

12

EUROPEAN PATENT APPLICATION

21 Application number: **88105968.7**

51 Int. Cl.4: **H01R 17/12**

22 Date of filing: **14.04.88**

30 Priority: **23.09.87 IT 8560687**

43 Date of publication of application:
19.04.89 Bulletin 89/16

64 Designated Contracting States:
AT DE ES FR GB IT

71 Applicant: **Calearo, Massimo**
Via Nazario Sauro, 20
Motta di Costabissara (VI)(IT)

72 Inventor: **Calearo, Massimo**
Via Nazario Sauro, 20
Motta di Costabissara (VI)(IT)

74 Representative: **Bonini, Ercole**
c/o STUDIO ING. E. Bonini Corso Fogazzaro,
8
I-36100 Vicenza(IT)

54 **Co-axial plug with a right-angle junction for a co-axial cable.**

57 According to the invention the co-axial plug particularly suited to be connected with antenna cables consists of a support of plastic material (30) presenting an appendix in which there is a shaped hole (31) suited to receive the co-axial cable, which has already been peeled off and is ready to be connected.

The plug presents an annular metal contact (20) consisting of at least two partially cylindrical surfaces and included in the support of plastic material ending with a thin band (23) connecting and fastening the external part of the co-axial cable; the central gudgeon of the plug, on the other hand, is inserted with pressure into the hole (31) and it goes to contrast against the wire (50) of the co-axial cable inserted into the hole (32).

Thus a co-axial plug is obtained which can be assembled with the help of mechanical means with the suitably prepared cable.

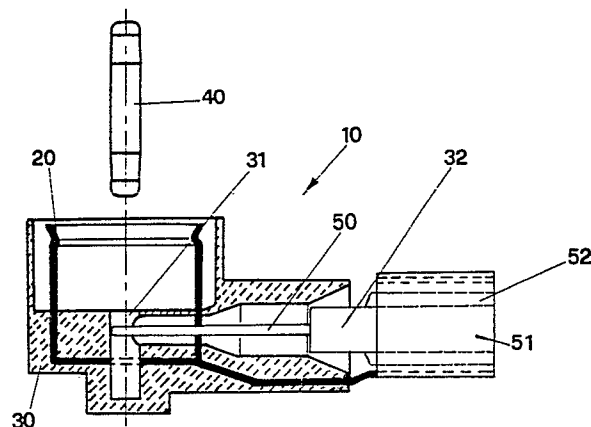


FIG. 1

CO-AXIAL PLUG WITH A RIGHT-ANGLE JUNCTION FOR A CO-AXIAL CABLE

The invention concerns a right-angle co-axial plug for cable, particularly suited for antenna cables of car radios and similar, wherein the plug has the characteristic of being suited to be applied also with automatic means to the terminal end of the cable..

It is a known fact that car radios are connected to their antennas by means of co-axial cables which carry the radio signal and which are connected with the car radio by means of gudgeon pins, which are also co-axial, and which consist essentially of a central cylindrical bar carrying the signal and of an external, co-axial cylindrical body, which is electrically insulated from the central body and connected with the earth of the circuit.

The standardization norms of said plugs have recently been changed and the international standardization has suggested a new type of plug wherein the two co-axial contacts, i.e. the gudgeon pin and the external cylindrical part concerning the earth are not only co-axial but also inserted into the same annular space.

One of the reasons which has induced the manufacturer to develop this type of plug is that the plug is substantially shortened, so that the overall dimensions and the dimensions of the connection between the plug and the corresponding socket in the car radio are reduced.

The plugs which have just been described are already circulating on the market, and they are costly made by moulding the plastic plug around the already pre-arranged cable.

This manufacturing technology, which undoubtedly presents some advantages, does not, however, allow the assembly between the plug and the already peeled-off cable with automatic machines.

In fact, in the mentioned case, the peeled-off cable must be placed under the mould of the injection press, in order for the moulding process of the plastic part of the plug to take place.

The purpose of the present invention is that of overcoming the just-mentioned drawbacks.

Specifically the purpose is that of realizing a co-axial plug with a right-angle cable junction which can be applied to co-axial cables by means of automatic machines, while avoiding to perform the moulding process under the press with the co-axial cable inserted in the mould.

All the above-mentioned purposes are reached with the realization of a co-axial plug with a right-angle junction for cables, particularly for co-axial cables, which presents a support made of plastic material having an essentially cylindrical shape and with a bored appendix suited to receive the cable with which it is to be connected, characterized by

the fact that it presents a metal annular contact consisting of at least two partially cylindrical surfaces and included in the support of plastic material ending with a thin band which connects and fastens the external part of the co-axial cable and is further characterized in that the central gudgeon plug connecting with the co-axial cable carrying the signal is forced into the central vertical hole moulded in the plastic support.

Other characteristics and details of the invention will be better understood from the description of a preferred form of execution, given by way of explanation only, but which is not meant to limit the scope of the invention, such as it is illustrated in the enclosed tables of drawing, where:

- Fig. 1 represents a cross-section of the plug of the invention;

- Fig. 2 is a top view of the plug of the invention;

- Fig. 3 shows the metal part of one of the two contacts of the plug.

With reference to the mentioned Figures of drawing, it can be observed that the co-axial plug, indicated as a whole with 10, consists of a metal part 20, obtained from a flat sheet by cutting and subsequent bending.

Said metal sheet 20 performs the external earth connection and for this reason it is provided with two partially cylindrical, equal and symmetrical elements 21 facing each other and being joined together at the bottom by a flat part of the thin plate 22.

Element 20 ends with the thin band 23 wherein the co-axial cable, already prepared for the connection is inserted.

The metal element 20 thus shaped, as can be seen in Fig. 3, is inserted in the plastic material moulding machine, so as to obtain unit 30, which can be seen in Fig. 1.

Said unit 30 presents included therein the metal element 20 and central to and co-axial with element 20 it presents the blind hole 31 which lodges the central cylindrical contact 40.

Element 30 made of plastic material presents a hole 32 with a profile having different cross-sections and a horizontal axis which is suited to receive the part of the co-axial cable 51 having the central wire 50 which is inserted as far as to reach the wall of hole 31.

The external wire 52 of the co-axial cable 51, on the other hand, is fastened by closing the thin band 23.

In the substance, when it is necessary to connect the plug of the invention with the co-axial

cable 51, after the cable has been peeled off, said cable is inserted into hole 32 and the insertion continues until wire 50 reaches the wall of the vertical hole 31.

The definite connection between plug 10 and the co-axial cable 51 is obtained by inserting the little cylinder 40 into hole 31, so as to insure the electric contact between the little cylinder 40 and wire 50 and, moreover, by tightening the thin band 23.

It can easily be understood that the above-mentioned operations can effectively be performed with automatic machines, which perform the insertion of the central contact 40 and the closing of the thin band 23, once the co-axial cable has been properly positioned.

The advantage arising from the possibility of performing the mechanical automatic assembly of the plug and the co-axial cable is obvious: in fact with this process the plugs can be manufactured, assembled and stocked separately from the cables, and the cables, in turn, can be separately pre-packed according to different lengths and according to different requirements, so that when it becomes necessary to prepare a cable complete with plug, this can be done by drawing the already assembled plugs from the stock and connecting it with the chosen cable.

It will be pointed out that, on the other hand, in the case of the present technique, the plug is made with the cable already attached through moulding to the cable with all the drawbacks connected therewith.

One instance will be mentioned: some types of cars require antenna cables differing in length from other cars, so that it will be necessary to put together stocks of plugs and cables according to the requirements. On the contrary, in the case of the invention the plug can be manufactured and kept in stock in considerable quantities, and can subsequently be connected with the required cables.

Execution variations may be applied during the manufacturing process with the purpose of improving the construction. Said variations will, however, not exceed the scope of the invention, such as it is described in the following claims.

Claims

1) A co-axial plug with a right-angle connection for cable, suited for the connection with co-axial cables, characterized in that it presents a support (30) made of plastic material having an essentially cylindrical shape and a bored appendix (31) having a vertical axis, suited to receive the cable (51) with which it is to be connected, further characterized in

that it presents an annular metal contact (20) consisting of at least two partially cylindrical surfaces (21) and included in the support (30) of plastic material ending with the thin band (23) which connects and fastenes the external part (52) of the co-axial cable, further characterized in that the central gudgeon (40) which connects with the signal-carrying wire (50) of the co-axial cable (51) is forced into the central vertical hole (31) obtained by moulding in the plastic support.

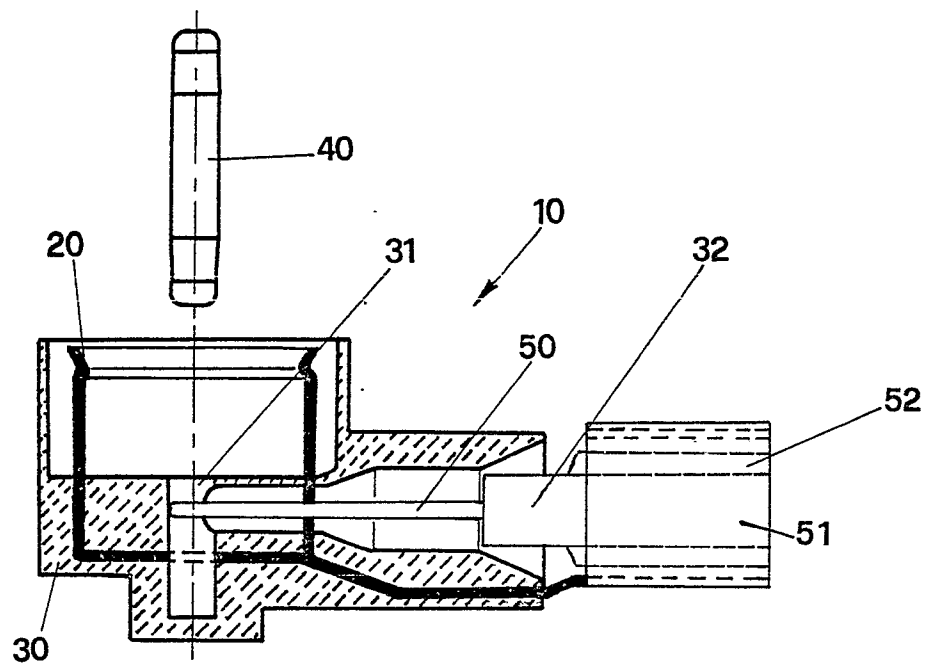


FIG. 1

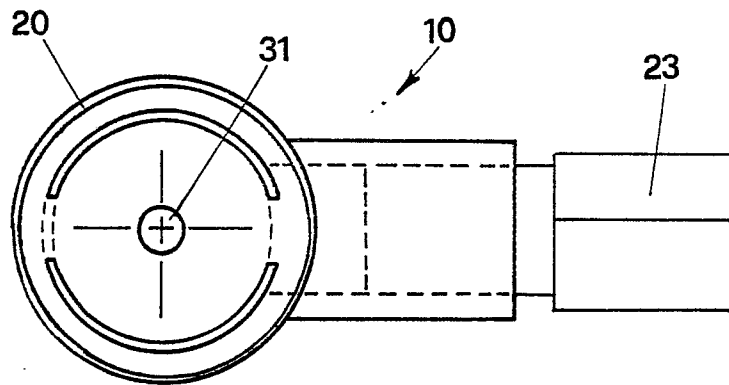


FIG. 2

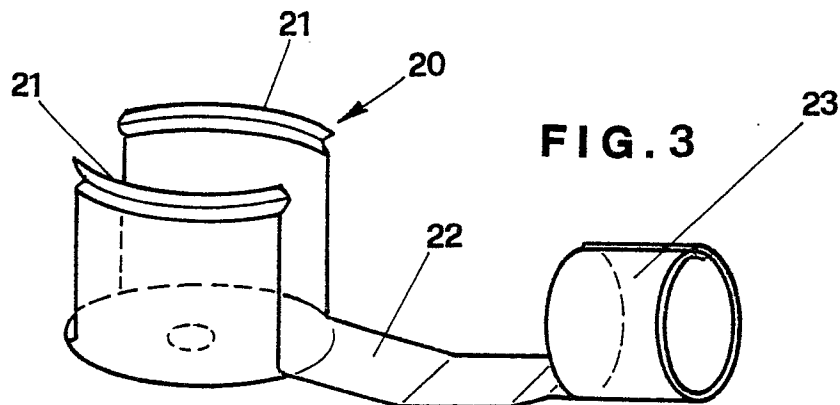


FIG. 3