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(54) SLIDE SWITCH

(71) We, PHILIPS ELECTRONIC AND ASSOCIATED INDUSTRIES LIMITED, of Abacus House, 33 Gutter Lane, London, E.C.2, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a slide switch comprising a strip-like contact slide which is displaceable in its longitudinal direction in a cavity in a housing which is bounded by guide faces, the said contact slide having one end which is connected to an operating member and one free end which projects outside the cavity at the rear of the housing.

For the assembly of a slide switch of this kind the contact slide, whose side faces are provided with movable contacts, is generally slid from the front into the cavity which is recessed in the housing for this purpose. This cavity is bounded by guide faces, two of which extend parallel to the side faces of the contact slide and accommodate stationary contacts. In order to prevent that the slide can be pulled out of the housing again at a later stage, it is necessary to incorporate a locking arrangement. It is desirable that this locking arrangement can be readily released without disassembly of the slide switch being necessary. This is necessary, for example, if the contact slide becomes defective and must be replaced. The invention has for its object to provide a locking arrangement of this kind without substantially increasing the cost of the slide switch.

To this end, the slide switch according to the invention is characterized in that the free end is provided with at least one resilient hook-like member which projects transverse to the longitudinal direction of the contact slide, one side of the said member which in order to lock the contact slide in the faces the housing being adapted to cooperate, housing, with an abutment face which is situated at the rear of the housing and

which encloses an acute angle with the nearest guide face. In this construction the member or members which serve for locking are situated behind the housing so that they can be readily depressed by means of a suitable tool, after which the contact slide can be pulled out of the housing. If the contact slide is manufactured by injection moulding, as is commonly done, the member or members can be readily formed on the contact slide; the connection between the or each member and the actual contact slide then having to be so thin that the member is sufficiently resilient.

Slide switches are usually mounted such that the largest transverse dimension of the contact slide is perpendicular to a flat plate, for example, a printed circuit board. One embodiment where locking is very readily released in the case of such a mounting, is characterized in that one member is provided which projects in the direction of the largest transverse dimension of the contact slide. Another preferred embodiment, offering the advantage that the switch does not have to take up substantial forces when the locking is released, is characterized in that two members are provided which project in mutually opposed directions, the said directions extending parallel to the smallest transverse dimension of the contact slide. In this embodiment the two members can be simply squeezed together in a pair of pliers.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawing, in which:—

Figure 1 is a perspective view of an embodiment of a slide switch according to the invention,

Fig. 2 is a cross-sectional view of the slide switch shown in Fig. 1,

Fig. 3 is a vertical sectional view of the rearmost part of the slide switch shown in Fig. 1,

Fig. 4a is a horizontal sectional view of the rearmost part of another embodiment of the slide switch according to the invention, and

[Price 33p]

Price 75p

Fig. 4b is a vertical cross-sectional view of the part shown in Fig. 4a.

The slide switch shown in Fig. 1 consists of a housing having two side walls 1, a bottom portion 3 and a cover plate 5. Arranged in this housing is a strip-like contact slide 7, one end (the right-hand end in Fig. 1) being extended in the form of a button rod 9 which has a pushbutton 11 connected thereto. When the pushbutton 11 is depressed, the contact slide 7 is displaced in its longitudinal direction to the left. When the pushbutton 11 is released, a reset spring 13 ensures that the contact slide 7 is returned to the position shown. If desired, the switch can of course also be provided with a known locking mechanism which prevents this return movement.

As can be seen in the cross-sectional view given in Fig. 2, the contact slide 7 is arranged in a cavity 15 inside the housing, the said cavity being bounded by four guide faces which are formed by the respective inner faces of the side walls 1, bottom portion 3, and cover plate 5. The contact slide 7 bears directly on the upper and the lower guide face and against the two side guide faces by way of resilient contact members 17. These resilient contact members are connected to the contact slide 7 in known manner (not shown) and constitute the movable contacts of the slide switch. They cooperate with respective stationary contacts 19 which are preferably provided in the side walls 1, with the result that the surface of the side guide faces is substantially flat. The stationary contacts 19 are provided on their lower side with solder tags 21 by means of which the switch can be soldered, for example, to a printed circuit board, and on their upper side with eyelets 23 for soldering connection wires of other parts.

In order to lock the contact slide 7 in the housing, the free end of the contact slide is provided with one or more hook-like members 25. These members project from the contact slide 7 transverse to its longitudinal direction, and can be depressed in a resilient manner so that they can pass through the cavity 15.

A first embodiment of this locking arrangement is shown in Fig. 1, and at an enlarged scale in Fig. 3. In this case the member 25 is situated on the upper side of the contact slide 7 and comprises a side 27 which faces the housing and which encloses an acute angle with the upper side of the contact slide. The side 29 of the member 25 which is remote from the housing encloses an angle with the upper side of the contact slide 7 which is smaller than the former angle. As a result, the member 25 has the shape of a hook, so that the contact slide 7 can be readily slid through the

cavity 15 from right to left, the connection portion 31 between the member 25 and the actual contact slide then being bent so that the member remains entirely within the profile of the cavity. The cover plate 5 of the housing is provided with an abutment face 33 on its rear (at the left in the Figs. 1 and 3) which also encloses an acute angle with the guide face formed by the inner surface of this cover plate. This abutment face cooperates with the side 27 of the member 25 with the result that the member abuts against the abutment face and also encounters an upward directed force when a force to the right is exerted on the contact slide 7. The member 25 is thus held in its active position *inter alia* by this force, with the result that further sliding of the contact slide 7 is prevented. If the side 27 or the abutment face 33 were to enclose an obtuse angle with the upper side of the contact slide 7 or the inner side of the upper plate 5, respectively, a force exerted to the right on the contact slide would cause a downward directed force on the member 25, with the result that the locking arrangement might be suddenly released.

It will be obvious that, if desired, the lower side of the contact slide 7 can also be provided with a member 25 which can then cooperate with a corresponding abutment face 33 on the rear of the bottom 3 of the housing. However, preference is given to the construction shown in which a member 25 is present only on the upper side, whilst on the lower side a projection 35 (Figures 1 and 3) is provided which serves for guiding the contact slide 7 along the inner surface of the bottom portion 3. The advantage of this construction is that the replacement of the contact slide 7 of a switch which is soldered to a board by means of the soldering tags 21 is then very easy. To this end, a suitable tool, for example a screwdriver, must be pressed onto the side 29 of the member 25 from above, with the result that the member is pressed down so that the contact slide 7 can be pulled to the right. If a member 25 were also present on the lower side, it would have to be pressed upwards from below, which would be difficult in view of the presence of the board.

When the member 25 is pressed downwards in order to remove the contact slide, a force is exerted on the switch and hence also on the soldering areas of the soldering tags 21. This force will generally not be so large that these soldering areas are inadmissibly overloaded. However, if desired, the possibility of such overloading can be completely avoided by making use of the embodiment shown in Figs. 4a and 4b. In this embodiment, the free end of the contact slide 7 is provided with two members 25, one above the other, one member pro-

jecting to the left and the other member projecting to the right. Each member 25 is again connected, by way of a flexible connection portion 31, to the actual contact slide 7. In this case each of the sidewalls 1 of the housing is provided with an abutment face 33 which again encloses an acute angle with the nearest guide face. The locking procedure by means of these members is completely analogous to that described above. In order to release the locking arrangement the two members 25 must now be displaced by means of a pair of pliers engaging on the sides 29, after which the contact slide 7 can be slid to the right. Substantially no force is then exerted on the switch. However, a drawback is then that during the fitting and removal of the contact slide 7 the members 25 slide along the stationary contacts 19 which, as already stated, form part of the two side guide faces. As a result, the contact slide 7 will slide less readily through the cavity 15 and there is also a risk, be it a very small one, that the stationary contacts 19 are damaged. However, these drawbacks are negligibly small since the replacement of a contact slide occurs only rarely in practice.

30 WHAT WE CLAIM IS:—

1. A slide switch comprising a strip-like contact slide which is displaceable in its longitudinal direction in a cavity in a housing which is bounded by guide faces, the
35 said contact slide having one end which is

connected to an operating member and one free end which projects outside the cavity at the rear of the housing, characterized in that the free end is provided with at least one resilient hook-like member which projects transverse to the longitudinal direction of the contact slide, one side of said member which faces the housing being adapted to cooperate, in order to lock the contact slide in the housing, with an abutment face which is situated at the rear of the housing and which encloses an acute angle with the nearest guide face. 40 45

2. A slide switch as claimed in Claim 1, characterized in that one said member is provided which projects in the direction of the largest transverse dimension of the contact slide. 50

3. A slide switch as claimed in Claim 1, characterized in that two members are provided which project in mutually opposite directions, the said direction extending parallel to the smallest transverse dimension of the contact slide. 55

4. A slide switch, substantially as herein described with reference to Figures 1, 2 and 3, or to Figure 1 as modified by Figures 4a and 4b, of the accompanying drawing. 60

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