ABSTRACT: A receptacle tap for disposition onto an electrical cable comprises a first section having disposed therein an electrical socket member provided with wire members, a second section extending outwardly from the first section and defining heat-shrinkable portions having sealant means on inside surfaces thereof which are adapted to be shrunk into sealing engagement with areas of the cable adjacent a stripped section of the electrical cable at which the wire members of the socket member are connected to conductor members of the electrical cable.
SEAL RECEPTACLE TAP

This application is a continuation of Ser. No. 768,335, filed Oct. 17, 1968, and now abandoned.

This invention relates to an electrical receptacle and more particularly an electrical receptacle having heat shrinkable sections that are adapted to be heat shrunken onto sections of an electrical cable adjacent a stripped section thereof.

Heretofore, one manner of forming an electrical cable having receptacles at spaced locations therealong was to strip insulation from the locations along the cable at which the wires of the receptacles were connected to stripped sections of conductors of the electrical cable. These stripped areas of the cable at which the receptacles are connected were then wrapped with insulating tape. Such approach is time consuming in addition to providing a connection that is generally bulky thereby providing an unsightly connection and its effectiveness depends on the skill of the wrapper.

Another manner of forming an electrical cable having receptacles at spaced locations therealong is to follow the same procedure as outlined above except that the stripped areas of the cable at which the receptacles are connected were subjected to a vulcanizing operation instead of being wrapped with insulating tape. This approach provided a more appealing connection but it also is time consuming in addition to subjecting the wire, conductors and cable insulation to excessive temperatures which can render the insulation brittle thereby reducing its efficacy. Also, the vulcanizing material has to be the same as the insulation covering.

Another object of the invention is to provide an electrical receptacle that can be sealingly applied to a stripped area of an electrical cable.

Another object is the provision of an electrical receptacle that can be sealingly applied to a stripped area of an electrical cable with a minimum of effort.

A further object is to provide an electrical receptacle having heat shrinkable sections which are heat shrinkable onto areas of an electrical cable adjacent a stripped section thereof.

An additional object is the provision of an electrical receptacle having heat shrinkable sections provided with sealant means thereon for sealingly engaging areas of an electrical cable adjacent a stripped section thereof when the heat shrinkable sections are heat shrinked onto these areas.

Still another object of the invention is to provide means on the heat shrinkable electrical receptacle to enable the receptacle to be hung on something.

A still additional object of the invention is the provision of a method of making an electrical cable having receptacles at spaced locations therealong.

Still another object is to provide an electrical receptacle having a heat shrinkable section which is heat shrinkable onto a rubber-covered receptacle portion of a pigtail.

Still a further object is the provision of a T-shaped tapoff having heat shrinkable sections heat shrinkable onto areas adjacent a stripped area of an electrical cable and onto another electrical cable spaced thereto to form a sealed tapoff connection.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention but are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

FIG. 1 is a perspective view of an electrical cable having electrical receptacles sealingly connected thereto at spaced locations therealong;

FIG. 2 is a perspective view illustrating a stripped section of the electrical cable and the electrical receptacle prior to being connected to the electrical cable;

FIG. 3 is a cross-sectional view of the electrical receptacle connected to a stripped section of the electrical cable in position over the stripped section of the electrical cable and before the heat-shrinkable sections of the electrical receptacle are heat shrunken into sealing engagement with the electrical cable;

FIG. 4 is a view similar to FIG. 3 with the heat shrinkable sections of the electrical receptacle heat shrunken into sealing engagement with the electrical cable;

FIG. 5 is a cross-sectional view of an embodiment of the invention;

FIG. 6 is a cross-sectional view of a further embodiment of the invention.

Turning now to the drawings and especially FIGS. 1 through 4, there is illustrated an electrical cable EC having stripped areas 1 provided therein at spaced intervals therealong in order to expose electrical conductors 2. Electrical cable EC can be of the two or three conductor variety, and in the case of the three conductor variety as illustrated, the two source electrical conductors are stripped of insulation at axially spaced areas 3 so as to be isolated from one another.

Receptacle tap RT has a body B which is provided with a receptacle-receiving section 4 and cable engaging sections 5. An extension 6 is located on receptacle tap RT extending outwardly from body B and it includes a hole 7 extending therethrough.

Receptacle tap RT is molded in accordance with conventional molding techniques from a suitable plastic material having heat shrinkable characteristics and this material is, for example, shrinkable polyolefin plastic. After receptacle tap RT has been molded, cable-engaging sections 5 are subjected to an expanding operation to expand them to a diameter greater than the original diameter when molded. A conventional sealant 8 is applied to the interior surfaces of sections 5. Receptacle 9 is force fitted into receptacle-receiving section 4 and it includes wires 10 extending outwardly from respective inner and outer terminals of receptacle 9. Of course, section 4 can be expanded, sealant applied to the interior surface and heat shrunken onto receptacle 9 if desired.

After electrical cable EC has been provided with stripped areas 1, receptacle tap RT in its expanded form as illustrated in FIGS. 2 and 3, is moved along electrical cable EC to a position adjacent a stripped area 1. Electrical conductors 11 are used to connect the stripped ends of wires 10 onto stripped areas 3 of connectors 2. Wires 10 can also be wrapped onto areas 3 or soldered thereto. Wires 10 are then bent into a bunched condition, as illustrated in FIG. 3, and receptacle tap RT is moved centrally of stripped area 1 so that cable-engaging sections 5 are disposed in alignment with the insulation of the electrical cable adjacent the stripped area with sealant 8 extending therealong as illustrated in FIG. 3. Heat is then applied to sections 5 by means of an electric heat gun, propane or butane gas torch or electric blanket thereby causing sealant 8 to flow and each of sections 5 to shrink down onto the insulation of electrical cable EC with sealant 8 providing a sealed connection therebetween as illustrated in FIG. 4. Receptacle tap RT can be provided with only one section 5 in order to provide a receptacle tap at one end of the electrical cable.

Extension 6 defines a hanging means so that a hook can extend through holes 7 in order to string the electrical cable and eliminates devising any special method for hanging the cable. After receptacle tap RT have been sealingly positioned along electrical cable EC at stripped areas 1 thereof in the manner described hereinbefore, electrical light bulbs can be screwed into receptacles 9 thereby providing a temporary lighting system. Of course, a female electrical plug can be placed in any of receptacles 9 to permit electrical connection with male plugs of any electrical equipment. The tensile strength of sections 5 in seal engaged with the insulation covering of the cable is excellent.
Simplicity of design, speed of installation and permanent sealing are the main features of the present invention. No special light sockets are required since standard light sockets can be used. Labor savings are accrued because the receptacle taps eliminate the need for installing temporary lights by such methods as soldering, taping, or vulcanizing. In addition to their excellent electrical properties, receptacle taps are highly resistant to moisture, fungus, and weathering as well as providing protection against abrasive or corrosive elements. The material of the receptacle tap can be different from that of the cable insulation covering.

FIG. 5 illustrates receptacle tap RTa which is similar in every respect to receptacle tap RT except that receptacle-receiving section 4a is also expanded when sections 5a are expanded so that section 4a can be heat-shrinkable onto a receptacle similar to receptacle 9 but having a rubber coating thereover to from a commonly called pigtail. Once this pigtail has been positioned within expanded section 4a, heat is applied thereto causing section 4a to shrink into tight engagement with the rubber covering of the pigtail to secure it in position therein. Otherwise, receptacle tap RTa is the same as receptacle tap RT and it is applied in the same manner to the electrical cable. Of course, sealant may also be applied to the interior surface of section 4a if desired.

FIG. 6 illustrates a T-shaped tapoff TTO which is similar in construction to the receptacle taps except that section 4b is the same as sections 5b and is provided with sealant 8b on the interior surface thereof in order to be heat shrinkable into sealing engagement with another electrical cable to provide a tapoff from the main electrical cable. The tapoff can, of course, be in the form of a Y configuration so that three electrical cables can be joined together within the tapoff. Strengthening ribs 12 extend between section 4b and section 5b. It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiments of the invention, which are shown and described herein, are intended as merely illustrative and not as restrictive of the invention.

We claim:
1. A method of connecting an electrical tap to an electric cable, comprising the steps of:
   fabricating a heat shrinkable section and a tubular section communicating with said heat shrinkable section, inserting and securing an electrical receptacle member having electrical leads within said heat shrinkable section, slidably overlapping said heat shrinkable section over an electrical cable adjacent to a stripped area of said cable, protruding said leads from within the tubular section outwardly of the heat shrinkable section, electrically connecting the protruding leads to the stripped area of the cable, slidably positioning said heat shrinkable section to enclose the stripped area and the leads connected thereto with the ends of said heat shrinkable section encircling the cable on each side of the stripped area, and heating the ends of said heat shrinkable section to shrink said ends around the cable on each side of the stripped area.
2. The method as recited in claim 1, and further including the step of:
   applying sealant internally of said ends, and
   wherein the step of heating said ends causes said sealant to flow around the cable on each side of the stripped area.