

A Switch for Kitchen & Bath Appliances

Technical Field

5 The present invention relates to a switch for kitchen and bath appliances.

Background Technology

10 Currently in the kitchen and bath field, switching mechanisms often have a complicated construction and are generally of the type pull-out switch, pull and pressing switch or pull and release switch, for example, a switch for a water diverter valve. These switches have a short service life and are subject to damages. Users also don't feel it is convenient to operate these switches. In addition, these switches are not interchangeable for different bathing appliances, which lead to
15 the facts that different switches must be used for different types of bathing appliances, which increase manufacture and management complicity and production cost.

Summary of the Invention

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 A technical problem solved by the present invention is to provide a switch for kitchen and bath appliances that is easy to operate and has a long service life. Accordingly, in a first aspect the present invention provides the following technical design: A switch for kitchen and bath appliances comprises a sliding
25 shaft, a fixed base, the fixed base having a sliding through hole for passing the

sliding shaft, and a retaining hook. A surface of the sliding shaft comprises a first stop position and a second stop position fitting with a hook part of the retaining hook, and the first stop position and the second stop position are located at different heights on the sliding shaft, with the first stop position being closer to a head of the sliding shaft than the second stop position. The surface of the sliding shaft further has a first unidirectional slide channel for the hook part of the retaining hook, the first unidirectional slide channel letting the sliding shaft move from a state where the first stop position is fitting with the hook part of the retaining hook to a state where the second stop position is fitting with the hook part of the retaining hook, a second unidirectional slide channel for the hook part of the retaining hook, the second unidirectional slide channel letting the sliding shaft move from a state where the second stop position is fitting with the hook part of the retaining hook to a state where the first stop position is fitting with the hook part of the retaining hook. The first unidirectional slide channel comprises a first slide way section starting at the first stop position and a second slide way section connected with the first slide way section and leading to the second stop position, with the connection from the second slide way section to the first slide way section being farther away from the head of the sliding shaft than the second stop position. The said second unidirectional slide channel comprises a third slide way section starting at the second stop position and a fourth slide way section connected with the third slide way section, with the connection from the fourth slide way section to the third slide way section being farther away from the head of the sliding shaft than the second stop position. The fourth slide way section is connected with the first slide way section or connected to the first stop position. The switch further comprises a spring pushing the sliding shaft along a direction from the head of the sliding shaft towards its tail.

The use of the technical design of the present invention changes traditional construction and operation method of the switch and provides simpler construction. In addition, the present invention allows changeover between switching-on and switching-off by only pressing the switch, so the present

invention is easy to operate and better complies with a user's ergonomic habit of applying a force, with good sealing effect, excellent durability and long service life. In addition, the present invention uses moving and static arrangement of fixed seat and sliding shaft, and installs corresponding auxiliary mechanism on the head of the sliding shaft, the switch can be turned on and off, so it can be widely applied and has a general purpose, so that this present invention is applicable to different kitchen, bathing, water supply and heating facilities, for example, installation requirements of waste of the sink, water diverter valve and other kitchen & bathing appliances.

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Brief Description of Drawings

Fig.1 is a sectional view of an example Embodiment 1 of the present invention when it fits with a first stop position at a hook part of a retaining hook.

Fig.2 is a sectional view of Embodiment 1 of the present invention when it fits with a second stop position at the hook part of the retaining hook.

Fig.3 is a diagram of a sliding shaft according to Embodiment 1 of the present invention.

Fig.4 is a front view of the sliding shaft shown in Fig.3 located in a unidirectional slide channel and stop position.

Fig.5 is a sectional view of an example Embodiment 2 of the present invention when it fits with a first stop position at a hook part of a retaining hook.

Fig.6 is a diagram of the present invention when it is applied in a water diverter and the water diverter is in down water dispensing position.

Fig.7 is a sectional view of the present invention when it is applied for a water diverter and is in upper water dispensing position.

Detailed Description of the Preferred Embodiment

Embodiment 1

Referring to Fig.1-Fig.4, a switch according to the present invention is provided with a sliding shaft 2, a fixed base 3 and a sliding through hole 31 for the sliding shaft 2 on the fixed base 3. The sliding shaft 2 passes through the hole 31, and the head of which extends out of the sliding through hole 31. If the head 21 of the sliding shaft 2 is connected with any extension, such extension may also extend out of sliding through hole 31 in the fixed base 3. In this embodiment, the tail of the sliding shaft 2 is connected with a button 1 by screw thread connection.

10 The switch has a spring 4 pushing the union body of the button 1 and the sliding shaft 2 from the head 21 of the sliding shaft 2 towards its tail. The spring 4 is located between the fixed base 3 and the button 1. The switch is also provided with a retaining hook 6 of the sliding shaft 2 connected to the fixed base 3 by hooking. There is a ring spring 5 fixing the retaining hook 6 on an outer side of the fixed base 3.

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If there is a supporting bracket for the spring 4 in the device using in the present invention, the spring 4 can also be located between the supporting bracket and the sliding shaft 2; the spring 4 can be positioned on the head 21 of the sliding shaft 2, inside the fixed base 3 or at any other positions where the sliding shaft 2 can obtain a force for moving from the head to the tail. The retaining hook 6 can also be connected to a device using the present invention. The retaining hook 6 can also be connected to a part connected with the fixed base 3.

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On the surface of the said sliding shaft 2, there are a first stop position 71 and a second stop position 72 fitting with a hook part of the retaining hook 6, and the first stop position 71 and the second stop position 72 are located at different heights on the surface of the sliding shaft 2, with the first stop position 71 closer to the head 21 of the sliding shaft 2. On the surface of the sliding shaft, there is a first unidirectional slide channel for the hook part 60 of the retaining hook 6 which lets the sliding shaft 2 move from a state where the first stop position 71 is

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fitting with the hook part 60 of the retaining hook 6 to a state where the second stop position 72 is fitting with the hook part 60 of the retaining hook 6. There is also a second unidirectional slide channel for the hook part 60 of the retaining hook 6 on the surface of the sliding shaft 2 which lets the sliding shaft 2 to move from a state where the second stop position 72 is fitting with the hook part 60 of the retaining hook 6 to the state where the first stop position 71 is fitting with the hook part 60 of the retaining hook 6. The first unidirectional slide channel comprises a first slide way section 81 starting at the first stop position 71 and a second slide-way section 82 connected with the first slide way section 81 and leading to the second stop position 72, with the connection from the second slide-way section 82 to the first slide way section 81 being farther from the head 21 of the sliding shaft 2 than the second stop position 72. The second unidirectional slide channel comprises a third slide way section 83 starting at the second stop position 72 and a fourth slide way section 84 connected with the third slide way section 83, with the connection from the fourth slide way section 84 to the third slide way section 83 being farther away from the head 21 of the sliding shaft 2 than the second stop position 72, and the fourth slide way section 84 is connected with the first slide way section 81 or connected to the first stop position 71.

To realize relative unidirectional slide movement between the slide channels and the hook part 60 can be through a design for the channel wall of the slide channels, or a design for the channel bottom of the slide channels. In this embodiment, such relative unidirectional slide movement is realized through the design for the channel bottom of the slide channel, so that the switch has higher operation reliability and longer service life. Its design scheme is as follows: the first slide way section 81 and second slide way section 82 are connected in the form of a step, and at connection 91, the channel bottom of the second slide way section 82 is lower than that of the first slide way section 81. The third slide way section 83 and fourth slide way section 84 are connected in the form of a step, and at connection 92, the channel bottom of the fourth slide way section 84 is lower than that of the third slide way section 83. The second slide way section 82 has a

down step 93 near the second stop position 72. The fourth slide way section 84 and first slide way section 81 are connected in the form of a step, and at connection 94, the channel bottom of the first slide way section 81 is lower than that of the fourth slide way section 84.

5 In operation, a pressure force is applied on the button 1, and the button 1 drives the sliding shaft 2 to move down. Meanwhile retaining hook 6 is affected by the ring spring 5 and its fixing end is positioned on the fixed base 3. The hook part 60 of the retaining hook 6 slides up along the first slide way section 81. When the button 1 is depressed all the time, the hook part 60 of the retaining hook
10 6 enters the second slide way section 82 at the connection 91. When the button 1 is released, and the button 1 drives the sliding shaft 2 to move up under the action of spring 4, but as the first slide way section 81 and second slide way section 82 are connected in the form of a step, and at the connection 91, the channel bottom of the second slide way section 82 is lower than that of the first slide way section
15 81, the hook part 60 of the retaining hook 6 cannot move back along the original way and can only move down to the second stop position 72 area along the second channel to hook the vector point position of the second stop position 72, which is one state position of the switch and achieves downward movement of the sliding shaft 2. Meanwhile the spring 4 is in the compressed state.

20 Press the button 1 again. Since the second slide way section 82 has a down step at the position near second stop position 72, and the hook part 60 of the retaining hook 6 cannot move back along the original way and can only move up along the third slide way section 83 and enters the fourth slide way section 84. When the button 1 is released, the button 1 and the sliding shaft 2 move up under
25 the action of spring 4. As the third slide way section 83 and fourth slide way section 84 are connected in the form of a step, and at the connection 92, the channel bottom of the fourth slide way section 84 is lower than that of the third slide way section 83. The hook part 60 of the retaining hook 6 cannot move back on the original way and can only move down to the first stop position 71 along the
30 fourth slide way section 84 or move down into the first slide way section 81 along the fourth slide way section 84 and finally returns to the first stop position 71 and

hooks the first stop position 71, which is another state position of the switch and finishes upward movement of the sliding shaft 2.

The present invention makes convenient and accurate reciprocating motion of the necessary mechanism between the upper and lower vector points through manual way. Add an auxiliary mechanism on the head 21 of sliding shaft 2, the
5 sliding shaft 2 will drive the auxiliary mechanism to move up and down and thus execute switching on/off function. Besides by adding seal equipments, the switch can execute switching on/off function in the applications where liquid exist. Particularly, it can execute switching on/off function widely in the field of kitchen
10 and bathroom. In this embodiment, the head 21 of the sliding shaft 2 extends out of the sliding hole which is convenient for the connection of the head of the sliding shaft and the auxiliary structure and can make the connection more securely. If these conveniences and effects are not taken into account, the head of the sliding shaft may not extend out of the sliding hole, and the auxiliary
15 structure is connected with the head of the sliding shaft via a connection part.

This embodiment is provided with a circumferential positioning mechanism for the sliding shaft 2, and fits with the slide-way on the immovable sliding shaft through a certain degree of the swinging of the hook part 60 of the retaining hook 6. This circumferential positioning mechanism comprises a positioning slot 22 in
20 axial direction provided on the sliding shaft 2 and a positioning block 32 provided on the fixed base 3, the positioning block 32 is fitted with the positioning slot 22. The shape of the positioning block 32 can also be used for fitting with the retaining hook 6. As shown in the figure, the retaining hook is connected by hooking to the protruding positioning block 32 part of the fixed base 3. The
25 circumferential positioning mechanism can also be the positioning channel provided in other position on the fixed base 3, such as inner hole. The protruding positioning block 32 is positioned at other corresponding position on the sliding shaft 2. In addition, the circumferential positioning mechanism can adopt other common circumferential positioning mechanisms between shaft and sleeve or
30 execute corresponding positioning function by applying of particular device.

In practice, the sliding shaft 2 can also be used to rotate by a specified angle

to provide the fit with the slide-way and retaining hook 6, but it is not as convenient and comfortable in use as the present embodiment.

Embodiment 2

The fixed base in Embodiment 1 can also be formed by some parts connected with each other. Referring to Fig.5, in this embodiment, the fixed base comprises a mounting body 33 and a sleeve 34 connected with the rear part of the mounting body 33. The sliding shaft 2 is smaller near its tail or between its middle and tail and goes through the sleeve 34. The sleeve 34 has a small hole 35 that fits with the section of the sliding shaft 2 which has shorter diameter. The retaining hook 6 is connected by hooking on the mounting body 33. A ring spring for fixing the retaining hook 6 is provided on an outer side of the mounting body 33.

Hence, the sealing device can be mounted on the smaller part of the sliding shaft 2 and is connected with the small hole 35 in the connection sleeve 34 in order to reduce sliding resistance and sealing difficulty, when the sliding shaft 2 must have a sealed connection with the fixed base 3.

Other parts of this embodiment are the same as Embodiment 1. The same item numbers in Fig.5 as in Figures 1-4 have the same meanings as in Figures 1-4.

Embodiment 3

Referring to Fig.6, in this embodiment, the present invention is installed on a water diverter. In this embodiment, a supporting bracket 41 for the spring 4 is mounted on the water diverter. The spring 4 is between the supporting bracket 41 and the valve core 23 connected with the head 21 of the sliding shaft 2. Up and down movement of the valve core 23 and sliding shaft 2 respectively turns on and off the water dispensing of upper and down sealing seats and thus provides control for upper dispensing and down dispensing.

Other parts of the switch in this embodiment are the same as which in Embodiment 2.

Claims

1. A switch for kitchen and bath appliances wherein it comprises a sliding shaft, a fixed base, the fixed base having a sliding through hole for passing the sliding shaft, and a retaining hook, a surface of the sliding shaft comprises a first stop position and a second stop position fitting with a hook part of the retaining hook, and the first stop position and the second stop position are located at different heights on the sliding shaft, with the first stop position being closer to a head of the sliding shaft than the second stop position, the surface of the sliding shaft further has a first unidirectional slide channel for the hook part of the retaining hook, the first unidirectional slide channel letting the sliding shaft move from a state where the first stop position is fitting with the hook part of the retaining hook to a state where the second stop position is fitting with the hook part of the retaining hook, a second unidirectional slide channel for the hook part of the retaining hook, the second unidirectional slide channel letting the sliding shaft move from a state where the second stop position is fitting with the hook part of the retaining hook to a state where the first stop position is fitting with the hook part of the retaining hook, the first unidirectional slide channel comprises a first slide way section starting at the first stop position and a second slide way section connected with the first slide way section and leading to the second stop position, with the connection from the second slide way section to the first slide way section being farther away from the head of the sliding shaft than the second stop position, the said second unidirectional slide channel comprises a third slide way section starting at the second stop position and a fourth slide way section connected with the third slide way section, with the connection from the fourth slide way section to the third slide way section being farther away from the head of the sliding shaft than the second stop position, the fourth slide way section is connected with the first slide way section or connected to the first stop position, the switch further comprises a spring pushing the sliding shaft along a direction from the head of the sliding shaft towards its tail.

2. The switch for kitchen and bath appliances according to Claim 1, wherein the first slide way section and second slide way section are connected in the form of a step, and at the connection, the channel bottom of the second slide way section is lower than that of the first slide way section, the third slide way section and fourth slide way section are connected in the form of a step, and at the connection, the channel bottom of the fourth slide way section is lower than that of the third slide way section, the second slide way section has a down step near the second stop position, the fourth slide way section and first slide way section are connected in the form of a step, and at the connection, the channel bottom of the first slide way section is lower than that of the fourth slide way section.

3. The switch for kitchen and bath appliances according to Claim 1, wherein the head or the extension section of the sliding shaft passes through and extends out of the sliding through the hole in the fixed base.

4. The switch for kitchen and bath appliances according to Claim 1 wherein it has a circumferential positioning mechanism for the sliding shaft.

5. The switch for kitchen and bath appliances according to Claim 4, wherein the circumferential positioning mechanism comprises a positioning slot in axial direction provided on the sliding shaft and a positioning block provided on the fixed base fitting with the positioning slot.

6. The switch for kitchen and bath appliances according to Claim 1, wherein the retaining hook is connected by hooking to the fixed base, and on an outer side of the fixed base there is a ring spring for fixing the retaining hook.

7. The switch for kitchen and bath appliances according to Claim 5, wherein the retaining hook is connected by hooking to the positioning block on the fixed base, and on an outer side of the fixed base there is a ring spring for fixing the

retaining hook.

8. The switch for kitchen and bath appliances according to Claim 1, wherein
the fixed base comprises a mounting body and a sleeve connected with the rear
5 part of the mounting body. The sliding shaft is smaller near its tail or between its
middle and tail and goes through the sleeve. The sleeve has a small hole that fits
with the section of the sliding shaft which has shorter diameter.

9. The switch for kitchen and bath appliances according to Claim 8, wherein
10 the retaining hook is connected by hooking onto the mounting body, and on an
outer side of the mounting body there is a ring spring for fixing the retaining
hook.

10. The switch for kitchen and bath appliances according to Claim 1, wherein
15 the tail of the sliding shaft is connected with a button, and the spring is located
between the fixed base and the button.