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CONNECTOR WITH ONE-PIECE GASKET AND BOOT

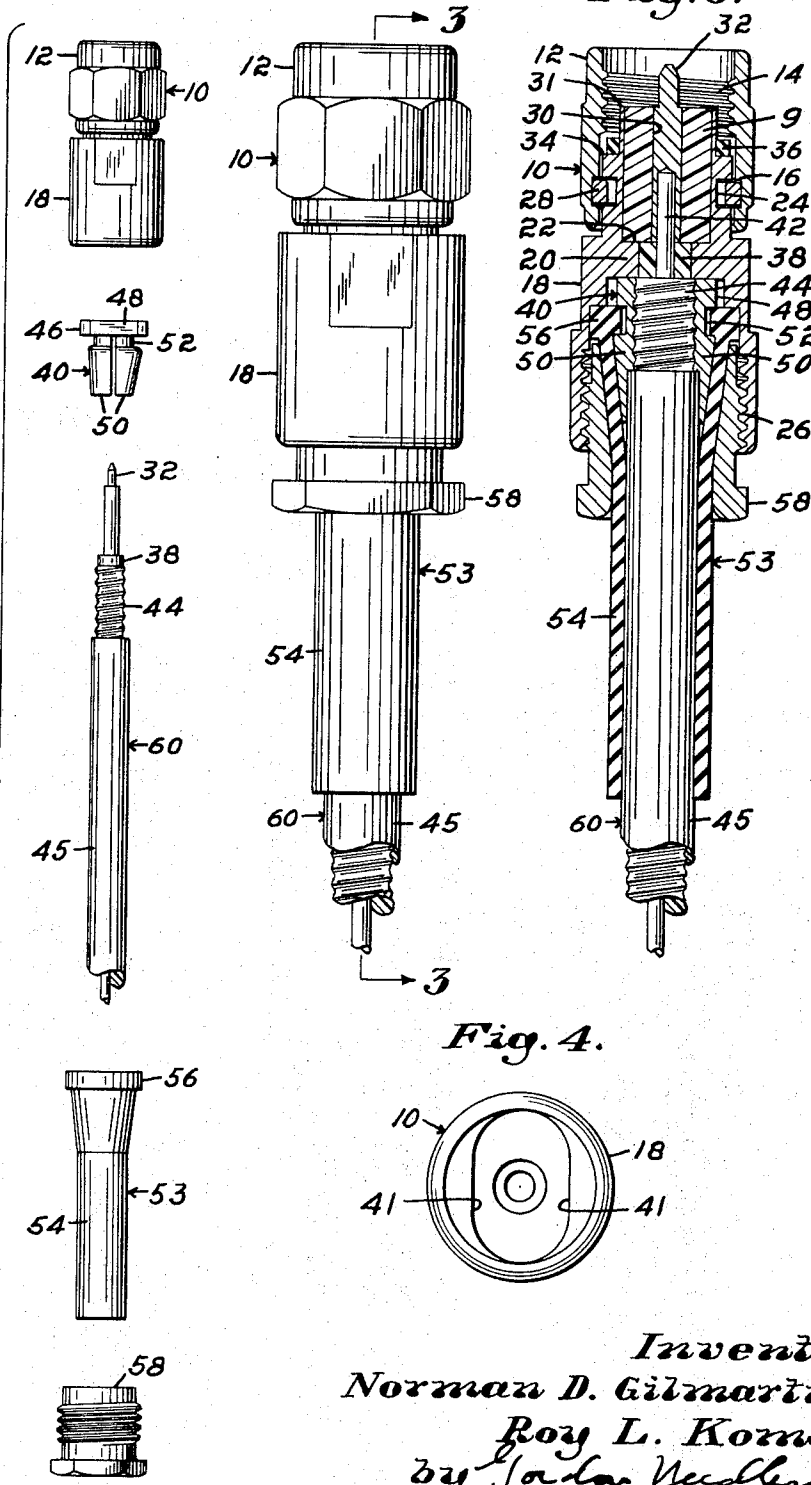
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Fig. 2.

Fig. 3.

Fig. 1.

Fig. 4.



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1

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CONNECTOR WITH ONE-PIECE GASKET AND BOOT

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ABSTRACT OF THE DISCLOSURE

This is a coaxial cable connector having a gasket boot element and having means for engaging grooves formed on the cable.

The present invention relates generally to electrical connectors, and in particular, to a coaxial cable connector for connecting a coaxial cable transmission line to an electrical apparatus.

An object of the present invention is to provide a connector having a one-piece combination gasket boot.

Other objects of the invention will in part, be obvious and will, in part, appear hereinafter.

In the drawings:

FIG. 1 is an exploded view of the coaxial cable and the connector.

FIG. 2 is a side elevation of the connector engaged to a coaxial cable.

FIG. 3 is a section taken on line 3-3 of FIG. 2.

FIG. 4 is a bottom plan of the body portion of the connector.

In the drawings, there is shown a plug housing 10 comprising a shell 12 which is generally tubular in configuration, open at both ends, and which includes internal threads 14 at its upper portion, and an internal groove 16 spaced from the end opposite from that of the threads 14, a separate body portion 18, which is also tubular in configuration, including an upper portion having a webbed portion 20 providing an internal shoulder 22 and having an external groove 24, and a lower portion which includes internal threading 26, adjacent an open end. To connect the shell 12 with the body portion 18, a C clamp or retaining ring 28 is engaged within the external groove 24, and then pressure is applied, allowing the internal surfaces of the shell 12 to slide over the C ring 28 until it is in line with the groove 16, and will then snap into the groove 16, thereby locking the two parts together, as shown in FIG. 3. The terminal edge 31 of the body portion 18 remote from the internal threading 26 provides the electrical contact area with the female contact (not shown). A plastic insert 9, having a core 30, axially formed therein, is placed within the body portion 18 and has a terminal end resting on the shoulder 22 as shown in FIG. 3. The plastic insert 9 is provided to insulate the contact area of the body portion 18 from an inner pin contact 32, to be described hereinafter. An external shoulder 34 is formed on the body portion 18 proximate the contact terminal edge 31 as shown in FIG. 3. A gasket 36 is placed around the upper portion of the body portion 18 and into superposed abutting relationship with the external shoulder 34. A bushing 38 is placed within the aperture formed through the web 20, and includes an axial core of less diameter than the core 30 of the plastic insert 9. The core 30 and the core of the bushing 38 are in axial alignment.

The "Teflon" bushing 38 prior to the placing together of the assembly is actually sandwiched between the pin contact 32 and the outer conductor 44 of the coaxial cable and the collet clamp 40, to be described hereinafter. The pin contact 32 has an axial recess formed for part

2

of its length commencing at the terminal end remote from the contact end, and the inner conductor 42 of the coaxial cable is engaged within the axial recess after being passed through the aperture formed in the bushing 38. The dielectric and the outer conductor 44 of the coaxial cable together have a diameter greater than the diameter of the bushing 38, and therefore the bushing 38 is trapped between pin contact 32 and the combination of the outer conductor 44 and the insulation of the coaxial cable.

The collet clamp 40 comprises a head portion 46 in the form of a flange, having two flats or lands 48 formed in opposed relationship on opposite sides of the head portion 46, for purposes to be described hereinafter. A series of legs 50 extend from the head portion 46 and describe a tapered circular configuration. Each of the legs 50 is spaced from the other, and each is necked adjacent the head portion 46 to provide an external engagement groove 52 and also to provide flexibility. An axial aperture is formed through the collet clamp 40 and internal threads are formed adjacent the upper surface of the head portion 46, and partly down into the legs 50, with the remaining internal surface of the legs 50 formed without threading.

The coaxial cable assembly 60, therefore, includes an inner or pin contact 32, an insulating bushing 38, an outer conductor 44, an inner conductor 42, and a jacket 45 which covers the outer conductor 44.

The gasket boot 53 formed of a flexible insulating material comprises a tubular main portion 54 which is open at both ends and which is flared slightly both internally and externally at one end. The last mentioned end has a flange portion 56 radially extending therefrom and also is extended slightly inwardly. A clamp nut 58 which is externally threaded and which has a head portion is utilized to connect the connector assembly together.

To assemble the connector the coaxial cable assembly 60 has its pin contact 32, the bushing 38, and the point of engagement between the pin contact 32 and the coaxial cable passed through the core of the gasket boot 53. The pin contact 32 is then passed into the cavity of the body portion 18 and through the plastic insert 9 to extend slightly beyond the plastic insert 9 within the area encompassed by the shell 12. Prior to the engagement of the coaxial assembly 60 with the plug housing 10, the collet clamp 40 is threaded onto the threads formed on the external or outer conductor 44. When the collet clamp 40, the coaxial cable assembly 60, and the gasket boot 53 are engaged with the plug housing 10, the lands 48 of the head portion 46 of the collet clamp 40 are in abutting relationship with internal lands 41 formed on opposite sides of the body portion 18. This engagement prevents the collet clamp 40 from turning once it has been threaded onto the coaxial cable. The gasket boot 53 can now be pressed up over the legs 50 of the collet clamp 40 and into a relationship whereby the flange portion 56 is in abutting relationship with the head portion of the collet clamp. The clamp nut 58 which may have been passed around the coaxial cable is now passed over the main portion of the gasket boot 53 and is threaded into the body portion 18. This threading engagement will force a portion of the flange portion 56 into the engagement 52 of the collet clamp 40. The engagement of the clamp nut 58 will also cause the legs 50 of the collet clamp 40 to be pressed against and tightly engage the outer conductor 44 and the jacket 45. The gasket boot thus provides a very effective sealing means to prevent dirt or moisture from getting within the connector, and also provides bend relief on the coaxial cable.

Since certain other obvious modifications may be made in this device without departing from the scope of the

invention, it is intended that all matters contained herein be interpreted in an illustrative and not in a limiting sense.

We claim:

1. The assembly of a coaxial cable and an electrical connector, said connector including a housing assembly, a tubular, externally tapered collet clamp and a one-piece, flexible, tubular gasket boot, said collet clamp having a head portion and a shank portion extending from said head portion, said shank portion being necked adjacent said head portion to provide a neck portion and the shank portion having an internal thread formed therein engaged around the coaxial cable, said gasket boot having a gasket portion and a boot portion extending from said gasket portion which forms a shoulder with the boot portion, said collet clamp and said gasket boot engaged within said housing assembly and said boot portion extending over a portion of said shank portion and beyond said housing assembly.

2. The assembly of a coaxial connector and an electrical connector as set forth in claim 1 wherein the neck portion has a smaller diameter than the adjacent shank portion.

3. The assembly of a coaxial connector and an electrical connector as set forth in claim 2 wherein the shank portion is divided into a series of spaced legs.

4. An assembly of an electrical connector and an externally grooved coaxial cable, said connector including a housing assembly, a tubular, externally tapered, collet clamp and a one-piece tubular gasket boot, said collet

clamp having a head portion and a shank portion extending from said head portion, said shank portion having a neck portion adjacent said head, said gasket boot having a gasket portion and a boot portion extending from said gasket portion, said coaxial cable having a pin contact at a terminal end thereof, said pin contact engaged to the inner conductor of said coaxial cable and an insulating bushing circumscribing said inner conductor and interposed between said pin contact and the outer conductor of said coaxial cable, said housing assembly having a body portion, said collet clamp having bore, a series of threads formed in the wall of said bore, said collet clamp engaged around said coaxial cable within the said body portion, said collet clamp engaged around said coaxial cable with its threads in threaded engagement with said external conductor and said gasket portion of said gasket boot engaged in said neck portion of said collet clamp and said boot portion circumscribing said shank portion of said collet clamp and being sandwiched between said shank portion and said body portion, said boot portion extending beyond said body portion.

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