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(54) Coaxial cable connector

(57) A coaxial cable connector has a housing (10) which is designed to receive a central conductor (32) of a prepared cable (24) which can be inserted in one direction. An Insulator (18) has a terminal (20) with a con-

tact end (22) and is insertable into the housing in a direction transversely of the insertion direction of the cable so that the contact end (22) is brought into secure electrical contact with the central conductor (32).

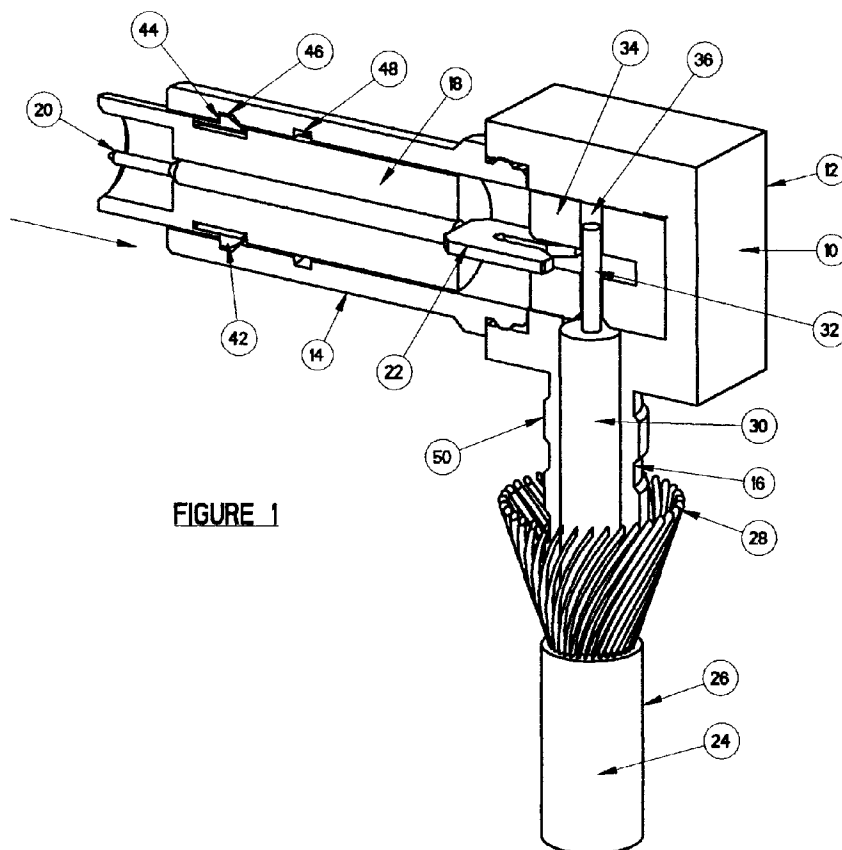


FIGURE 1

EP 0 779 676 A1

Description

This invention relates to a coaxial connector such as is used for terminating the end of a coaxial cable to permit its connection to an electrical equipment or printed circuit board.

Coaxial cable connectors are well known and normally require a complex construction and difficult or time consuming cable terminating process. The present invention seeks to provide a connector which facilitates termination.

According to the invention there is provided a coaxial cable connector comprising a housing adapted to receive a central conductor of a prepared cable end inserted in one direction and an insulator provided with a terminal having a contact end, which insulator is insertable into the housing in a direction transversely of said one direction so that the contact end is brought into secure electrical contact with the central conductor.

A retaining means may be provided which is effective to mutually secure the housing and the insulator with the electrical end in contact with the central conductor. The retaining means may comprise cooperating latching means on the housing and the insulator. The latching means may have provision for latching the insulator in the housing in two relative dispositions, wherein in one of the two dispositions the contact end is spaced from a central conductor location to permit insertion of a cable, and in the other of the two dispositions the contact end can engage a central conductor inserted into the location. The latching elements may comprise a cooperating projection and groove(s) mutually engageable to secure the insulator in the housing.

In a particularly advantageous form of the invention the contact end has a knife edge which is arranged to cut into the central conductor upon displacement of the insulator in the housing to the contact position. The contact end may be forked so that it straddles the central conductor upon displacement of the insulator in the housing to the contact position. Inner opposing edges of the forked end may be knife edges which are arranged to cut into opposite sides of the central conductor upon displacement of the insulator in the housing to the contact position.

The housing may be adapted to locate the central conductor with its insulating sheath, and the contact end may be arranged to penetrate the sheath to make electrical contact with the central conductor. A separate insulator element may be provided which is locatable in the housing and which is formed to locate the central conductor.

The housing may be formed from metal or from an insulating material having a metallising outer coating and may be provided with means for electrical connection of the screen of the electrical cable to the metal housing or metallising coating. A projection forming the cable entry end may be provided which is shaped to permit securement of the screen of the cable by crimping.

In order that the invention and its various other preferred features may be understood more easily, some embodiments thereof will now be described, by way of example only, with reference to the drawings:-

Figure 1 is a schematic view, partly in cross-section, illustrating a coaxial connector constructed in accordance with the invention prior to securement of a coaxial cable, and

Figure 2 is a detail illustrating the fitting of an insulator element in the housing of the connector of Figure 1.

In the drawings a metal housing 10 has a hollow rectangular body 12 having two cylindrical projections 14, 16 which extend substantially at right angles. The projection 14 serves to receive an insulator 18 formed of a plastics material with an integral terminal 20 having a contact end 22 which is fork shaped and preferably has opposing edges of the fork formed as knife edges. The cylindrical projection 16 serves to receive a prepared end of a cable 24 in which an outer sheath 26 is stripped back to reveal a screen 28 and an inner sheath 30 whilst the inner sheath is stripped back to reveal an inner conductor 32. An insulator element 34, details of which can be seen more easily from Figure 2, is of circular cross section having a bore 36 extending diametrically therethrough. A slot 38 extends diametrically from one end of the element and intersects the bore 36. The diameter of the insulator element is such that it permits insertion through the cylindrical projection 14 into the hollow rectangular body 12. The insulator is provided with radially outwardly extending lugs 40 which are an interference fit in the body 12 so that the insulator is a press fit in the body. The press fit is arranged such that the bore 36 aligns with the axis of the cylindrical projection 16 to permit insertion of the central conductor 32 when the cable is introduced to the cylindrical projection 16. It will be seen that the groove 38 is then aligned with the contact end 22. The insulator 18 is provided with one or more radially outwardly extending projections 44 which are tapered towards the contact end 22 and have an abrupt rear face 44. These projections cooperate with radially outwardly extending grooves 46 and 48 which are provided in the inner wall of the cylindrical projection 14. As illustrated in Figure 1 the insulator 18 is inserted in the cylindrical projection 14 and is located therein by the latching action between the projection(s) 42 and the recess 46 such that the assembly is retained in a disposition suitable for insertion of the prepared cable 24 with the contact end 22 spaced from the insulator element 34. The cylindrical projection 16 has on its outer surface peripherally extending ribs 50.

In order to terminate the cable 24 it is first prepared by stripping back the outer sheath and the inner sheath to the form as illustrated in Figure 1. The central conductor and its inner sheath is then introduced through the cylindrical projection 16 such that the inner conductor

32 enters into the bore 36. The insulator 18 is then depressed into the cylindrical projection 14 such that the forked contact end 22 is caused to straddle the inner conductor 32 and cut into opposite sides of the central conductor and is secured in that position by snap engagement of the projection 42 in the recess 48. The outer screen 28 of the cable 24 is then laid over the ribs 50 of the cylindrical projection 16 and is secured thereto by crimping.

There are various modifications or refinements of the construction illustrated in Figures 1 and 2 which may be made without departing from the scope of this invention. For example, it is not essential to have the recess 46 and a single latching action in the terminated position in recess 48 would suffice. Any other means of securing the insulator 18 in the terminated position may be employed for example the insulator 18 may be arranged to be a press fit into the housing. Although the contact end 22 is shown to be fork shaped and preferably knife edged, a single knife edge or any other formation which makes good electrical contact with the inner conductor may be employed. Whilst the terminal 20 is shown to be a pin type terminal it may be a socket or spade type. Although the described construction employs a metal housing made of for example brass the housing may be formed from an insulator by for example moulding and provided with a metallised outer coating for connection to the screen 28. It is also possible for the insulator element 34 to have a bore sized to receive the central conductor 32 together with the inner sheath without that sheath having been cut back. In such circumstances the contact end must be designed as an insulation displacement contact such as for example the fork end illustrated having opposing edges of knife shaped to penetrate the sheath and make electrical contact with the central conductor. Although the screen 28 is shown to be secured by crimping any other suitable means of connection can be employed for example a clamping collar or securing screw. In the case of a housing formed from an insulating material, the insulator element 34 could be dispensed with and the features thereof could be integrated in the housing construction.

Claims

1. A coaxial cable connector comprising a housing (10), adapted to receive a central conductor (32) of a prepared cable end (30) inserted in one direction and an insulator (18) provided with a terminal (20) having a contact end (22) which insulator is insertable into the housing in a direction transversely of said one direction so that the contact end is brought into secure electrical contact with the central conductor.
2. A connector as claimed in claim 1, comprising retaining means (42,48) effective to mutually secure

the housing (10) and the insulator (18) with the electrical contact end (22) in contact with the central conductor (32).

3. A connector as claimed in claim 2, wherein the retaining means comprises cooperating latching means (48,46) on the housing (10) and the insulator (18).
4. A connector as claimed in claim 3, wherein the latching means has provision (46,48) for latching the insulator in the housing in two relative dispositions wherein in one of the two dispositions the contact end (22) is spaced from a central conductor location to permit insertion of a cable and in the other of the two dispositions the contact end can engage a central conductor (32) inserted into the location.
5. A connector as claimed in claim 3 or 4, wherein the latching means (42,46,48) comprise a cooperating projection (42) and grooves(s) (46,48) mutually engageable to secure the insulator (18) in the housing (10).
6. A connector as claimed in any one of the preceding claims, wherein the contact end (22) has a knife edge which is arranged to cut into the central conductor (32) upon displacement of the insulator (18) in the housing (10) to the contact position.
7. A connector as claimed in any one of claims 1 to 5, wherein the contact end (22) is forked so that it straddles the central conductor (32) upon displacement of the insulator (18) in the housing (10) to the contact position.
8. A connector as claimed in claim 7, wherein the inner opposing edges of the forked end (22) are knife edges which are arranged to cut into opposite sides of the central conductor (32) upon displacement of the insulator (18) in the housing (10) to the contact position.
9. A connector as claimed in any one of the preceding claims, wherein the housing (10) is adapted to locate the central conductor with its insulating sheath (30), and the contact end (22) is arranged to penetrate the sheath to make electrical contact with the central conductor (32).
10. A connector as claimed in any one of the preceding claims, wherein a separate insulator element (34) is provided which is locatable in the housing (10) and which is formed to locate the central conductor (32).
11. A connector as claimed in any one of the preceding claims, wherein the housing (10) is formed from

metal and is provided with means (16) for electrical connection of the screen of the electrical cable.

- 12.** A connector as claimed in any one of claims 1 to 10, wherein the housing (10) is formed from an insulating material having a metallising outer coating and is provided with means (16) for electrical connection of the screen of the electrical cable to the coating.

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- 13.** A connector as claimed in claim 11 or 12, wherein the housing has a projection (16) forming the cable entry and shaped to permit securement of the screen of the cable by crimping.

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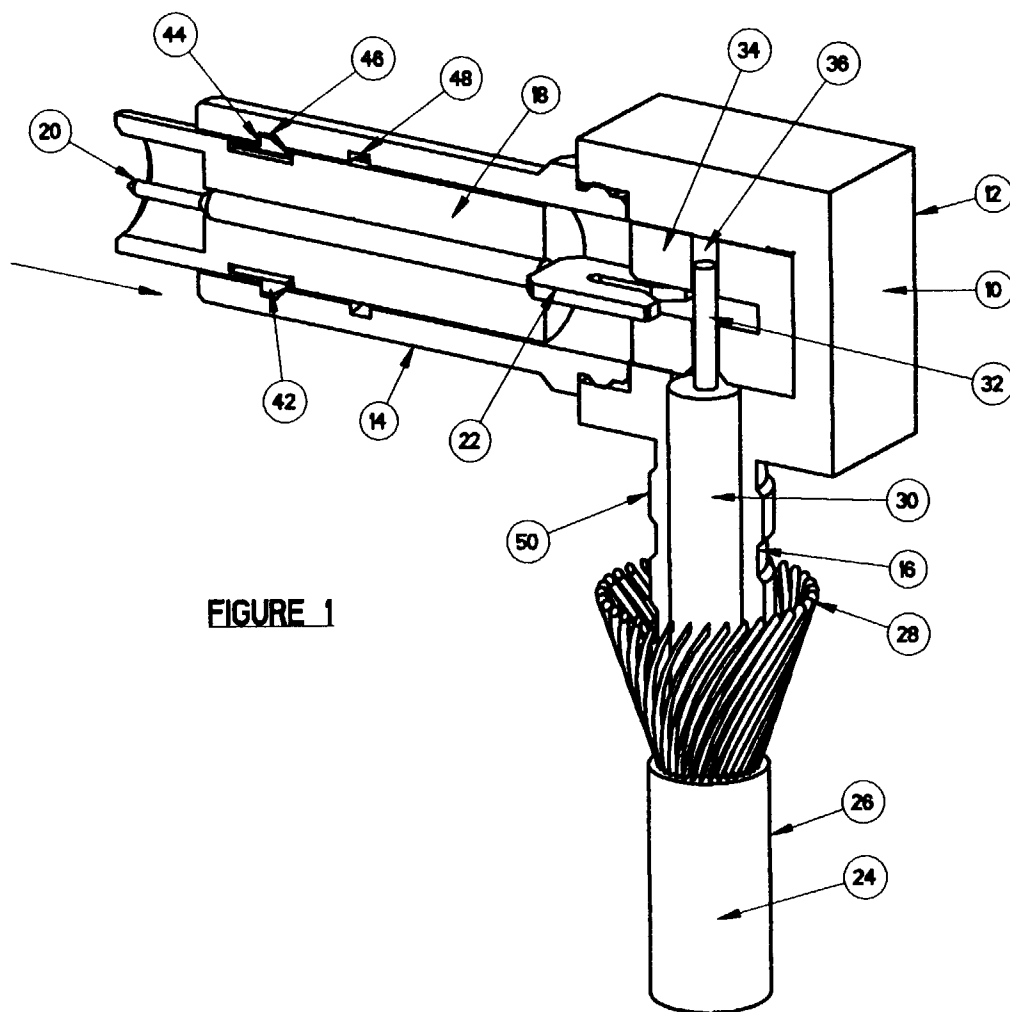
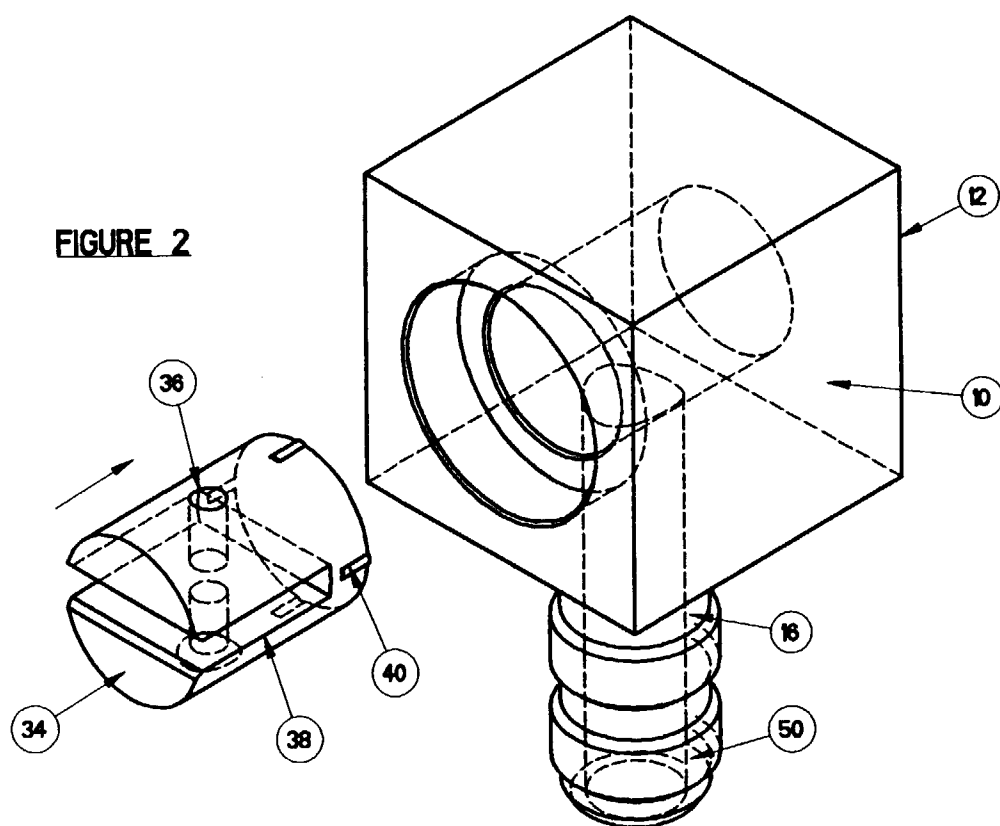


FIGURE 1

FIGURE 2





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 9151

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	WO 93 19498 A (K.JOHNSEN) * page 3, last paragraph - page 4, paragraph 3; figures 1-3 * -----	1,2,7,11 10	H01R9/05 H01R17/12
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01R
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26 March 1997	Examiner Alexatos, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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