United States Patent [19]

Horak

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[54] **ELECTRICAL CONNECTOR FOR COAXIAL CABLE**

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[52] **U.S. Cl.** ..... **339/97 P,** 339/177 R

[51] **Int. Cl.** **H01r 9/08**

[58] **Field of Search** 339/95, 97–99, 339/177

[56] **References Cited**

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[57] **ABSTRACT**

An electrical connector for a coaxial cable. The connector body contains a longitudinal bore which receives one end of the coaxial cable. Teeth which face inwardly towards the bore are slidably movable in the connector body at right angles to the longitudinal bore and are driven into the cable to make contact with the outer conductor of the cable by the rotation of a screw which is operatively connected to the teeth.

6 Claims, 6 Drawing Figures

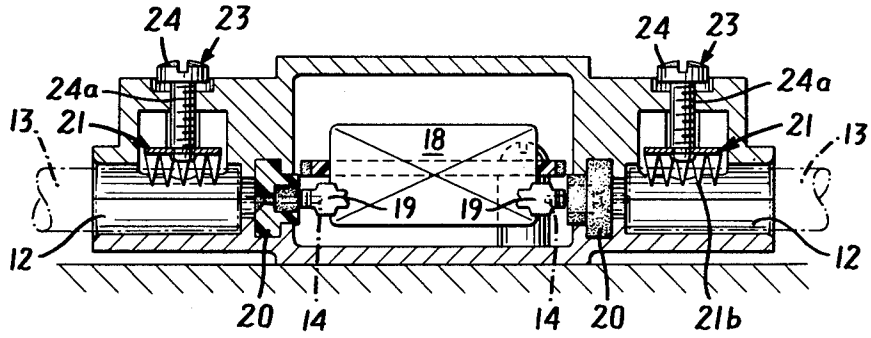
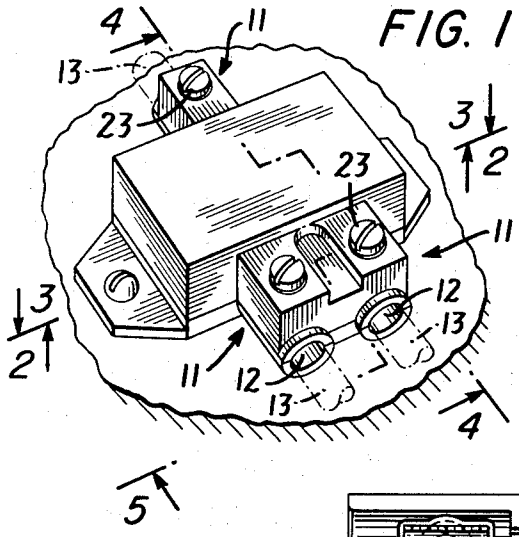


FIG. 1



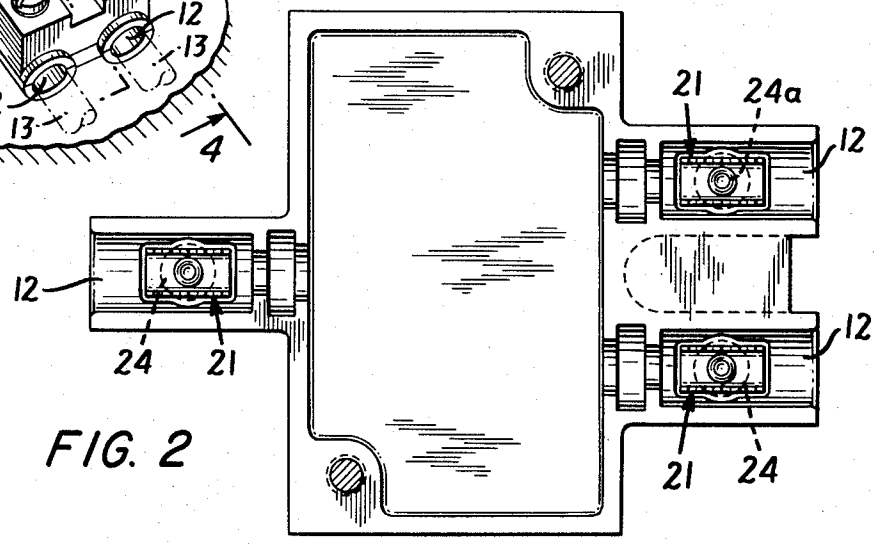


FIG. 2

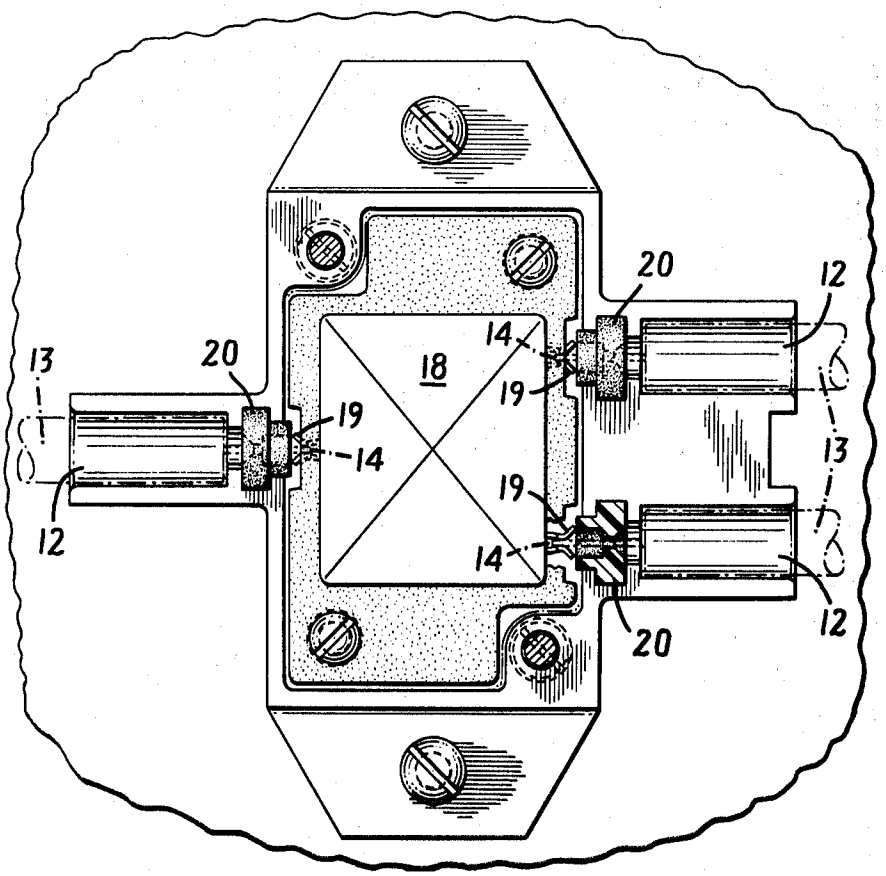


FIG. 3

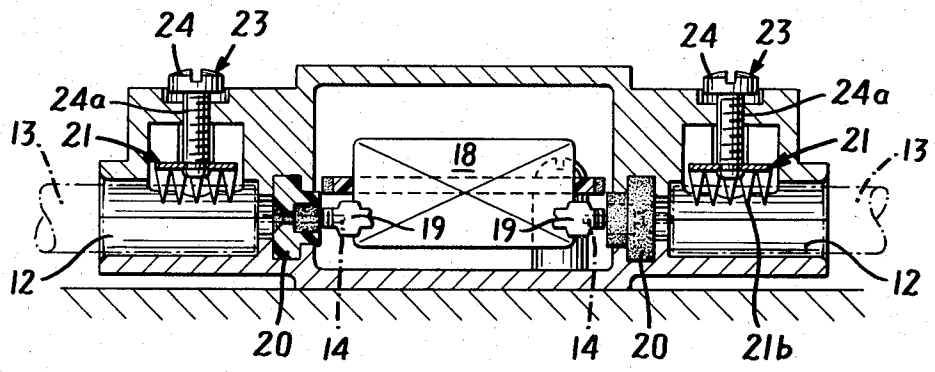


FIG. 4

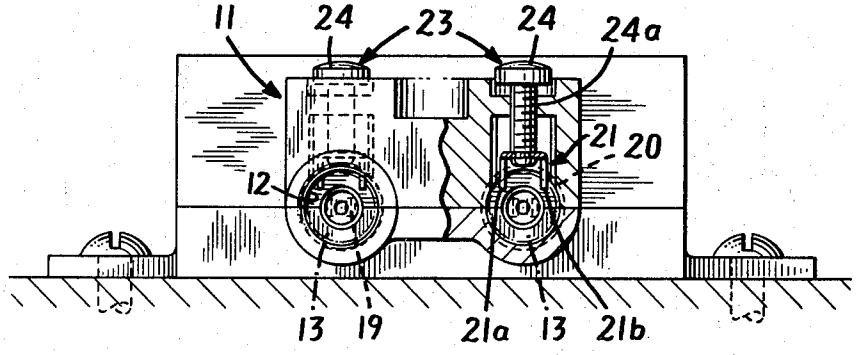


FIG. 5

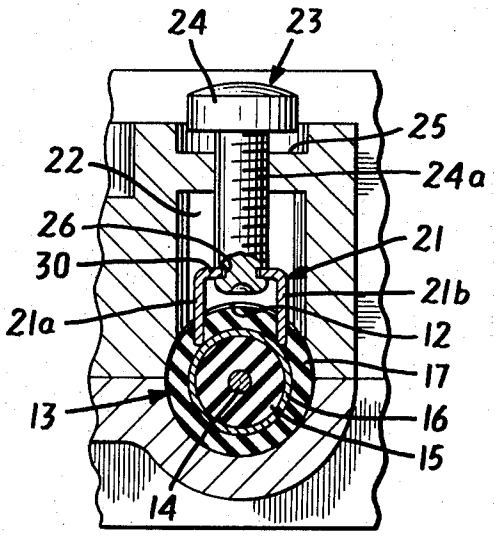


FIG. 6

ELECTRICAL CONNECTOR FOR COAXIAL CABLE

BACKGROUND OF THE INVENTION

The present invention is an electrical connector and, more particularly, an improved electrical connector for a coaxial cable.

A need exists for a simple and efficient coupling device for coaxial cables which have an inner centrally-located conductor surrounded by a thickness of dielectric material, which in turn is surrounded by an outer conductor that can be of the braided or foil type, and an outer covering of dielectric material. Although many types of connectors exist for connecting such coaxial cables to an instrument chassis, another line or a similar cable, they have a number of disadvantages. Some connectors now in use employ a large number of parts and are of relatively complex construction and are hence, expensive to manufacture. The strength of grip afforded by some of the connectors now in use has also been found to be insufficient to prevent separation by relatively small axial forces. Sometimes when the cable is under tension, the connection with the outer conductor of the cable tends to tear the outer conductor, thereby producing a weak mechanical grip and a poor electrical contact. Another significant disadvantage with some connectors now in use is the need for preliminary preparation of the coaxial cable before the cable may be inserted within the connector body. Such preparation commonly means exposing the center conductor of the coaxial cable for a short distance. Many connectors now in use also require that the outer jacket or insulation be removed to a certain degree to expose the outer conductor before a good electrical contact can be achieved.

SUMMARY OF THE INVENTION

An object of this invention is to provide a simple electrical connector having an improved mechanical and electrical connection to coaxial cables which provides a strong grip on the cable and a positive electrical connection thereto, yet which requires only minimal cable preparation.

The foregoing and other objects are attained in accordance with the invention by the provision of a connector body having a longitudinal bore therein to accommodate the end of a coaxial cable, a set of slidably movable, contact means facing inwardly towards the bore and which are adapted to pass through the outer dielectric of the cable and to make contact with the outer conductor of the cable, and drive means which move the contact means inwardly into the longitudinal bore and into contact with the outer conductor of the coaxial cable.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be further understood upon a consideration of the following detailed description of the presently preferred embodiment when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a device containing three connectors each made according to the invention;

FIG. 2 is a bottom plan view of the device shown in FIG. 1 taken along line 2—2 in FIG. 1 in the direction of the arrows;

FIG. 3 is a top view, partially broken away, of the device shown in FIG. 1 taken along line 3—3 in FIG. 1 in the direction of the arrows;

FIG. 4 is a sectional view of the device shown in FIG. 1 taken along line 4—4 in FIG. 1 in the direction of the arrows;

FIG. 5 is a sectional view, partially broken away, of the device shown in FIG. 1 taken along line 5—5 in FIG. 1 in the direction of the arrows; and

FIG. 6 is an enlarged sectional view of the inwardly facing teeth and screw means utilized in the connector.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 is a perspective view of a device utilizing three connectors, each made according to the present invention. It will be readily apparent to a person in the art that other devices utilizing a differing number of incoming or outgoing coaxial cables may use the connector described and claimed herein.

Each connector comprises a connector body, indicated by reference numeral **11**, having a longitudinal bore **12** formed therein to accomodate one end of a coaxial cable **13**, which is shown in phantom. The coaxial cable, as best shown in FIG. **6**, includes an inner conductor **14**, an inner dielectric **15** surrounding the inner conductor, an outer conductor **16** surrounding the inner dielectric **15**, and an outer dielectric **17** surrounding the outer conductor **16**. The inner conductor **14** of the cable is connected to appropriate conventional electronic circuitry **18** inside the device shown in perspective in FIG. **1** by means of appropriate contacts **14**. Insulation **20** prevents a shorting or grounding of the inner conductor **14**. The connector of the present invention includes simple means to achieve a good ground connection for the coaxial cable **13** as will now be described.

The connector of the present invention includes contact means **21** which face inwardly towards the bore **12** and which in the preferred embodiment are two separate spaced-apart sets of teeth **21***a* and **21***b*, as best shown in FIGS. **5** and **6**. The contact means **21** give a good ground connection with the outer conductor **16** of the coaxial cable **13**. The contact means **21** are slidably mounted in a bore **22** which can be generally at right angles to the longitudinal bore **12** holding the coaxial cable. Drive means **23**, which in the preferred embodiment is a screw, are provided to allow for the movement of the contact means towards the bore **12**. The contact means **21** are supported by a common flange **30** which is bent at right angles to the contact means and are slidably mounted in a slot **26** which goes completely around shank **24***a* of screw **23** to allow for the rotation of the contact means **21** in bore **22**. If desired the two sets of contact means **21***a* and **21***b* can be integral with one another and flange **30**. The points of the contact means **21** are preferably arranged in a plane which is substantially parallel to the longitudinal bore **12**.

The connector of the present invention is quite simply utilized. The first step is the insertion of the suitably prepared coaxial cable **13** into the longitudinal bore **12** and the connection of its inner conductor **14** with the appropriate electronic circuitry **18**. when this has been accomplished the screw head **24** is rotated, thereby driving the screw shank **24***a* downwardly. The contact

means **21**, situated adjacent to the lowermost end of the shank **24***a*, slidably move in the slot **26** in shank **24***a* as the screw is turned but retain the orientation shown in cross-sectional views in FIGS. **5** and **6** due to the narrow width of bore **22** which prevents their turning. They are driven downward by the action of the screwing operation until the points of the contact means **21** are driven through the outer dielectric **17** and into secure engagement with the outer conductor **16** of the cable **13**. The screw **23** can be dimensioned, if desired, so that the engagement of the contact means and outer conductor occurs just before the undersurface of screw head **24** makes contact with ledge **25**. When the contact means **21** make contact with the conductor **16** a good ground connection is established because of the secure placement of the two sets of contact means on opposite sides of conductor **16**.

Upon reading the foregoing, a person in the art will become aware of modifications which can be made to the above-described preferred embodiment without departing from the spirit and scope of the invention. For example, the contact means need not comprise a series of discrete teeth. A single blade could serve as the contact. All such modifications are intended to be included within the scope of the invention and the foregoing is merely intended to be illustrative of a preferred embodiment. The appended claims define the scope of protection sought.

I claim:

1. An electrical connector for a coaxial cable which contains an inner conductor, a dielectric surrounding said inner conductor, an outer conductor surrounding said dielectric, and an outer dielectric surrounding said outer conductor, said connector comprising:

a connector body having a longitudinal bore formed therein for receiving one end of said coaxial cable;

contact means which face inwardly towards the bore, the contact means being slidably movable in the connector body and adapted to be moved inwardly into the longitudinal bore to pass through the outer dielectric of the cable to make contact with the outer conductor of the cable; and

drive means upon a portion of which the contact means are rotatably mounted, whereby the contact means will be moved in a direction towards the longitudinal bore and into contact with the outer conductor of the coaxial cable.

2. A connector as claimed in claim **1** wherein the contact means comprise teeth.

3. A connector as claimed in claim **1** wherein the drive means comprise a rotatable screw.

4. A connector as claimed in claim **1** wherein the contact means are slidably mounted in the connector body in a bore which is generally at right angles to the longitudinal bore for receiving the coaxial cable.

5. A connector as claimed in claim **1** wherein the contact means have points at their end which are formed in a row which is substantially parallel to the longitudinal bore.

6. A connector as claimed in claim **1** comprising two parallel, spaced-apart sets of inwardly facing teeth.

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