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HANDLE SWITCH AND CONDUCTOR CONSTRUCTION

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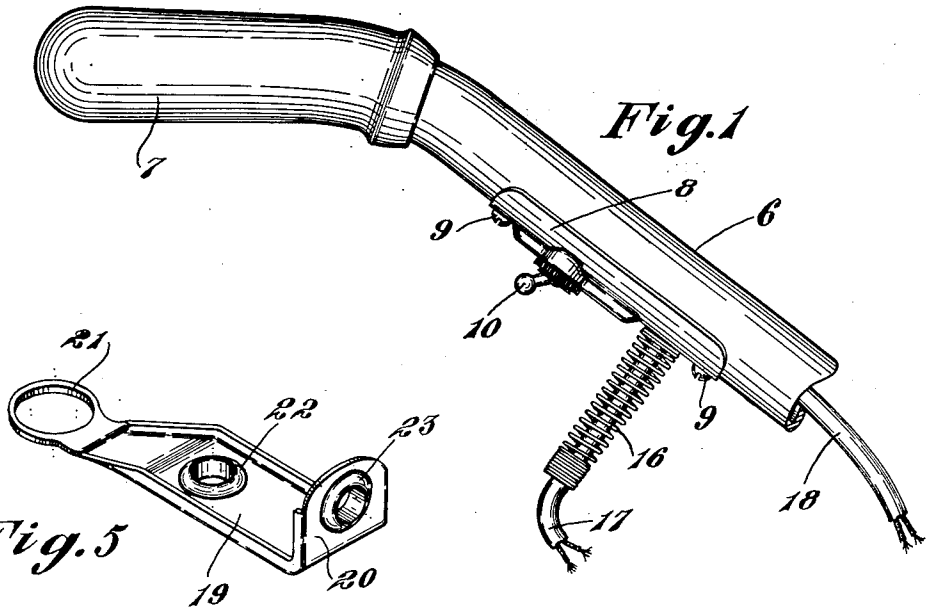


Fig. 1

Fig. 5

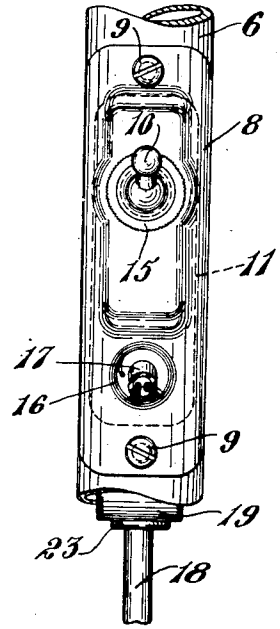


Fig. 4

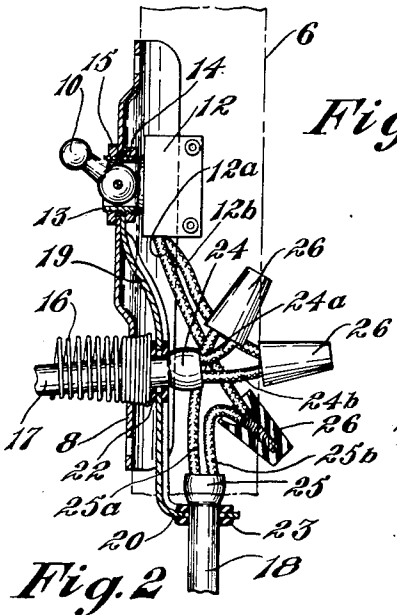


Fig. 2

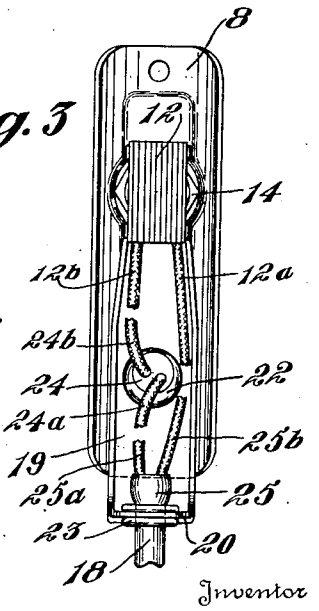


Fig. 3

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HANDLE SWITCH AND CONDUCTOR CONSTRUCTION

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5 Claims. (Cl. 200—157)

The invention relates generally to electric conductor connections, and is particularly adapted for electrical switch and conductor connector units for handles for suction cleaners and the like, which units are preferably removable from the handle for inspection and repair.

A conventional form of a trigger switch unit which is removably mounted in the pistol grip handle of a suction cleaner is disclosed in U. S. Patent No. 1,517,811 to O. C. Willis. To facilitate assembly, as well as inspection and repair, tubular suction cleaner handles having removable switch units of the type shown in the Willis patent have a conductor cord running from the cleaner motor through the handle to the switch unit, and another conductor cord running from a wall receptacle through a switch unit mounting plate and terminating in juxtaposition to the terminal of the other conductor cord.

In such switch and conductor connector units, the trigger switch is mounted on the inside of the mounting plate and electrically connected in series with the conductor wires of the two conductor cords, so that the switch unit can be inserted into a slot in the tubular handle after all the electrical connections have been made between the switch and conductor cords, and so that the electrical connections are all accessible for inspection and repair by removing the mounting plate from the suction cleaner handle.

The main difficulty with constructions of this type is that any pulls, yanks, strains or stresses on the conductor cord at the motor or on the conductor cord leading to the wall receptacle are transmitted directly to the connections between the conductor wires themselves or between the conductor wires and the switch, with the result that these connections are continually being broken, causing short circuiting and burning of the conductors.

It is therefore an object of the present invention to provide an improved switch and conductor connector unit having positive means for resisting any pull on the conductor cords to protect the connections between the conductor wires at the switch unit.

Another object is to provide a conductor connector unit which has all the advantages of prior constructions with respect to removability and accessibility in addition to the advantage of protecting the conductor and switch connections.

A further object is to provide for accomplishing all the foregoing advantages in a novel construction which is very simple, compact and inexpensive to manufacture and use.

These and other objects are attained by the improvements, combinations and arrangements comprising the present invention, a preferred embodiment of which is shown by way of example in the accompanying drawing, and hereinafter described in detail and defined in the appended claims.

In general terms the invention includes the provision of an anchor member secured to the inside of a switch and conductor connector unit mounting plate, and means for securing the conductor cords to said anchor member to eliminate any strain or pull on the connections between the conductor wires of said cords.

Referring to the drawing forming part hereof—

Figure 1 is a fragmentary side elevation of a suction cleaner handle embodying the improved switch and conductor construction;

Fig. 2 is an enlarged detached side view of the improved switch and conductor construction, showing the mounting plate and anchor plate in section and other parts in elevation;

Fig. 3 is a rear elevation thereof;

Fig. 4 is a fragmentary front elevation of the mounting plate attached to the handle; and

Fig. 5 is a detached perspective view of the anchor plate.

Similar numerals refer to similar parts throughout the several views of the drawing.

In the drawing, the improved conductor connector construction is shown by way of example as applied to a trigger switch unit removably mounted in the pistol grip handle of a suction cleaner, although the invention is applicable to other electrical appliances.

In Fig. 1, a tubular suction cleaner handle is indicated at 6 having a preferably rubber pistol grip 7, and the mounting plate 8 for the switch and conductor unit is removably attached to the handle by screws 9 and has the trigger 10 of a trigger switch projecting therefrom.

As shown in Fig. 4, the mounting plate 8 covers or closes a slot 11 in the under side of the handle 6 through which slot the switch and conductor units are inserted into or withdrawn from the handle.

The trigger switch 12 may be of the type shown which has a threaded shank 13. This shank extends through a hole in the mounting plate and is secured on the mounting plate by a nut 14 on the shank at the under side of the mounting plate and a nut 15 on the shank at the outer side of the mounting plate. The nut 15 may be a knurled ring nut as shown and the whole trigger switch unit is easily mounted on the mounting

plate 8 merely by manipulating the ring nut 15.

An opening is provided in the mounting plate for receiving a usual helical wire guard 16 for engirdling and protecting a conductor cord 17 which may have on its outer end a terminal plug for insertion into a wall receptacle. The conductor cord 17 terminates at the inside of the mounting plate and its conductor wires are adapted to be connected with those of a conductor cord 18 which extends through the handle 6 from the electric motor of the cleaner.

The improved means for preventing movement of the conductor cords away from the connections between their wires preferably includes an anchor plate 19 which may be angular or L-shaped as shown having the angular flange portion 20 at one end. Preferably, the other end of the anchor plate is provided with a ring shaped portion 21 which is attached to fit around the shank 13 of the trigger switch 12 so that the nuts 14 and 15 can be utilized to securely clamp the anchor plate 19 to the mounting plate 8.

If a different type of trigger switch is used, it may be attached to the mounting plate independently of the anchor plate and separate attaching means provided for the anchor plate.

The anchor plate is provided with a conductor cord opening in its main portion intermediate its ends and with a similar conductor cord opening in its flange portion 20, and preferably insulating grommets 22 and 23, respectively, are secured in said openings, the grommet 22 being adapted to register with the opening in the mounting plate in which the guard 16 is inserted.

The conductor cords 17 and 18 are provided on the inner side of the anchor plate with enlarged terminal portions 24 and 25 respectively, for preventing withdrawing movement of the cords through the grommets 22 and 23 respectively, in a direction away from the anchor plate.

The conductor wires 24*a* and 24*b* projecting from enlarged portion 24 of cord 17 are connected in series with the conductor wires 25*a* and 25*b* projecting from enlarged portion 25 of cord 18, and with conductor wires 12*a* and 12*b* of switch 12. The connections between these wires may be protected in a usual manner, as for example by the insulated connecting caps indicated at 26, one of which is shown in section in Fig. 2, and which wedge fit over the bare wires twisted together.

As shown, one wire 24*a* of cord 17 is connected directly to wire 25*a* of cord 18, while the other wire 24*b* of cord 17 is connected to wire 12*b* of switch 12. The other wire 12*a* of switch 12 is connected to wire 25*b* of cord 18, so that the switch is electrically connected in series with the conductor cords 17 and 18.

When the improved switch and conductor construction is inserted into the tubular handle 6 and the mounting plate 8 is attached thereto by screws 9, as shown in Fig. 1, any pulls, yanks, strains or stresses on the free end of conductor cord 17, or on the conductor cord 18 at the suction cleaner motor, tending to pull or withdraw the cords from the anchor plate, will be positively resisted by the anchor plate 19 due to the engagement between the grommets 22 and 23 and the enlarged cord portions 24 and 25 respectively.

Thus none of the pulls or strains tending to move the cords away from the connections between the conductor wires are transmitted to said connections, with the result that breaking, burning, and short circuiting at these connections is substantially eliminated.

In connecting the conductor cords 17 and 18 with the switch 12 when the handle is assembled, the mounting plate 8 and anchor plate 19 are removed from the handle through the slot 11, in which position the conductor cords 17 and 18 are passed through the grommets 22 and 23; and the wires 24*a* and 25*a*, 24*b* and 12*b* and 12*a* and 25*b* all may be connected as previously described, and the caps 26 applied to said connections. The connected wires together with the switch and the anchor plate can then be inserted through slot 11 and the screws 9 applied to attach the mounting plate to the handle.

The switch and conductor unit and any of the connections thereof can be inspected easily at any time without disturbing the connections, by merely unscrewing the screws 9 and withdrawing the unit from the slot 11, because the anchor plate prevents any strain or pull placed on the conductor cords due to such withdrawing movement from being transmitted to the connections.

Various modifications in details of construction and arrangement are comprehended within the scope of the invention defined in the appended claims.

I claim:

1. Electric switch and conductor construction for the tubular handle of a suction cleaner including a mounting plate removably mounted on said handle, a switch mounted on the inside of said mounting plate, an L-shaped anchor plate secured to the inside of the mounting plate and having angularly disposed openings, conductor cords from the suction cleaner motor and the wall receptacle slidably inserted through said openings, said cords terminating in enlarged portions preventing withdrawing movement of the cords from the anchor plate, and wires projecting from said enlarged cord portions electrically connected with each other and with said switch.

2. Electric switch and conductor construction for the tubular handle of a suction cleaner including a mounting plate removably mounted on said handle, a switch, an L-shaped anchor plate having angularly disposed openings, single means mounting the switch and anchor plate on said mounting plate, conductor cords from the suction cleaner motor and the wall receptacle being slidably inserted in said anchor plate openings and having projecting wires electrically connected with each other and with said switch, and enlarged portions on said conductor cords within said anchor plate preventing withdrawal of said cords from said anchor plate.

3. Electric switch and conductor construction for the tubular handle of a suction cleaner including a mounting plate removably mounted on said handle, a switch mounted on the inside of said mounting plate, an anchor plate secured to the inside of the mounting plate and having angularly disposed openings therein, conductor cords from the suction cleaner motor and the wall receptacle plug passing through said anchor plate openings, means anchoring the ends of said conductor cords in said anchor plate for preventing withdrawing of the cords therefrom, and wires projecting from said cord ends electrically connected with each other and with said switch.

4. Electric switch and conductor construction for the tubular handle of a suction cleaner including a mounting plate removably mounted on said handle, a switch, an anchor plate having angularly disposed openings therein, single means mounting the switch and anchor plate on said mounting plate, conductor cords from the suction

cleaner motor and the wall receptacle plug passing through said anchor plate openings, means anchoring the ends of said conductor cords in said anchor plate for preventing withdrawing of the cords therefrom, and wires projecting from said cord ends electrically connected with each other and with said switch.

5. Electric switch and conductor construction for the tubular handle of a suction cleaner including a mounting plate removably mounted on said handle, a switch mounted on the inside of said mounting plate, an L-shaped anchor plate secured to the inside of the mounting plate and having angularly disposed openings therein, conductor cords from the suction cleaner motor and the wall receptacle plug passing through said anchor plate openings, means anchoring the ends of said conductor cords in said anchor plate for preventing withdrawing of the cords therefrom, and wires projecting from said cord ends electrically connected with each other and with said switch.

ELMER J. KASPER.