

[54] COAXIAL CABLE ASSEMBLY  
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 [58] Field of Search ..... 339/177 R, 177 E; 174/75 C, 88 C, 89

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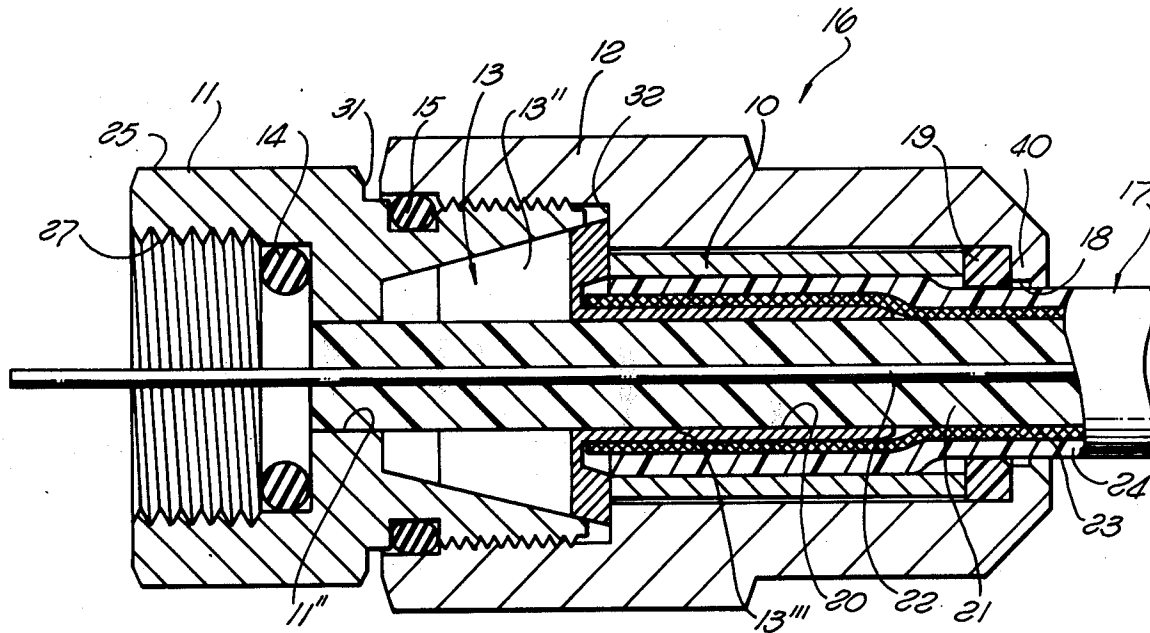
[57] ABSTRACT

A coaxial cable and an electrical connector therefor including a back-nut threaded to a body to receive a female fitting. The body has a stop for the back-nut. The back-nut has an internal shoulder. The body has an internal frusto-conical surface. A conductive ferrule is also provided. A cylindrical member clamps a cylindrical portion of the ferrule to the cable outer conductor. The ferrule has a shoulder. The ferrule also has a slotted frusto-conical surface to fit against the frusto-conical surface of the body. The slots form spring projections that are held in pressure contact with and in good electrical contact with the said body surface. The back-nut shoulder pushes the ferrule toward the body as the back-nut is threaded thereto. The back-nut has a flange behind which a gasket gland is retained. The clamping member is held in axial compression between the ferrule shoulder and the gasket gland. The gasket gland then provides a seal between the back-nut and the cable, the cable being surrounded by the flange.

[56] References Cited  
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 3,639,890 2/1972 Stevens et al. .... 339/177 R  
 3,668,612 6/1972 Nepovim ..... 339/177 R  
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 778781 7/1957 United Kingdom ..... 339/177 R  
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Primary Examiner—Neil Abrams

6 Claims, 8 Drawing Figures





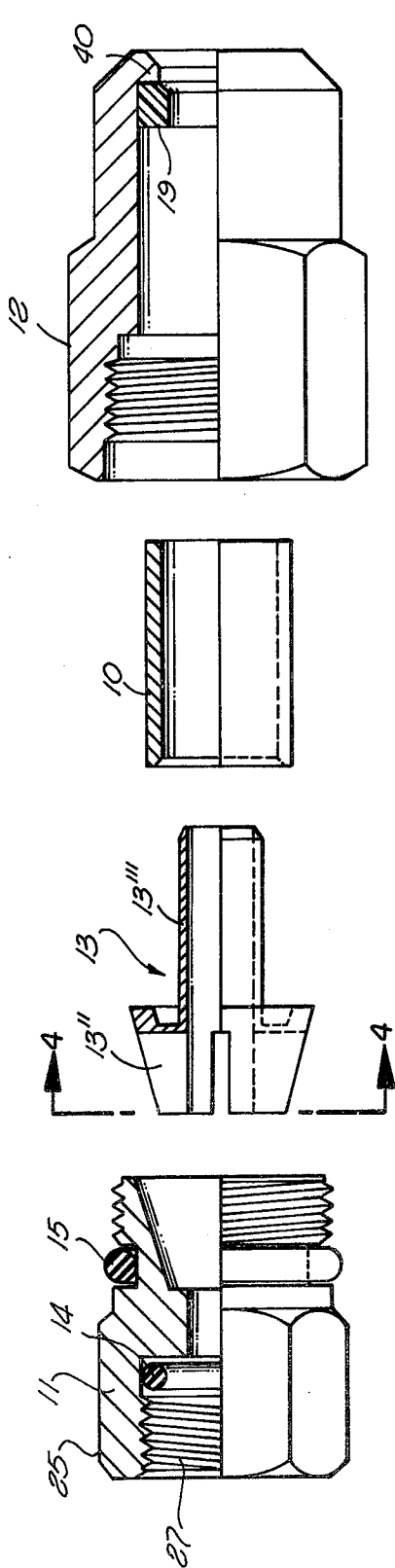
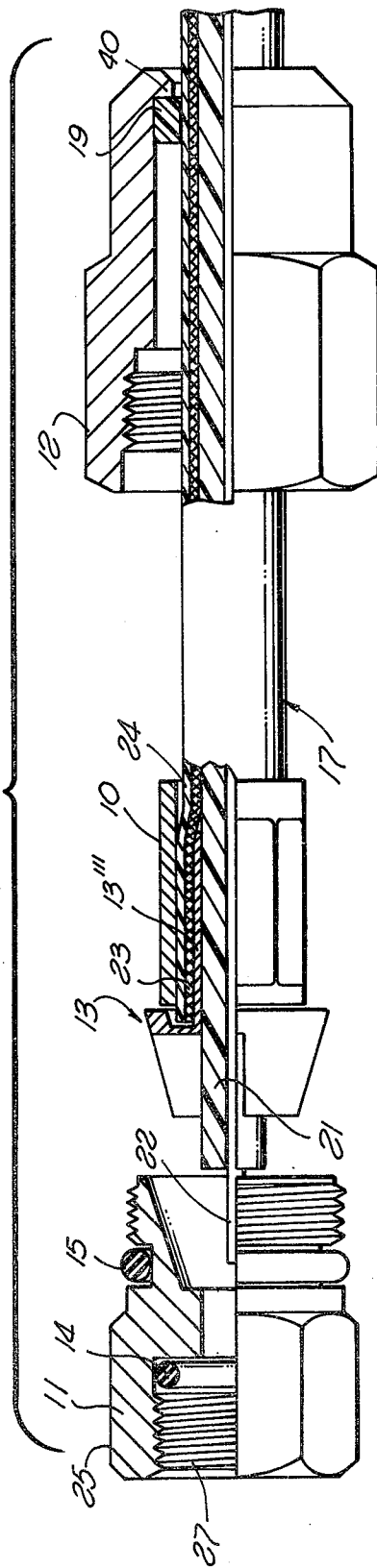


FIG. 3

FIG. 5



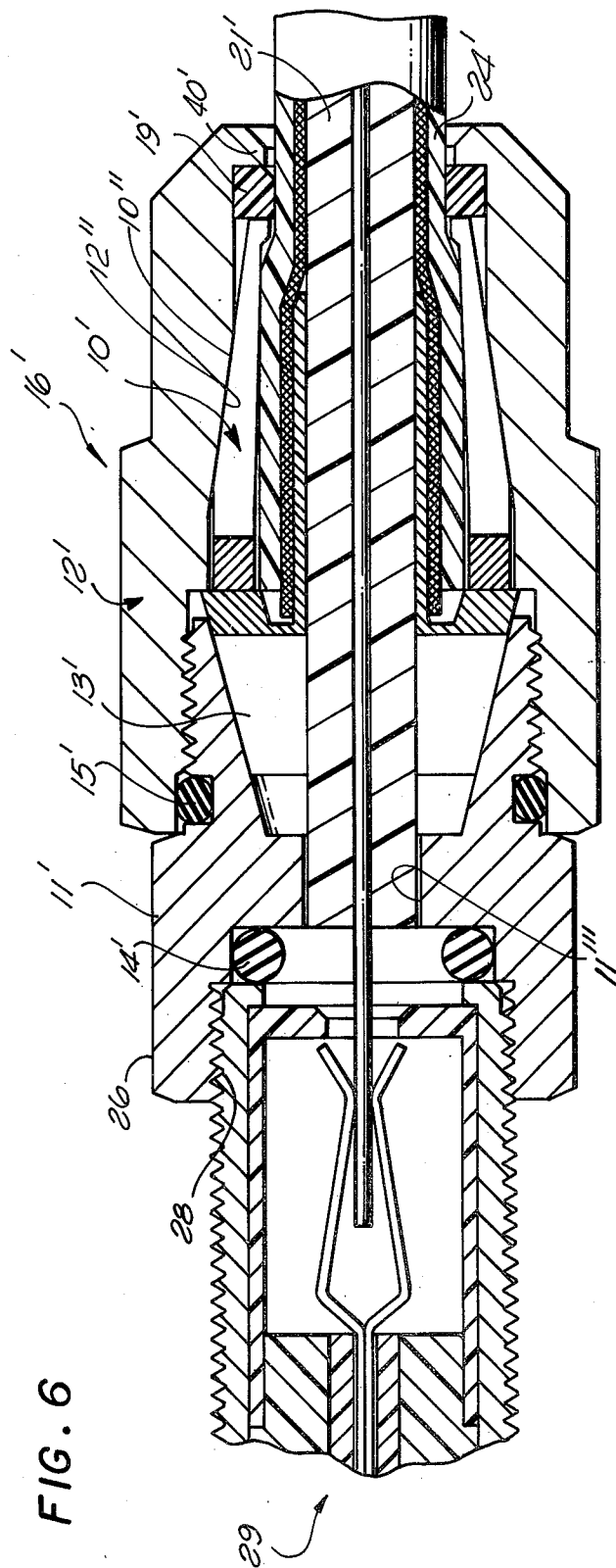


FIG. 6

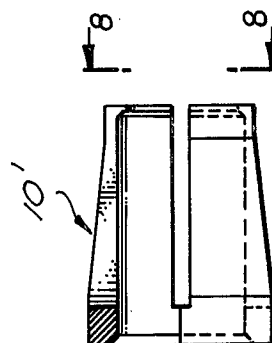
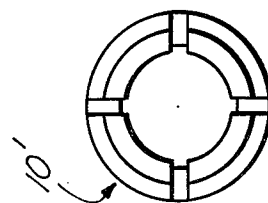


FIG. 8

FIG. 7

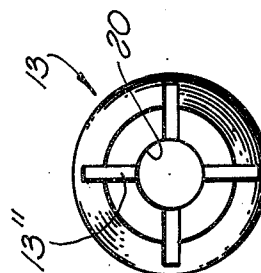


FIG. 4

## COAXIAL CABLE ASSEMBLY

## BACKGROUND OF THE INVENTION

This invention relates to an electrical assembly and, more particularly, to a coaxial cable with a radio frequency interference (RFI) proof and/or weather proof connector.

## PRIOR ART STATEMENT

Two searches were made. The following is an incomplete list of the patents cited in the search. However, this list includes what are believed to be the pertinent patents.

Inventor	U.S. Pat. No.
Dupre et al.	2,958,845
O'Keefe et al.	3,281,756
O'Keefe et al.	3,297,979
Brishka	3,432,798
Hutter et al.	3,646,502
Nepovim	3,671,926

In Dupre et al., see tapered pin 8.

In O'Keefe et al., 3,281,756, see "crimped" in column 2, line 5.

In O'Keefe et al., U.S. Pat. No. 3,297,979, see "a housing crimping sleeve 32" in column 3, line 26.

In Brishka, see "a clamp gasket" in line 19 of column 2.

In Hutter et al., see "a standard crimp ferrule 54" in lines 38-39 of column 2.

In Nepovim, see FIG. 3 and the first full paragraph in column 6.

The need for effective shielding of coaxial interconnections has increased significantly with the rapidly expanding use of electronic equipment for communications and data processing systems. In addition, government specification BP23 has now placed more stringent limits on the amount of signal that can lawfully leak out of or leak into a cable interconnect system. The signal which leaks into such a system is called radio frequency interference (RFI). RFI leaks into the system through poor shielding of connectors for coaxial drop cables. In this regard, existing fittings known as 'F' fittings offer very little protection against destructive corrosion brought about by the ingress of today's polluted atmosphere at the connecting region and around the components. The operation of such a degraded connection in the high signal level and frequency ranges ultimately becomes a prime source of RFI. Resulting from the described conditions, the frequent replacement of malfunctioning components is necessary. This then increases costs and maintenance.

## SUMMARY OF THE INVENTION

According to the present invention, there is provided an electrical assembly comprising: a coaxial cable having an end portion, a center conductor, a dielectric surrounding said center conductor, an outer conductor which may be comprised of a braid, a foil, or a hollow tube surrounding said dielectric, an insulating jacket surrounding said outer conductor, and said outer conductor being stripped away from said dielectric over said cable end portion; a conductive ferrule having a passageway therethrough somewhat larger in size than said dielectric, said cable end portion projecting through said passageway, said ferrule having first and second axial portions, said first portion having a frusto-

conical external surface around said cable end portion, said first portion being axially slotted to form resilient prongs; a back-nut surrounding said first and second ferrule portions; a conductive body to which said back-nut is threaded; said body having a frusto-conical internal surface to mate with said ferrule frusto-conical surface, said back-nut being so threaded and constructed that said prongs lie in pressure contact with said body surface to make good electrical contact therewith; and securing means to hold said cable jacket and outer conductor and said ferrule second portion in fixed positions relative to each other and in pressure contact and in electrical contact with each other.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which illustrate exemplary embodiments of the present invention:

FIG. 1 is a side elevational view of a cable and connector assembly;

FIG. 2 is a longitudinal sectional view of the assembly shown in FIG. 1, and taken on the line 2-2, shown therein;

FIG. 3 is an exploded elevational view, partly in section, of the assembly shown in FIGS. 1 and 2;

FIG. 4 is an end elevational view of a ferrule shown in FIG. 3, and taken on the line 4-4 shown therein;

FIG. 5 is an exploded subassembly, partly in section, of the cable and connector shown in FIGS. 1-4;

FIG. 6 is a longitudinal sectional view of an alternative embodiment of the present invention;

FIG. 7 is a side elevational view, partly in section, of a seizing collet shown in FIG. 6; and

FIG. 8 is an end elevational view of the collet taken on the line 8-8 shown in FIG. 7.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention may be employed in, for example, the CATV industry as a new and improved 'F' fitting for aerial installations of a communication channel between the distribution trunk and the subscribers' premises. Other uses are, of course, possible. The present invention provides an RFI-proof and weather-proof connector system resulting in reduced CATV system operating costs and maintenance.

The accompanying drawings illustrate two embodiments. One embodiment is shown in FIGS. 1-5. The other is shown in FIGS. 6-8. Both embodiments are identical except that a female fitting 29 in FIG. 6 is omitted in FIG. 1, and a seizing collet 10' is employed in FIG. 6, whereas a retention sleeve 10 is employed in FIG. 2 in lieu of the collet 10'.

FIGS. 2 and 6, respectively, have bodies 11 and 11', back-nuts 12 and 12', ferrules 13 and 13', and sealing rings (O-rings) 14, 15 and 14', and 15'. Back-nuts 12 and 12' have flanges 40 and 40', respectively, that retain gasket glands 19 and 19', respectively, in FIGS. 2 and 6, respectively. Back-nut 12' is also provided with a tapered section 12'' complimentary to the tapered section 10'' of the seizing collet 10'.

As shown in FIGS. 2 and 6, the connectors to the cable assemblies are indicated at 16 and 16', respectively. In FIG. 2, a coaxial cable 17 is inserted through a rear wall bore 18 of back-nut 12, a gasket gland 19, and the tubular retention sleeve 10.

The ferrule 13 is provided with an axially slotted frusto-conical front portion 13'' and a reduced diameter-

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