United States Patent [19]

Phillips

[11] **3,903,577**

[45] **Sept. 9, 1975**

[54] **TOOL FOR REMOVING PUSH BUTTONS**

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[52] **U.S. Cl.** ..... **29/203 H**; 29/278

[51] **Int. Cl.**[2] **B25B 27/14**

[58] **Field of Search** ..... 29/203 H, 203 HM, 225, 29/230, 235, 270, 278

[56] **References Cited**

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Assistant Examiner—Harold P. Smith, Jr.

[57] **ABSTRACT**

A tool for removing spring-retained push buttons from panels without damaging either the push buttons or the panels. The tool comprises a hollow sleeve for sliding over the push button to release the retainer spring, and a plunger which slides within the sleeve for thrusting the released push button out of the panel.

5 Claims, 4 Drawing Figures

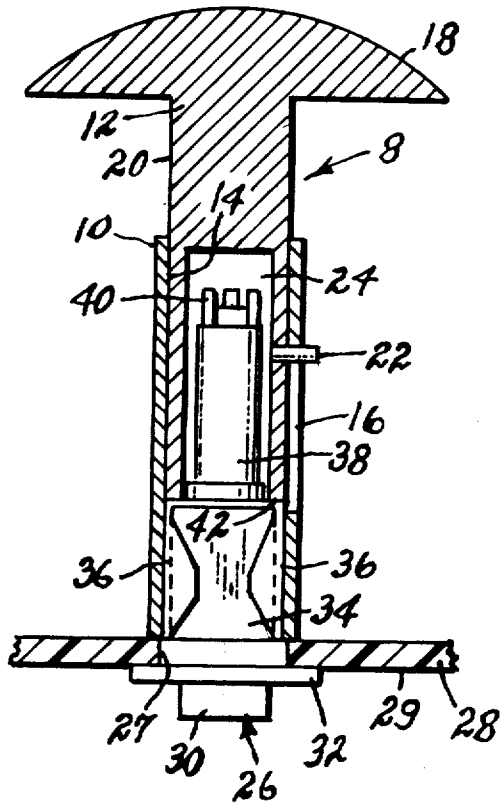


Fig. 1

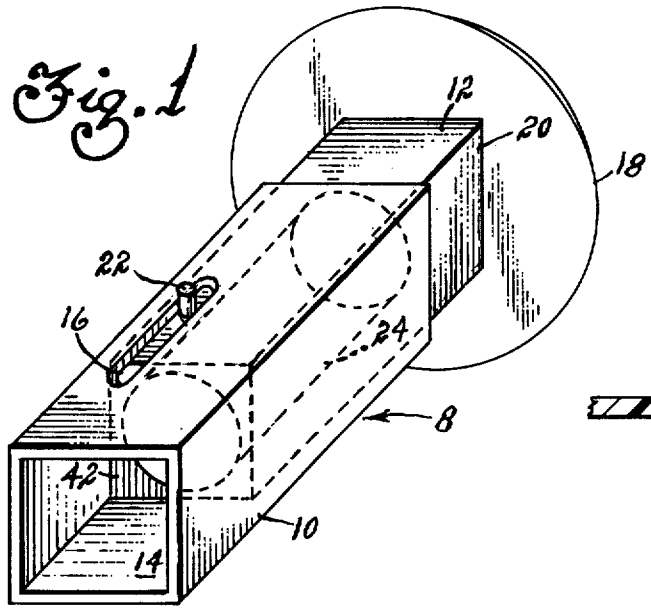
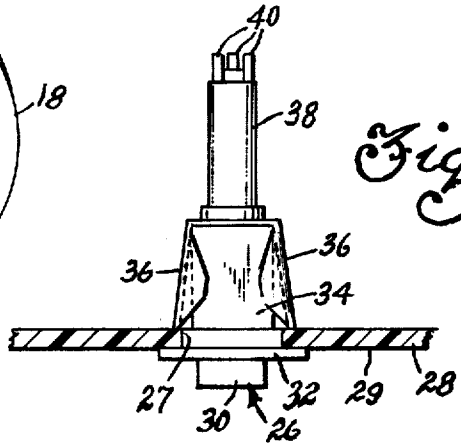


Fig. 2



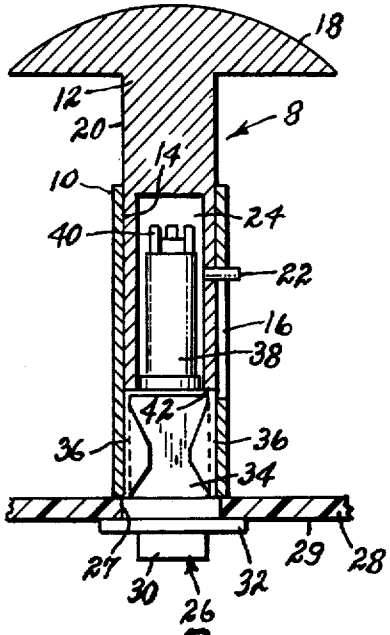


Fig. 3

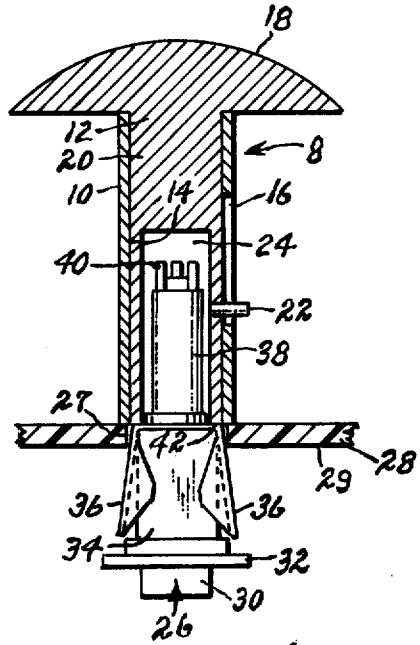


Fig. 4

TOOL FOR REMOVING PUSH BUTTONS

BACKGROUND OF THE INVENTION

This invention relates to tools for removing push buttons from panels and more particularly for removing spring-retained push buttons from panels.

In the assembly of panels which contain push buttons, it is frequently necessary, for one reason or another to remove one or more push buttons after they have been secured to the panel. When the push button to be removed is of the type secured to the panel by a leaf spring, as opposed to the type secured to the panel by a ring nut, removal of the push button often results in damage to the spring-retained push button, to the panel, or to both.

Applicant herein discloses a new type of tool which releases the retainer leaf spring on the spring-retained push button, allowing the push button to be easily removed from the panel without damaging the push button or the panel. Thus, the present invention provides a tool for removing spring-retained push buttons from panels without damaging either the push buttons or the panels.

SUMMARY OF THE INVENTION

The invention provides a tool for removing from a panel a spring-retained push button. The tool consists of a hollow rectangular sleeve for sliding over the push button to release it, and a plunger which slides within the hollow rectangular sleeve for thrusting the released push button out of the panel. When it becomes necessary to remove a spring-retained push button from a panel, the hollow rectangular sleeve portion of the tool is slid into position over the push button body of the spring-retained push button, compressing the retainer leaf spring against the push button body. The hollow rectangular sleeve has an internal rectangular bore with the same shape as and dimensions slightly larger than the periphery of the push button body so that when the sleeve is in place, enclosing the push button body, the retainer leaf spring is compressed against the push button body, releasing the push button and rendering it capable of being thrust out of its hole in the panel. The plunger is provided with a round relief hole for extensions on the push button. When the hollow rectangular sleeve is in place and the push button released, pressure is put on the plunger which in turn puts pressure on the push button body, thrusting the push button out of the panel without damaging either the push button or the panel.

In summary, the invention provides a tool for removing spring-retained push buttons from panels without damaging either the panels or the push buttons.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the tool for removing spring-retained push buttons from panels.

FIG. 2 is a side view of a mounted spring-retained push button.

FIG. 3 is a side view of the push button removing tool in place over a mounted spring-retained push button.

FIG. 4 is a side view of a spring-retained push button removed by the push button removing tool.

DETAILED DESCRIPTION

FIG. 1 depicts a perspective view of the tool 8 for removing spring-retained push buttons from panels. In

FIG. 1 there is shown the two major components of the tool, a hollow rectangular sleeve 10, and a plunger 12. The sleeve 10 is hollow, having an internal rectangular bore 14 of constant dimensions. One side of the rectangular sleeve 10 contains a slot 16. The plunger 12 consists of a palm button shaped plunger handle 18 connected to a rectangular plunger slide 20. The rectangular plunger slide 20 fits within, and is designed to slide through the internal rectangular bore 14 of the hollow rectangular sleeve 10. A roll pin 22 is fitted into the rectangular plunger slide 20, and extends out of the rectangular plunger slide 20 and through the slot 16 in the rectangular sleeve 10 in order to maintain the rectangular plunger slide 20 within the hollow rectangular sleeve 10, and to limit the extent of travel of the rectangular plunger slide 20 within the rectangular sleeve 10. In addition, the rectangular plunger slide 20 has drilled into its end opposite the plunger handle 18 a round relief hole 24 extending substantially into, but not through the rectangular plunger slide 20.

FIG. 2 depicts a side view of a spring-retained push button 26 mounted through a hole 27 in panel 28. The mounted push button 26 consists of a button 30 and flange 32 on the outside of the panel 28, and push button body 34, a retainer leaf spring 36, and columnar extension 38 with attached contacts 40 on the inside of panel 28. When inserting the push button 26 into the panel 28, the columnar extension 38 is fed through hole 27 in panel 28 until the retainer leaf spring 36 comes in contact with the sides of hole 27. In its relaxed condition, the retainer leaf spring 36 is larger than the hole 27. As the push button body 34 is fed through the hole 27, therefore, the retainer leaf spring 36 is compressed against the push button body 34. The push button body 34 is fed through hole 27 until the flange 32 contacts the outside face 29 of panel 28. When that contact is made, the retainer leaf spring 36 has passed substantially, or completely through hole 27 in panel 28, and has returned substantially or completely to its relaxed condition. In this state, the retainer leaf spring 36 cannot be pushed back through hole 27 in panel 28 without doing damage to both the retainer leaf spring 36 and the panel 28.

FIG. 3 shows the side view of the push button removing tool 8 depicted in FIG. 1 in place over the spring-retained push button 26 depicted in FIG. 2. The hollow rectangular sleeve 10 has been placed in position over the portions of the push button 26 inside the panel 28, enclosing the push button body 34 and compressing the retainer leaf spring 36 against the sides of the push button body 34. The internal rectangular bore 14 in the hollow rectangular sleeve 10 is of the same shape as and slightly larger in dimensions than the periphery of the push button body 34, and when the hollow rectangular sleeve 10 of the tool 8 is in place enclosing the push button body 34 and compressing the retainer leaf spring 36 against the push button body 34 as shown in FIG. 3, the push button 26 is released, and may be removed from the panel 28 by thrusting it through the hole 27 in panel 28. Plunger 12 is shown in place with rectangular plunger slide 20 within hollow rectangular sleeve 10. The round relief hole 24 in the rectangular plunger slide 20 is situated over the columnar extension 38 and contacts 40 of the push button 26, and the surface 42 around the round relief hole 24 on the end of the rectangular plunger slide 20 opposite the plunger handle 18 is in contact with the push button body 34.

The plunger **12** is thus in position to thrust the push button **26** through the hole **27** in the panel **28.** When the retainer leaf spring **36** is compressed against the push button body **34** and the push button **26** is therefore released, push button **26** may then be removed by exerting pressure on the palm button shaped plunger handle **18,** and thrusting push button body **34** out hole **27** in panel **28,** resulting in the removed push button **26** shown in FIG. **4.**

FIG. **4** shows the side view of the push button removing tool **8** and the spring-retained push button **26** depicted in FIG. **3.** In FIG. **4,** the plunger **12** has been depressed, and the push button **26** has been thrust out of panel **28** through hole **27.** Retainer leaf spring **36** has been pushed free of hollow rectangular sleeve **10** and hole **27,** and has returned to its relaxed condition. The push button **26** is free of the panel **28,** and has been removed without damaging either the panel **28** or the retainer leaf spring **36** of push button **26.** Thus, utilization of the present inventions permits removal of spring-retained push buttons from panels while eliminating damage to either as the result of such removal.

While particular embodiments have been shown and described, it should be understood that many other arrangements using the teachings of this disclosure could be utilized without varying from the scope and spirit of the invention or the appended claims.

What is claimed is:

1. An apparatus for removing from a panel a spring-retained push button having a retainer spring and a push button body with extensions thereon, said apparatus comprising:

a. means for releasing the retainer spring to permit removal of said push button from the panel; and

b. a plunger in sliding engagement with said releasing means for removing the released spring-retained push button from the panel, said plunger having means for enclosing the push button body extensions to protect them during removal.

2. The apparatus of claim **1,** wherein said releasing means further comprises a hollow sleeve with internal bore of the same shape as and dimensions slightly larger than the periphery of the push button body for enclosing the push button body and compressing the retainer spring against the push button body to permit removal of the spring-retained push button from the panel.

3. The apparatus of claim **2,** wherein said means for enclosing further comprises a cavity in said plunger for providing relief for the push button body extensions, said plunger cooperating with said sleeve, for thrusting the released spring-retained push button through the panel, whereby the push button is removed without damaging the extensions thereon.

4. An improved apparatus for removing from a panel a spring-retained push button having a retainer spring and a push button body with extensions thereon, said apparatus having a hollow sleeve for enclosing the push button body and compressing the retainer spring, releasing the push button for removal from the panel; and a plunger having a surface for engaging the push button, said plunger being slidably contained within said sleeve and cooperating with said sleeve for thrusting the released push button from the panel, wherein the improvement comprises means on said plunger for providing relief for the push button body extensions upon engaging of the push button by said plunger, permitting the push button to be removed without damage to the extensions thereon.

5. The apparatus of claim **4,** wherein said means for providing relief further comprises a cavity on the push button engaging surface of said plunger for providing relief for the push button body extensions upon engaging of the push button by said plunger.

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