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COAXIAL CABLE CONNECTOR

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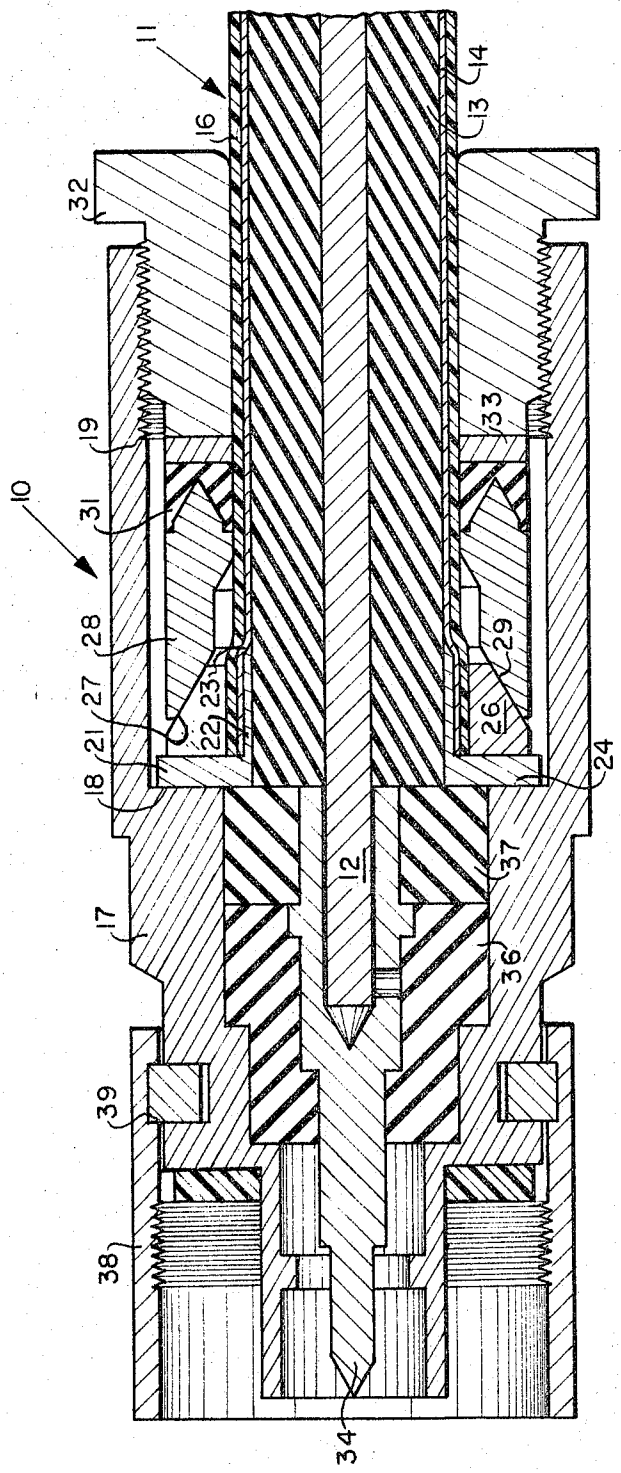

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COAXIAL CABLE CONNECTOR

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Our invention relates to connecting means for cables having coaxial conductors and particularly to connecting means for cables having dielectric jackets bonded to the outer of said conductors.

Coaxial cables of the type for which suitable connectors have long been known have comprised an outer conductor consisting of a copper braid and a polyethylene dielectric jacket over the braid. When connections were made to such cables it was a simple matter to strip the jacket from a terminal length of the cable and to clamp or solder a connecting element to the exposed braid.

Connectors of known types have, however, proven to be entirely unsuitable for a type of coaxial cable which has recently found widespread utility. This cable has an outer conductor which comprises an aluminum or copper foil that is strongly bonded to itself at an overlap and is also bonded to the overlying dielectric jacket. Because of the bond the jacket cannot be readily removed to expose the conductor, nor can the conductor be greatly expanded in the manner of a braid.

We have now invented a connector that is capable of making excellent connections to the new type of coaxial cables both electrically and mechanically.

Our connector comprises a cylindrical electrically conducting shell with a shoulder, that may be circular and normal to the axis of the shell, extending radially inwardly. Our connector also comprises a bushing having a thin-walled tubular length insertable between the conductor and the wall of cable insulation, and a flange that matches the aforementioned shoulder. When the thin-walled length of the bushing is inserted it makes a good wiping electrical contact with the outer conductor and the electrical path is continued unbroken by the contact between the flange of the bushing and the shoulder extending from the shell. We have provided a split ring that is tapered inwardly and fits over both the tubular length of the bushing and the jacket and abuts the flange, and a clamping ring tapered to match the taper of the split ring. In our connector there are means for urging the clamping ring against the split ring so that the flange is urged against the shoulder, making good electrical contact therewith, and the jacket and outer conductor are compressed between the split ring and the tubular length of the bushing. Preferably the shell of our connector is threaded and the urging means comprises a nut that engages the threads of the shell.

A more thorough understanding of our invention can be gained from a study of the appended drawing.

The figure shows a male connector, indicated generally by the numeral **10**, for a coaxial cable indicated generally by the numeral **11** and comprising an inner conductor **12**, a wall **13** of dielectric insulation such as extruded polyolefin. Although we do not wish it to be limiting, our connector is particularly adapted to cables where the dielectric wall **13** is comprised of expanded polyethylene. Over the insulation **13** the cable **11** has an outer conductor **14** of copper or aluminum. The conductor **14** of the illustrated cable is comprised of a longitudinal overlapped tape. The tape is firmly bonded to itself at the overlap and this, of course, limits its circumferential extensibility. Our connector is particularly useful for connecting cables of the type shown but it can also be used

with other known coaxial cables such as those with braided outer conductors which have substantial extensibility.

The conductor **14** is covered with a dielectric jacket **16** that is firmly bonded to it in the manner disclosed in an application Ser. No. 422,275, assigned to the assignee of the present invention.

The connector **10** comprises a cylindrical shell **17** with an inwardly extending annular shoulder **18** normal to the shell axis and an internal threaded portion **19**. A bushing **21** has a thin tubular length **22** that is inserted between the wall **13** and conductor **14**. The length **22** has a sharpened edge **23** and because of its thinness can be readily inserted under the conductor **14** without tearing the latter in spite of its limited stretchability. The bushing **21** also comprises a right-angle flange **24** that fits in good electrical contact against the shoulder **18**. A split ring **26** fits over the jacket **16** and the inserted length **22**, and is abutted against the flange **24**. The ring **26** is tapered inwardly by a bevel **27** so that it can be compressed by means of a compression ring **28** so as to squeeze the jacket and outer conductor onto the bushing **21**. For this purpose the compression ring **28** has a matching taper or bevel **29**. The ring **28** fits a notched sealing gasket **31** which is separated from a nut **32** by a washer **33**. The nut **32** threads into the threaded portion **19** of the shell **17** and when it is turned it expands the gasket **31** to seal the connector, compresses the ring **26** to make good electrical contact between the tape **14** and the bushing **21** and also presses the ring **26** against the flange **24** so that the latter makes permanent electrical contact of low resistance with the shoulder **18**.

We have described one embodiment of the novel elements of our invention, the remaining features of our connector being conventional wherein the conductor **12** is soldered into a male contact **34** that is maintained in electrical separation from the shell **17** by dielectric spacers **36, 37**. A threaded swivel cap **38** connected to the shell **17** by means of an imbedded locking ring **39** serves to fasten the connector to a female member of known type. While we have shown our connector associated with a male contact, it will be understood that it may also be connected to female contacts, of which many types are known, within the scope of our invention.

To use the connector of our invention for a cable such as the cable **11**, the outer conductor **14** and jacket **16** are cut square and removed to expose a 2-inch length of the dielectric **13**. This is easy to do since although the outer conductor is bonded to the jacket it is not bonded to the dielectric **13**. The nut **32**, washer **33**, gasket **31**, and rings **28, 26** are then slid, in that order, over the end of the cable. The dielectric is rotated by hand enough to loosen it from the outer conductor, and the bushing **21** is slid over the dielectric and under the outer conductor until the cut end of the jacket is flush against the flange **24**. The dielectric **13** is then trimmed off flush with the end of the bushing **21** leaving a length of the conductor **12** projecting. The contact **34** and spacer **37** are then placed over the conductor **12** and crimped or soldered in a known manner. The washer **33** is pushed forward sliding the elements ahead until the ring **26** abuts the flange **24**. Thereafter the spacer **36** is put on and the assembly is inserted into the shell **17**. The nut **32** is then threaded into the shell to compress the gasket **31** and the ring **26**.

The foregoing description of our invention is exemplary rather than definitive and other embodiments will be included within the scope of our invention defined by the following claims.

We claim:

1. A connector for a coaxial cable of the type having

a dielectric jacket bonded to the outer conductor and a wall of insulation under said conductor comprising:

(A) a cylindrical, electrically conducting shell,

(B) a radially inwardly extending shoulder formed in said shell,

(C) a bushing fitting within said shell,

(a) said bushing having a thin-walled tubular length insertable between said conductor and said wall, and

(b) a flange matching said shoulder,

(D) a split ring

(a) abutting said flange, and

(b) fitting over said tubular length and capable of enclosing said jacket,

(c) said ring being tapered inwardly,

(E) a clamping ring tapered to match the taper of said split ring, and

(F) means for urging said clamping ring against said split ring whereby said flange is urged against said shoulder, making good electrical contact therewith, and said jacket and outer conductor are compressed between said split ring and said tubular length of said bushing.

2. The connector of claim 1 wherein said urging means comprises a nut threaded to said shell.

3. The connector of claim 1 wherein said shoulder is circular.

4. The connector of claim 3 wherein said shoulder is normal to the axis of said shell.

No references cited.

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