

An Electric Switch Assembly Comprising an Arc Shield

Field of the Invention

5 This invention is directed to an electric switch assembly and typically to a domestic electric switch of the type which is known as a "dolly" type switch and which is provided with an arc shield to protect the dolly against damage.

Background Art

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A dolly type switch for use in domestic electric switches is well-known. The switch typically comprises a dolly (which is the part of the switch which is touched by the person's fingers). The dolly can pivot between an "on" position and an "off" position. The pivoting action causes the switch to be turned on or turned off.
15 Typically, the switch includes three electrical contacts (positive, negative and earth), and the switch also includes a pivoting bridge which typically comprises a small shaped metal plate. Pivoting of the dolly causes the bridge to pivot between an on position and an off position.

The arrangement of the dolly and the bridge causes arcing (a small
20 spark) to occur every time the switch is manipulated. Over time, the arcing can cause deterioration of the dolly either by discoloration of the dolly, pitting of the dolly etc.

Therefore, attempts have been made to protect the dolly against such deterioration by inserting or providing an arc shield. One known type of arc shield comprises a substantially rectangular intermediate member which is provided with a
25 large central opening. The dolly sits over the opening to allow the dolly to manipulate the bridge, and the remainder of the arc shield is there to protect the rest of the dolly against deterioration caused by arcing. One disadvantage with this arrangement is the need to assemble a separate part (the arc shield) to the switch housing and then to position the dolly correctly to enable it to operate the bridge through the opening in
30 the arc shield. Another disadvantage is that while the arc shield protects some parts of the dolly, the large central opening in the arc shield can still allow some deterioration to occur on parts of the dolly that are not properly shielded.

Therefore, there would be an advantage if it were possible to provide

protection to the switch dolly using an arc shield which is not provided with a large central opening.

It will be clearly understood that, if a prior art publication is referred to herein, this reference does not constitute an admission that the publication forms part
5 of the common general knowledge in the art in Australia or in any other country.

Object of the Invention

It is an object of the invention to provide a switch assembly that may at
10 least partially overcome some of the above-mentioned disadvantages or provide the consumer with a useful or commercial choice.

In one form, the invention resides in a dolly for an electric switch, the dolly comprising at least two parts, one part comprising an outer part and the second part comprising an arc shield, the arc shield being positioned inside the first part.

15 In this form, the arc shield can be seen as forming part of the dolly and not a completely separate part that needs to be separately assembled between the dolly and the switch housing.

In another form, the invention resides in a switch assembly which comprises a housing, at least one electrical contact, a bridge which is movable
20 between an electrical on position and a electrical off position, a bridge actuator member which moves the bridge between the on position and the off position, and a dolly which manipulates the bridge actuator mechanism, the dolly being provided with an arc shield.

In this form of the invention, it is preferred that the dolly comprises an
25 outer part and an inner part, the inner part comprising the arc shield.

The outer part of the dolly may comprise a shell, and will typically have a flattened or concave top portion to facilitate finger manipulation of the dolly between the on and off position, and a side wall depending from the top portion. Typically, the outer shell will be formed as a unitary part. The size and shape of the
30 dolly can vary. Also, the material from which the dolly is manufactured can vary but it is envisaged that this material will be conventional for the manufacture of dollies.

The second part (the arc shield) will typically comprise an inner part that sits within the outer part. Suitably, the second part is made from material which

will protect the outer part. As an example, the inner part may be manufactured from black nylon although no particular limitation is meant thereby.

The dolly may be provided with attachment means to enable the bridge actuator member to be attached to the dolly. The attachment means may comprise a sleeve or passageway in which one end of the bridge actuator member can pass. Alternatively, the attachment means may comprise any other type of part or member to slidingly capture, attach or otherwise operate the bridge actuator. Typically, the attachment means will comprise a short tubular member into which one end of the bridge actuator member can pass.

The dolly will typically be pivotly attached to the switch housing to enable the dolly to pivot or rock between the on position and the off position. It is typical for the dolly to be provided with a pair of diametrically opposed pivot pins which pass into openings in the switch housing to capture the dolly in a pivoting manner. This arrangement is well-known but in this particular invention, it is preferred that the inner part is provided with the diametrically opposed pivot pins as this can provide further shielding of the outer part of the dolly. Therefore, it is preferred that the outer part of the dolly (i.e. the shell) is provided with recesses, cutouts or other types of openings or means to accommodate the pivot pins of the inner part.

The inner part may be provided with a pair of spaced apart parallel rib members and it is preferred that a pair of such rib members is provided immediately behind each pivot pin.

The bridge actuator member may comprise an elongate member which may be substantially cylindrical in shape and which may be provided with a rounded front nose portion. The rear portion of the elongate member may pass into the tubular member that may be present on the dolly. A biasing means will typically be provided to bias the bridge actuator member into engagement with the bridge. The biasing means may comprise a spring. The spring may comprise a helical spring. The biasing means may be provided behind or adjacent the rear portion of the bridge actuator member and it is preferred that the biasing means is positioned at least partially within the tubular member on the dolly.

The bridge will typically comprise a small metal plate which is electrically conductive. The bridge will typically be mounted for pivotal movement in

the housing and this type of arrangement is known.

Brief Description of the Drawings

An embodiment of the invention will be described with reference to the following drawings in which:

- 5 Figure 1. Illustrates a front perspective view of the dolly.
- Figure 2. Illustrates a rear perspective view of the dolly and illustrating the arc shield insert.
- Figure 3. Illustrates a cutaway view of the dolly.
- Figure 4. Illustrates an "exploded" view of the dolly.
- 10 Figure 5. Illustrates a rear perspective exploded view of part of a switch assembly and particularly illustrating the dolly, the bridge actuator, the bridge and the electric contact components of the switch.
- Figure 6. Illustrates a front perspective exploded view of the switch of Figure 5.
- Figure 7. Illustrates a front partially cutaway view of the dolly assembled to the
- 15 switch housing.
- Figure 8. Illustrates the view of Figure 7 with the dolly in phantom.

Best Mode

Referring initially to figures 1-4, there is illustrated a dolly 10 which has a shape which is more or less conventional from the outside. In the particular
20 embodiment, dolly 10 is formed from two parts this being best illustrated in figure 4 and comprising an outer part 11 which can be seen as an "shell" and an inner part 12. Inner part 12 is fitted inside outer part 11 this being best illustrated in figure 2 and figure 3. Inner part 12 is formed of black nylon and functions as an arc shield and to provide chemical resistance to deterioration of outer part 11.

25 Inner part 12 is provided with a pair of diametrically opposed and outwardly extending pivot pins 13. Therefore, outer part 11 is formed with rather large curved recesses 14 (see figure 4) to accommodate pins 13. Pins 13 are mounted to a much larger curved platform 15. When platform 15 passes into recess 14, a flush finish is obtained this being evident in figure 1 and figure 2.

30 Inner part 12 also comprises a pair of spaced apart ribs 30 on the inside of the inner part and extending immediately behind the each pivot pin 13.

 Inner part 12 is provided with a small extending hollow boss 16 which is illustrated in figure 2 and figure 3. The purpose of this will be explained below.

Referring to figures 5 and 6, there is illustrated dolly 10 as described above and part of a switch assembly. The switch assembly comprises a housing 17 containing three electrical contacts 18-20 these being best illustrated in figure 6. This type of arrangement is known. A bridge 21 is positioned to be permanently connected to the central contact 19. Bridge 21 can pivot to make contact with electrical contact 18 or electrical contact 20. This causes the assembly to move between the "on" position and the "off" position. The concept of bridge 21 is known in the art. Bridge 21 is pivoted between each position by a bridge actuator 22 which is illustrated in figures 5 and 6. Actuator 22 comprises a small cylindrical member having a rounded front nose portion 23. The rear part of actuator 22 has a stepped portion 24 to accommodate one end of a helical spring 25. Spring 25 and the rear part of actuator 22 sits within boss 16. The functional spring 25 is to bias actuator 22 into engagement with bridge 21.

Dolly 10 can be pivoted between one position where actuator 22 pivots bridge 21 into engagement with the central contact 19 and either of contact 18 or contact 20.

Figure 7 and 8 illustrate an assembled view partially cutaway or showing the dolly in phantom to more clearly illustrates the various components.

Throughout the specification and the claims, unless the context requires otherwise, the term "comprise", or variations such as "comprises" or "comprising", will be understood to apply the inclusion of the stated integer or group of integers but not the exclusion of any other integer or group of integers.

Throughout the specification and claims, unless the context requires otherwise, the term "substantially" or "about" will be understood to not be limited to the value for the range qualified by the terms.

It should be appreciated that various other changes and modifications can be made to any embodiment described without departing from the spirit and scope of the invention.

CLAIMS

1. A dolly assembly for an electric switch, the assembly comprising at least two parts, one part comprising an outer part and the second part comprising an arc shield, the arc shield being positioned substantially inside the first part.
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2. The assembly of claim 1, wherein the outer part comprises a shell having a top portion, a depending sidewall, and an open bottom, the arc shield extending substantially about an inner wall of the top portion and an inner wall of the sidewall.
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3. The assembly of claim 2, wherein the shell comprises a pair of diametrically opposed recesses, and the arc shield comprises a pair of diametrically opposed pins which extend through the recesses, the pins adapted to pivotly attach the dolly to a switch housing.
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4. The assembly of claim 3, wherein each said pin is positioned on a platform which is configured to fit snugly into the recess on the shell to provide a flush outer finish between the shell and the platform.
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5. The assembly of claim 3, wherein the arc shield is provided with a open ended boss to accommodate an actuator which is adapted to move a bridge member in a switch housing.
- 25 6. A switch assembly comprising a housing, electrical contacts within the housing, a bridge pivotly connected to the housing to make contact with the electrical contacts, a bridge actuator to operate the bridge, the actuator comprising a pin, and a dolly assembly which comprises at least two parts, one part comprising an outer part and the second part comprising an arc shield, the arc shield being positioned inside the first part, the arc shield being pivotly connected to the housing and containing a open
30 ended boss to accommodate one end of the pin.