limit column, a guide portion being provided on the trigger;
wherein the plurality of positions include:

a normal-OFF position, at which position the guide portion is limited by the first limit column and the switch assembly is in the normal-OFF state;
a selective ON/OFF position, at which position the guide portion is movable in the guide passage and the switch assembly is in the selective ON/OFF state;
a normal-ON position, at which position the guide portion is limited by the second limit column and the switch assembly is in the normal-ON state.

5. The power tool of claim 4, wherein a guide wall is arranged at a side of the first limit column proximal to the second limit column, the guide passage being formed between the second limit column and the guide wall.

6. The power tool of claim 5, wherein the guide wall comprises a first stop rib extending in a direction towards the trigger; in the normal-OFF state with the trigger being pressed, the first stop rib and the guide portion interact to limit the position shifter from being disengaged from the normal-OFF position.

7. The power tool of claim 4, wherein the second limit column comprises a second stop rib extending towards the trigger; in the selective ON/OFF state with the switch being open, the second stop rib and the guide portion interact to limit the position shifter from moving towards the normal-ON position.

8. The power tool of claim 4, wherein the second limit column comprises a third stop rib extending in a direction towards the switch; in the normal-ON state with the trigger being not pressed, the third stop rib and the guide portion interact to limit the position shifter from being disengaged from the normal-ON position in a direction towards the selective ON/OFF position.

9. The power tool of claim 4, wherein the second limit column comprises a limit wall; in the normal-ON state, the limit wall limits the position shifter from being disengaged from the normal-ON position in a direction opposite the selective ON/OFF position.

10. The power tool of claim 4, wherein the trigger and the switch are movably connected via a connector, a second reset unit being sleeved on the connector, the second reset unit being operable to reset the trigger.

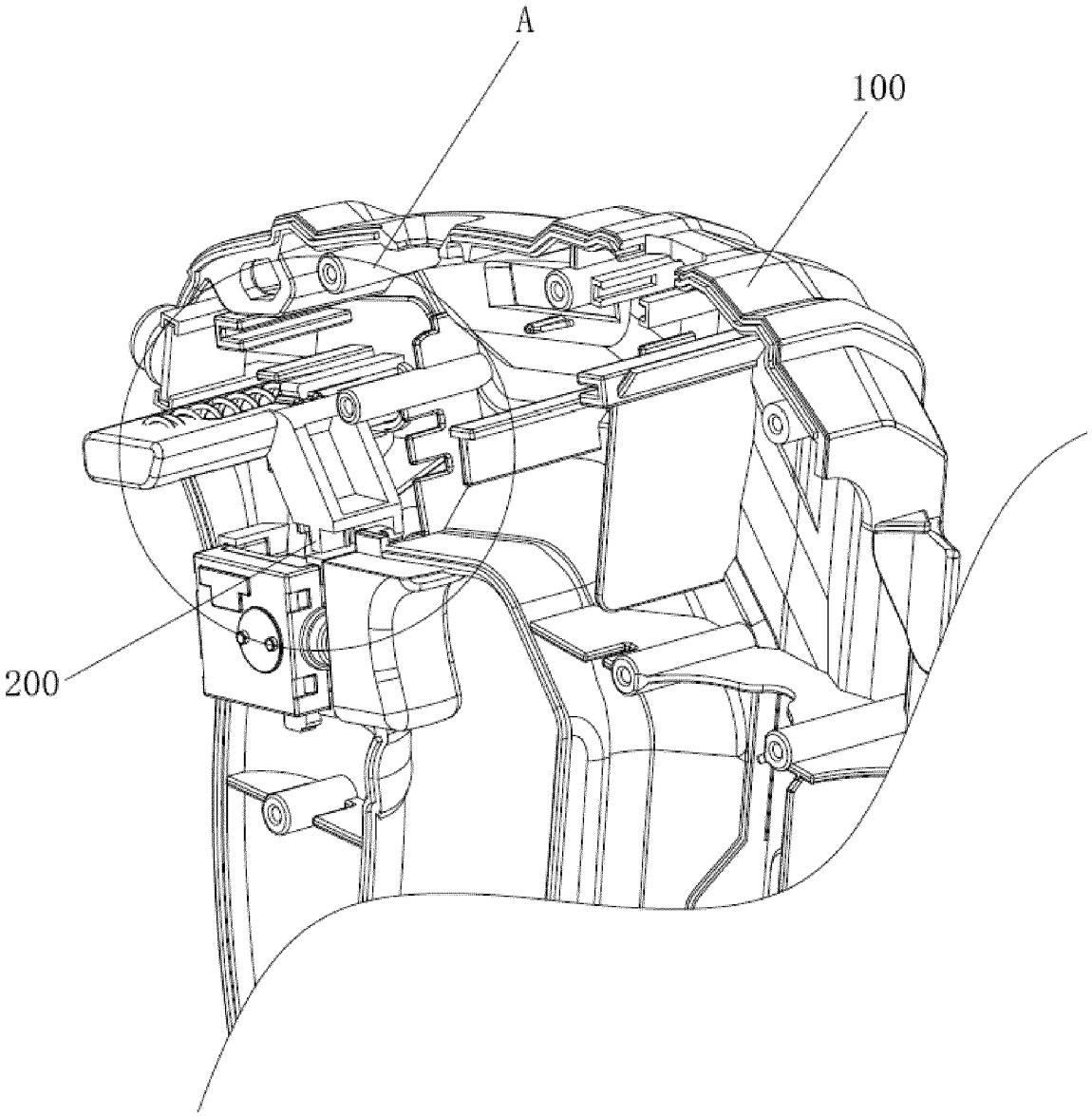

Fig. 1

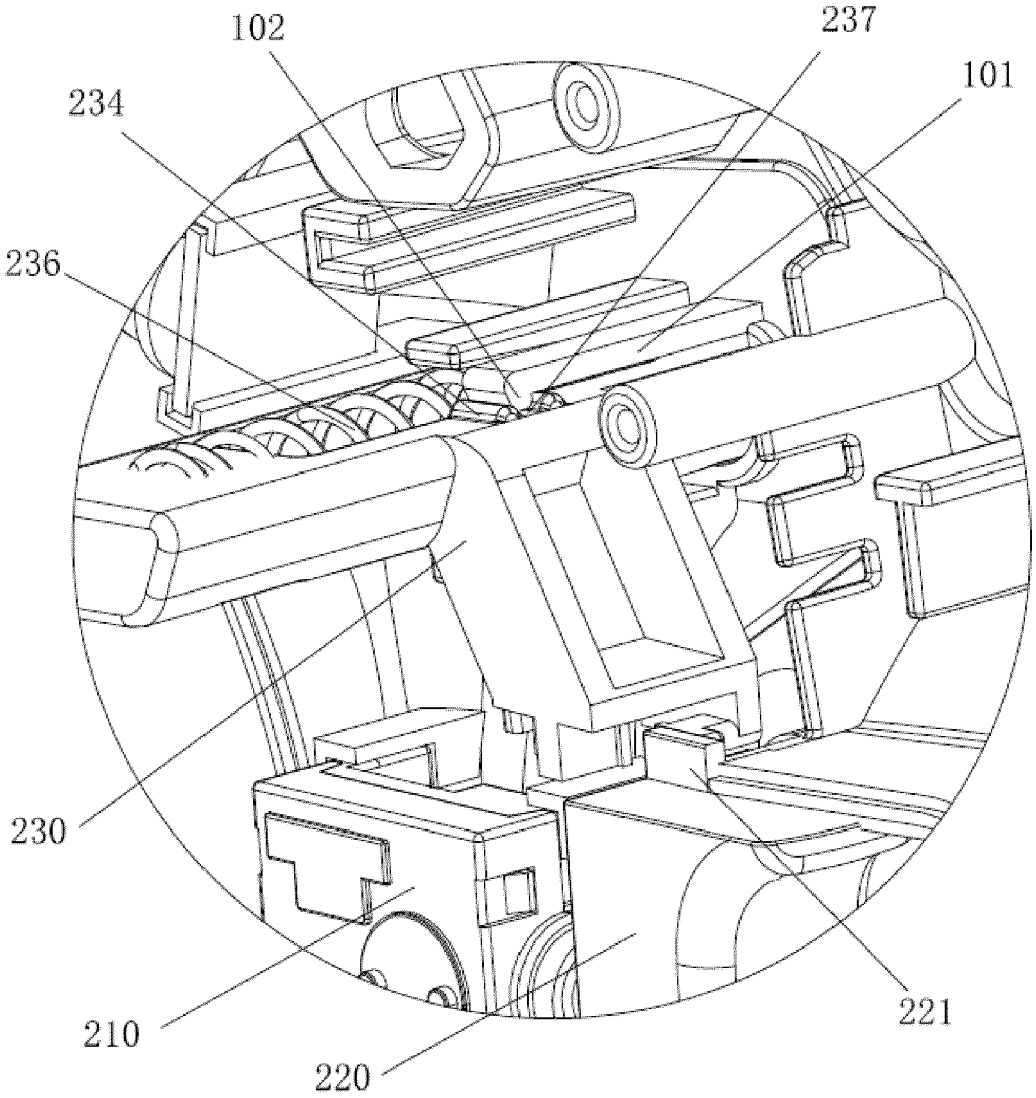

Fig. 2

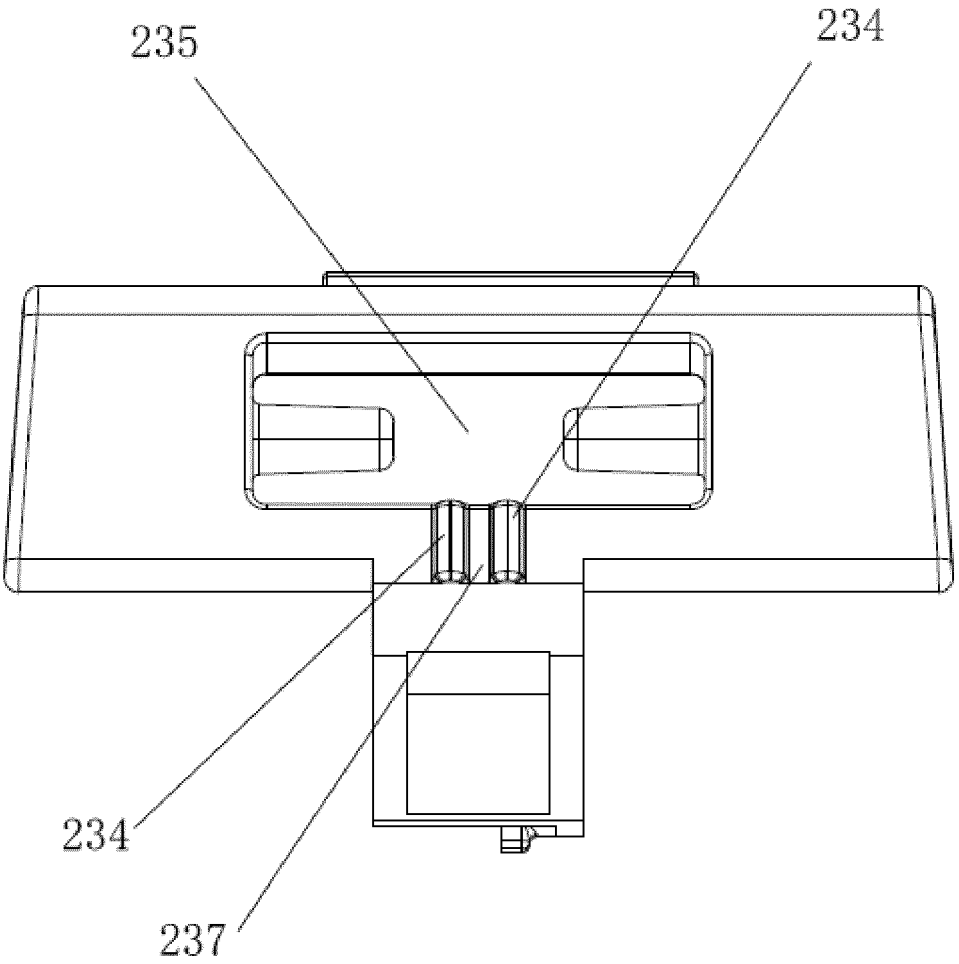

Fig. 3

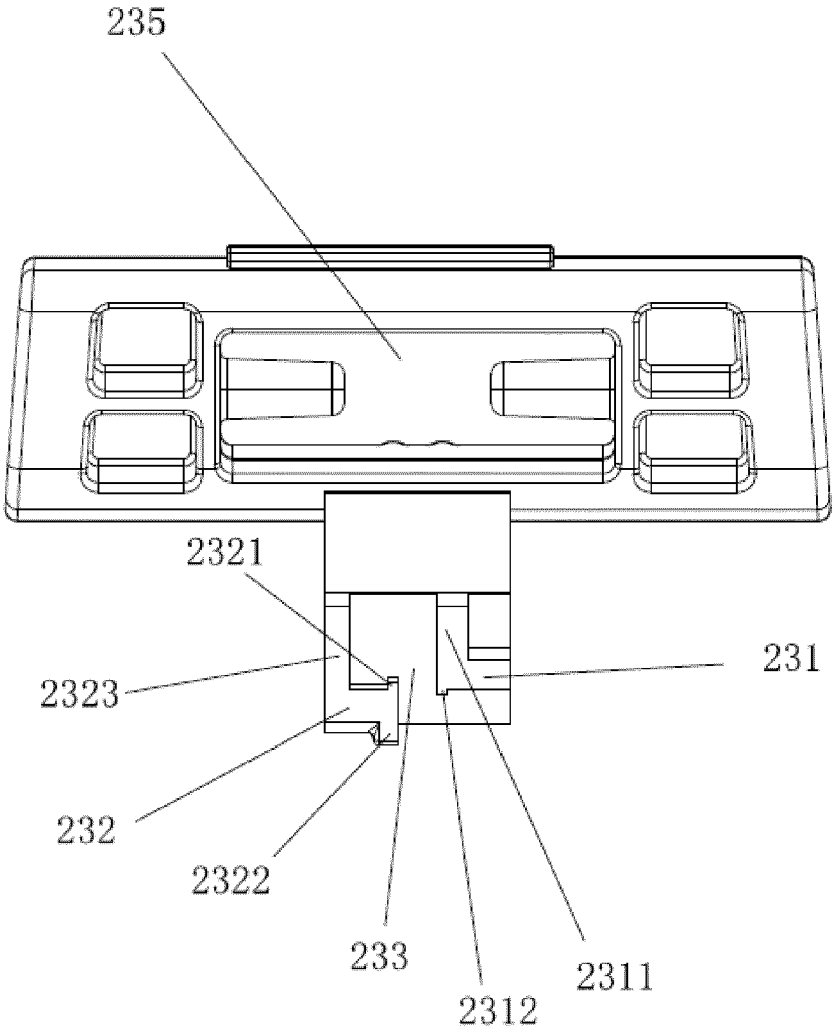

Fig. 4

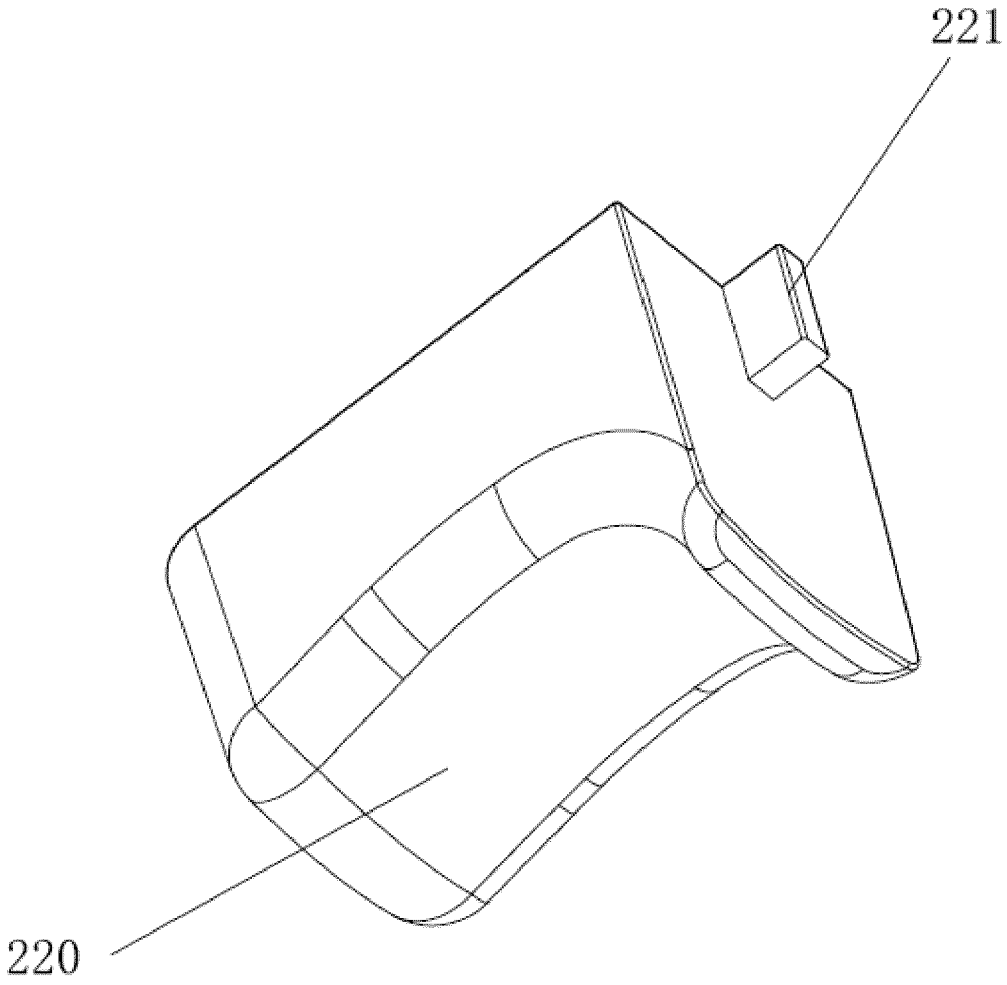

Fig. 5

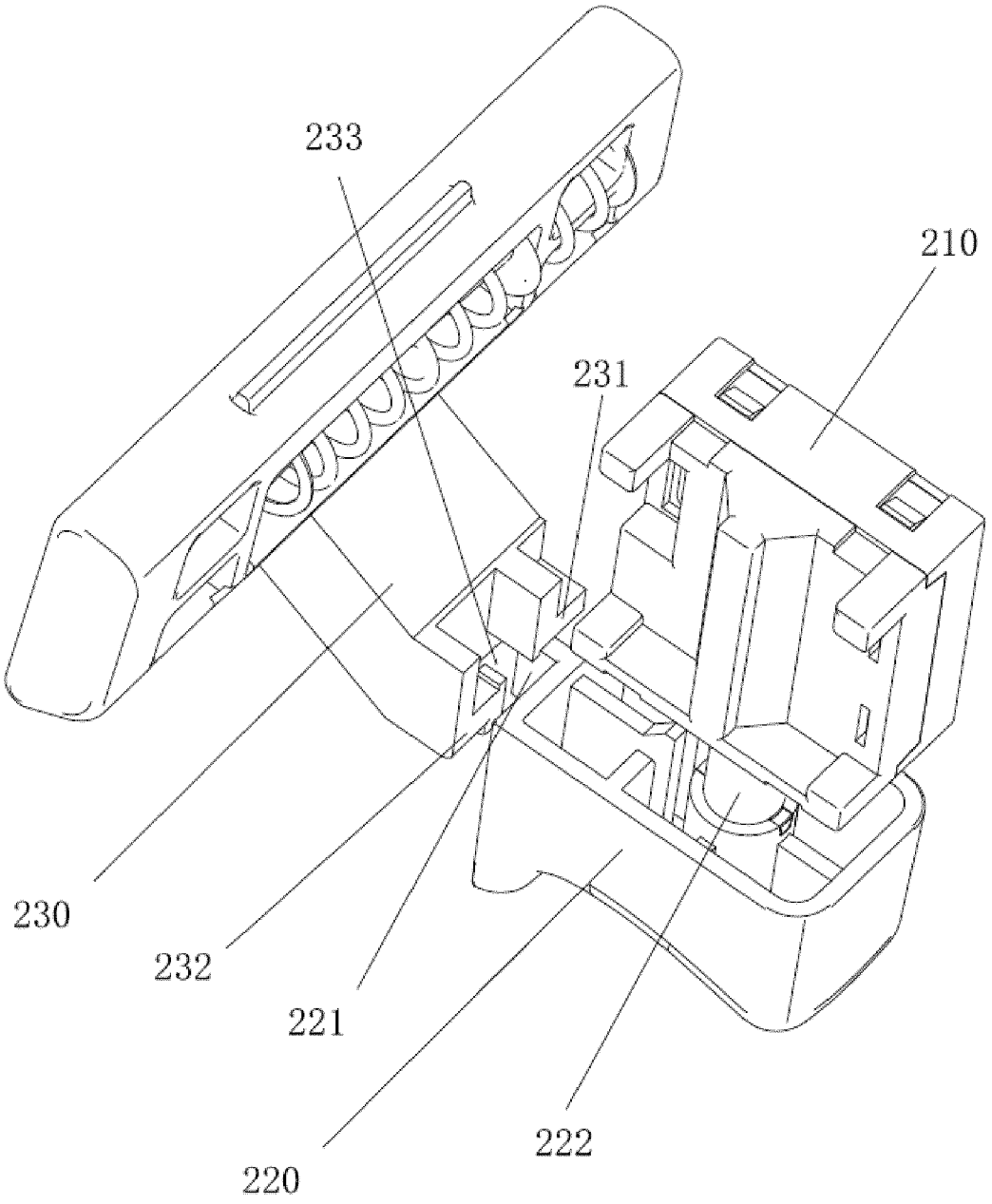

Fig. 6

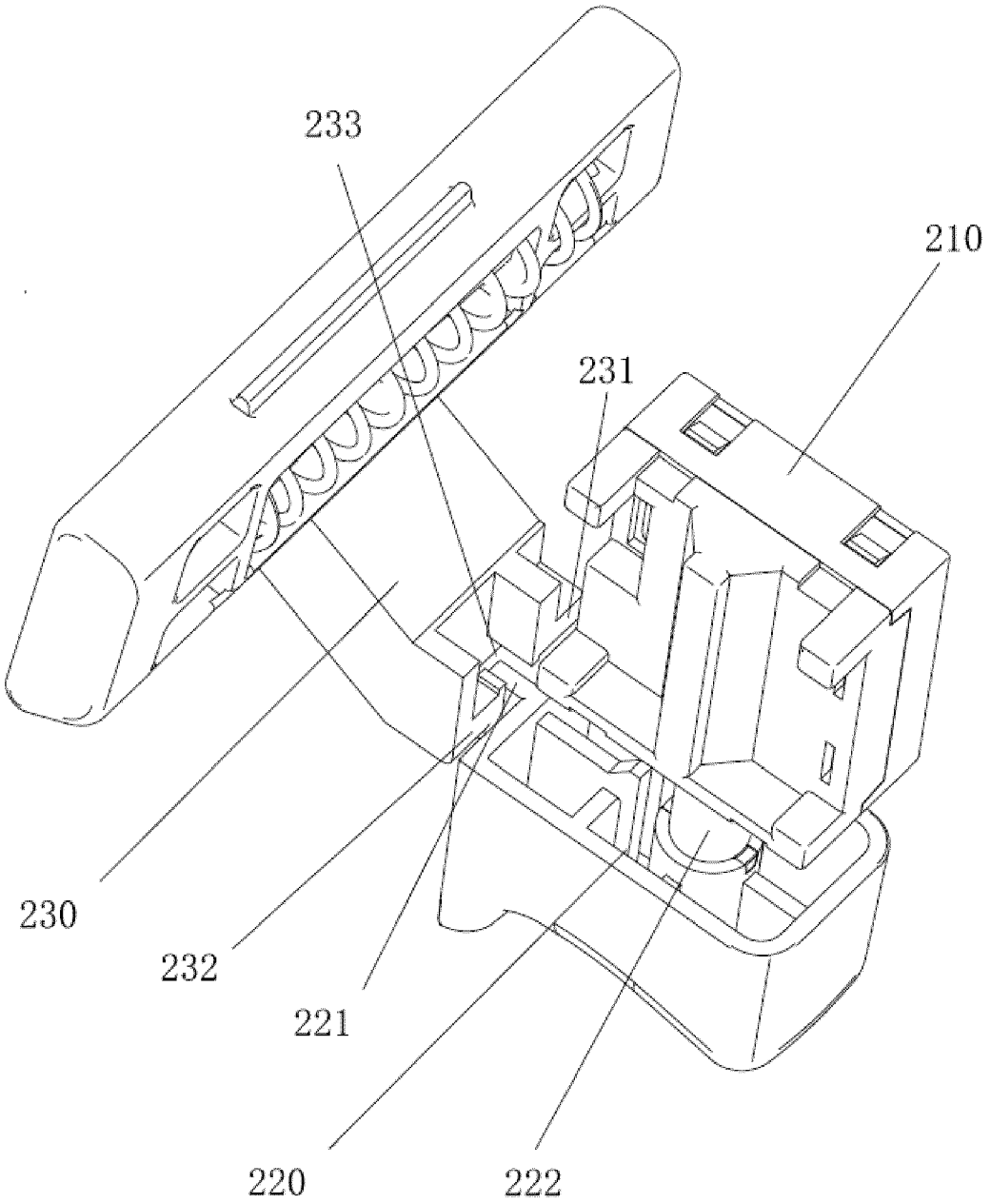

Fig. 7

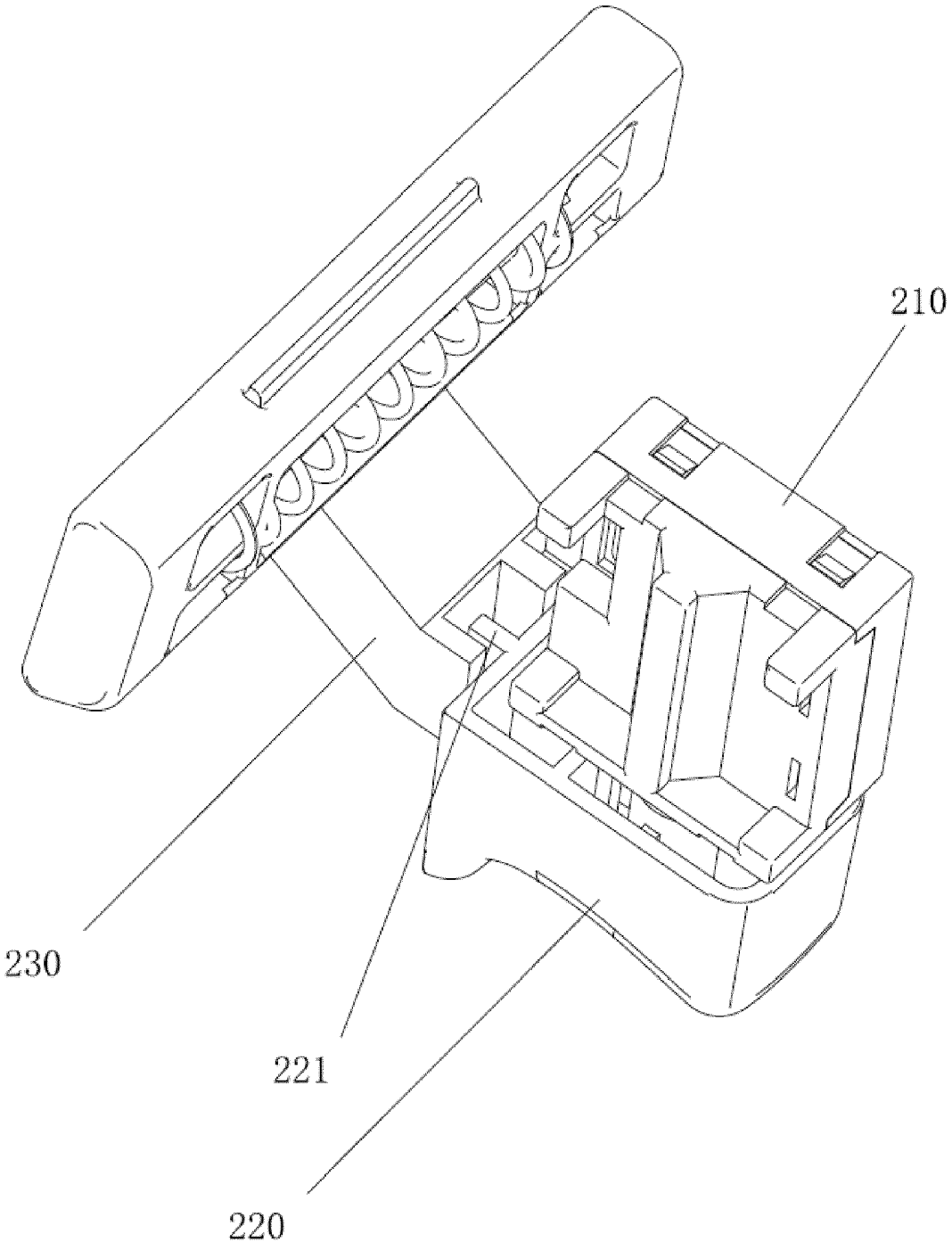

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 September 2024	Ramírez Fueyo, M

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