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COAXIAL CABLE CONNECTOR

Filed Oct. 9, 1967

FIG. 1

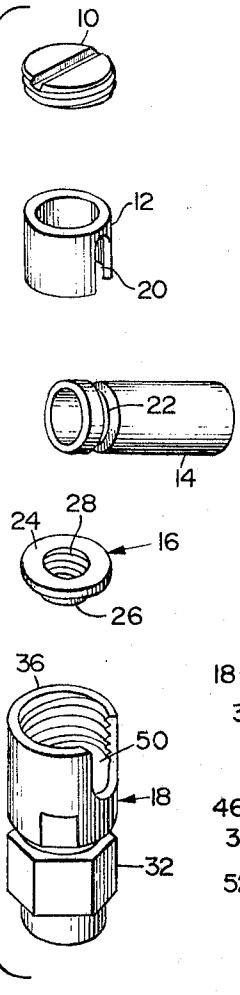


FIG. 2

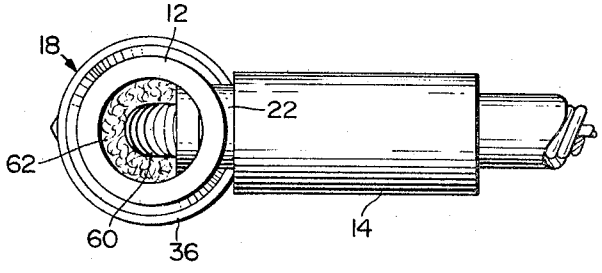
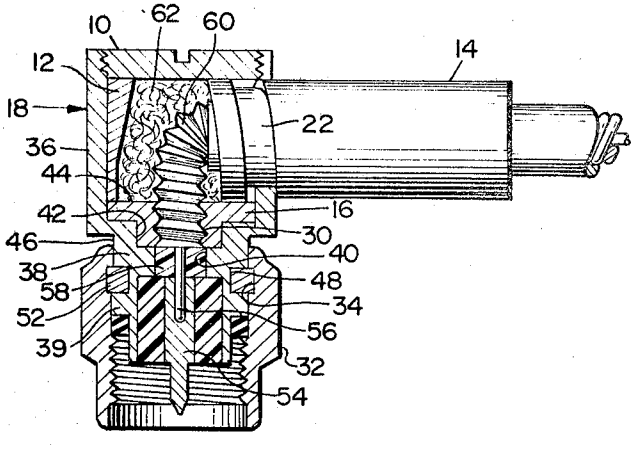


FIG. 3



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COAXIAL CABLE CONNECTOR

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ABSTRACT OF THE DISCLOSURE

This is a connector for making a right angle attachment with a coaxial cable. The connection is made by providing a threaded engagement with the external conductor and a fixed connection with the internal conductor and bending the cable into an arc within the connector.

BACKGROUND OF THE INVENTION

Broadly speaking, there are two ways of going around a bend for producing a right angle connection in high frequency coaxial cable work. You may utilize two intersecting machine cylinders, however, in order for the machine cylinders to work efficiency you must match the diameter of the inner conductor of the cable to the external diameter of the cavity. This construction produces a very sharp right angle bend in the cable with a resulting high electrical loss.

Another method, in forming a connection around a bend, is to intersect two tubes at right angles and then bend the cable around through the tubes. Although in this case the angle is not as sharp as in the first method it is still sharp enough to provide a high electrical loss.

SUMMARY OF THE INVENTION

This invention relates generally to coaxial cable connectors and more specifically to right angle coaxial cable connectors.

The applicants utilize a threaded member which is engageable with the external surface of the coaxial cable and through the use of a slot formed in the body element of the connector provided a means of creating a smooth arc in the bent cable while simultaneously assuring a fixed engagement.

DESCRIPTION OF THE DRAWING

FIG. 1 is an exploded view of the right angle connector.

FIG. 2 is the top plan view of the connector incorporated with an externally grooved coaxial cable. The connector has its cap removed; and a portion of the packing removed.

FIG. 3 is a longitudinal section of the connector showing the sealing sleeve and part of the cable in full.

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

The right angle connector comprising a cap **10** a compressor cap **12** a sealing sleeve **14** a clamping member **16** and a housing **18**.

The cap **10** is cylindrical in configuration having a threaded parameter and a slot diametrically formed across its upper surface.

The compressor member or clamp **12** has a tubular body portion, open at both ends, and has a longitudinal engagement slot **20** formed in the body portion which is open at a terminal end thereof. The inner wall of the body portion is tapered from bottom to top.

The sealing sleeve **14** is formed from a flexible insulated material such as neoprene, is tubular in configuration having an external taper, if desirable, and is open at both ends. A rectangular groove **22** is formed circumferentially around the outside surface of the sleeve **14** and in close proximity to a terminal end thereof.

The clamping member **16** comprises a head portion **24** and a shank portion **26** which uses a smaller external diameter than the head portion **24** and extends in right angle relations thereto. An aperture **28** is formed through the head portion **24** and continues as a core **30** in the shank portion **26**. A series of threads are formed on the wall defining the aperture **28** and are continued in the core **30**.

The housing **18** includes a body element **36** and a shell **32** which is generally tubular in configuration and includes external angular surfaces adapted to be engaged by a wrench or similar tool. The shell **32** is open at both ends and includes internal threading at its lower end and an internal groove **34** in close proximity to its upper end. The body element **36** is also tubular and has a base portion **38** almost closing off a mid-portion. A tubular extension **39** extends from the base **38** as shown in FIGURE 3. The base portion **38** has a hole **40** formed through it which extends into an internal well which, in turn, opens into the main cavity of the body element **36**. The internal well is of smaller diameter than the main cavity and thereby forms an internal circumferential shoulder **44**. The external diameter of the body element **36** at the terminal end close to the base portion **38** is of reduced diameter to provide a necked portion **46**. An external groove **48** is cut on the external surface of the base portion **38** a predetermined distance from the terminal end. At the terminal end of the body element **36** remote from the base portion **38** a longitudinal holding slot **50** is provided. The connector shell **32** with the body element **36** a "C" clamp or ring **52** is engaged within the external groove **48** and then pressure is applied allowing the internal surface of the shell **32** to slide over "C" ring **52** until it is in line with the internal groove **34** and will snap into that groove locking the two parts together while maintaining one part in rotational relationship with the other.

The body element **36** could be provided with internal threading and thereby eliminate the necessity of the clamping member **16**.

An inner pin contact **54** is soldered or otherwise attached to the inner conductor **56** after engaging an insulating bushing **58** between the outer conductor **60** and the inner pin contact **54** as shown in FIGURE 3.

The sealing sleeve **14** is slipped onto the cable with the groove **22** close to a terminal end as partly shown in FIGURE 3. The clamping member or compressor nut **16** is threaded onto the cable with the shank portion **26** directed toward the end of the cable to which the inner pin contact **54** is attached.

The clamping member **16** is press-fitted into the body element **36** with the head portion **24** in superposed abutting relationship to the internal circumferential shoulder **44** and the shank portion **26** within the well **42** as shown in FIGURE 3. The well **42** is defined by the base portion **38** and the inner wall of the housing **18**.

The cable is then bent so that the groove **22** is engaged with the edge of the arcuated slot or holding slot **50** in a tight friction fit. In this position the compressor clamp **12** is pushed down into the cavity formed by the body element **36** with the edges of the arcuate slot **20** engaged in the groove **22** behind the engagement of the holding slot **50**. This latter operation securely holds the sealing sleeve **14** in engagement and also provides a means of protecting the coaxial cable from being crushed on engagement of the cap **10**. The cap **10** is engaged to the body element **36** by threading it therewith

until the lower surface butts against the internal flange of the compressor clamp **12**.

A packing material **62** is put into the cavity formed by the body element **36** on top of the head portion **24** and around the coaxial cable as shown in FIGURES 2 and 3. The packing material **62** may be a conductive epoxy resin or a material consisting of closely packed strands of conductive material.

We claim:

1. The assembly of a coaxial cable connector and a coaxial cable, the coaxial cable having an outer conductor and an inner conductor, the coaxial cable connector comprising a tubular housing having a first opening formed at one end, a second opening formed through a base portion, a slot formed in the wall of the housing and a coaxial cable having a sleeve circumscribing a portion of it, the coaxial cable having a sleeve circumscribing a portion of it, the coaxial cable having a terminal end engaged within the area defined by the second opening holding the outer conductor in electrical engagement with a surface in the housing and the inner conductor electrically insulated from the housing and a portion of the sleeve being engaged with the edges of the slot whereby the coaxial cable is bent between the second opening and the slot.

2. The assembly as set forth in claim **1** wherein the slot is a longitudinal slot opening at the first opening and a groove is formed on the external surface of the sleeve which is the portion of the sleeve engaging the edges of the slot.

3. The assembly as set forth in claim **2** wherein a tubular compression member open at both ends and having a longitudinal engagement slot opening at one of the ends, fitted within the housing and the edges of the longitudinal engagement slot is engaged with the groove of the sleeve.

4. An assembly as set forth in claim **3** which is a clamping member having a head portion and a shank portion, of smaller external diameter than the head portion, extending therefrom, said clamping member having an axial core and the housing having an internal shoulder formed proximate the second opening and the clamping member engaged with the second opening and said head portion abutted against the internal shoulder and the core having means of engaging the coaxial cable.

5. The assembly as set forth in claim **4** wherein the means of engaging the coaxial cable formed in said core being a series of threads and said compression member having a tapered inner wall.

6. The assembly of a coaxial cable connector and a coaxial cable, the coaxial cable having an outer conductor and an inner conductor, the coaxial cable connector comprising a tubular housing having a first opening formed at one end, a second opening formed through a base portion, a collet fitted against the base portion and provided with an internal surface, the terminal end of the coaxial cable having its inner conductor engaged to a contact and the outer conductor circumscribed in abutting relationship by the collet providing an electrical termination of the outer conductor and the coaxial cable being bent between the terminal end and the plane where the remaining portion of the cable reaches the housing.

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