ABSTRACT

An externally threaded tubular coupling for electrical connector and other electrical fittings is provided with a telescoping cylindrical sleeve formed of a flexible resilient polymeric resin. The sleeve main portion has an outside diameter in unstressed condition greater than the coupling inside diameter and terminates in a coaxial inner thinner skirt wall of an outside diameter about that of the coupling inside diameter. In the coupling telescoped position the sleeve is compressed to effect the outward flaring of the skirt wall into engagement with the coupling inside face.

10 Claims, 2 Drawing Figures
1 TUBULAR COUPLING WITH INSULATIVE THROAT LINER

BACKGROUND OF THE INVENTION

The present invention relates generally to improvements in tubular couplings and it relates more particularly to an improved coupling for electrical conduit and other tubular fittings of the type provided with a telescoping insulator sleeve.

A conventional coupling for electrical conduit and electrical fittings includes a tubular body or collar which is usually externally threaded and is commonly provided with an end telescoping insulator sleeve. This type of coupling possesses an important drawback in that the inner end of the insulator sleeve constitutes an impediment to the advance of the cable through the coupling by way of the sleeve. The inner end of the sleeve frequently acts to snag the leading end of the cable being pushed through the conduit and also acts to retard the further advance of the cable. While many attempts have been made to overcome the aforesaid drawbacks, these have been unsuccessful and the resulting structures have been unreliable and leave much to be desired.

SUMMARY OF THE INVENTION

It is a principal object of the present invention to provide an improved tubular coupling structure.

Another object of the present invention is to provide an improved coupling or connector for electrical conduit and electrical fittings.

Still another object of the present invention is to provide an improved electrical conduit coupling of the type provided with a telescoping insulator sleeve.

A further object of the present invention is to provide an electrical conduit coupling having an insulator sleeve which does not interfere with the advance of cable through the conduit and coupling.

Still a further object of the present invention is to provide an article of the above nature characterized by its reliability, ruggedness, low cost, great versatility and adaptability.

The above and other objects of the present invention will become apparent from a reading of the following description taken in conjunction with the accompanying drawing which illustrates a preferred embodiment thereof.

It has been found that when a tubular sleeve formed of a flexible compressible polymeric resin and having a peripheral recess formed in the outer face of an end border is radially peripherally compressed, the resulting stresses cause the end border of the sleeve to deflect outwardly. Accordingly, the present invention contemplates the provision of a coupling device comprising an outer tubular collar having a cylindrical inside face and a cylindrical sleeve formed of a compressible flexible polymeric resin having, in its unstressed condition, an outer diameter greater than that of the collar inside face and being peripherally recessed at its outside face proximate its inner end, the sleeve telescoping the collar and being radially peripherally compressed to outwardly deflect the inner end of said sleeve into intimate engagement with the inside face of said collar.

In the preferred form of the coupling, the collar is formed of metal and is externally threaded. The sleeve is provided at its outer end with a peripheral flange and its inner end border is of reduced diameter to define a relatively thin peripheral skirt wall whose inside face is bevelled to a sharp wall end edge, the outside face of the skirt wall, in the sleeve unstressed condition, being about equal in diameter to that of the collar inside face. In the telescoped condition of the sleeve in the collar, the skirt wall curls or flares outwardly to bring its end edge into intimate engagement with the collar inside face and form a generally smooth surface.

The improved coupling assembly provides a smooth continuous inside face which does not impede the advance of cable through the conduit and fitting and is reliable, rugged, of low cost, easy and convenient to produce and assemble and of great versatility and adaptability.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an enlarged longitudinal medial sectional view of a coupling portion embodying the present invention shown in an unassembled condition; and

FIG. 2 is a view similar to FIG. 1, showing the coupling in its assembled condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing which illustrates a preferred embodiment of the present invention, the reference numeral 10 generally designates the improved coupling which includes an outer collar member 11 and an inner insulator sleeve member 12. In the assembled condition of the coupling 10 the sleeve 12 telescopes the collar 11 and is in retained engagement therein.

The collar member 11 includes a front tubular cylindrical section 14 having a smooth circular cylindrical inside face 16 and a threaded outside face 17. Integrally formed at the inside end of the tubular section 14 is a nut defining polygonal section 18 from which coaxially projects an integrally formed connector collar 19 of greater inside diameter than that of collar section 14 which firmly engages and is affixed to the outside face of the conduit 13. Section 18 contains flat sections for engagement with a wrench or the like.

The sleeve 12 is formed in integrally formed fashion, such as by injection molding, of a compressible flexible advantageously resilient synthetic organic polymeric resin such as polyvinyl chloride, a polylefin or polypropylene, or the like. The sleeve 12, per se, includes a main circular cylindrical wall 20 terminating at its outer end in a peripheral radially outwardly directed annular flange 21 and terminating at its inner end in a longitudinally inwardly directed peripheral skirt wall 22 of lesser thickness and lesser outside diameter than the wall 20, for example, of about one-half to one-third the thickness of wall 20.

The outside face 23 of skirt wall 22 is circular cylindrical and has a diameter approximately equal to the inside diameter of collar section 14 and its inner edge is joined to the outside face of wall 20 by an outwardly flaring conical shoulder 24. The outside diameter of sleeve wall 20 is greater than the inside diameter of collar wall 14. The inside faces of walls 20 and 22 are coplanar; the outer border of the inside face of skirt wall 22 is bevelled or outwardly flared to the outer edge 26 of skirt wall outside face 23.
In assembling the collar and sleeve, members 11 and 12 respectively, the skirt wall is easily axially inserted into the collar wall 14, being facilitated by the leading inside curved bevelled edge 28 of the collar wall 14, and the sleeve 12 is advanced until the inclined shoulder 24 engages the inside bevelled edge 28 of collar wall 14. Axial pressure is then applied to the sleeve 12 to further advance it into the collar 11, the coaction between the shoulder 24 and the inside end edge of collar wall 14 affecting the radial compression of the sleeve wall 20 until it telescopes the collar wall 14 and the pressure is continued until the sleeve 12 is fully inserted into collar 11 with the sleeve flange 21 engaging the front end face of collar 11, as shown in FIG. 2.

The radially peripheral compression of the sleeve wall 20 by the collar inside face 16 causes, under the influence of the compressive stresses thereby imparted to sleeve wall 20, the skirt wall 22 to curl or curvedly flare or deflect radially outwardly, as shown in FIG. 2, until the skirt wall edge 26 intimately and firmly engages the collar inside face 16 proximate its inner end.

The assembled coupling 10 is employed in the known manner. By reason of the funneling or converging throat provided by the flared sleeve skirt wall 22 and its being resiliently retained in such configuration in intimate firm engagement with the collar inside face 16, there is no impediment to the advance of cable through the coupling 10 which is greatly facilitated by the improved construction of the sleeve 12, and its relationship to the collar 11.

While there has been described and illustrated a preferred embodiment of the present invention, it is apparent that numerous alterations, omissions and additions may be made without departing from the spirit thereof.

What is claimed is:

1. A coupling comprising an outer collar having an inside face and an outside face, and an inner sleeve formed of a compressible flexible polymeric resin telescoping said collar, said sleeve in its unstressed state having an outside diameter greater than and a length less than that of the inside face of said collar and having a peripheral recess in its outer face proximate its inner end and said sleeve being peripherally radially compressed in its collar telescoping position and the inner end thereof being outwardly deflected under the influence of the compressive stress in said sleeve into intimate engagement with the inside face of said collar.

2. The coupling of claim 1 wherein said peripheral recess extends to the inner end edge of sleeve and has a base which defines with the inside face of said sleeve an inner skirt wall of lesser thickness than the main sleeve wall thickness, said skirt wall flaring outwardly with its end edge engaging said collar inside face under the influence of said compressive stress.

3. The coupling of claim 2, the inner end border of the inside face of said sleeve being tapered toward the front peripheral edge of said skirt wall outside face.

4. The coupling of claim 2 wherein said skirt wall in the unstressed condition of said sleeve has an outside diameter approximately equal to the inside diameter of said collar.

5. The coupling of claim 2 wherein said sleeve has a peripheral flange formed at its outer end and overlying the end face of said collar.

6. A coupling comprising an outer collar having an inside face and a threaded cylindrical outside face, and an inner sleeve formed of a compressible flexible polymeric resin telescoping said collar, said sleeve in its unstressed state having an outside diameter greater than that of the inside face of said collar and having a peripheral recess in its outer face proximate its inner end, and said sleeve being peripherally radially compressed in its collar telescoping position and the inner end thereof being outwardly deflected under the influence of the compressive stress in said sleeve into intimate engagement with the inside face of said collar, said peripheral recess extending to the inner end edge of sleeve and having a base which defines with the inside face of said sleeve an inner skirt wall of lesser thickness than the main sleeve wall thickness, said skirt wall flaring outwardly with its end edge engaging said collar inside face under the influence of said compressive stress.

7. The coupling of claim 6 including a nut section integrally formed with said collar proximate the base of said threaded outside face.

8. The coupling of claim 6 wherein said sleeve has a peripheral flange formed at its outer end and overlying the end face of said collar.

9. The coupling of claim 6, the inner end border of the inside face of said sleeve being tapered toward the front peripheral edge of said skirt wall outside face.

10. The coupling of claim 6 wherein said skirt wall in the unstressed condition of said sleeve has an outside diameter approximately equal to the inside diameter of said collar.

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