

[54] **SWITCH FOR PUSH KEY**
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 [51] Int. Cl.....**H01h 9/08, H01h 3/12**
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235/145 R

[56] **References Cited**
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Primary Examiner—Roy N. Envall, Jr.
Attorney—Robert E. Burns et al.

[57] **ABSTRACT**
 A switch for a push key of a calculator or the like comprising, a switch case with built-in members and a cover. Hooks projecting downwardly from the cover engage with edges of an upper flange of the switch case and the extreme ends of said hooks fit into positioning holes bored in a supporting plate on the calculator. This enables the key-top to be mounted at a desired position.

6 Claims, 5 Drawing Figures

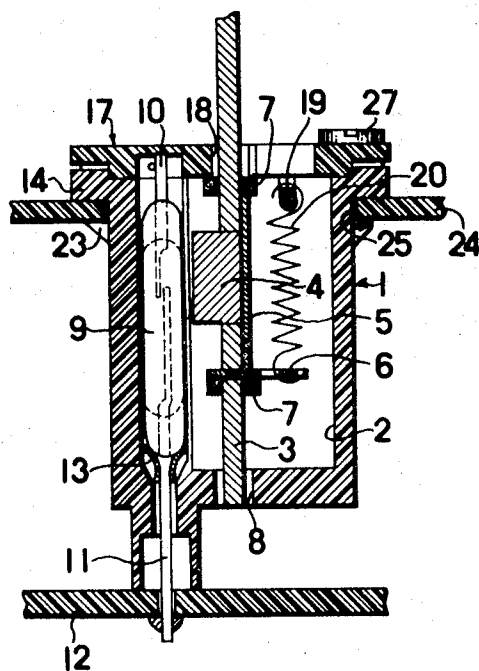


FIG. 1

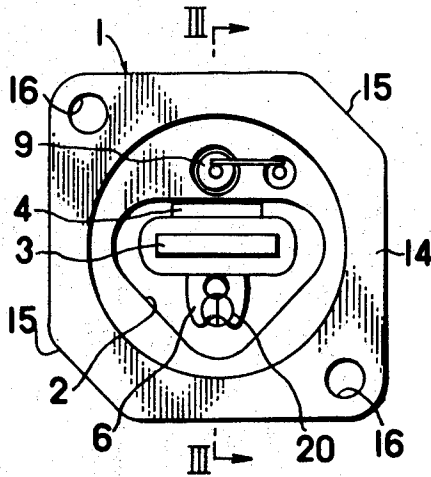


FIG. 2

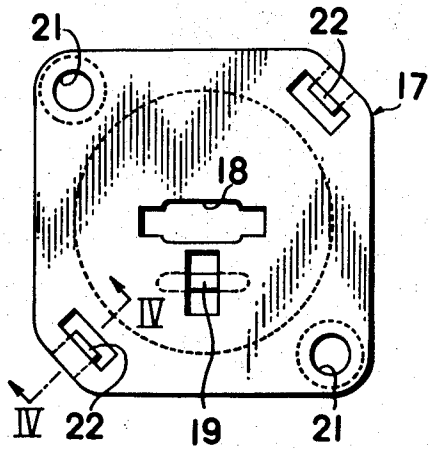


FIG. 3

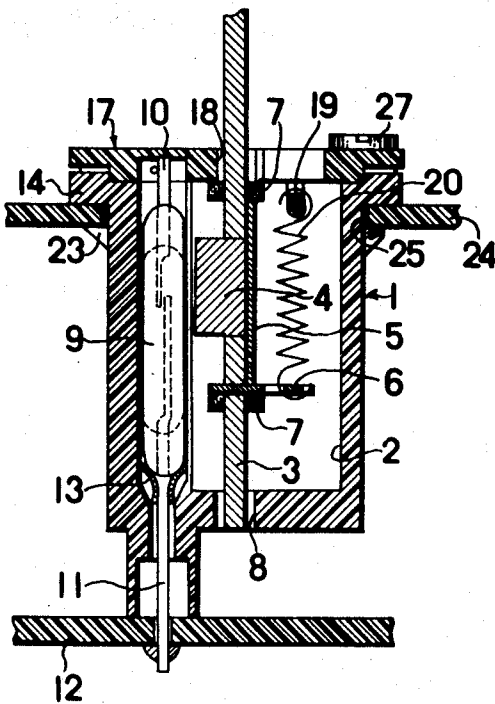


FIG. 4

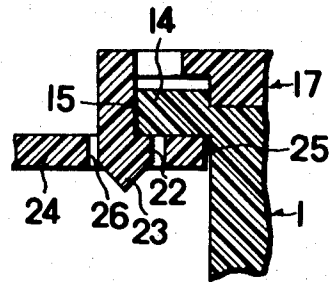
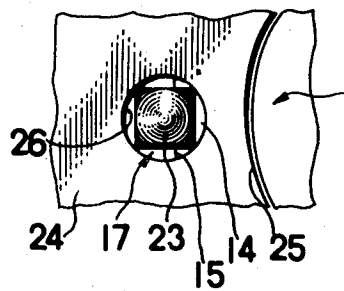


FIG. 5



SWITCH FOR PUSH KEY

BACKGROUND OF THE INVENTION

This invention relates to a switch for a push key and more particularly to a switch for a push key of an electronic calculator and the like.

DESCRIPTION OF THE PRIOR ART

Conventionally in order to mount a switch for a push key to a frame of a calculator or the like a hole which meets with the outside dimensions of the switch case is made in the frame, and the switch case is inserted into this hole. A cover is put on the switch case and is fine-adjusted in such a manner that a key lever may be arranged in a regular or desired position and in a set order. Then the cover is screwed on.

In the construction described above, there is a disadvantage in that a clearance between the hole and the switch case occurs, and it is very difficult to fix the switch case at its regular position, so that to screw the switch case and the cover to the supporting plate a fine-adjustment is necessary. Thus it takes much time and labor to fix the switch case and the cover.

SUMMARY OF THE INVENTION

One object of the present invention is to provide a switch for a push key which is provided with a position-regulating member and thus a key lever is arranged at the regular position without fine-adjustment.

Another object of the present invention is to provide a switch for a push key which is easy to set on a switch supporting plate and simple in construction.

According to a feature of the present invention, there is provided an improved switch for a push key comprising a switch case with built-in switch members and a cover for the switch case. The switch case is provided with edges and the cover is provided with hooks engageable with these edges. The hooks fix their extreme ends into positioning holes bored in a supporting plate.

BRIEF DESCRIPTION OF THE DRAWINGS

These object, other objects and the characteristic features of the present invention will become evident and will be more readily understood from the following description and claims taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a plan view of a switch case according to the invention;

FIG. 2 is a plan view of a cover of the switch case of FIG. 1;

FIG. 3 is a sectional view taken along section line III—III in FIG. 1;

FIG. 4 is an enlarged fragmentary sectional view along section line IV—IV in FIG. 2; and

FIG. 5 is a fragmentary bottom view showing the positioning portion of a supporting plate in FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, in the center of a switch case 1, is provided a cavity or space 2 in which a key lever 3 is slidably accommodated. A permanent magnet 4 is mounted in a hole bored in the central portion of the key lever 3. A magnetically permeable plate

5 is fixed to the back side of the permanent magnet 4. Lower end portions of the magnetically permeable plate 5 are hooked or L-shaped and protrude through the lever 3, and another lower end portion of the plate 5 is reversely hooked and forms a spring hook 6. The key lever is provided with two washers 7 made of rubber axially spaced from each other. The lowermost end of the key lever 3 can protrude into a hole 8 bored in the bottom of the case 1. In front of the magnet 4 of the case 1, there is provided a reed switch 9. An upper side reed wire 10 is bent and led to a printed circuit board, and another reed wire 11 is also connected to a certain point of the printed circuit board by soldering or the like. A cushion material elongated washer B is provided in the hole in which the reed switch 9 is inserted.

At the top of the switch case 1, a circumferential flange 14 is formed. This flange is nearly square as shown in FIG. 1, and one pair of opposing corners is cut off to form engageable edges and in the other pair of opposing corners are bored mounting holes 16, 16. A cover 17 has at the center thereof a hole 18 through which the top of the key lever 3 slidably protrudes and a spring hook 19 is provided opposed to the spring hook 6. A coil spring 20 is connected at opposite ends between the spring hooks 6 and 19.

In the cover 17 mounting holes 21, 21 are bored at opposite corners corresponding to the mounting holes 16, 16 of the switch case 1. At the other pair of opposite corners there are provided downwardly extending catches or hooks 22, 22 engageable with the engageable edges 15, 15 of the case as shown. These hooks 22, 22, as shown in FIG. 4 and FIG. 5, project inwardly from square depending portions and the axial ends of the hooks are formed as conically shaped or bevelled portions 23, 23. In a supporting plate 24 of a calculator is provided a hole or opening 25 into which the case 1 is inserted. Positioning holes 26, 26 and mounting tapped holes are likewise provided. The positioning holes 26, 26 are bored at selected positions and they receive the depending or downwardly extending mounting portions 23, 23. The mounting holes are preferably round-shaped into which the square or rectangular fitting portions 23, 23 are forced, as shown in FIG. 5.

In the operation the cover 17 is mounted on the switch case 1 in such a manner that the upper portion of the key lever 3 protrudes from the hole 18, and the upper end of the coil spring 20 is mounted over the hook 19. When the cover 17 is pressed to the switch case 1, the bevelled tips of the hooks 22, 22 of the cover engage the top flange of the case and the hooks bend slightly outwardly and snap over the flange 14 to engage with the edges 15, 15 of the switch case 1. The switch case 1, covered with the cover 17 in the manner described above, is inserted into the hole 25 of the supporting plate 24, and the mounting portions 23, 23 are forced into the positioning holes 26, 26. The hooks 22, 22 are square-shaped in cross section and the positioning holes 26, 26 are round-shaped, so that the hooks are pressed into the positioning holes even if the holes are a little tight for the hooks. Thus the key lever 3 is arranged in a regular position. Finally the switch case 1 and the cover 17 are fixed to the supporting plate 24 by screws 27, 27 threaded in the threaded mounting holes

21, 21 and 16, 16. Those skilled in the art will understand that the switch operates in known manner upon axial actuation of the push key. The spring 20 biases the push-key upwardly and when it is actuated by depressing it the magnet carried thereon closes the reed switch elements and upon release of the key it is restored to its raised position and the switch opens.

What I claim and desire to secure by Letters Patent is:

1. For use in a calculator and the like, in combination, a push-key, a switch case, switch means in said case having contacts operable to a closed and open position in response to actuation of said push-key, means on said switch key for actuating said switch contacts, a cover on said case having integral thereon snap-on hooks extending in a direction for engaging catch surfaces on said case, a support member having mounting holes, and said hooks having portions extending past said cover surfaces when said cover is mounted on said case for being received snugly in said mounting holes on said support member.

2. The combination according to claim 1, in which said hooks comprise, a portion mounted adjacent the periphery of said cover bendable outwardly from said periphery for clearing said case and snapping back to engage said hooks on said surfaces.

3. The combination according to claim 1, in which

said switch comprises, a reed switch, said means on said push-key for actuating said contacts comprising a permanent magnet.

4. The combination according to claim 3, in which said integral hooks comprise, a bendable plastic material.

5. A case for a push-key comprising, a body, a cover having an opening for inserting a key therein into said body, said body having an inner space for housing a push-key actuated switch, said cover having a greater transverse dimension than said body, said cover having integral hooks extending in a direction for engaging surfaces on said case body, said hooks having shanks integral with said cover and having bevelled surfaces for engaging said body and being actuated outwardly away from said body and snapping back to engage said body, said body having flange surfaces for actuating said hooks outwardly when said bevelled surfaces are pressed against said flange surfaces and undersurfaces defining the first-mentioned surfaces engaged by said hooks.

6. A case for a push-key according to claim 5, in which said bevelled surfaces extend downwardly of said hooks for being received in mounting openings on a support member on which case is mounted.

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