

April 7, 1964

R. J. NOSCHESE

3,128,138

CONNECTOR

Filed March 23, 1960

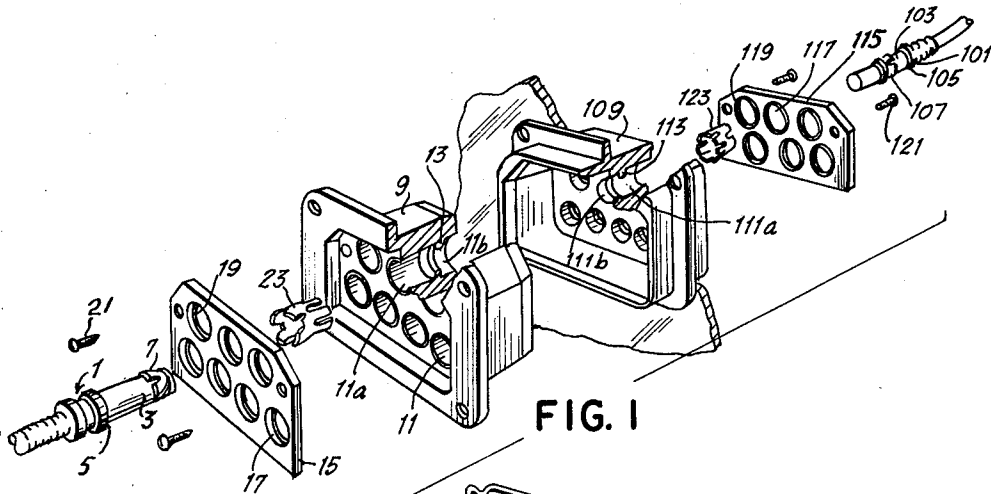


FIG. 1

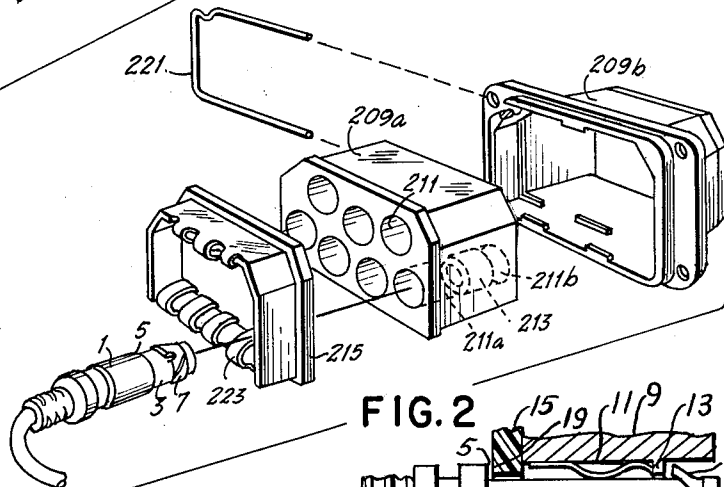


FIG. 2

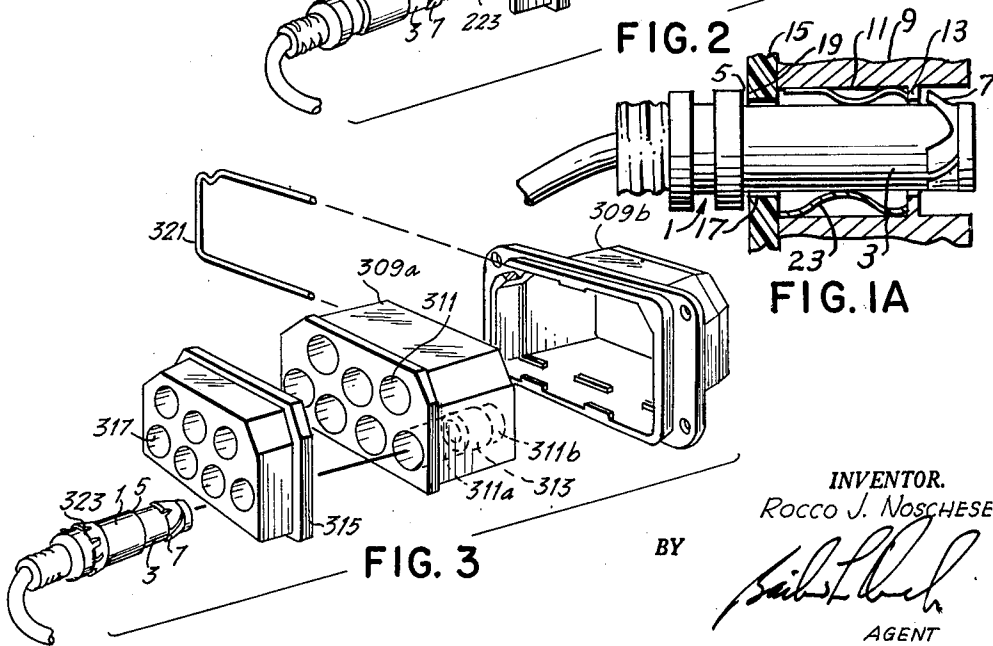


FIG. 3

INVENTOR.
Rocco J. Noschese

BY

Rocco J. Noschese
AGENT

1

3,128,138
CONNECTOR

Rocco J. Noschese, 16 Thomes St., Rowayton, Conn.
Filed Mar. 23, 1960, Ser. No. 16,981
4 Claims. (Cl. 339-14)

This invention relates to electrical connectors, and more particularly, to a multiple coaxial type plug assembly.

There are many connectors available which are designed to provide an assembly of a plurality of coaxial type plugs which will interlock with a mating assembly, whereby several coaxial circuits may be established or disestablished in one manual operation. While, obviously, it is necessary that the center conductors of each coaxial plug be isolated, so that the conductor will not be shorted to ground or some other conductor; yet it is often desirable that the outer conductors, which are customarily held at a nominal ground potential, be connected to each other so that all will be at the same ground potential. In the past this has generally been accomplished by labouriously wiring all the outer conductors together.

It is, therefore, an object of this invention to provide a multiple coaxial type plug assembly connector which will automatically interconnect and ground the outer conductors of all coaxial plugs inserted therein.

Another object of this invention is to provide a connector into which the coaxial plugs may be inserted while the connector is, or is not engaged with its mating connector, all with automatic grounding of the outer conductor; and from which connector the plug may be conveniently extracted.

A feature of this invention is a metal connector body including a plurality of cavities to accommodate coaxial plugs, each cavity having associated therewith a contact spring means to establish a ground circuit between the outer conductors and the connector body.

These and other objects and features of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a connector embodying this invention; FIG. 1A is a side elevation partially in cross section showing some of the component parts of FIG. 1 in assembled relation;

FIG. 2 is a perspective view of another embodiment of this invention; and

FIG. 3 is a perspective view of still another embodiment of this invention.

Referring to FIGS. 1 and 1A, reference character 1 illustrates the outer conductor of a female coaxial plug, having an area 3 of slightly reduced diameter, a shoulder 5, and an interlocking spring 7 carried in a necked portion of the conductor.

A metal connector body 9 has a plurality of cavities 11 each adapted to receive one coaxial plug. Each cavity has a mediate internal bead 13 dividing each cavity into two portions 11a and 11b. A cover plate 15, having holes 17, each with a lip 19, therein, which are aligned with cavities 11, is mounted on the body by suitable means, such as screws 21. A contact spring 23 is disposed in each cavity portion 11a and is retained in place by bead 13 and the internal lip 19 of the plate 15.

As shown in FIG. 1A, when a plug 1 is inserted through a hole 17 into a cavity 11, contact spring 23 makes electrical contact with contact area 3, interlocking spring 7 snaps behind bead 13 and shoulder 5 abuts lip 19. The coaxial plug, specifically outer conductor 1, is thus removably interlocked with the connector body and

2

the outer conductor is also in good electrical contact with the body.

Connector body 9 is adapted to engage a mating connector body 109 having a plurality of cavities 111, which are aligned with cavities 11. Each cavity 111 has a mediate bead 113 dividing each cavity into two portions 111a and 111b. A cover plate 115, having holes 117, each with a lip 119 therein, which are aligned with cavities 111, is mounted on the body by suitable means, such as screws 121. A contact spring 123 is disposed in each cavity portion 111a and is retained in place by bead 113 and the internal lip 119.

When a male coaxial plug 101 is inserted through hole 117 into cavity 111, contact spring 123 makes electrical contact with the contact area 103, interlocking spring 107 snaps behind bead 113 and shoulder 105 abuts lip 119, thus grounding the outer conductor to the plug body.

A plug may be extracted from the body by first inserting a tubular tool (not shown) into the cavity 11b to depress interlocking spring 7 away from bead 13, and then pulling out the plug.

When the connectors 9 and 109 are mutually engaged, their corresponding coaxial plugs will also be mutually engaged.

Referring now to FIG. 2, another connector is illustrated which embodies this invention. A plastic connector body 209a having a plurality of cavities 211, each cavity containing a molded-in locking insert 213 dividing said cavity into two portions 211a and 211b is disposed in a shell 209b. A metal contacting spring body 215, having a plurality of contact fingers 223 aligned with cavities 211 is also disposed in shell 209b. Connector body 209a and spring body 215 are locked into shell 209b by suitable means, such as a retaining spring 221.

When a coaxial plug is inserted into cavity 211, interlocking spring 107 passes into cavity portion 211b and snaps behind insert 213, locking the plug into the connector body 209a. Contact finger 223 engages the outer conductor of the plug and establishes a common circuit between the outer conductor and spring body 215.

The mating connector for connector 209a is similar thereto, and is not shown.

Referring finally to FIG. 3, another connector is illustrated which embodies this invention. A plastic connector body 309a having a plurality of cavities 311, each cavity containing a molded-in locking insert 313 dividing said cavity into two portions 311a and 311b is disposed in a shell 309b. A metal contacting body 315 having a plurality of holes 317 aligned with cavities 311 is also disposed in shell 309b. Connector body 309a and contacting body 315 are locked into shell 309b by suitable means, such as a retaining spring 321.

When a coaxial plug having mounted in a neck thereon a contact spring 323, is inserted through a hole 317 into to cavity 311, interlocking spring 7 passes into cavity portion 311b and snaps behind insert 313, locking the plug into the connector body 309a. Contact spring 323 engages the surface of a hole 317, and establishes a common circuit between the outer conductor and the common body 315.

The mating connector for connector 309 is similar thereto, and is not shown.

It will be noted that the same arrangement can be made to electrically couple the outer conductors of plugs, each having any number of inner conductors.

The invention has thus been described but it is desired to be understood that it is not confined to the particular forms or usages shown and described. The same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of the invention, and therefore, the right is broadly claimed to

3

employ all equivalent instrumentalities coming within the scope of the appendent claims, and by means of which objects of this invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to obtain these objects and accomplish these results.

I claim:

1. A connector assembly for electrically connecting a plurality of pairs of coaxial cables, each of said cables having an outer and inner conductor comprising,
 - a plurality of pairs of coaxial connector means each pair terminating one of said pairs of coaxial cables; each of said connector means having an outer conductive sleeve coupled to the outer conductor of one of said cables, and;
 - a coaxially disposed inner member coupled to the inner conductor of one of said cables;
 - the outer sleeves and inner members of the connector means for each of said pair of cables adapted to mate with each other respectively;
 - a pair of housings each having an electrically conductive portion;
 - each of said housings including a portion having a plurality of cavities;
 - one of each of said pairs of coaxial connector means disposed within a cavity in one of said housings and; the other of each of said pairs of coaxial connector means disposed in a corresponding cavity in the other of said housings;
 - means for removably interlocking each of said connector means in one of said cavities in said housings;
 - and spring means associated with each of said housing cavities to couple said outer sleeves of said connector means to said conductive portion of said housings whereby the outer conductors of each of said coaxial cables are electrically connected.
2. A connector assembly according to claim 1 wherein said spring means comprises: a metal spring disposed on

4

each of said outer conductive sleeves of each of said outer connector means, said housings being of metal, and said spring means in electrical contact with said housings and adapted to electrically contact an outer conductive sleeve of the coaxial connector means disposed in said cavity.

3. A connector assembly according to claim 1 wherein said spring means comprises: a plurality of interconnected metal fingers, at least one of said fingers associated with each of said cavities, each said finger being adapted to electrically contact the outer conductive sleeve of the coaxial connector means disposed in said cavity.

4. A connector assembly according to claim 1 wherein said spring means is disposed on each of said coaxial connector means and in electrical contact therewith; and wherein the electrical conductive portion of each of said pair of housings includes a metal plate having a plurality of holes each aligned with one of said cavities, said holes being adapted to permit the passage therethrough of said coaxial connectors to cause each of said spring means to be associated with one of said housing cavities and said spring means being adapted to electrically contact said plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,750,014	Lofgren	Mar. 11, 1930
2,411,861	Antony et al.	Dec. 3, 1946
2,702,894	David	Feb. 22, 1955
2,762,024	Heath	Sept. 4, 1956
2,802,958	Curley	Aug. 13, 1957
2,869,094	Francis	Jan. 13, 1959
2,874,365	Woofter	Feb. 17, 1959
2,916,718	Hess	Dec. 8, 1959
3,002,175	Bertram et al.	Sept. 26, 1961

OTHER REFERENCES

Publication I, "Electronic Design," page 44, issue of November 11, 1959; copy available in Div. 20, Class 339—177.