United States Patent [19]

Potter

[11] **3,900,710**

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[54] **SQUEEZABLY ACTUATED GENERAL PURPOSE ELECTRIC SWITCH**

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[52] **U.S. Cl.**..... **200/81 H;** 200/83 Z; 200/61.04; 200/333

[51] **Int. Cl.**[2] **H01H 35/34**

[58] **Field of Search** ... 200/83 B, 83 Z, 81 H, 51.14, 200/51.16, 61.04, 168 J, 172, 159 R, 159 B, 157, 329, 330, 333, 82 R, 82 Y, 82 V; 337/67, 557

[56] **References Cited**

UNITED STATES PATENTS

2,119,146	5/1938	Adams	200/51.16
2,534,875	12/1950	Miller	200/51.16
2,786,909	3/1957	Goldman	200/51.14
3,541,485	11/1970	Moret	200/51.16

FOREIGN PATENTS OR APPLICATIONS

825,731	12/1959	United Kingdom	200/81 H

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[57] **ABSTRACT**

A squeezably actuated electric switch is disclosed comprising a standard push on - push off electric switch mounted in a housing; and a flexible, hollow squeezable switch member filled with a liquid attached to the housing. The squeezable switch member has an expandable surface portion in contact with the push on - push off switch actuator end face. The expandable surface portion bulges upon squeezing the body of the switch in any position forcing the switch actuator inward to throw the push switch. The housing may comprise among other things an incandescent lamp socket.

2 Claims, 5 Drawing Figures

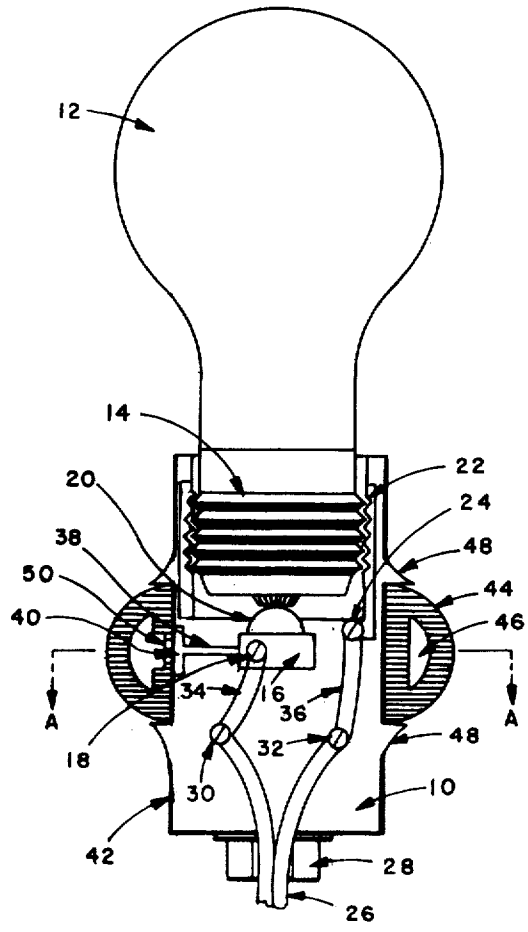


FIG. 1.

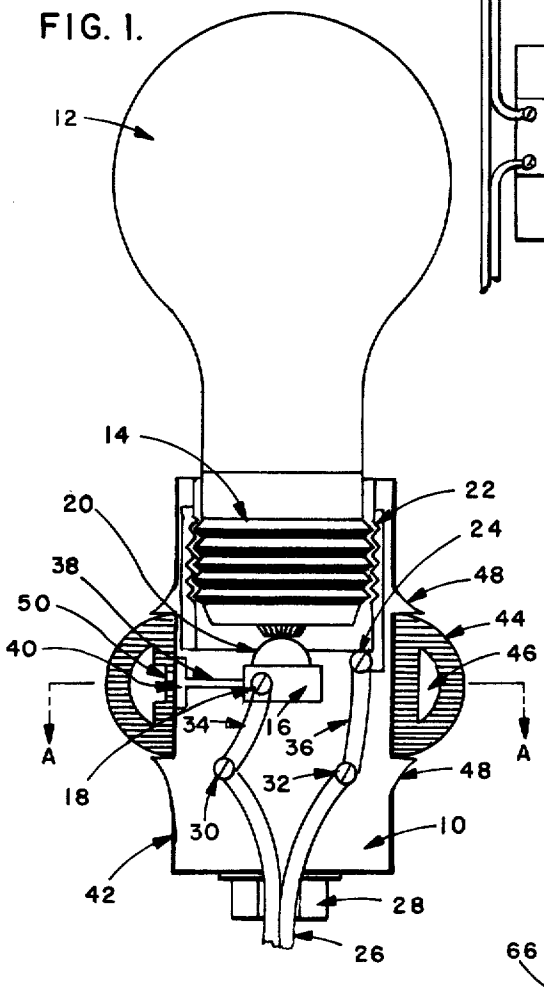


FIG. 5

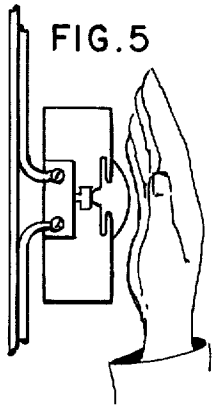
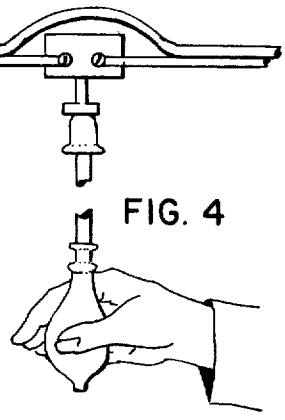


FIG. 4



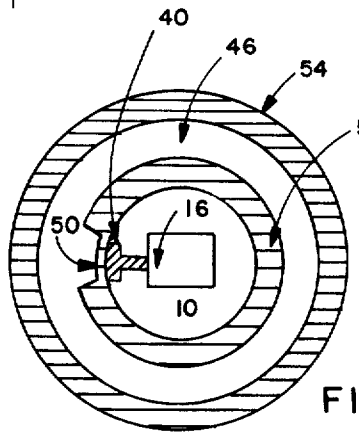


FIG. 2

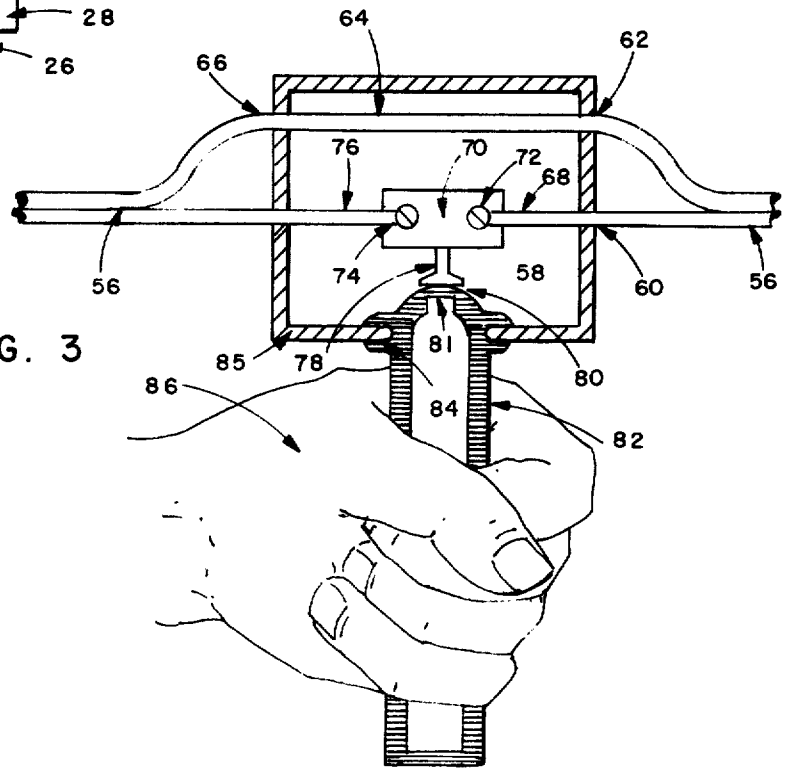


FIG. 3

SQUEEZABLY ACTUATED GENERAL PURPOSE ELECTRIC SWITCH

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention resides in the field of hand actuated electric switches and more particularly those of the type usually employed in home appliances such as lamp sockets or convenience switches attached to extension cords.

2. Description of the Prior Art

The prior art is repleat with a multiplicity of hand actuated electric switches for home appliances such as rotary, flip, single button push, chain, dual button push and slideable bar switches plus many others too numerous to mention. Each has its own merits and disadvantages which depend on the application of the switch. The present invention is designed to reduce the certain amount of fumbling or groping which is inherent in the use of all switches with a small actuating member as well as to provide a switch of great convenience for those who have difficulty operating commonly available switches such as blind persons or invalids.

One form of the invention comprises a donut or toroid shaped flexible switch member which surrounds an incandescent lamp socket. Several patents, particularly U.S. Pat. Nos. 2,446,768; 2,786,909; and 2,985,729 show structures which appear similar. However, those inventions all consist of solid rings which are either rotated about the socket or slide back and forth along its axis. In contrast, and as will be described in greater detail below, the ring shaped embodiment of the present invention is flexible and is designed to be squeezed by exerting minor pressure with one or two fingers in any position to achieve the desired result of actuating the switch.

Additionally, U.S. Pat. No. 2,119,146 discloses a flexible lamp socket casing which when squeezed in the proper spot actuates a push type switch by direct contact through the casing, the casing serving as an insulating barrier. As will be further seen the instant invention differs from this structure as well, particularly in the construction and disposition of the flexible, squeezable switch member. Other differences and advantages will become more clear from the following summary.

SUMMARY OF THE INVENTION

As stated above, the invention comprises a squeezably actuated electric switch utilizing a push on - push off switch mounted in a housing and an actuator for the push switch slideably mounted to said switch and within said housing. The face end of the actuator is exposed to the exterior of the housing where it is contacted by an expandable surface portion of a hollow, flexible, liquid-filled squeezable switch member. Squeezing the switch member in any position causes the expandable surface portion to bulge forcing the switch actuator inward to throw the push switch. Each squeeze causes the push switch to change state, either on or off, just as pushing the switch actuator directly would. The push switch is of the conventional type having an input and output for supplying electricity to an appliance. Either one or both lines of a standard electrical cord may be controlled by the push switch depending upon which of a number of conventional designs is chosen.

Two embodiments are described below. One comprises a donut shaped squeezable switch member surrounding a lamp socket. The other is a general purpose switch which might be inserted in an auxiliary or extension cord and is actuated by a tube-shaped squeezable member. Each is designed to be actuated by a slight squeeze between two fingers. The characteristics and advantages of the invention will be more evident from the following description of the preferred embodiment taken with the drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional schematic view of one embodiment of the invention; and

FIG. 2 is a cross-sectional view of FIG. 1 along line A—A; and

FIG. 3 is a cross-sectional schematic view of an additional embodiment of the invention.

FIGS. 4 and 5 illustrate alternate embodiments of the squeezable switch member of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIG. 1, there is illustrated in cross-sectional schematic representation a particularly useful embodiment of the invention comprising a lamp socket and housing **10** containing light bulb **12** having base **14**. Push on - push off switch **16** is mounted in socket and housing **10**, which switch can be any conventional design of this general type. Particular mounting means, not shown, are a matter of choice as would be obvious to those skilled in the art. Switch **16** has input terminal **18**, a screw terminal for example, and an output terminal **20**, a domed contact for the tip of the lamp bulb as shown.

Screw receptical **22** for receiving lamp base **14** is supplied with input screw terminal **24**. Dual wire electric cord **26** enters socket **10** through base aperture **28** and terminates at screw terminals **30** and **32**. Internal connections are made between terminals **30** and **18**, and **32** and **24** by wires **34** and **36** respectively. It should be understood that the internal electrical connections of the socket are shown for representational purposes only and are subject to modification as would best suit the needs of the industrial designers and manufacturers.

Switch actuator **38** is slideably mounted to said push switch **16** as a part thereof and within said housing **10** and connects to push switch **16** such that a forward thrust on the face **40** of the actuator **38** turns the switch either on or off and an additional thrust reverses the previous state. The face **40** as shown is of substantially larger cross-section than the shaft of the actuator and protrudes slightly through wall **42** of socket housing **10**.

Squeezable switch member **44** is flexible, hollow and filled with a substantially non-compressible liquid **46** which should also be of low conductivity in the event of accidental rupture of the switch member surface. The squeezable switch member **44** in this embodiment takes the form of a donut or toroid and is secured in place by flange rings **48** molded into the housing **10**.

A thin, expandable surface portion **50** is molded into the surface of the squeezable member **44** and is aligned with actuator face **40**. Upon squeezing the switch member **44** from any angle or orientation with the tips of the fingers, the expandable portion will bulge inwardly through the aperture in the socket wall **42**, driving the actuator **38** forward to throw the push switch **16**. Since

the donut can be grasped in any position about the circumference, fumbling and groping in the dark is eliminated to a large degree. The benefit to blind people at anytime of day is equally great especially since the donut can be made substantially larger than is illustrated. Similarly, and as will be described below, the squeezable switch may be made as large as the palm of a hand to enable arthritic persons to grasp the switch with the entire hand to reduce pain and remove the difficulty of manipulating individual fingers.

Referring now to FIG. 2 where like members signify like parts of the apparatus of FIG. 1, a cross-sectional representation illustrating the thin expandable surface or wall portion of the squeezable switch member **44** is shown. As described above, push switch **16** is mounted in housing **10.** Inner wall **52** and outer wall **54** of the squeezable switch member **44** contain liquid **46.** The walls are composed, for example, of any tough flexible plastic or other resilient material. When the outer wall is squeezed, the liquid displaces and forces the thinner section **50** of inner wall **52** to bulge through the aperture in socket wall **42** and against the actuator face **40.** The actuator **38** is then driven forward and the push switch thrown.

Referring next to FIG. **3,** an alternative embodiment of the invention is illustrated. Line cord **56** enters housing **58** through apertures **60** and **62.** One wire **64** of the cord passes through the housing **58,** and out aperture **66** uninterupted. The other wire **68** is connected to push switch **70,** mounted in the housing, at screw terminal **72.** An additional output screw terminal **74** is located on switch push **70** to which is connected a continuation **76** of wire **68.** Switch actuator **78** is slideably mounted to said push switch **70** and within said housing **58,** and has a face **80** of larger cross-section than the shaft.

Squeezable switch member **82** is composed of a flexible hollow elongated tube which is held in place in the housing by a double molded ring **84** in the wall **85** of the switch in the manner of a grommet. The thin wall or expandable portion of the tube is the end surface and abuts face **80** of the switch actuator. The operation is the same as described above. When the tube is squeezed by fingers or hand **86** as is shown, the end of the tube forces actuator **78** forward and throws the push switch. Another squeeze and the state of the switch is reversed.

In addition to being adaptable to a lamp socket in the manner described above, this general purpose switch has particular applications in an extension cord since one end of wire **56** may be fitted with an ordinary electric plug for a wall socket and the other end with a receptacle for plugging in household appliances. The cord may then be concealed but the tube exposed for operating the appliance. This embodiment is particularly useful where the user is bed-ridden and wishes to operate a televison, radio or other appliance from a distance. An embodiment of such a design is illustrated in FIG. **4.** In addition, the principles disclosed in this specification are easily adaptable to a wall switch, an embodiment of which is illustrated in FIG. **5.** The squeezable switch member would be in the form of a hemisphere which when squeezed or touched would move a switch actuator to change the state of a switch. This embodiment would be particularly useful for blind or otherwise physically handicapped persons and for small children. Other variations, modifications, and uses of the invention will now become obvious from the foregoing drawings and specification.

What is claimed is:

1. A squeezably actuated general purpose electric switch comprising in combination:

a. a housing;

b. a push on-push off electrical switch mounted within said housing having an electrical input terminal for receiving a conductor of electrical power and an electrical output terminal for transmitting electrical power to an appliance;

c. an actuator for said push switch slideably mounted within said housing, said actuator having an end face communicating with the exterior of said housing; and

d. a flexible hollow squeezable switch member in the shape of a toroid surrounding said housing filled with a substantially non-compressible liquid secured to said housing, said member having an expandable surface portion in communication with said actuator end face, said expandable surface portion being relatively thinner than the remaining surface of said member.

2. The apparatus of claim **1** wherein said housing comprises a lamp socket.

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