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SOLDERLESS COAXIAL CABLE FITTING

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The present invention relates to terminal devices or end connectors for coaxial cable and in particular to a terminal device or end connector which mates with existing standard types of coaxial cable terminals or end connectors.

It is an object of the present invention to provide a readily and economically fabricated end connector for coaxial cables which may be quickly and easily applied thereto by unskilled personnel.

It is another object of the present invention to provide a coaxial cable terminal device or end connector which may be securely and firmly attached to the cable both mechanically and electrically by crimping.

It is another object of the present invention to provide a coaxial cable connector comprising essentially two hollow cylinders which may be slipped over the coaxial cable and crimped into operative engagement with each other, and a hollow central terminal member supported by but insulated from one of the hollow cylinders for receiving the central conductor of the cable and which is electrically connected thereto by crimping.

It is still another object of the present invention to provide a coaxial cable terminal device either of the female or male connector type which may be readily applied to the coaxial cable by unskilled personnel in a minimum of time.

It is yet another object of the present invention to provide a male or female terminal device for coaxial cables having a threaded element for securing a terminal device of one type to a terminal device of a mating type.

It is another object of the present invention to provide male and female connectors for coaxial cable which are substantially identical in structure except for the structure of the central terminal and the threaded and mating elements for securing the male and female connectors together.

It is still another object of the present invention to provide a terminal device or end connector for coaxial cables having a small number of parts of simple configuration and large tolerances which consequently may be fabricated by inexpensive stamping and drawing techniques and which do not require costly finishing operations such as machining, grinding, etc.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings, in which:

Fig. 1 is a side view of a male connector of the present invention applied to a coaxial cable;

Fig. 2 is a side view partially in longitudinal section of a male connector of the present invention applied to a coaxial cable;

Fig. 3 is a longitudinal cross section of a coaxial cable with one element of a connector of the present invention applied thereto;

Fig. 4 is a side view partially in section of a female connector of the present invention illustrated juxtaposed to a male connector of the present invention;

Fig. 5 is a side view of a male connector of the present invention adapted to cooperate with a cable of smaller diameter than the cables of Figs. 1–4;

Figs. 6A and 6B are respectively a side view and a transverse cross section taken on line B—B of the connector of the present invention illustrating a preferred form of crimped configuration employed to secure a terminal of the present invention to an associated cable; and

Figs. 7A and 7B are respectively a side view and a transverse cross section taken on line A—A of another preferred form of crimped configuration.

Referring specifically to Figs. 1–3 of the accompanying drawings a coaxial cable **1** has a central conductor **2**, preferably although not necessarily stranded, a concentric layer **3** of insulating material, such as polyethylene, disposed about the inner conductor **2**, a concentric stranded and preferably braided outer conductor **4** encircling the insulation **3** and an outer sheath **5** of insulating material. The insulation material **3** is shown in Figs. 1, 2, 3, 6A and B, and 7A and B as being uniformly distributed between the two conductors and filling the space therebetween. A male connector or terminal generally designated by the reference numeral **6** includes an inner, conductive, thin-walled, hollow cylinder or sleeve **7** which may be slipped over the sheath **5**. The conductor **1** is initially prepared as illustrated in Fig. 3 of the accompanying drawings by removing predetermined portions of the insulation **3** and the sheath **5** to provide a section of each of the outer conductor **4** and the central conductor **2** projecting beyond the insulating members **3** and **5**. The inner hollow cylinder **7** has an inwardly projecting flange **8** at its forward end which engages the end of the sheath **5** and positively positions the cylinder **7** on the cable **1**; the terms "forward" and "rearward" and the various forms thereof being employed hereinafter to designate respectively the ends of the various elements directed toward the illustrated end of the cable **1** and the main body of the cable **1**. The braided conductor **4** may be unraveled or cut longitudinally so that it may be folded back over the cylinder **7**. The connector **6** further includes an outer conductive, thin-walled, hollow cylinder or sleeve **9** of such a diameter that it may be slipped over the inner cylinder **7** with the outer conductor **4** folded thereover. As shown in Fig. 2, the assembled cylinders or sleeves **7** and **9** and the portion of the outer conductor **4** sandwiched therebetween are located over the forward end of the insulation sheath **5**. The forward end of the outer cylinder **9** (that is, the end adjacent the end of the cable **1**) is enlarged radially outwardly to provide an inner annular recess at **10**. Disposed within this recess and encircled by the outer cylinder **9** is a flat circular disc **11** of high quality insulating material such as polyethylene which is retained in the recess **10** by an inwardly directed flange of the cylinder **9**. The disc **11** is provided with an aperture **12** axially aligned with the central conductor **2** of the cable **1** which passes therethrough. An elongated hollow pin **13** has an axially extending rear section **14** of reduced diameter which is disposed in the aperture **12** of the disc **11**; a portion of section **14** protruding through the rear of the disc **11** and being flared outwardly to fasten the pin **13** securely to the disc **11**. The pin **13** is made tubular to freely receive the central conductor **2** of the cable **1**. Near the tip of the pin **13**, is a section **15** of reduced diameter which provides a thin-walled portion which can be readily deformed by any suitable tool to provide a good crimped connection both electrical and mechanical between the pin **13** and the conductor **2**. The thin walled construction of the reduced portion **15** is such that the deformation illustrated in Fig. 2 of the accompanying drawings produces a bulge illustrated in Fig. 1 which does