

[54] **REPLACEMENT COVER FOR ELECTRICAL WIRING DEVICES**

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[22] Filed: **June 3, 1974**

[21] Appl. No.: **475,537**

[52] U.S. Cl. **339/97 P**

[51] Int. Cl.² **H01R 13/38**

[58] Field of Search **339/97-99**

[56] **References Cited**

UNITED STATES PATENTS

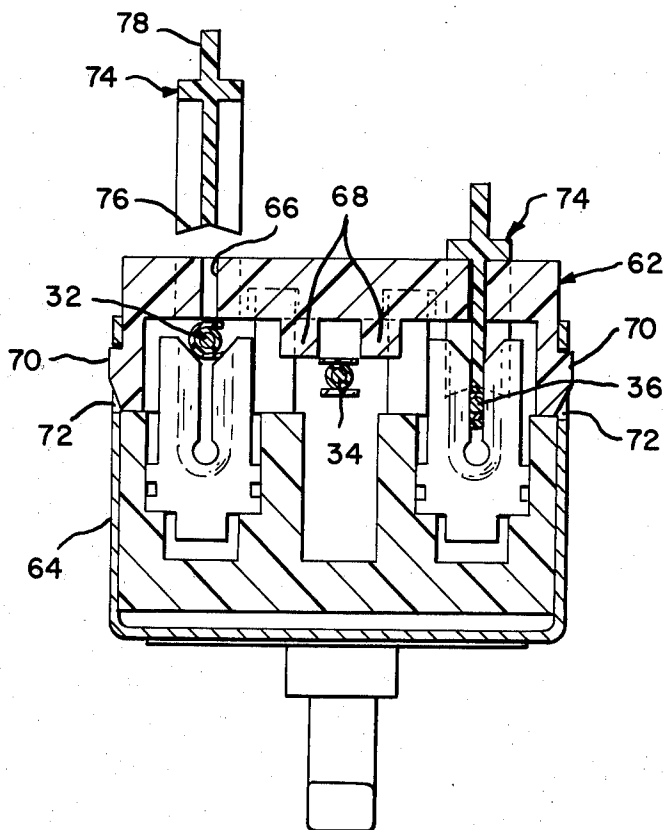
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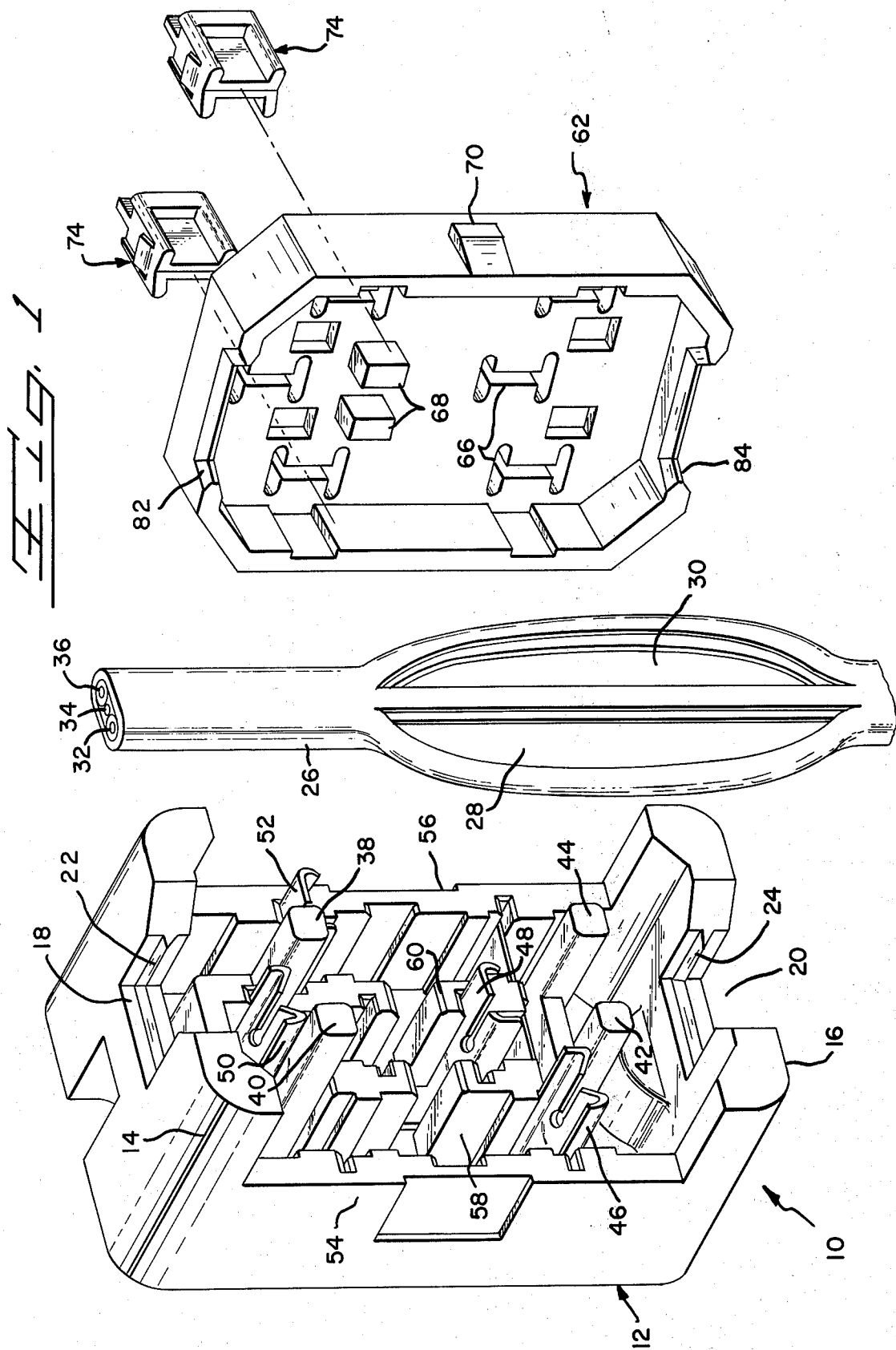
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[57] **ABSTRACT**

A replacement cover is disclosed for use with electrical wiring devices which are connected to multiconductor cables in an electrical system by pressing the cables into related slotted beam contacts mounted in the wiring device. The subject replacement cover is utilized when a wiring device is replaced. The new wiring device is positioned on the existing wires and the cover is snapped over the associated housing. Individual termination plugs are inserted into slots in the cover. As the plugs are inserted they apply adequate pressure to engage the appropriate wire and force it into engagement with the slotted beam contacts of the device. Retaining latches in the plugs maintain them in the cover to prevent removal and also to close the openings. The installation of this cover can be accomplished with simply a pair of pliers.

8 Claims, 3 Drawing Figures





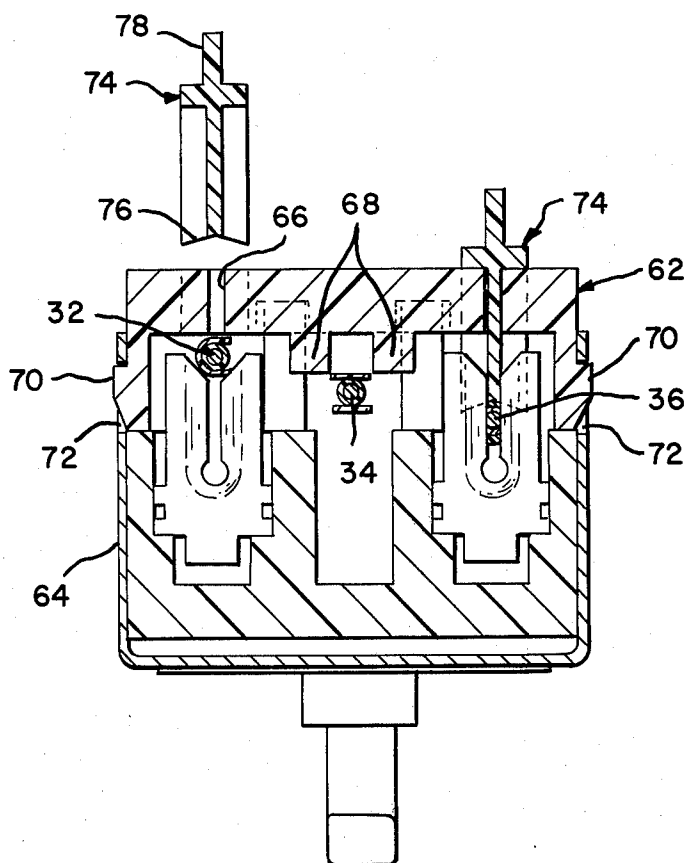


FIG. 2

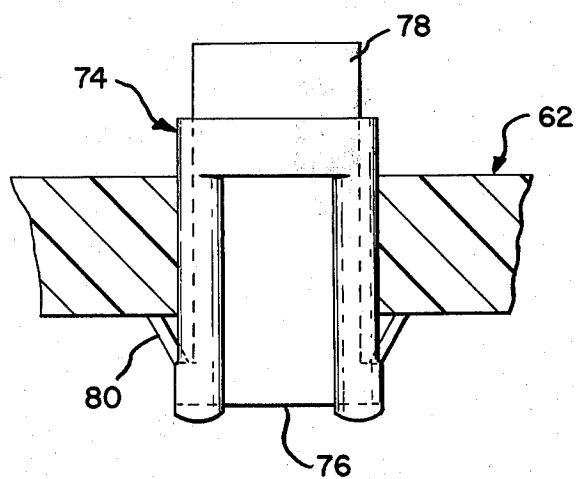


FIG. 3

REPLACEMENT COVER FOR ELECTRICAL WIRING DEVICES

BACKGROUND OF THE INVENTION

1. The Field of the Invention

The present invention relates to a replacement cover to be used with electrical devices which are attached to electrical cables without the use of screws, and in particular to a replacement cover wherein the individual wires are forced into contact with slotted beam contacts in an associated electrical device by insertion of terminal plugs in appropriate holes in the cover.

2. The Prior Art

There has been a continuing trend to move away from the type of electrical device which has been standard in the art for many years. Namely the type of electrical outlet switch, or other fixture which requires the cable connected thereto to have the installation stripped from the cable, the installation stripped from the ends of the individual conductors, the conductors bent in a loop configuration and attached to the device by means of individual screws. The device must then be forced into a suitable outlet box which has previously been mounted in the desired location. Often times a great amount of force is necessary to overcome the resistance of the wires in being stuffed into such a box.

The above described standard devices are being replaced by devices having contacts with integral slotted beams. An example of such a device is set out in U.S. Pat. No. 3,723,948. In the more current type of device, it is only necessary to slit the insulating jacket of the cable, separate and form the individual insulated conductors into a predetermined pattern, force the conductors into the related slotted beams and close the device with a back cover. The slotted beams pierce the insulation to contact the metallic wire of the conductor. Clearly there is a tremendous labor savings in the installation of this latter type of device.

SUMMARY OF THE INVENTION

The subject replacement cover is manufactured in a configuration adapted to engage in the housing of the above described devices. A plurality of I-shaped slots are disposed about the surface of the cover. The slots are aligned with the slotted beam terminals fixedly mounted in the associated electrical devices. The cover includes latching means for engagement with the associated electrical device and a plurality of termination plugs each adopted to be inserted into the appropriate I-shaped slots of the cover. The plugs each include a profiled conductor engaging end portion adapted to drive the conductor into the associated slotted beam contact, a gripping portion having dimensions appropriate for gripping by a pair of conventional pliers, and latching means projecting laterally from the sides of the plug to hold the plug in position in the cover when fully inserted.

It is therefore an object of the present invention to produce a replacement cover for use with electrical devices employing slotted beam contacts with the cover being provided with a plurality of individual apertures through which termination plugs are inserted to drive wires into the associated contacts.

It is a further object of the invention to produce a replacement cover having a plurality of I-shaped apertures therein and a like plurality of termination plugs adapted to be inserted in respective ones of the aper-

tures to drive conductors lying thereunder into associated slotted beam contacts.

It is a further object of the present invention to provide a replacement cover for electrical devices which cover may be readily and economically produced.

The means for accomplishing the foregoing objects and other advantages of the present invention will become clear from the following detailed description taken in relation to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a switch device, cable, and the subject replacement cover with associated termination plugs;

FIG. 2 is a schematic transverse section through the device of FIG. 1 showing the insertion of the terminal plugs into the replacement cover; and

FIG. 3 is a partial longitudinal section through a portion of the cover showing the latching means for a terminal plug.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

The present invention is intended for use with any electrical wiring device employing slotted beam contacts. It has been shown in an exemplarily embodiment in connection with a switch 10. The housing 12 includes a pair of end walls 14, 16. A notch or wire receiving opening 18, 20 is provided in each end wall 14, 16 with a generally continuous ridge 22, 24 projecting internally into the notch and providing a stress relieving bearing surface for the electric cable 26 to be received in the switch 10. The conventional three conductor cable 26 is sliced at 28 and 30 to allow separation of medial portions of individual conductors 32, 34, 36 in the manner well known. Portions of the cable 26 are received in the notches 18, 20 when the cable is mounted in the housing. The housing is provided with four integral posts 38, 40, 42, 44. The medial portions of the conductors are looped around the posts insuring that the conductors are properly located over the electrical terminals 46, 48, 50, and 52 which are fixedly mounted in the housing. The terminals are located between the outer sidewalls 54, 56 and interior sidewalls 58, 60 adjacent to the posts 38, 40, 42, 44. The posts and the notches engage and retain the slit portion of the cable and the associated spread apart individual conductors thereof in proper alignment with the housing leaving an operator free to attach the cover 62 to the casing 64 housing 12 without inadvertently displacing the conductors from alignment with the terminals and without the need for repeated inspection to assure such alignment.

The back cover 62 includes a plurality of I-shaped slots 66 which are disposed over the contacts mounted in the housing 12. It also includes a pair of inwardly directed studs 68 which are used for alignment purposes and prevent reversed application of the cover to the housing. In the correct position shown, the studs 68 will pass beneath posts 38, 40. In the reversed position, the studs 68 would abut posts 42, 44. Locking projections 70 extend from opposite sides of the cover to mate in apertures 72 in the casing 64.

A plurality of termination plugs 74 are provided equal in number to the apertures 66 in the cover. Each of the plugs has a generally I-shaped transverse section. The driving end 76 of each plug has a profile which is

concave and adopted to guide conductors to a central location. A narrow gripping portion 78 projects from the opposite end of the plug and is of adequate thickness to be grasped by pliers or the like which are used to exert force on the plug during insertion into the cover. A pair of locking lances 80 project from opposite sides of the plug body.

The assembly of the substitute electrical device and replacement cover on the existing cable is accomplished as follows: the cable 26, if necessary, is reshaped as shown so that the conductors 32, 36 are initially supported in the U-shaped end notches 18, 20 encircling the posts 38, 40, 42, 44. In this position the conductors lie against or partially within the slotted beam portions of the associated contacts. The cover 62 is pressed into the housing until the locking projections 70 engage in apertures 72 of the casing 64 to hold the cover tightly against housing 12. The individual termination plugs 74 are then inserted into respective ones of the apertures 66. As each plug is inserted, it presses the associated individual conductor internally of the slotted beam contact as shown on the right hand side of FIG. 2. The cover is in latching engagement with the metal casing surrounding the housing with notches 82, 84 cooperating with ridges 22, 24 in the housing notches to encircle and grip the cable to anchor the cable to the housing. Tension forces on the cable are thus prevented from being transmitted internally of the housing and cause and separation of the conductors from their contacts.

It should be noted that the subject replacement cover is not limited to use with the particular switch shown. With minor changes the arrangement of the I-shaped apertures and the proper placement of the terminal plugs, the cover can be used for return line switches, 3-way switches, duplex receptacles, light fixtures, etc. It is contemplated that the cover can be manufactured with a plurality of apertures in a regular spaced configuration with appropriate ones of the apertures being permanently sealed by a filler material in order to accommodate the cover for various types of switches and other wiring devices.

In practice it has been discovered that a faulty wiring device can be replaced with a new or repaired wiring device terminated to the individual conductors which are already spread apart and otherwise treated for termination with the replacement wiring device. This replacement wiring device may be terminated at the same location on the same individual conductors without having to further prepare or treat the individual conductors prior to installation of the replacement wiring device. In practice it was observed that the individual conductors and the installation thereof were only slightly knicked after repeated termination to replacement wiring devices. Since the damage to the conductors and installation was slight and since the conductors were only spread apart and not wrapped, coiled or even severed at the locations of the electrical connections thereto, the individual conductors were repeatedly terminated to replacement wiring devices without degrading significantly the electrical connections obtain thereby.

Although the foregoing has described a preferred embodiment of the invention, the present invention may be subject to many modifications and changes

without departing from the spirit or scope thereof.

What is claimed is:

1. In an electrical wiring device of the type including a housing, at least one multi-conductor cable receiving opening in said housing, and electrical contacts fixed in said housing with each contact having a slotted beam portion adapted to electrically and mechanically engage individual conductors of a multi-conductor cable, the improvement comprising:

10 a cover for said device, said cover formed of insulating material and having a plurality of apertures therein, each of said apertures being aligned with a slotted beam portion of a respective one of said electrical contacts in said housing,

15 latching means locking said cover to said housing, a like plurality of terminal plugs each formed of insulating material and received freely in a respective one of said apertures with a first end in driving engagement with the conductor lying thereunder and locking lance means extending from each said plug, whereby each said plug is pushed into said cover to drive the conductor lying thereunder into engagement with the slotted beam portion of the associated electrical contact with said lances locking said plugs in said cover in the fully inserted position.

2. The invention according to claim 1 wherein said cover further comprises:

latching means locking said cover to said housing.

3. The invention according to claim 1 wherein said cover and said terminal plugs are formed of insulating material.

4. The invention according to claim 1 wherein said apertures and said plugs have an I-shaped profile.

5. The invention according to claim 1 wherein each said first end of each said plug has a concave profile adapted to center said conductor with respect to said plug as the plug drives the conductor into said slotted beam.

6. The invention according to claim 1 wherein the other end of each said plug is profiled for engagement by tools used to insert said plugs into said cover.

7. The invention according to claim 1 further comprising stud means extending from said cover towards said housing permitting only unidirectional assembly therewith.

8. A replacement cover assembly for closing an opening in an electrical wiring device and driving individual conductors of electrical cables fed to the device into slotted beam contacts fixed in the device, said cover assembly comprising:

a cover member having a plurality of profiled apertures therein, each said aperture positioned to lie above a respective one of said slotted beam contacts, means for lockingly securing said cover on said device, and means insuring unidirectional engagement of said cover on said device; and

a like plurality of profiled termination plugs each adapted to be loosely inserted into one of said apertures, one end of each said plug having a concave configuration for centering the underlying conductor and driving it into the associated slotted beam, and integral locking lance means lockingly securing said plugs into said cover member in the fully inserted position.

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