

[54] **OPEN BARREL COAXIAL CABLE
TERMINAL**

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[51] Int. Cl. **H01r 11/08**

[58] Field of Search..... **339/177, 276**

[56] **References Cited**

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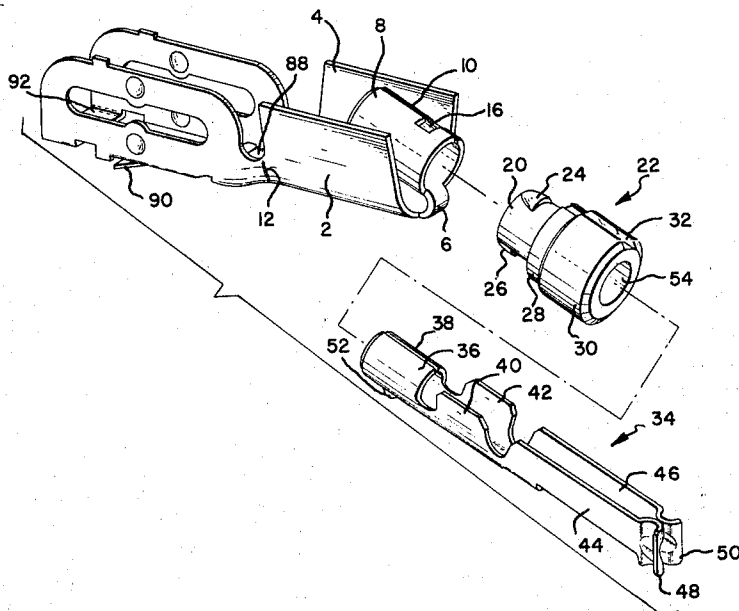
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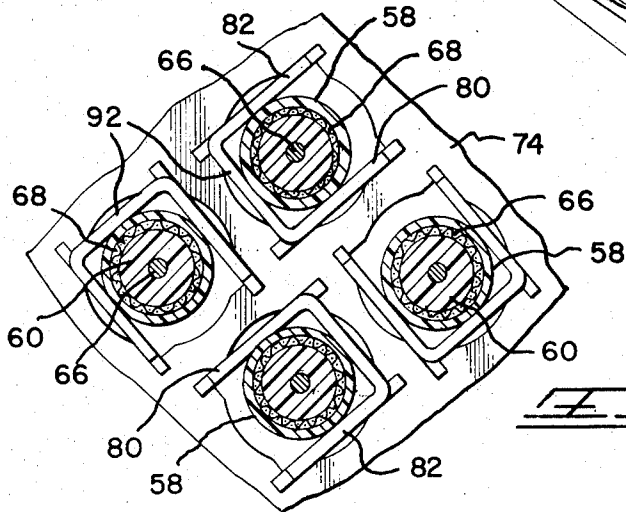
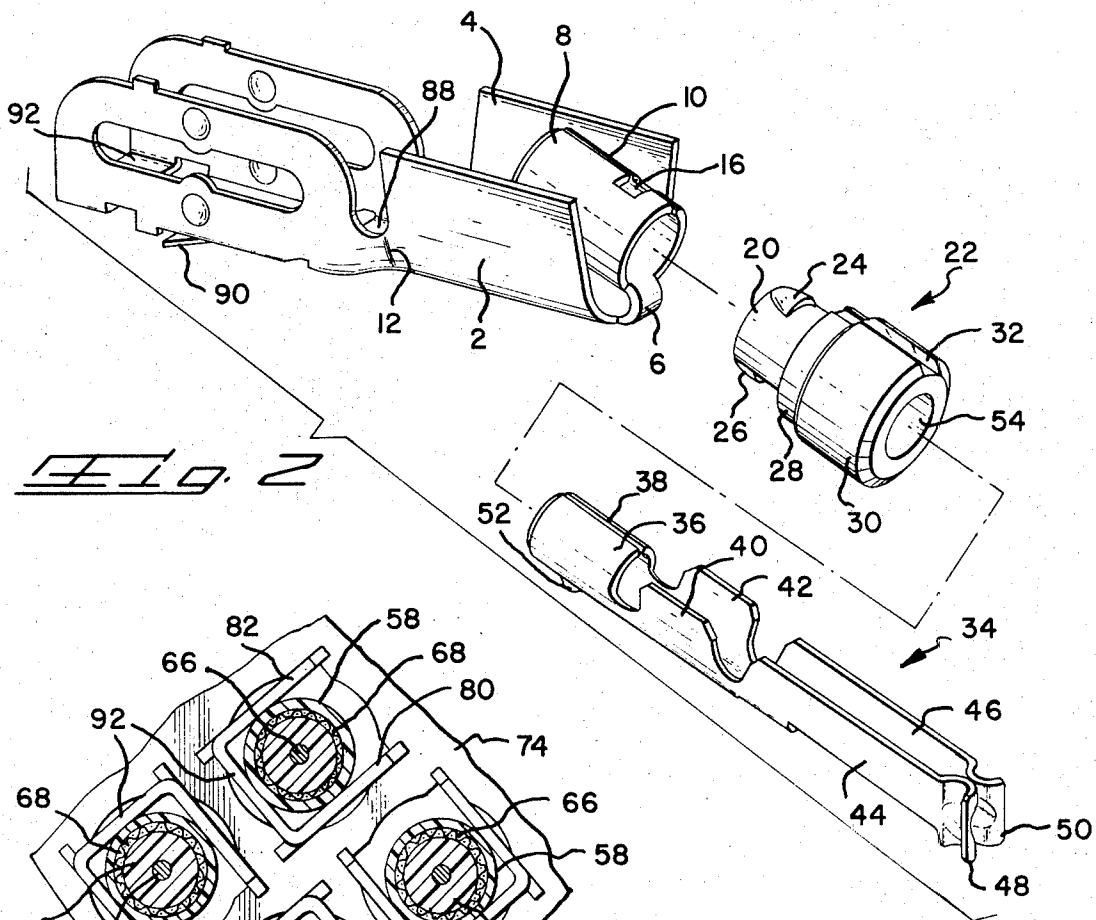
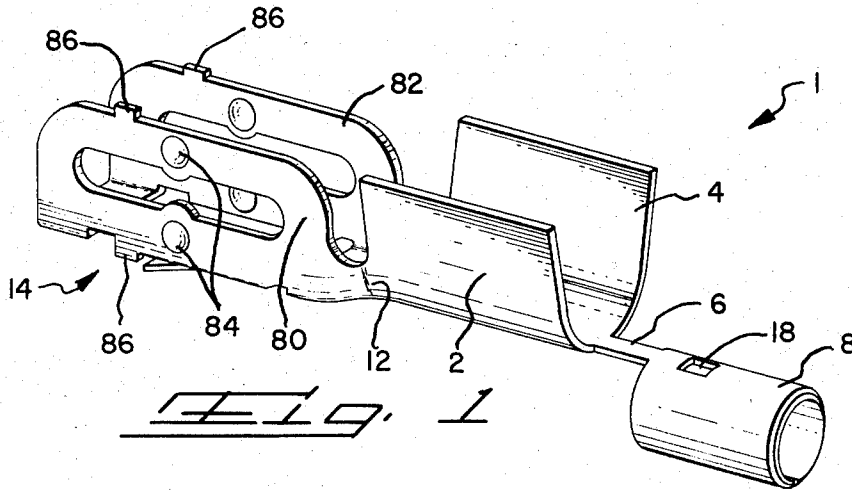
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[57] **ABSTRACT**

Method and apparatus for providing a coaxial cable terminal, wherein, a sleeve of dielectric material supports a coaxial cable center conductor in electrically isolated relationship with respect to a conducting sleeve. The outer conducting shield of the coaxial cable is terminated to the conducting sleeve and the center conductor of the cable is electrically connected to a terminal externally of both the conducting sleeve and the dielectric sleeve. Ears extending from the conducting sleeve are adapted for forming a crimped open barrel which encircles and retains the outer conducting shield electrically to the conducting sleeve.

5 Claims, 5 Drawing Figures





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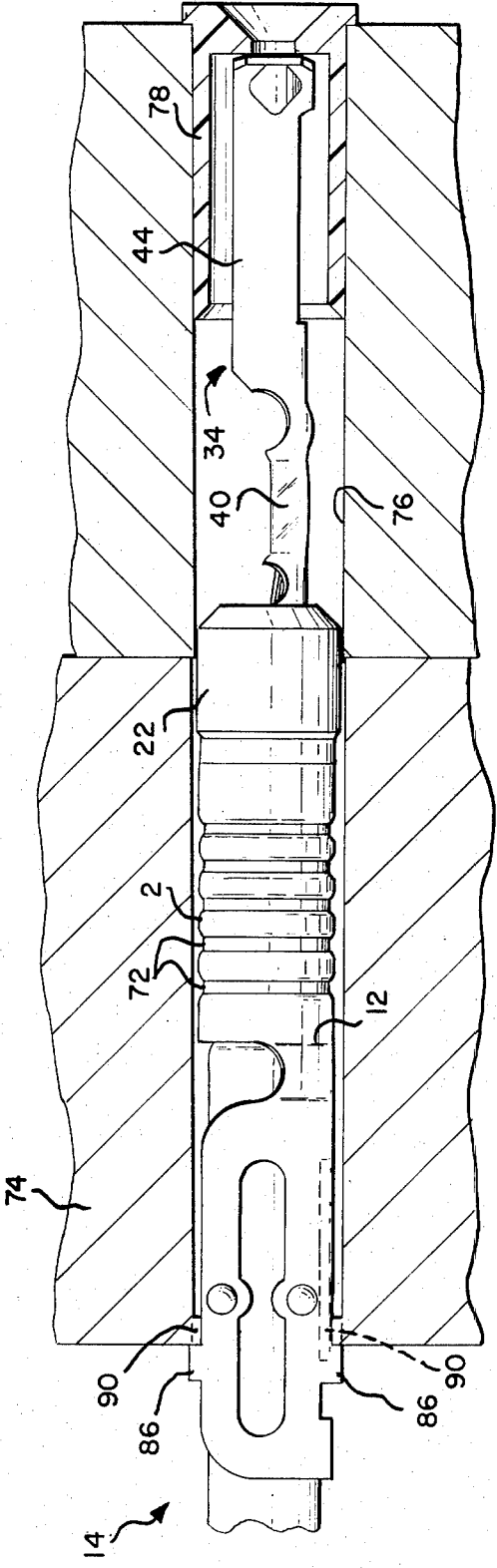
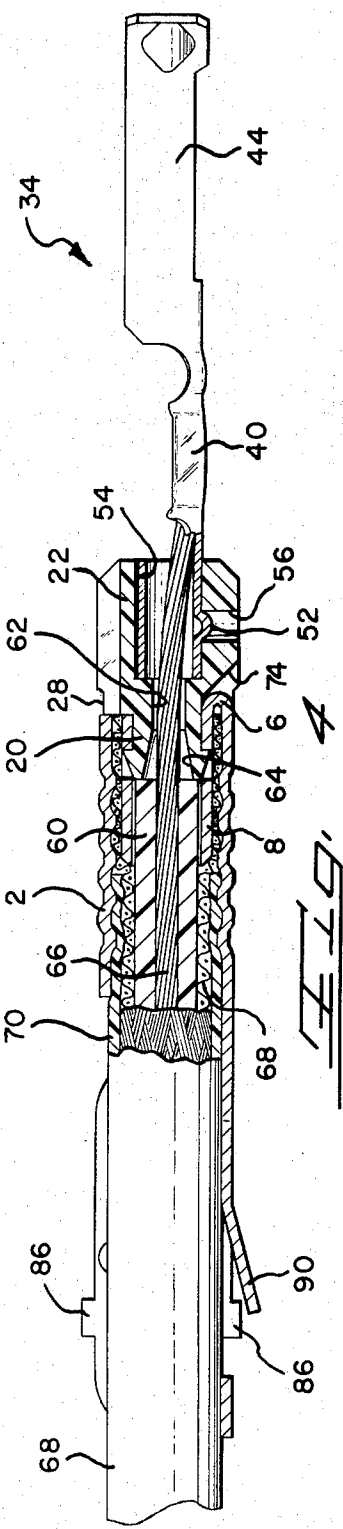


FIG. 5

OPEN BARREL COAXIAL CABLE TERMINAL

The present invention relates to a coaxial cable terminal, and more specifically, to method and apparatus for providing an open barrel terminal and a center contact terminal externally of the open barrel termination for a coaxial cable.

It is often desired to provide a coaxial cable with a low profile terminal. It is also desirable to provide a receptacle-type or other specialized terminal for a coaxial cable center conductor. The present invention accordingly provides method and apparatus for a low profile open barrel type terminal receiving the outer conducting shield of a coaxial cable, and for providing a center conductor terminal externally of the open barrel termination which attains the objective of a low profile connection. A further advantage residing in the invention is that the external terminal for the center conductor may advantageously comprise a receptacle-type terminal or other desired specialized application terminal.

It is therefore an object of the present invention to provide a low profile open barrel terminal for a coaxial cable.

Another object of the present invention is to provide method and apparatus for a coaxial cable terminal wherein the terminal for the cable center conductor is established externally of the terminal for the cable outer conductor shield.

Another object of the present invention is to provide method and apparatus for a low profile coaxial cable terminal wherein the terminal for the center conductor of the cable is unshielded by the remaining portions of the terminal.

Other objects and many attendant advantages of the present invention will become apparent upon perusal of the following detailed description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an enlarged perspective of a stamped and formed terminal according to a preferred embodiment of the present invention, and provided specifically for connection to the outer conducting shield of a coaxial cable with a low profile, open barrel crimp, and further illustrating an alternative integral alignment portion;

FIG. 2 is an exploded enlarged perspective of the preferred embodiment shown in FIG. 1 together with a dielectric sleeve and a preferred embodiment of a terminal specially provided for connection to the center conductor of a coaxial cable, all of which parts illustrated in exploded configuration may be assembled to form a completed low profile terminal for a coaxial cable;

FIG. 3 is an enlarged fragmentary view of a plurality of terminals according to the preferred embodiment shown in FIG. 2, terminated respectively to coaxial cables and arranged in relatively closely spaced relationship within respective cavities of a housing;

FIG. 4 is an enlarged elevation with parts in section and with parts broken away to illustrate a completed termination utilizing the terminal according to the apparatus and method of the present invention; and

FIG. 5 is an enlarged elevation with parts partially in section illustrating a typical application of the present invention in the form of a low profile termination, with the alignment portion of the preferred embodiment shown in FIG. 1 lockingly retaining the low profile termination internally of a housing cavity.

With more particular reference to FIG. 1 of the drawings, there is shown generally at 1 a preferred embodiment of a coaxial cable outer conductor terminal fabricated from a suitable conducting material provided with a pair of projecting deformable ear portions 2 and 4 generally of rectangular configuration and integrally joined to each other along a common longitudinal dimension. A generally narrow rectangular web portion 6 is integral with and projects from the intersection of portions 2 and 4. Integral with one end of the web portion 6 is a generally cylindrical sleeve provided with a longitudinal seam 10, more particularly shown in FIG. 2. For example, the ear portions 2 and 4, together with the web portion 6 and the sleeve portion 8, may be stamped and formed from a single sheet of conducting material. Additionally, the ear portions 2 and 4 may be integrally joined along a parting line indicated generally by the phantom line 12 to an optional terminal alignment and latching mechanism generally indicated at 14. The optional mechanism 14 may be advantageously stamped and formed from the same sheet material integral with the ear portions 2 and 4 along the parting line 12. It is understood however, that the ear portions 2 and 4 may be separated from the mechanism 14 along the parting line 12, thereby eliminating the need for the mechanism.

With reference to FIGS. 1 and 2, additional features according to the present invention will be described in detail. The relatively thin sidewall of the sleeve portion 8 is provided with opposed rectangular apertures 16 and 18. As shown in FIG. 2, the aperture 16 is contiguous with the seam 10. The web portion 6 is doubled back upon itself to orient the sleeve 8 generally between the ear portions 2 and 4. Further with reference to FIG. 2, a reduced diameter cylindrical end portion 20 of a sleeve, generally shown at 22 and advantageously formed from a suitable dielectric material, is provided with opposed projecting resilient buttons 24 and 26. The end portion 20 is freely insertable within the open end of the sleeve 8, with the buttons 24 and 26 respectively registering in and latching within the apertures 16 and 18, respectively. The end portion 20 is thereby latchingly received in registration within the sleeve 8, with a portion of the dielectric sleeve protruding from the sleeve 8. The dielectric sleeve 22 is additionally provided with a central portion 28 of intermediate diameter and an enlarged diameter end portion 30. A longitudinal slot is provided externally in the periphery of the portions 28 and 30 allowing alignment of the sleeve 22 with automatic inserting apparatus, now shown.

With further reference to FIG. 2, there is shown generally at 34, an additional terminal portion for a center conductor of a coaxial cable. The terminal portion 34 includes a reduced diameter cylindrical sleeve portion 36 provided with a longitudinal seam 38, which sleeve is integral with and axially aligned with respect to a pair of laterally spaced ear portions 40 and 42. In turn, the ear portions are integral with and longitudinally spaced with respect to a pair of adjacent and laterally spaced cantilever spring arms 44 and 46, which arms terminate in generally C-shaped end portions 48 and 50 disposed in back-to-back relationship and engaging each other. Generally, the spring arms 44 and 46 cooperate to form a receptacle type terminal,

although any desired special application terminal may be substituted for the spring arms 44 and 46.

With reference to FIG. 2, taken in conjunction with FIG. 4, the sleeve 36 is provided with a projecting detent 52 on the sleeve periphery opposite the longitudinal seam 38. The sleeve portion 36 is freely insertable within the inner diameter portion 54 of the dielectric sleeve 22, with the detent 52 in registration with an aperture 56 provided within the enlarged diameter end portion 30 of the dielectric sleeve 22 and in communication with the internal diameter portion 54 thereof. Such registration of the detent within the aperture 56 lockingly retains the sleeve portion 36 of the terminal 34 generally in concentric arrangement within the dielectric sleeve 22, with a portion of the terminal protruding from the dielectric sleeve.

As further shown in FIG. 4, the spring arms 44 and 46 extend and project longitudinally from the dielectric sleeve 22.

In operation, reference will be made to FIG. 4, wherein a coaxial cable generally indicated at 58 includes the usual generally cylindrical elongated dielectric portion, which is received internally of the conducting sleeve portion 8 and stopped against the terminal end of the reduced diameter portion 20 of the dielectric sleeve 22. As shown in FIG. 4, the inner diameter portion 54 of the dielectric sleeve 22 communicates with a reduced diameter bore 62 provided with a generally frusto-conical or otherwise flared counterbore 64 in the terminal end of the reduced diameter portion 20. The coaxial cable center conductor 66 protrudes from the end of the dielectric portion 60 and is received freely through the counterbore 64, the reduced diameter portion 62 and the inner diameter portion 54 of the dielectric sleeve 22. The center conductor 66 additionally is received between the upstanding ear portions 40 and 42 of the terminal 34 which ear portions are suitably wrapped in surrounding relationship over the center conductor 66 and crimped thereto in mechanical and electrical engagement. The coaxial cable 50 additionally includes the usual surrounding outer conductor shield 68 which extends past the terminal end of the dielectric portion 60 of the cable and which is received over the conducting sleeve 8. More specifically, the sleeve 8 is interposed between the surrounding outer conductor shield 68 and the generally cylindrical elongated dielectric portion 60. The terminal end of the shield 68 is stopped against the intermediate diameter portion 28 of the dielectric sleeve 22. Yet with reference to FIG. 4, the coaxial cable 58 may additionally be provided with an outer dielectric shield 70 which terminates adjacent to the terminal end portion of the conducting sleeve 8.

With reference to FIGS. 4 and 5, the upstanding ear portions 2 and 4 are suitably wrapped in encircling relationship over the protruding dielectric shield. Additionally, the ear portions 2 and 4 extend beyond the end portion of the conducting sleeve 8 and are suitably wrapped in encircling relationship over the end portion of the outer dielectric sheath 70. The wrapped ear portions 2 and 4 are then provided thereover with a series of compression crimps, generally indicated at 72 and preferably of corrugated configuration to prevent unwrapping of the crimped ear portions and further to provide an open barrel, low profile termination with

the conducting sleeve portion 8 substantially retained in coaxial relationship therewith. As shown in FIG. 4, the open barrel crimp configuration substantially sealingly compresses over the dielectric sheath 70 and mechanically and electrically engages the conducting sheath 68. Additionally, such open barrel crimp configuration generally flattens the reversely bent web portion 6. As shown in FIG. 4, the dielectric sleeve 22 has a generally relieved portion 74 receiving the flattened web portion 6, thereby further insuring a low profile configuration for the termination. Additionally, the terminal 34 and its termination for the center conductor 66 is externally of the dielectric sleeve and the conducting sleeve 8, which further contributes to the low profile configuration and allows substitution of any desired special application terminal for the terminal 34 specifically disclosed.

With reference to FIG. 5, one of many applications for the termination will be described in detail. With reference to the Figure, a single piece housing or, as shown specifically, a two piece housing 74 is provided with a cavity 76 therein. The completed termination may be slidably inserted within the recess 76 with the terminal 34 being freely received within a dielectric sleeve 78 partially lining the recess 76 to prevent grounding of the terminal 34 against a sidewall of the recess 76. The dielectric sleeve 22 is relatively larger in diameter than the open barrel crimp configuration of the ear portions 2 and 4 and thereby serves to laterally support the finished termination against the sidewalls of the recess 76. It is particularly desirable in such application to include the locking and aligning portion 14 together with the completed termination as described. With reference to FIG. 1 taken in conjunction with FIG. 5, the details of the alternatively provided portion 14 will be described in detail. As shown in FIG. 1, the portion 14 is characterized by a pair of laterally spaced projecting flanges 80 and 82 which advantageously receive and laterally support a portion of the coaxial cable 58 therebetween. Each flange is provided with a pair of buttons 84 which project from the surface of each flange. Additionally, each flange is provided with a pair of projecting tabs 86 each of which project from an opposed marginal edge of each flange.

As shown in FIG. 2, the flange portions 80 and 82 are connected together by an integral web 88 generally contiguous with the ear portions 2 and 4 along the parting line 12. A resilient lance 90 is disposed generally between the laterally spaced flange portions and is integrally joined to the web portion 88. A second web portion 92 integrally connects together the flanged portions 80 and 82. As shown in FIG. 3, with the termination viewed at its end, the web portion 92 and the laterally spaced flanges 80 and 82 form a generally rectangular channel configuration. FIG. 3 additionally discloses the advantage of the described low profile termination which enables a plurality of like terminations to be located within closely spaced cavities of the housing 74.

With reference to FIG. 5, the projecting tabs 86 engage against the face of the housing 74 to prevent over-insertion of the terminal into the housing cavity. The projecting buttons 84 slidably pass behind an integral lip 94 of the housing and lockingly engage behind the lip to prevent inadvertant withdrawal of the termina-

tion from the housing cavity. The elongated lance 90 provides a resilient electrical contact which positively engages against the lip 94. The lance further provides a wiping action over the lip 94 upon insertion of the termination within the housing cavity.

Other modifications and embodiments of the present invention are to be covered by the spirit and scope of the appended claims, wherein:

What is claimed is:

1. A coaxial cable terminal comprising: a sleeve of conducting material, ear means on said sleeve for encircling and gripping a coaxial cable shield received over said sleeve, dielectric means in registration with said sleeve for receiving and supporting a center conductor of a coaxial cable, terminal means in registration with said dielectric means for receiving the center conductor, and means for electrically securing said terminal means to said center conductor externally of said dielectric means and externally of said sleeve.

2. The structure as recited in claim 1, wherein said ear means and said sleeve are joined by an integral web, with said sleeve being received generally internally of said ear means.

3. The structure as recited in claim 1, and further including: latching means on said dielectric means for retaining said dielectric means in registration with said sleeve, and latching means on said terminal means for retaining said terminal means in registration with said dielectric means.

4. The structure as recited in claim 1, and further including: retaining and alignment means connected to said ear portions and receiving and laterally supporting a portion of a coaxial cable.

5. The structure as recited in claim 1, wherein said dielectric means is relatively larger in circumference than said ear means.

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