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COMPRESSIBLE INSULATED CONNECTOR FOR A SHIELDED CABLE

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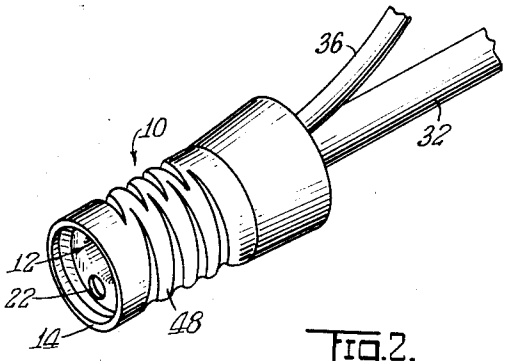



FIG. 1.

FIG. 2.

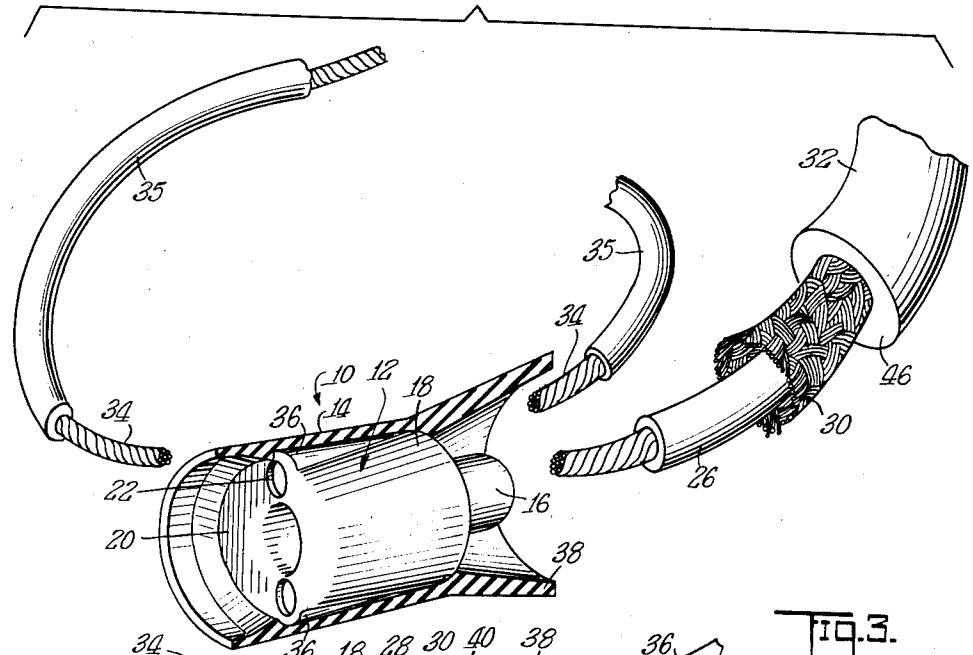
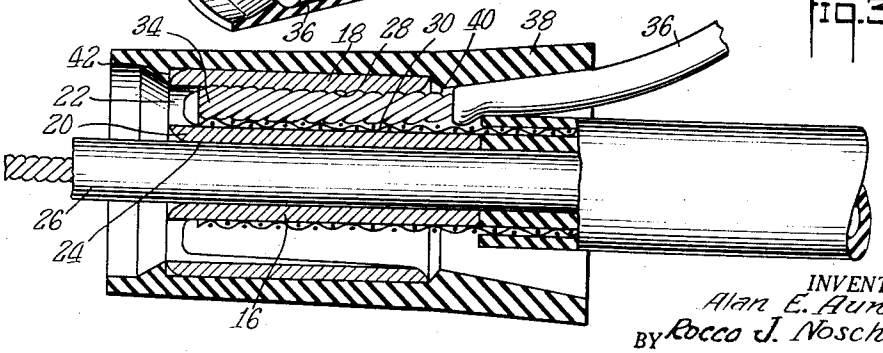



FIG. 3.




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# COMPRESSIBLE INSULATED CONNECTOR FOR A SHIELDED CABLE

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2 Claims. (Cl. 174—75)

This invention relates to a connector for terminating or grounding a shielded or coaxial cable.

Previous methods in use require a plurality of loose parts which are individually positioned on the cable in a specific sequence and finally adjusted and secured into a unitary connection. The sequence of installation was not always followed, the installation itself was time consuming, and the final results were uncertain.

Accordingly, among the objects of our invention is to provide a simpler, faster and surer method for terminating or grounding one or more jumper or ground wires to shielded or coaxial cables; to provide a connection which is preinsulated, and compressible to secure all the connections simultaneously through the insulation; to provide a means for inspecting the final connection without the necessity of removing the insulation; and to provide a connection which the parts are factory assembled so that they may be applied as a unit to the conductors.

Further objects are to provide a connector having the foregoing characteristics which may be readily identified as to size and type, and which is inexpensive to manufacture by mass production techniques.

We accomplish these and other objects and obtain our new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of the completed connection.

Fig. 2 is a perspective, partially longitudinally sectioned view of the connector before assembling, with the conductors in exploded position.

Fig. 3 is a longitudinally sectioned view of the assembled connectors.

The connector **10** comprises a metal barrel **12**, and an insulating cover **14**. The barrel is made by closing one end of an inner ferrule **16** and an outer sleeve **18**, respectively, by a connecting wall **20**, into which is formed one or more holes **22**. The inner ferrule contains the hollow portion **24** for passing the insulated conductor **26** therethrough, and between ferrule **16** and sleeve **18** is the annular hollow portion **28** into which the braided wire **30** of the shielded or coaxial cable **32** is inserted.

The outer sleeve **18** tapers conically from the mouth in the direction of the closed end wall **20** and towards the inner ferrule **16**. This permits the braided cable **30**, as well as the bared end **34** of the ground or jumper lead **35**, to be easily inserted into the correct position for crimping. The taper also minimizes the distance that the outer sleeve **18** has to be collapsed to form a good crimp. A bulge **36** is formed in the outer sleeve adjacent each hole **22** to permit larger holes to be formed without enlarging the entire periphery of the outer sleeve. These holes permit the connection to be inspected and also serve as entrances for the ground or jumper leads if a change of direction of entrance is considered more desirable.

The inner ferrule is longer than the outer sleeve so



that the braided wire shield can be first applied over the inner ferrule, facilitating passage under the outer sleeve thereafter. The edges of the ferrule and sleeve are made smooth to make such entrance easier.

The insulation cover is of tubular construction, and is made of suitable plastic which can transmit a crimping force without damage thereto, as is shown in the Rogoff Patent 2,429,585. Certain nylon compositions may also be used. The insulation cover is preferably formed separately from the metal barrel **12**. The plastic being slightly springy, permits sufficient resilient deformation to permit the metal barrel to be inserted at the flared end **38** over peripherally formed shoulder **40** until it engages the stop shoulder **42**. Shoulder **40** then springs back upon the edge **44** of outer sleeve to form a stop, preventing accidental separation of the two parts. The shoulders **40** and **42** are outwardly chamfered to minimize snagging of the wire braid and connecting conductors when inserted into the barrel. The shoulders are inwardly positioned from the ends of the cover to provide an adequate overhang to prevent accidental exposure of the exposed cable ends due to any imperfection in assembly. Suitable adhesives may be used to further secure the cover and barrel, and the insulation may be baked and bonded to the barrel.

The barrel may be easily and cheaply made of brass or other suitable material, such as copper, on an eyeletting machine.

The insulation cover may be stamped or molded to provide a better designation, as well as being color coded, making positive size and type identification easier than in pre-existing devices.

The assembly procedure is as follows:

The shield insulation **46** is removed for the correct distance. The braided shield or conductor **30** is then stripped back for the necessary distance, exposing the insulated conductor. The conductor is then swung around in an arc to flare out the end of the braid, as shown in Fig. 2. The conductor is then inserted into the hollow of the ferrule with the braided shield entering the annular space, until the end of the braid is seen through the holes **22**. The connector is slowly revolved during the process of insertion to prevent the strands of the braid from bunching. At this point, the shield insulation **46** should be well under the insulating cover **14**.

The jumper lead is then inserted into the hollow portion **28**, making certain that the strands of the braid are undisturbed, and that the conductor **34** is not exposed.

The assembly is then crimped, as at **48**, using preferably a circumferential crimping tool which will cause intermeshing groove indentations, preserving a substantially circular cross-section when reduced by the compression.

The compression tool is designed to compress the insulation cover and outer sleeve upon the inner ferrule. The barrel may be formed so that the outer sleeve is softer than the inner ferrule to facilitate collapse on the inner ferrule. Alternatively, the inner barrel may be made thicker to resist collapse when the outer sleeve is crimped.

The pre-insulated connector just described provides a compact, simple device for joining ground or jumper wire to shielded or coaxial cable.

Summarizing the advantages of the invention, the one-piece barrel eliminates the need to locate a loose inner ferrule under the wire braid, and eliminates the rejects which are caused by inner ferrules which failed to pass inspection due to improper location during installation.

The peep hole **22** provides a means for inspection to determine that the braid is fully inserted, and allows for periodic examination of the installation without having to remove the insulation.

The taper of the outer sleeve results in a large opening for the insertion of the wire braid and for any ground or jumper wires. At the same time, the taper minimizes the distance that the barrel has to be deformed to give the crimp pressure needed to secure the installation.

The bulge around the peep holes allows for a larger opening than would ordinarily be possible for the insertion of ground or jumper wires. This is accomplished without interfering with the function of the taper design of the sleeve.

The longer inner ferrule simplifies the assembly operation to the coaxial or shielded cable, by making it possible to first insert the inner ferrule portion under the wire braid before the outer ferrule passes over the wire braid. This minimizes the possibility of any individual strands of the wire braid from becoming snagged at the mouth of the connector.

The chamfer built into the inner shoulders minimizes the snagging of the wire braid at the mouth by providing an uninterrupted transition from the larger opening of the barrel.

The pre-assembled insulating cover provides a means for lettering each connector with its size designation, in addition to providing a better method of color identification.

The connector provides a lower installed cost of making terminations or grounding coaxial or shielded cable because only one piece need be handled instead of the many hitherto required.

The circumferential type of compression secures the insulating cover to the outer portion of the barrel, and at the same time reduces the diameter of the outer portion of the barrel, thereby compressing the braid and grounding lead (if used) between the outer and inner portions of the barrel.

Our construction makes possible the use of a softer sleeve wall compared to the ferrule wall or variations in thicknesses to obtain a readily collapsible sleeve on the ferrule.

We have thus described our invention, but we desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of our invention, and, therefore, we claim broadly the right



to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of our invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

We claim:

1. An electrical cable connector for securing a connection to a cable having a shield which comprises an inner metal ferrule, an outer concentric positioned metal sleeve having the inherent physical characteristic of being more soft than said ferrule, said ferrule and sleeve formed of a single piece of metal, the free edge of said sleeve lying in a single plane, and an insulating cover for said outer sleeve, said ferrule, sleeve, and cover secured into a unitary assembly having a hollow portion in the ferrule for inserting said cable, a space between said ferrule and sleeve for containing the shield of said cable, said sleeve and cover being collapsible to permit a conductor inserted between the inner metal ferrule and sleeve to be electrically and mechanically joined to the connector and shield of said cable.

2. The connector of claim 1, wherein the ferrule extends longitudinally for a greater distance than the sleeve and the cover extends longitudinally for a greater distance than the ferrule.

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