

SWITCH APPARATUS

FIELD

[0001] Embodiments of the present disclosure relate to a switch apparatus and particularly, to a switch apparatus that is convenient for replacing an indication marker.

5 BACKGROUND

[0002] The current button switching panel may be equipped with a plurality of switch modules for different control circuits, for example, for controlling different lights or power sockets. Users who are unfamiliar with the switching panel equipped at a certain position in a strange place (such as a restaurant) may not clearly know which light or power socket for
10 each operating position on the switching panel or each sub-panel on the switching panel is used for controlling. Therefore, the user cannot use these switching panels correctly and conveniently.

[0003] It is known that patterns or characters can be printed on a switching panel, or adhesive paper with patterns or characters can be stuck on the switching panel, to indicate the function of the switching panel. However, it is difficult to modify or remove these printed
15 patterns or characters from the panel, or to clean and replace the stuck adhesive paper completely. Therefore, when it is desired to change the light or power socket controlled by the switching panel, it is rather inconvenient to replace the indication marker of the function of the switching panel. Besides, even if the indication marker can be changed by replacing
20 the adhesive paper, the use of adhesive paper makes the switching panel less attractive.

[0004] Hence, it is desired that a switch apparatus can be provided which is convenient for replacing the indication marker and has an attractive appearance.

SUMMARY

[0005] The purpose of this utility model is to provide a switch apparatus to at least partially
25 solve the above problem.

[0006] According to the embodiments of the present disclosure, there is provided a switch apparatus, comprising: at least one switch module, each of the switch modules being capable of being connected to an operating circuit for controlling the on/off of the operating circuit; and an operating panel, being capable of being driven to respectively operate each of the
30 switch modules. An indication block is detachably mounted between each of the switch

modules and the operating panel, which indication block indicating the function of each of the switch modules.

[0007] According to the embodiments of the present disclosure, the switch apparatus further comprises an illuminating device for projecting the marker on the indication block to the operating panel.

[0008] According to the embodiments of the present disclosure, the indication block comprises a self-luminous marker which is visible through the operating panel.

[0009] According to the embodiments of the present disclosure, each of the switch modules comprises a switch button on which the indication block is detachably mounted. The operating panel is configured to be capable of operating the corresponding switch modules respectively by pressing the respective indication blocks.

[0010] According to the embodiments of the present disclosure, the switch button is sheathed by the indication block, and the the indication block is in interference-fitting with the switch button.

[0011] According to the embodiments of the present disclosure, the first end face of the indication block is provided with a blind hole. On the side wall of the blind hole, there is provided with a protrusion. The switch button is inserted in the blind hole and engaged with the protrusion to achieve the interference-fitting.

[0012] According to the embodiments of the present disclosure, an operating part is provided on the indication block for facilitating the indication block to be operated to be separated from the switch button.

[0013] According to the embodiments of the present disclosure, the switch apparatus further comprises a mounting panel which is provided with at least one through hole; the at least one switch module is mounted on the mounting panel such that the switch button of each of the switch modules extends into one of the through holes; the end face of the indication block is shaped to cause the indication block to be adapted to move in the through hole on the mounting panel along the axial direction of the through hole, and not to be adapted to turn in the through hole.

[0014] According to the embodiments of the present disclosure, the indication block is detachably mounted on a side of the operating panel facing towards the switch module.

[0015] According to the embodiments of the present disclosure, on the side of the operating

panel facing towards the switch module, there is provided with a projection block or a receiving recess. The indication block is detachably matched to the projection block or in the receiving recess.

[0016] Various embodiments of the present disclosure make it possible to replace the indication marker for the switch apparatus conveniently and quickly by providing an indication block that is detachably mounted between the switch module and the operating panel. As the indication block is located behind the operating panel, the operating panel of the switch apparatus facing towards the user looks clean and clear. Furthermore, by projecting the indication marker on the operating panel, the indication marker appears more attractive, thereby improving the level of the product and meeting the user's diversified needs for the appearance of the switch apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Through the following detailed description with reference to the accompanying drawings, the above and other objectives and feature combinations of the present disclosure will become more apparent, in which

[0018] FIG. 1 is an exploded view of a switch apparatus according to an embodiment of the present disclosure;

[0019] FIG. 2 illustrates an indication block of a switch apparatus according to an embodiment of the present disclosure;

[0020] FIG. 3 illustrates a side sectional view of the switch apparatus shown in FIG. 1;

[0021] FIG. 4 illustrates a partially enlarged view of section A of the switch apparatus shown in FIG. 3;

[0022] Throughout all the drawings, identical reference numbers refer to the same, similar or corresponding features or functions.

DETAILED DESCRIPTION OF EMBODIMENTS

[0023] Now, reference will be made to the embodiments of the present disclosure. One or more examples of the embodiments are shown by the drawings. The embodiments are provided by illustration of the present disclosure and do not intend to limit the present disclosure. For example, features illustrated or depicted as a part of an embodiment may be used in another embodiment to produce a further embodiment. The present disclosure aims

to cover these and other modifications and alternations that fall under the scope and spirit of the present disclosure.

[0024] FIG. 1 is an exploded view of a switch apparatus according to an embodiment of the present disclosure. The switch apparatus comprises a mounting panel 1 to be fastened to a surface, for example, a wall, to which the switch apparatus is to be mounted. At least one (four in FIG. 1) switch module 2 can be mounted to this mounting panel 1 in any manner of arrangement. The switch module 2 is capable of being connected to an operating circuit to control the on/off of the same, for example, control the on/off of a light or a power socket. The switch module 2 shown in FIG. 1 is a button switch module, each button switch module having a switch button 21. The characteristic of this kind of button switch module is that the switch module is closed or opened when the button is pressed for the first time, and the switch module is opened or closed when the button is pressed again. A through hole 11 is provided on the mounting panel 1 at a position corresponding to each switch module 2. When the switch module 2 is mounted on the mounting panel 1, the switch button 21 extends into the through hole 11.

[0025] The operation panel 3 is moveably connected to the mounting panel 1 and can be driven to operate each of the switch modules 2 respectively. In the embodiment shown in FIG. 1, there is only provided with an integral operating panel 3, which is pivotally connected to the center of the mounting panel 1 so as to be able to swing towards respective directions around the pivot and press switch buttons 21 of a plurality of switch modules 2 located in respective directions around the pivot to operate the respective switch modules 21 to close or open. Certainly, it is also necessary to provide a resetting mechanism, such as a spring, such that the operating panel 3 can return to the balancing position parallel to the mounting panel 1 for facilitating the next operation after each time it pivotally swings relative to the mounting panel 1 to perform a press operation.

[0026] The switch button 21 of each switch module 2 can be detachably sheathed with an indication block 4 to indicate the function of each switch module 2. The indication block 4 is provided in a position between the switch button 21 and the operating panel 3, and the operation panel 3 can just contact the indication block 4 or be located with a few distance from the indication block 4 (see FIG.s 3 and 4). In this way, when the operating panel 3 is pressed, the operating panel 3 will drive the indication block 4 and the corresponding switch button 21 to move in the through hole 11 to operate the switch module 2.

[0027] FIG. 2 illustrates an indication block 4 according to an embodiment of the present disclosure. As shown in FIG. 2, the indication block 4 has two end faces and a side face between the two end faces. On one of the end faces there is provided with a blind hole 41 which is shaped to be matched with the shape of the switch button 21. For example, the blind hole 41 shown in FIG. 2 is round for matching with the round switch button 21 shown in FIG. 1, but it is not necessarily like this. However, it should be ensured that the dimension of the blind hole 41 should be slightly larger than that of the switch button 21. There are several protrusions 42 on the side wall of the blind hole 41, extending along the axial direction of the blind hole 41. As shown in FIGs 3-4, upon sleeving the indication block 4 on the switch button 21 by sliding, the switch button 21 is inserted into the blind hole 41, being engaged with the protrusions 42 and slightly squeezing the protrusions 42 to achieve interference-fitting which prevents the indication block 4 from being disengaged from the switch button 21. As there are only several thin protrusions 42 that are interference fitted with the switch button 21 while the majority of the side of the switch button 21 does not contact the indication block 4, there is no great resistance during mounting and disengaging the indication block 4, thereby facilitating mounting and disengaging the indication block 4. Of course, the protrusions 42 can also not be provided if it is ensured that the switch button 21 and the blind hole 41 in the indication block 4 both have high dimension precision. Instead, the blind hole 41 in the indication block 4 directly sleeves on the switch button 21 to achieve interference fitting, but the dimension of the blind hole 41 should be just equal to or slightly smaller than that of the switch button 21.

[0028] In an embodiment, an operating part can be provided on the indication block 4, such that the indication block 4 is easy to be operated by fingers or by a tool to be separated from the switch button 21 when it is to be replaced or disengaged. For example, in FIG. 2, a recess 43 is provided on the side of the indication block 4 as an operating part. A human finger or a tool such as a screwdriver can dig into this recess 43 to separate the indication block 4 from the switch button 21.

[0029] In an embodiment, the shape of the end face of the indication block 4 can be configured to enable the indication block 4 to be adapted to move in the through hole 11 on the mounting panel 1 along the axial direction of the through hole 11 while not adapted to turn in the through hole 11, to ensure that the indication block can be driven by the operating panel 3 to operate the switch button 21 while no rotation will be incurred to cause change of the orientation of the marker on the indication block 4. For this purpose, the shape of the end

face of the indication block 4 should be smaller than the dimension of the through hole 11 and can be shaped to be matched with the through hole 11, but the round shape should be avoided to prevent rotation. As shown in FIG.s 1-2, for example, when the through hole 11 is in square shape, the end face of the indication block 4 can also be shaped in square. As such, the square shaped indication block 4 cannot rotate in the square shaped through hole 11.

[0030] On the end face of the indication block 4 which is not provided with a blind hole 41, various markers 44 can be printed to represent the functions of switch module 2 corresponding to the indication block 4, for example, to indicate which light or power socket the switch module 2 is used for controlling. The marker 44 can be any pattern, character or a combination thereof. The marker 44 can be formed as a transparent part on the opaque end face of the indication block 4 or as an opaque part on the transparent end face of the indication block 4. In the switch button 21, there is further provided with a light-emitting device. By illuminating the indication block 4 with the light from the light-emitting device, the light coming through the transparent part on the end face of the indication block 4 is projected to the operating panel 3 right facing the indication block 4, thereby projecting a pattern of the marker on the operating panel 3. Depending on the manner of forming a marker on the indication block 4, the projected pattern of the marker can be bright for the marker portion while leaving the surrounding dark (namely, convex carving), or dark for the marker portion while leaving the surrounding bright (namely, concave carving). The operating panel 3 is made of relatively thin material which is partially transparent, such as thin plastic. On normal conditions, the operating panel 3 is opaque. However, when the light from the light emitting device in the switch button 21 which is very close to the operating panel 3 is projected to the operating panel 3 through the transparent part in the indication block 4, the projected light beams are sufficient to pass through the operating panel 3. As a result, when viewed from the side of the operating panel 3 facing away from the indication block 4, it is possible to see the marker in convex carving or concave carving formed by the light projected on the operating panel 3. As such, the user can see the corresponding markers clearly on different positions on the operating panel 3 and learn that by pressing the positions of the operating panel 3 where the respective markers locate, the corresponding switch modules 2 can be operated to achieve the functions indicated by the markers.

[0031] For a marker in convex carving, an overall opaque indication block 4 can be provided on whose end face a hollowed-out marker pattern can be carved to make the marker

part transparent; a transparent end face of the indication block 4 can also be provided and then, other areas apart from the marker are sprayed or covered with paper, only leaving the marker part bared. For a marker in concave carving, an opaque marker pattern can be printed on the transparent end face of the indication block 4 directly.

5 **[0032]** The light emitting device can normally stay in a luminous state such that the user can see the marker on the operating plane 3 at any time, which is advantageous when the marker on the indication block 4 is used to indicate which electrical equipment is controlled by the operating panel. However, in the case that the switch apparatus only has one switch module 2 and the marker is used to indicate the switching state of the known electrical equipment, the
10 light emitting device may be only illuminated when the switch module 2 is closed or opened. As such, the illumination or extinguishment of the marker on the operating panel 3 can represent the state of the corresponding electrical equipment.

[0033] Where it is required that the marker should normally stay in a luminous state, illumination can be provided not through a separate light emitting device. Instead, the
15 indication block 4 can have a self-luminous marker, such as a fluorescent marker. Besides, the light from the self-luminous marker can be visible through the operating panel 3. Since the self-illuminating light is relatively weak, it could be more advantageous in a dark environment.

[0034] Because the indication block 4 is hidden behind the operating panel 3 and invisible to
20 the user, the surface of the operating panel 3 appears very clear and attractive. When the marker is illuminated, the illuminating pattern of the marker is presented clearly on the operating panel, which makes the switch apparatus appear to be in an appearance of high quality.

[0035] In another embodiment, the indication block 4 can also be provided on another
25 position between the switch module 2 and the operating panel 3. For example, the indication block 4 can also be detachably mounted on the side of the operating panel 3 facing the switch module 2. For example, a projection block or a receiving recess can be provided on a side of the operating panel 3 facing the switch module 2, and the indication block 4 can be detachably matched to the projection block or the receiving recess. In a switch apparatus in
30 which an operating panel 3 is used to control a plurality of switch modules 2, when it is required to indicate a certain switch module 2 with the marker on the indication block 4, it is still necessary to place the indication block 4 on the operating panel 3 at a position

corresponding to the position of the switch module to provide an accurate indication. However, this indication block 4 can be aligned or not aligned to the switch button 21, namely, the operating panel can drive the switch button 21 through the indication block 4 or drive the switch button 21 directly without the indication block 4. In the case that the indication block 4 is not aligned to the switch button 21, it may be needed to place the light emitting device on the operating panel 3 at a position aligned to the indication block 4 to illuminate the indication block.

[0036] While the switch apparatus of the present disclosure is depicted based on the button switch module in the above text, it is to be understood that the switch apparatus of the present disclosure also applies to other types of switch modules. For example, for a rocker switch module, it is advantageous to configure the indication block 4 on the side of the operating panel 3 facing the switch module, as the rocker switch module does not have a switch button, and it is inconvenient to provide an indication block 4 on the rocker switch module.

[0037] Besides, although only one operating panel 3 is provided in the embodiments described above, it is to be understood that more than one operating panel 3 can be provided for the switch apparatus, and each of the operating panels 3 is used to control one or more switch modules. In the case that a plurality of operating panels 3 are provided, each operating panel 3 can be provided with one or more indication blocks 4 to indicate the function or state corresponding to the one or more key positions of the operating panel 3.

[0038] The operating panel 3 in the switch apparatus according to the embodiments described above is preferably convenient to be disengaged. When the indication mark needs to be replaced after the electrical equipment controlled by the switch apparatus is changed, the operating panel 3 is detached at first, and the indication block 4 is then taken off from the switch button 21 or the operating panel 3, and then, a new indication block 4 with the mark corresponding to the electrical equipment under control is put on, and the operating panel 3 is mounted afterwards. Thus, when the marker is illuminated again, the new marker is displayed on the operating panel. If the marker on the indication block 4 is formed by a sticker pasted on the indication block 4, it is also possible not to detach and replace the indication block 4 but only tear the original sticker on the indication block 4 and paste the sticker with a new marker again. Thus, the marker for the switch apparatus can be replaced conveniently at low cost, without the need of changing a new operating panel and damaging or dirtying the appearance of the original operating panel.

[0039] It is to be understood that the switch apparatus of the utility model is adapted to be mounted in a recess of a plane, such as a wall and a panel, to be utilized in household, commercial or industrial scenarios. The respective switch modules in the switch apparatus can be used for controlling a lighting circuit, a power source, an electrical equipment and so on respectively.

[0040] It should be noted that the above embodiments are given to describe the principles of the present utility model rather than to limit its scope; moreover, it is to be understood that modifications and alterations adopted without departing from the principles and spirits of the present utility model are easily comprehensible to those skilled in the art. These modifications and alterations are considered to be under the scope of the present utility model and the appended claims. The scope of protection of the present utility model is defined by the appended claims. Moreover, any reference signs in the claims should not be construed as limiting to the claims. The verb “comprise” and its variants are used not to exclude elements or steps apart from those defined in the claims. The indefinite articles “one” and “a” used preceding the elements or steps do not exclude the presence of a plurality of such elements or steps.

What is claimed is:

1. A switch apparatus, characterized in comprising:

at least one switch module (2), each switch module (2) being capable of being connected to an operating circuit for controlling the on/off of the operating circuit; and

5 an operating panel (3), being capable of being driven to operate each of the switch modules (2), respectively;

wherein an indication block (4) is detachably provided between each of the switch modules (2) and the operating panel (3), the indication block (4) indicating the function of each of the switch modules (2).

10

2. The switch apparatus according to Claim 1, characterized in further comprising a light emitting device to project the marker on the indication block (4) to the operating panel (3).

15 3. The switch apparatus according to Claim 1, characterized in that the indication block (4) has a self-luminous marker which is visible through the operating panel (3).

4. The switch apparatus according to any one of Claims 1-3, characterized in that each of the switch modules (2) has a switch button (21), the indication block (4) is detachably
20 mounted on the switch button (21), and the operating panel (3) is configured to operate the corresponding switch modules (2) respectively by pressing the respective indication blocks (4).

5. The switch apparatus according to Claim 4, characterized in that the switch button
25 (21) is sheathed by the indication block (4), and the indication block (4) is in interference-fitting with the switch button (21).

6. The switch apparatus according to Claim 5, wherein the first end face of the indication block (4) is provided with a blind hole (41) whose side wall is provided with a
30 projection (42), and the switch button (21) is inserted in the blind hole (41) and engaged with the projection (42) to achieve the interference-fitting.

7. The switch apparatus according to Claim 4, characterized in that an operating part is

provided on the indication block (4) for facilitating the indication block (4) to be operated to be separated from the switch button (21).

5 8. The switch apparatus according to Claim 4, characterized in that the switch apparatus further comprises a mounting panel (1) on which at least one through hole (11) is provided; the at least one switch module (2) is mounted to the mounting panel (1) such that the switch button (21) of each of the switch modules (2) extends into one of the through holes (11); the end face of the indication block (4) is shaped to cause the indication block (4) to be adapted to move in the through hole (11) on the mounting panel (1) along the axial direction
10 of the through hole (11), and not to be adapted to turn in the through hole (11).

9. The switch apparatus according to any one of Claims 1-3, characterized in that the indication block (4) is detachably mounted on a side of the operating panel (3) facing the switch module (2).

15

10. The switch apparatus according to Claim 9, characterized in that a projection block or a receiving recess is provided on a side of the operating panel (3) facing the switch module (2), and the indication block (4) is detachably matched to the projection block or the receiving recess.