Oct. 27, 1964 J. BIERENFELD 3,154,661

INSERT FOR A SWITCH BUTTON

Filed May 15, 1961

Fig. 1.

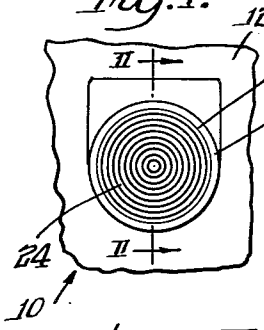


Fig. 4

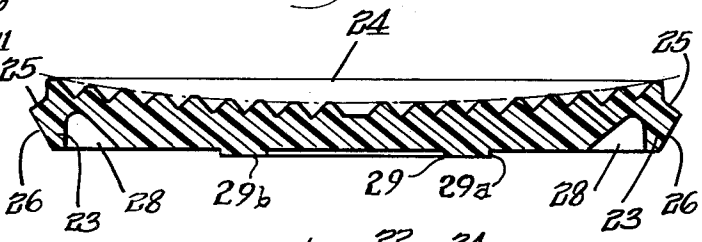


Fig. 3.

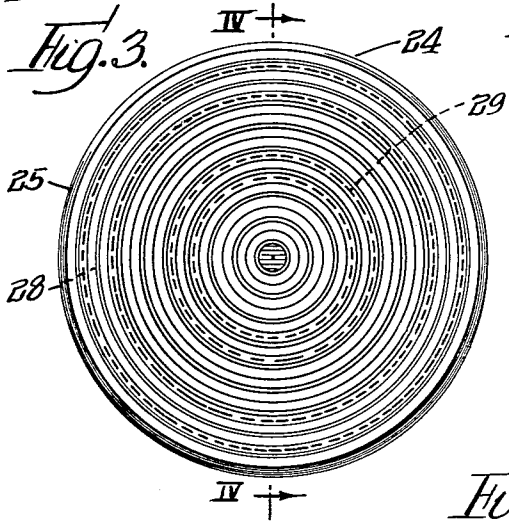


Fig. 2.

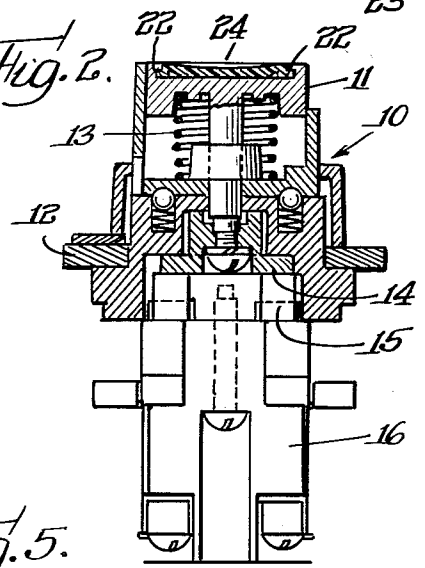
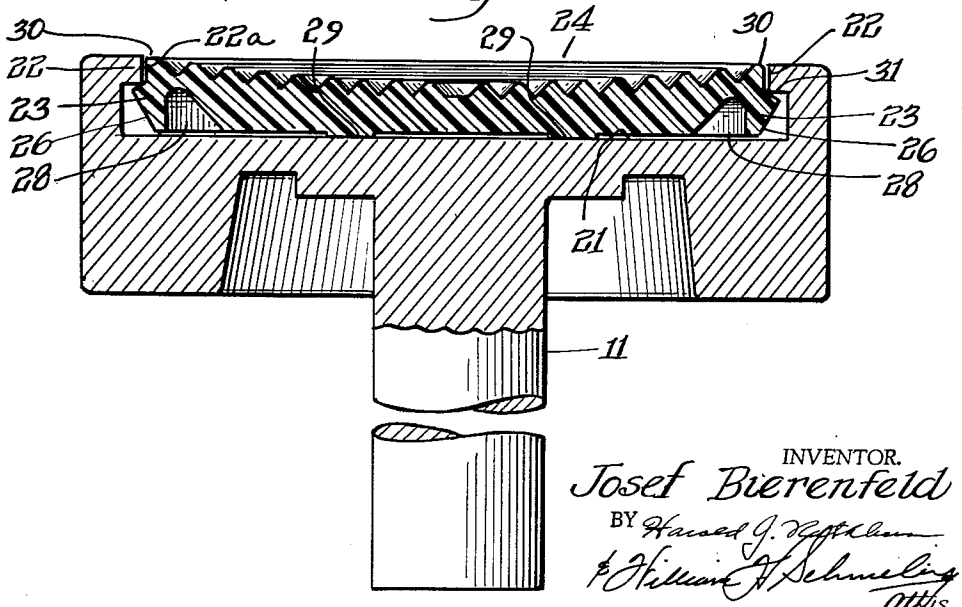


Fig. 5.



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INSERT FOR A SWITCH BUTTON

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This invention relates to electrical push button switches and more particularly to the provision of indicia for the rectilinearly movable operators of such switches.

It is desirable, especially in cases where a plurality of push button switches are arranged in a group, to provide indicating means on the forwardly exposed faces of the switch operators for indicating the functions of the respective switches or the types of equipment with which they are respectively associated. For certain classes of service, it is not only desirable that the indicating means permit quick and ready distinction between the several operators of a group of switches, but also that the indicating means be readily alterable in accordance with changes in the equipment controlled by the switches or changes in the functions of the switches.

In the past, push button switches, such as shown in Mekelburg Patent No. 2,631,203, issued March 10, 1953, often were provided with different colored operators for easy identification. These operators, however, could not be interchanged with others of different colors without disassembly of the switch, and, in some instances, were so secured in place that removal and replacement of the entire switch mechanism was necessary when an operator of a different color was required. When, on occasion, such a push button switch having an operator of an incorrect color was inadvertently installed in a control panel, time-consuming removal of the entire switch and replacement by one with an operator of the proper color was required. With such prior push button switches, it was necessary also for sales outlets to have on hand a multiplicity of switches with an assortment of different colored operators for efficient servicing of customers.

It is, therefore, desirable to provide a push button switch in which the switch mechanism need not be disassembled or removed and replaced when it is desired to change the color or other indicium of classification associated with the operator. In accordance with this invention, a means for push button switch identification is provided which is easily changeable from one push button switch to another while the switches are mounted in position and operable, and without the necessity of dismantling or completely replacing the switch.

A principal object of this invention is to provide a push button switch having an operator arranged in an improved manner to receive different distinguishing indicia selectively for providing positive identification which will continue even under heavy usage.

A further object is to provide an improved switch operator arranged to receive an indicating insert which may be readily snapped into place in the operator and removed therefrom, selectively, but which remains securely in place unless deliberately removed.

Another object is to provide an improved operator for a push button switch having an indicating insert removably received in a recess formed in the front face of the operator.

Another object is to provide an improved indicating insert arranged to be removably mounted on the operator of a push button switch.

Other objects and advantages of the invention will be apparent from the following description, wherein reference is made to the drawings, in which:

FIG. 1 is a front elevation view of a push button switch embodying the present invention;

FIG. 2 is a partial sectional view on the line II—II of FIG. 1;

FIG. 3 is an enlarged front elevational view of an indicating insert according to the present invention;

FIG. 4 is an enlarged sectional view on the line IV—IV of FIG. 3; and

FIG. 5 is an enlarged view in diametrical section showing the insert of FIGS. 3 and 4 in position in the operator of FIGS. 1 and 2.

A push button switch operator in accordance with this invention has a concavity in its forward face provided with overhanging wall portions. A relatively stiff resilient plate member is receivable flatwise in the concavity and has peripheral fastening portions arranged to lie outwardly from the inner peripheral limits of the overhanging wall portions. There are provided means on the peripheral fastening portions of the plate member and on the inner peripheries of the overhanging wall portions which inter-engage as the plate member is pressed flatwise into the concavity to displace the peripheral fastening portions of the plate member inwardly of the overhanging wall portions toward the mid-portion of the plate member. When the plate member is fully received in the concavity, the inter-engaged portions disengage to permit the peripheral fastening portions to move to positions outwardly from the inner peripheral limits of the overhanging wall portions.

Referring first to FIGS. 1 and 2, there is shown an electrical push button switch 10 having a rectilinearly movable operator 11 in accordance with this invention. The switch 10 is adapted to be mounted on a panel 12, and it will be understood that movement of the operator 11 downwardly in FIG. 2 against the bias of a spring 13 causes a disc 14 to engage a plunger 15 of an enclosed switch mechanism 16. Upon release of the operator 11, the spring 13 returns it to its initial position and pressure of the disc 14 on the plunger 15 ceases.

Referring now to FIGS. 2 and 5, the operator 11 has a concavity 21 in its forward or upper face, and an inwardly directed annular flange 22 formed on the upper edge of the wall portion of the concavity 21 overlies the outer peripheral area of the concavity to define an overhanging wall portion positioned forwardly of the base of the concavity. An inner face 22*a* of the flange 22 is preferably flat as shown and normal to the parallel upper and lower faces thereof. The concavity 21 is arranged to receive a relatively stiff resilient insert 24 shaped generally like a flat plate and preferably made of a plastic material of selected color or bearing indicia (not shown) of some form.

Referring now to FIGS. 3, 4, and 5, a peripheral fastening portion 23 of the insert 24 is provided with a forwardly or upwardly directed inclined annular shoulder 25 and a rearwardly or downwardly directed annular bevelled edge 26. The shoulder 25 and the edge 26 are substantially normal to each other, and the portion of the insert 24 next adjacent to, and inward from, the inner marginal edge of the shoulder 25 extends upwardly from that edge approximately the same distance as the width of the face 22*a* of the flange 22. The rearward or lower face of the insert 24 is provided with an annular notch 28 near its outer periphery having an outer annular wall substantially parallel to the axis of the insert 24 and an inward annular sloping wall. The rearward or lower face of insert 24 has a raised annular ring 29 slightly extending below the bottom surface thereof. The ring 29 is concentric with the center of the insert 24 and has its outer edge 29*a* spaced from notch 28 to permit flexure of the body portion of the insert between edge 29*a* and notch 28. Further, the vertical dimension from the bottom face 29*a* of the ring 29 and the shoulder 25 preferably is slightly greater than a lower face 31 of flange 22 and the bottom wall of concavity 21 to tightly secure the insert 24 in the

concavity. The insert 24 further has suitable serrations 29 in the form of circular grooves in its forward face 30 concentric to and extending from the center of the insert 24 toward and near its outer periphery. Preferably, the forward face 30 is concave as shown.

The insert 24 is installed in the operator 11 by coaxially aligning it flatwise with the concavity 21 and applying pressure about the periphery of its forward face 30. Because of the notch 28, the peripheral fastening portion 23 of the insert 24 is deformed inwardly to permit its entry into the concavity 21. During installation, the bevelled edge 26 of the fastening portion 23 engages the upper inner edge of the flange 22 and continued pressure applied about the periphery of the insert 24 on its forward face 30 causes the fastening portion 23 to be cammed inwardly, thus permitting entry of the fastening portion 23 of the insert 24 into the concavity 21. When the insert 24 is fully received in the concavity 21, the inclined shoulder 25 of the peripheral fastening portion 23 tightly engages the lower inner face 31 of the flange 22 because of the presence of ring 29 as it engages the bottom surface of concavity 21. The flange 22 thus provides an overhanging metallic border extending completely around the fastening portion 23 of the insert 24 so that the fastening portion 23 lies generally beneath and outwardly from the inner peripheral limits of the flange 22.

In practice, the insert 24 is preferably molded of a colored polyethylene material, which color does not fade or wear away even under heavy usage. The inserts 24 may, of course, be available in several different colors. If desired, some or all of the concentric rings may be omitted and a numeral or letter molded in their place.

Although the flange 22 and the peripheral fastening portion 23 have been shown and described as continuous, it is to be understood that they could be interrupted to define a series of cooperating overhanging wall portions and fastening portions.

The invention thus provides an electrical push button switch with an insert 24, preferably of a selected color, which is easily replaceable in the switch operator without requiring disassembly or replacement of the switch to effect a color change. Although a change in the insert 24 may be made with equal ease either before or after the switch is installed on a panel, the method of engagement of the insert within the operator is so secure that accidental loosening due to vibration or abuse is prevented. Once installed, the insert 24 may be removed only by prying it out with a suitable tool, thus effectively discouraging promiscuous changing of inserts by unauthorized personnel.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto, as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims.

I claim:

1. In combination, a push button switch operator having a rigid body with a forward face and a concavity therein, said concavity having a substantially flat bottom wall and an integral annular peripheral wall with portions thereof overhanging the bottom wall of the concavity in forwardly spaced relation thereto, and a relatively stiff resilient plate-like insert member disposed flatwise in the concavity with a centrally located portion thereof in engagement with the bottom wall and having peripheral fastening portions arranged to lie in spaced relation to the bottom wall and outwardly from the inner peripheral limits of said overhanging wall portions of said concavity when said member is in said concavity, interengageable means on said peripheral fastening portions of said member and the inner peripheries of said overhanging wall portions operable as the member is pressed flatwise into the concavity to displace said peripheral fastening portions of said member inwardly of said overhanging wall portions toward the centrally located portion of said member, said overhanging wall portions of said peripheral wall of said concavity being portions of a peripherally continuous inwardly directed flange member and said interengageable means on said peripheral fastening portions of said member being a surface which is bevelled endwise of said member for camming said peripheral fastening portions of said plate member inwardly toward the centrally located portion of the member to permit passage of said member flatwise past said flange member into the concavity to the position wherein the centrally located portion engages the bottom wall of the concavity.

2. An apparatus according to claim 1 wherein said member has a peripheral notch adjacent its peripheral fastening portion for facilitating inward displacement of said peripheral fastening portions by said overhanging wall portions.

3. The combination as recited in claim 1 wherein said member is provided with a raised annular ring at its central portion which engages the bottom wall of the concavity while other portions of the member are substantially flush with the forward face of the operator.

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