

[54] CONNECTOR CAP ASSEMBLY

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[51] Int. Cl. H01r 13/44, H01r 13/58

[58] Field of Search 339/36, 103; 85/9,
85/32

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[57]

ABSTRACT

A connector cap assembly for use in an attachment plug or cable connector wherein the cap assembly comprises a cylindrical body having an open bottom and a top with a cylindrical wall extending upwardly therefrom. A pair of supporting ears projects upwardly from the top to adjustably carry a pair of clamping members by means of a pair of screw assemblies. Cooperating guide means are provided on the clamping members and the wall portions to assure alignment of the clamping members throughout their entire travel.

3 Claims, 10 Drawing Figures

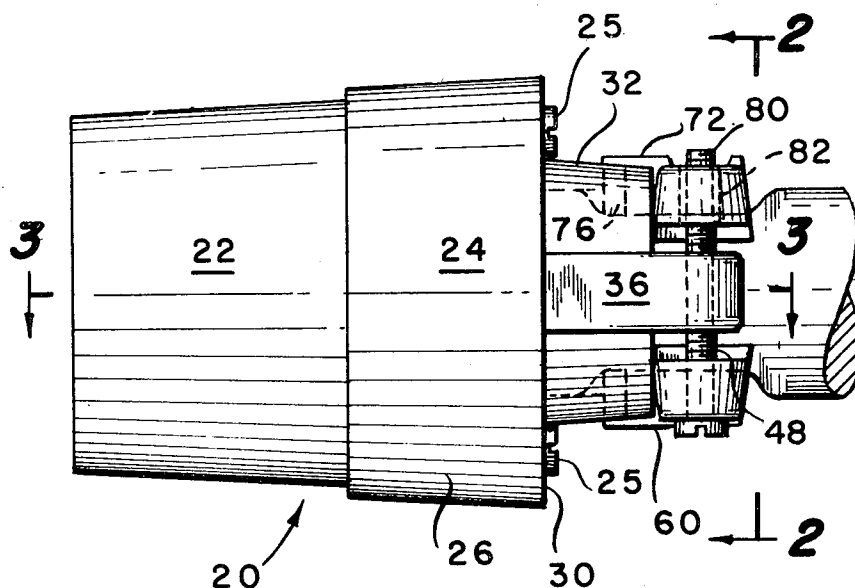


Fig. 1

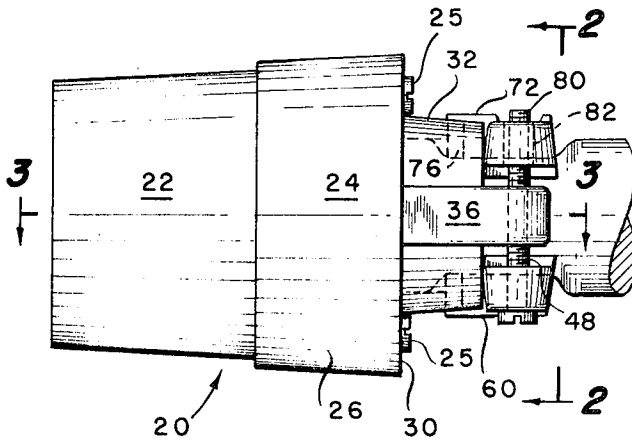


Fig. 2

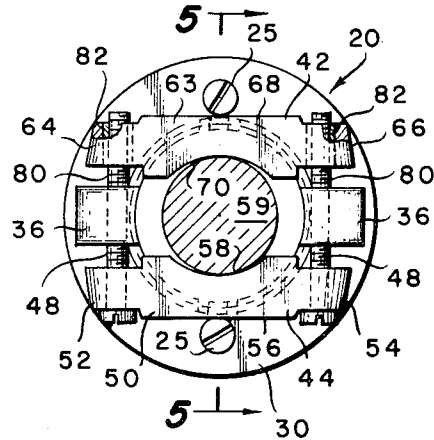


Fig. 3

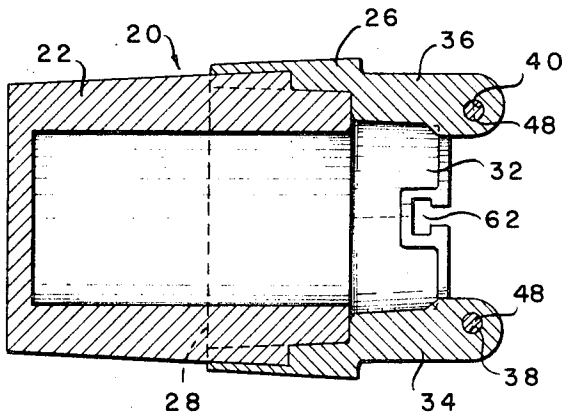
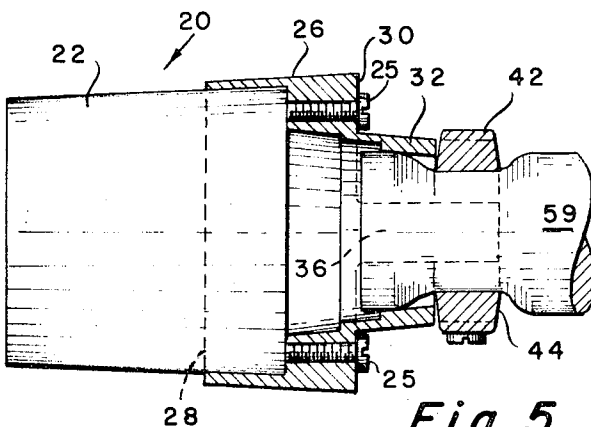
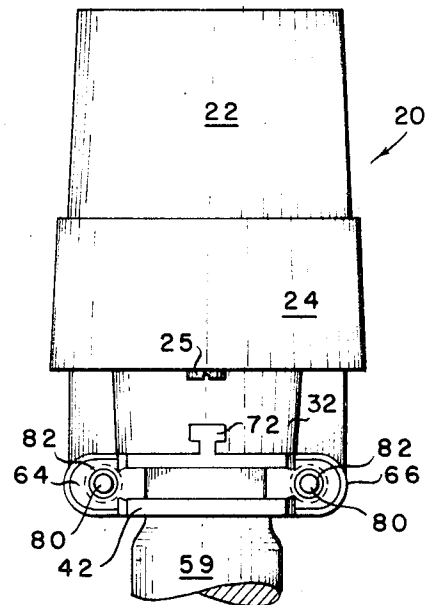


Fig. 5

Fig. 4



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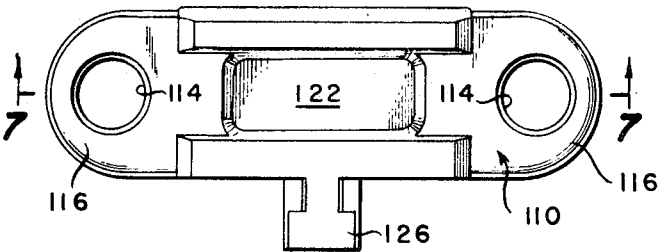


Fig. 6

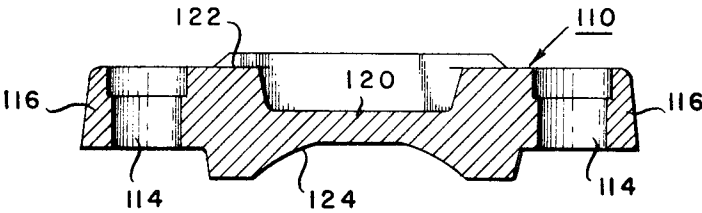


Fig. 7

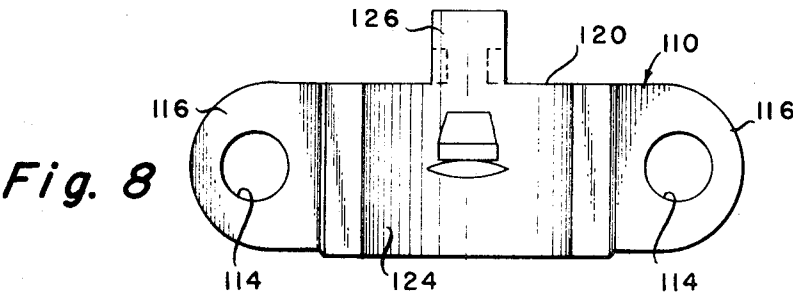


Fig. 8

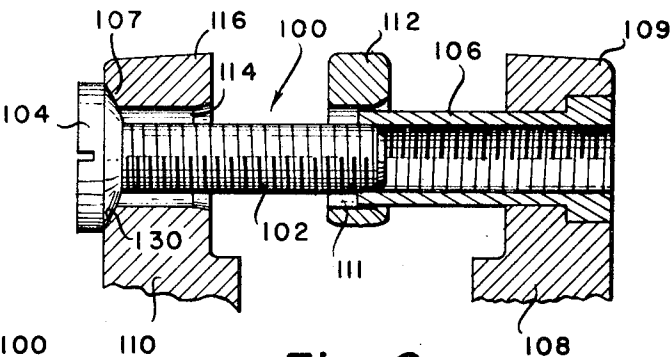


Fig. 9

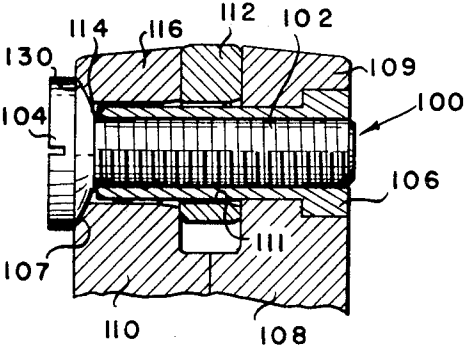


Fig. 10

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CONNECTOR CAP ASSEMBLY

SUMMARY OF THE INVENTION

This invention relates to connector cap assemblies for use in attachment plugs or cable connectors wherein the cap assemblies are provided with clamping members to retain the cable in fixed position with respect to the cap.

This invention is an improvement on the cable clamping means in U.S. Pat. No. 3,328,748, wherein the clamping members are integral with the cap itself. It was found that in the integral construction the needed flexibility to handle cables of various sizes was not present. Due to the fact that integral clamping members cannot be maintained in exact alignment throughout their entire travel the cap assembly of this invention was developed to overcome this problem. In addition, in the present invention cooperating guide means have been provided on the clamping members and adjacent wall portions to make certain that the clamping members are held in alignment throughout their full travel.

In the cap assembly of this invention, the confronting pair of clamping members are carried by a pair of diametrically positioned supporting ears. A pair of screw assemblies mount the clamping members on the supporting ears. Each screw assembly comprises a conventional screw having a rounded portion on the underside of its head and a threaded insert serving the function of the conventional nut. The threaded inserts are positioned in opposite ends of one of the clamping members and the screws in the other clamping member with the intermediate screw portion fitting through an opening in the adjacent supporting ear. It was found that when small diameter cable was used in the cap assembly that the threaded end portions of the screws would present problems by protruding outwardly beyond the threaded insert in the clamping member. This has been overcome by lengthening the threaded insert to such an extent that when the clamping members are fully apart the screw engages the inner end of the threaded insert and is generally flush with the outer end of the insert when the clamping members are compressed to their minimum position. Obviously, the screw is shortened by an amount equal to the extension of the threaded insert. cylindrical

With the above in mind, it is an object of this invention to provide a connector cap assembly for use in an attachment plug or a cable connector wherein the cap assembly includes a pair of clamping members held in alignment throughout their entire travel so as to readily accommodate cable of various sizes.

It is another object of this invention to provide a cap assembly including a pair of clamping members held in alignment by cooperating guide means on the clamping members and the adjacent portions of the cap.

It is yet another object of this invention to provide a cap assembly comprising a generally cylindrical body having an open bottom and a top portion with an opening therein, a cylindrical wall extending upwardly from the top portion coaxially with the body, a pair of diametrically positioned supporting ears projecting upwardly from the top portion, a pair of clamping members, means for mounting and adjustably positioning the clamping members on the supporting ears, and cooperating guide means on the clamping members and

adjacent wall portions to assure alignment of the clamping members throughout their entire travel.

It is a still further object of this invention to provide a pair of screw assemblies for adjustably positioning the pair of clamping members wherein each screw assembly comprises a headed screw and a threaded insert to receive said screw, the insert having a threaded length commensurate with the maximum adjustable distance between the two clamping members whereby when the clamping members are in their most compact condition the end of the screw will not extend beyond the outer end of the threaded insert.

DESCRIPTION OF THE DRAWINGS

The above and additional objects and advantages will become more apparent when taken in conjunction with the following detailed description and drawings showing by way of example two preferred embodiments of this invention.

In the drawings:

FIG. 1 is an elevational view of a cable connector embodying the connector cap assembly of this invention,

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1 illustrating the clamping members in engagement with the cable,

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1 with the cable and clamping members removed to show the supporting ears,

FIG. 4 is an elevational view taken 90° from the view of FIG. 1 and illustrates the manner in which the clamping members cooperate with the upstanding wall portion,

FIG. 5 is a sectional view taken along line 5—5 of FIG. 2 showing the manner in which the cable is gripped and deformed to cooperate with the upstanding wall,

FIG. 6 is an elevational view of one of the clamping members,

FIG. 7 is a sectional view taken along line 7—7 of FIG. 6,

FIG. 8 is an elevational view of the clamping member of FIG. 6 taken from the opposite side,

FIG. 9 is a sectional view illustrating the cooperation of the clamping members and screw assembly in the fully open position, and

FIG. 10 is a sectional view similar to FIG. 9 showing the arrangement of clamping members and screw assembly when in fully compressed condition.

DETAILED DESCRIPTION OF THE INVENTION

The embodiment of FIGS. 1—5 illustrates the connector cap assembly of this invention as used in a cable connector of the general type shown in U.S. Pat. No. 3,328,748. Reference may be had to the aforementioned patent to show the arrangement of electrical elements within the cable connector since they have been omitted from the drawings for sake of simplicity and further since such elements form no part of the present invention.

Referring to FIGS. 1—5, the cable connector 20 comprises a body 22 and a connector cap assembly 24 held in assembled relation by means of screws 25—25. The cap assembly comprises a generally cylindrical body 26 having an open bottom 28 and a flat top portion 30. A cylindrical wall 32 extends upwardly from the flat top portion 30 and is generally coaxial with the cylindrical body 26. A pair of diametrically disposed supporting

ears 34 and 36 project upwardly from the flat top portion 30. In this particular embodiment the body 26, the flat top portion 30, the cylindrical wall 32 and the pair of supporting ears 34 and 36 are integral and preferably made by a molding process involving a suitable plastic possessing the necessary electrical and mechanical qualities. It should be noted that the supporting ears 34 and 36 extend somewhat above the top of the cylindrical wall 32 and are each provided with transverse holes 38 and 40, respectively, in that portion above the top of wall 32.

A pair of clamping members 42 and 44 are supported by means of screw assemblies 48—48 which fit in ears 34 and 36, respectively. Clamping member 44 comprises a central body portion 50 having a pair of projecting lugs 52 and 54 each of which is apertured. The outer face 56 of the body 50 may be relatively straight whereas the inner face 58 of the body 50 is curved to conform to the circular cable 59 which it will engage. A T-shaped key 60 extends down from the lower central body 50 and fits into T-shaped slot 62 in the cylindrical wall 32. It should be noted that the inward end of the T-shaped key 60 is closed so that the key will not pass completely out through the slot 62. Similarly, clamping member 42 comprises a body 63 provided with end lugs 64 and 66, each of which is apertured. The outer face 68 of the body is relatively square while the inner face 70 is curved to conform to the circular cable 59 which it engages. A T-shaped key 72 extends downwardly from the lower central part of the body 63 and fits into conformed T-slot 76 in the cylindrical wall 32. Here again the back or inner end of the T-shaped key 72 is closed so that the clamping member 42 will not slide completely out of the T-slot 76. It should be noted that the T-shaped key 72 is of such length that it is in engagement with T-slot 76 throughout the travel of the clamping members.

It will be observed that the T-shaped key 72 extends centrally and downwardly from the body 63 of the clamping member 42. The arrangement provides balanced support for both screw assemblies 48—48 and further aids greatly in preventing tendency of the clamping members to swing upwardly or downwardly about the supporting ears 34 and 36.

Each of the screw assemblies 48 comprises a flat headed screw 80 and a threaded insert 82 adapted to receive the screw in the manner of the conventional nut. The threaded insert 82 is positioned in the aperture in the lugs 64 and 66 of the clamping member 42.

In use, cable 59 which is shown in symbolized fashion, is introduced down between the clamping members 42 and 44 into the area defined by the cylindrical wall 32. With the cable 59 so inserted, screws 48 are turned to bring the clamping members 42 and 44 toward each other into gripping engagement with the cable 59. A smooth and even travel is provided for the clamping members 42 and 44 by means of the T-shaped keys 60 and 72 riding in slots 62 and 76 of the cylindrical wall 32. Continued compression of the cable produces a bulging immediately beneath the clamping area for a two-fold purpose, namely, aid in resisting the pulling out of the cable and also the filling of the area within the cylindrical wall 32 to provide dust and moisture protection for the unit.

As previously described, when the clamping members are drawn closely together as when a small diameter cable is used, then the ends of the screws will project

outwardly a considerable distance beyond the threaded inserts and the clamping member itself. In order to overcome this problem the embodiment of FIGS. 6—10 was invented.

Referring particularly to FIGS. 9 and 10 showing the clamping members at a maximum distance apart and at a fully compressed position, screw assembly 100 comprises a screw 102 having a head 104 with a rounded bottom 107 and an elongated threaded insert 106 inserted in the clamping member lug 109. The length of the threaded insert 106 should be approximately equal to the maximum travel of the clamping members 108 and 110 so that the end portion of the screw 102 will not project beyond the outer end of the threaded insert 106 when the clamping members 108 and 110 are in their most compressed position as shown in FIG. 10. In order to allow the threaded insert 106 to pass through the aperture 111 in the supporting ear 112 and into the opening 114 in the clamping member lug 116 both the aperture 111 and the opening must be somewhat enlarged. This will not present any problems since the clamping members 108 and 110 are provided with T-shaped lugs to ride in T-shaped slots in the same manner as in the embodiment of FIGS. 1—5.

The clamping member 110 is shown in detail in FIGS. 6—8 and is generally similar to the clamping member 44 of the embodiment of FIGS. 1—5. As shown, the clamping member 110 comprises a body 120 having projecting lugs 116 with an aperture 114 in each lug. These apertures are sized to receive the inner end of the threaded insert 106 when so required. As in the other clamping members, the front face 122 is generally flat while the inner face 124 is curved to conform to the circular cable to be gripped thereby. This clamping member is also provided with a T-shaped key 126 which is closed at its inner end so as to prevent the clamping member from sliding out of the T-slot in which it rides.

It was noted in assembling the cap assemblies that many times the electrician will turn one screw in as far as possible before turning the other. This causes the clamping member 110 to become canted to a substantial extent and sometimes causes the screw head to be broken off the screw because of the strain placed on the head. In order to overcome this, the screw head 104 has been provided with a curved bottom face 107 adapted to ride in a correspondingly curved surface 130 surrounding opening 114 in the clamping member lug 116. This allows relative movement between the bottom face 107 of the screw head and the lug surface 130.

The operation and use of the embodiment of FIGS. 6—10 is like that of the embodiment of FIGS. 1—5 and will not be repeated. Obviously, the only difference between the two embodiments are those illustrated in FIGS. 6—10. Matters of proportions, dimensions and tolerances may be varied to meet the needs of the particular environment without departing from the spirit of the invention as set forth in the claims.

We claim:

1. A connector cap assembly for use in an attachment plug or cable connector, said assembly comprising:
 - a generally cylindrical body having an open bottom and a top portion with an opening therein;
 - a cylindrical wall extending upwardly from the top portion coaxially with the body;
 - a pair of diametrically positioned supporting ears projecting upwardly from the top portion;

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a pair of clamping members;
means for mounting and adjustably positioning the
clamping members on the supporting ears; and
cooperating T-shaped keys on the clamping members
and T-shaped slots in the adjacent wall portions, 5
the inner end of each slot being closed so as to
make certain that the respective clamping member
does not slide completely outwardly from the slot.
2. The invention as set forth in claim 1 and wherein
the T-shaped key on each clamping member is of suffi- 10

cient length that it will engage the T-slot throughout
the travel of said clamping member.

3. The invention as set forth in claim 1 and wherein
the T-shaped key on each clamping member extends
downwardly from the center portion thereof so that
when it is engaged in its slot in the cylindrical wall there
will be less tendency for the clamping member to swing
about the upstanding ears.

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