

PANEL SWITCH

FIELD OF THE INVENTION

[0001] Embodiments of the present disclosure relate to a panel, and more specifically to a panel switch with a replaceable operation panel.

BACKGROUND OF THE INVENTION

[0002] Panel switches are widely applied in various fields such as households and factories. In some cases, a user desires to change a switch panel color of a panel switch for example for the sake of beautification. However, an operational panel of a traditional panel switch is irreplaceable or hardly replaceable, and a special tool is needed for replacement even if it is replaceable. If the user is unfamiliar with its structure, its structure would be easily broken when dismantling. Further, a household user is always unfamiliar with its internal structure; therefore, there is a requirement for improving a traditional panel switch.

SUMMARY OF THE INVENTION

[0003] In view of the above, one of the objectives of the embodiments of the present disclosure lies in providing a panel switch whose switch operation panel can be easily replaced.

[0004] According to one aspect of the present disclosure, there is provided a panel switch, comprising: a first panel provided with an opening that can accommodate at least one switch function module; at least a second panel whose number corresponds to a number of the switch function modules, each of the second panel abutting to a corresponding switch function module and being configured to interact with the switch function module when the second panel is pressed so as to achieve a switch between ON and OFF states; a third panel configured to be capable of releasing an engagement between the first panel and the second panel when the third panel is pressed.

[0005] According to one embodiment of the present disclosure, the first panel and the second panel are axle-hole connected, the third panel and the first panel being axle-hole connected, and the second panel and the third panel are clip-fitted together.

[0006] According to one embodiment of the present disclosure, the second panel comprises a aperture inclining towards a predetermined direction, the first panel comprising a first axle; when the second panel is installed on the first panel, the first axle being adapted to be inserted into the aperture such that the second panel, when a predetermined area of the second panel is pressed, rotates about the first axle so as to interact with the corresponding switch function module.

[0007] According to one embodiment of the present disclosure, the third panel comprises a second axle, the first panel comprises a aperture; when the third panel is mounted on the first panel, the second axle is adapted to be inserted in the aperture such that the third panel, when being pressed, rotates about the second axle so as to release a clip-fit connection between the third panel and the second panel.

[0008] According to one embodiment of the present disclosure, the second panel comprises a fixture block; after the second panel is mounted to the first panel, the fixture block projects from the second panel and is adapted to be suppressed by an edge of a lower surface of the third panel.

[0009] According to one embodiment of the present disclosure, a side edge of the second panel abuts against an end face of the first panel, the fixture block is disposed at an opposite side

edge of the second panel, and the panel switch is configured such that the second panel and the third panel are arranged substantially on a plane in a manner of covering the first panel when the second panel, the first panel, and the third panel are mounted together.

[0010] According to one embodiment of the present disclosure, the first panel further comprises a location column, the location column being provided thereon with a first reset spring for resetting the third panel.

[0011] According to one embodiment of the present disclosure, the switch function module is provided with a hole, inside the hole being provided a second spring for applying force towards the second panel.

[0012] According to one embodiment of the present disclosure, the second panel is a switch key panel, and the first panel is a mount panel.

[0013] According to one embodiment of the present disclosure, an area of the second panel is larger than an area of the third panel, and the number of the third panel is 1.

[0014] The switch according to the embodiments of the present disclosure can easily release an engagement between the first panel and the second panel by pressing the third panel because the third panel is configured to be capable of releasing an engagement between the first panel and the second panel when the third panel is pressed. Further, the user can conveniently replace the second panel without using any tool, which facilitates the user to easily replace the panel, thereby satisfying the user's demands of free combination of multiple appearance colors, as an example.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0015] Now, the embodiments of the present disclosure will be described with reference to the accompanying drawings only in an exemplary manner, wherein:

[0016] Fig. 1 shows a schematic perspective diagram of an integral structure of a panel switch according to one embodiment of the present disclosure;

[0017] Fig. 2 shows a schematic perspective diagram in which a switch operation panel in the panel switch of Fig. 1 is dismantled;

[0018] Fig. 3 is an exploded view of a panel switch shown in Fig. 1;

[0019] Fig. 4 shows a structural detail of front and back faces of a switch operation panel;

[0020] Fig. 5 is a schematic diagram of a mount panel according to one embodiment of the present disclosure;

[0021] Fig. 6 is a sectional view of panel switch sectioned along a switch operation panel according to one embodiment of the present disclosure, wherein the mount panel and the switch operation panel are engaged with each other;

[0022] Fig. 7 shows a structural detail of engagement between a mount panel and a switch operation panel;

[0023] Fig. 8 shows a detailed diagram of releasing mutual interaction among a release operation panel, a mount panel, and a switch operation panel, wherein the release operation panel releases an action between the mount panel and the switch operation panel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0024] Hereinafter, the embodiments of the present disclosure will be described in detail. It should be noted that like reference numerals may be used for like components or functional

assemblies in the drawings. The drawings only intend to illustrate the embodiments of the present disclosure. Those skilled in the art may obtain an alternative solution from the description below without departing from the spirit and protection scope of the present disclosure.

[0025] The embodiments of the present disclosure provide a panel switch, comprising: a first panel provided with an opening that can accommodate at least one switch function module; at least a second panel whose number corresponds to the number of the switch function modules, each of the second panel abutting to a corresponding switch function module and being configured to interact with the switch function module when the second panel is pressed so as to achieve a switch between ON and OFF states; and a third panel configured to be capable of releasing an engagement between the first panel and the second panel when the third panel is pressed.

[0026] In the embodiments of the present disclosure, the first panel corresponds to a mount panel, the second panel corresponds to a switch operation panel, while the third panel corresponds to a release operation panel, wherein the mount panel is for fixing a switch module onto for example a wall; the switch operation panel, e.g., in a key or button form, is for controlling an action of the switch function module, so as to switch between ON and Off of the switch; the release operation panel, e.g., in a button form, is for being capable of releasing an engagement between the mount panel and the switch operation panel when being pressed, thereby conveniently replacing the switch operation panel. It should be understood that the term operation panel here, although referred to as a panel, is not necessarily a panel, which, for example, may assume a form of key, or a form of panel button, as long as it is a component that functions when being pressed.

[0027] Hereinafter, a panel switch according to the present disclosure will be illustrated in detail.

[0028] Fig. 1 shows a schematic perspective diagram of an integral structure of a panel switch according to one embodiment of the present disclosure; and Fig. 2 shows a schematic perspective diagram in which the switch operation panel in the panel switch of Fig. 1 is dismantled.

[0029] As shown in Figs. 1 and 2, a panel switch according to the embodiments of the present disclosure comprises: a mount panel 6 provided with an opening that can accommodate two switch function modules 5; two switch operation panels 3, each of the switch operation panels 3 abutting to a corresponding switch function module 5 and being configured to interact with the switch function module 5 when the switch operation panel 3 is pressed so as to achieve a switch between ON and OFF states. The panel switch according to the embodiments of the present disclosure further comprises a release operation panel 1 configured to be capable of releasing an engagement between the mount panel 6 and the switch operation panel 3 when the release operation panel 1 is pressed. In the panel switch according to the embodiments of the present disclosure, because the release operation panel 1 is configured to be capable of releasing an engagement between the mount panel 6 and the switch operation panel 3 when the release operation panel 1 is pressed, the user may conveniently replace the second panel without any tool, which facilitates the user to easily replace the panel, thereby satisfying the user's demands of free combination of multiple appearance colors, or other replacement requirement.

[0030] Although the figure shows a scenario of comprising two switch function modules 5 and

corresponding two switch operation panels 3, it should be understood that it is merely exemplary, and for example there may only be provided one switch function module 5 and one switch operation panel 3. The numbers of the switch function module 5 and the switch operation panel 3 may be set as required, e.g., in a further embodiment, three or more may be provided. Each switch operation panel 3 controls a switch function module 5, and the interaction between the switch function module 5 and the switch operation panel 3 may be realized by pressing the switch operation panel 3, thereby realizing an ON/OFF state of the switch. The switch function module 5 is a switch function module in the prior art, e.g., the switch function module 5 is a auto-restoration switch function module, i.e., performing switch between ON and OFF states by pressing the switch, and the panel automatically restores the initial position upon release of the external force. Its detailed depiction will be omitted, and in the description infra, it will focus on features related to the inventive point of the present application.

[0031] Now, structural details of the switch panel of the embodiments according to the present disclosure will be further illustrated with reference to Figs. 3-8. Fig. 3 is an exploded view of a panel switch shown in Fig. 1; Fig. 4 is a structural detail of front and back faces of a switch operation panel; Fig. 5 is a schematic diagram of a mount panel according to one embodiment of the present disclosure; Fig. 6 is a sectional view of panel switch sectioned along a switch operation panel according to one embodiment of the present disclosure, wherein the mount panel and the switch operation panel are engaged with each other; Fig. 7 shows a structural detail of engagement between a mount panel and a switch operation panel; Fig. 8 shows a detailed diagram of mutual interaction among an release operation panel, a mount panel, and a switch operation panel, wherein the release operation panel releases an action between the mount panel and the switch operation panel.

[0032] According to one embodiment of the present disclosure, the mount panel 6 and the switch operation panel 3 are axle-hole connected, the release operation panel 1 and the mount panel 6 being axle-hole connected, and the switch operation panel 3 and the release operation panel 1 are clip-fitted together.

[0033] As shown in the figures, the switch operation panel 3 comprises a aperture 3.1 inclining towards a predetermined direction. As shown in Figs. 6 and 8, the aperture inclines towards the right bottom direction. In the embodiments as shown in the figures, the mount panel 6 comprises an axle 6.3 (particularly shown in Fig. 5). When the switch operation panel 3 is installed on the mount panel 6, the axle 6.3 is adapted to be inserted into the aperture 3.1 such that the switch operation panel 3, when a predetermined area of the switch operation panel 3 is pressed, rotates about the axle 6.3 so as to interact with the corresponding switch function module 5. There is no limitation on the inclination angle and shape of the aperture, as long as it is adapted to accommodate the rotation of the axle 6.3 and can leave the space for the axle 6.3 to disengage. Through the axle-hole connection between the mount panel 6 and the switch operation panel 3, the connection between the mount panel 6 and the switch operation panel 3 can be simply realized. Where the aperture inclines towards a predetermined direction (e.g., right bottom), the switch operation panel 3 may be rotated about the axle 6.3 when a predetermined area of the switch operation panel 3 is pressed; meanwhile, under the action of the pressing force, the panel transmits force to the switch function module 5, further driving the switch function module 5 to act, thereby implementing a switch function.

[0034] According to one embodiment of the present disclosure, the release operation panel 1

and the mount panel 6 are axle-hole connected. Particularly, as shown in Fig. 3, the release operation panel 1 comprises an axle 1.1. The axle 1.1 for example extends along a panel extension direction. The mount panel 6 comprises an aperture 6.1. For example, the aperture 6.1 is disposed at an end part of the mount panel 6 which is adapted to mount the release operation panel 1. In one embodiment, the aperture 6.1 of the mount panel 6 is different from the aperture 3.1. For example, the aperture 6.1 does not have an open end, such that the release operation panel 1 cannot disengage from the mount panel 6. When the release operation panel 1 is mounted on the mount panel 6, the second axle is adapted to be inserted in the aperture (e.g., through elastic deformation) such that the release operation panel 1, when being pressed, rotates about the second axle so as to release a clip-fit between the release operation panel 1 and the switch operation panel 3.

[0035] According to one embodiment, as shown in Figs. 4 and 6, the switch operation panel 3 comprises a fixture block 3.2; after the switch operation panel 3 is mounted to the mount panel 6, the fixture block 3.2 projects from the switch operation panel 3 and is adapted to be suppressed by an edge of a lower surface of the operation panel 1. In this manner, the release operation panel 1 suppresses the fixture block so as to firmly attach the switch operation panel 3 to the mount panel 6. In one embodiment, a side edge of the switch operation panel 3 abuts against an end face of the mount panel 6, the fixture block 3.2 is disposed at an opposite side edge of the switch operation panel 3, and the panel switch is configured such that the switch operation panel 3 and the release operation panel 1 are arranged substantially on a plane in a manner of covering the mount panel 6 when the switch operation panel 3, the mount panel 6, and the release operation panel 1 are mounted together. Such a structure is relatively beautiful and can be easily operated.

[0036] According to one embodiment of the present disclosure, the mount panel 6 further comprises a location column 6.2, the location column 6.2 being provided thereon with a first reset spring 2 for resetting the release operation panel 1. Where the reset spring 2 is provided, when pressing the release operation panel 1, the axle 1.1 of the release operation panel 1 will rotate within the aperture 1.1, and the release operation panel 1 will be biased towards one side, and the first reset spring 2 will rotate along with this; when the pressure is removed, under the action of the first reset spring 2, the release operation panel 1 will be reset.

[0037] According to one embodiment of the present disclosure, the switch function module 5 is provided with a hole 5.1, inside the hole 5.1 being provided a second spring 4 for applying force towards the switch operation panel 3. When the spring 4 is provided, after the engagement between the switch operation panel 3 and the mount panel 6 is released by pressing the release operation panel 1, under the action of the spring 4, the spring pushes the switch operation panel 3 upwards, thereby conveniently and quickly separating the switch operation panel 3 from the mount panel 6, thereby facilitating the user to replace the switch operation panel 3.

[0038] According to one embodiment of the present disclosure, an area of the switch operation panel 3 is larger than an area of the release operation panel 1, the number of the release operation panel 1 being 1. With one release operation panel, an engagement between one or more switch operation panels 3 and the mount panel may be released.

[0039] Hereinafter, the operation manner of the panel switch according to the embodiments of the present disclosure will be illustrated with reference to Figs. 6 and 8.

[0040] Fig. 6 shows a normal operation state of the panel switch according to the

embodiments of the present disclosure. In the state of Fig. 6, the switch panel button will be clipped on the switch panel so as to move along with the switch module panel, for switching between ON/OFF states of the switch. When the user presses a part of the switch operation panel 3 at the left side of the spring 4, under the action of the pressing force, the switch operation panel 3 rotates counterclockwise about the axle 6.3, thereby driving the switch function module 5 to move, so as to control the switch function module 5 to play a switching function. In this state, because the release operation panel 1 is not pressed, the switch operation panel 3 is clipped with the release operation panel 1 via the fixture block 3.2, and the mount panel 6 and the switch operation panel 3 are securely engaged with each other.

[0041] Fig. 8 shows an operation state when the release operation panel 1 releases the engagement between the mount panel 6 and the switch operation panel 3. As shown in Fig. 8, the user presses the release operation panel 1; because the release operation panel 1 and the mount panel 6 are axle-hole connected, under the action of pressing force, the release operation panel 1 rotates counterclockwise within the aperture 6.1, thereby relieving the clip-fitting action between the release operation panel 1 and the fixture block 3.2. The first spring 2 is preset at a compressed state; after the clip-fitting action is released, under the action of the first spring 2, the first spring 2 applies an upward force to the switch operation panel 3, thereby ejecting the switch operation panel 3; in this case, the user may conveniently replace the switch operation panel 3. On the other hand, the second spring 4 is likely preset at a compressed state, such that when the clip-fitting action between the release operation panel 1 and the fixture block 3.2 is released, the second spring 4 resets the release operation panel 1.

[0042] For the switch panel according to the embodiments of the present disclosure, when the release operation panel 1 is pressed, the release operation panel 1 will rotate downward and meanwhile compresses the release button spring 2; when the release operation panel 1 rotates over a certain angle, the clip portion provided on the switch operation panel 3 completely separates from the limit of the release operation panel 1; under the action of a panel ejecting spring 4, the switch operation panel 3 will be ejected, and the user may directly take the switch operation panel off to freely replace with a switch panel with an appearance color as desired. Besides, the release operation panel 1 and the switch operation panel 3 assume a form of panel and are clip-fitted with each other, such that the gap size between switch panels is relative short; therefore, it would be easy to align a plurality of switch panels. The switch panels will be uniform and beautiful. Besides, their mount structures are simple; they are easy to mount; they can be dismantled without tools.

[0043] It should be understood that in the embodiments of the present disclosure, although springs 2 and 4 are illustrated as springs, they may also be other elastic elements well known to those skilled in the art, e.g., an elastic sheet, an elastic body, etc. It should be understood that in the embodiment of the present disclosure, the release operation panel 1, the switch operation panel 3, and the mount panel 6, although described as a panel, may also assume various other shapes as required, e.g., the form of a button, or other forms. It should also be understood that in the embodiments of the present disclosure, the manner of axle-hole connection is not limited to the embodiments, e.g., the axle hole may be arranged upside-down; and there is also no limitation on the shape of the axle hole. For example, the angle of the guided angle of the aperture 3.1 may be any other appropriate angle.

[0044] Through the teachings provided in the above description and relevant figures, many

modification forms and other embodiments of the present disclosure will be realized by those skilled in the art. Therefore, it should be understood that the embodiments of the present disclosure are not limited to the preferred embodiments as disclosed; moreover, the modified forms and other embodiments are intended to be included within the scope of the present disclosure. Besides, although the above description and relevant figures have described the exemplary embodiments under the background of some exemplary combinations of components and/or functions, it should be aware that different combination forms of the components and/or functions may be provided by alternative embodiments without departing from the scope of the present disclosure. In this case, for example, other combination forms of components and/or functions somewhat different from what have been explicitly described are also predicted to fall within the scope of the present disclosure. Although specific terms are employed here, they are only used in their general and descriptive meanings, not intended for limitation.

What is claimed is

1. A panel switch, comprising:

a first panel provided with an opening that can accommodate at least one switch function module;

at least a second panel whose number corresponds to the number of the switch function modules, each of the second panel abutting to a corresponding switch function module and being configured to interact with the switch function module when the second panel is pressed so as to achieve a switch between ON and OFF states;

a third panel arranged side by side with respect to the at least a second panel, the third panel and the at least a second panel forming appearance panels of the panel switch and the third panel being configured to be capable of releasing an engagement between the first panel and the second panel when the third panel is pressed.

2. The panel switch according to claim 1, wherein the first panel and the second panel are axle-hole connected, the third panel and the first panel being axle-hole connected, and the second panel and the third panel are clip-fitted together.

3. The panel switch according to claim 2, wherein the second panel comprises an aperture inclining towards a predetermined direction, and the first panel comprising a first axle; when the second panel is installed on the first panel, the first axle being adapted to be inserted into the aperture such that the second panel, when a predetermined area of the second panel is pressed, rotates about the first axle so as to be interact with the corresponding switch function module.

4. The panel switch according to claim 2, wherein the third panel comprises a second axle, and the first panel comprises an aperture; when the third panel is mounted on the first panel, the second axle is adapted to be inserted in the aperture such that the third panel, when being pressed, rotates about the second axle so as to release a clip-fit connection between the third panel and the second panel.

5. The panel switch according to claim 2, wherein the second panel comprises a fixture block; after the second panel is mounted to the first panel, the fixture block projects from the second panel and is adapted to be suppressed by an edge of a lower surface of the third panel.

6. The panel switch according to claim 5, wherein a side edge of the second panel abuts against an end face of the first panel, the fixture block is disposed at an opposite side edge of the second panel, and the panel switch is configured such that the second panel and the third panel are arranged substantially on a plane in a manner of covering the first panel when the second panel, the first panel, and the third panel are mounted together.

7. The panel switch according to claim 2, wherein the first panel further comprises a location column, the location column being provided thereon with a first reset spring for resetting the third panel.

8. The panel switch according to claim 2, wherein the switch function module is provided with a hole, inside the hole being provided a second spring for applying force towards the second panel.

9. The panel switch according to any one of claims 1-8, wherein the second panel is a switch key panel, and the first panel is a mount panel.

10. The panel switch according to any one of claims 1-8, wherein an area of the second panel is larger than an area of the third panel, and the number of the third panel is 1.