Sept. 30, 1969 F. R. BONHOMME 3,470,527

ELECTRICAL CONNECTOR SOCKET

Filed June 22, 1966

Fig. 1.

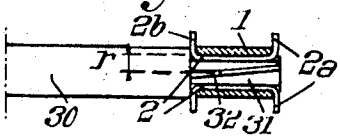


Fig. 2.

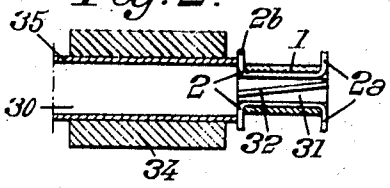


Fig. 3.

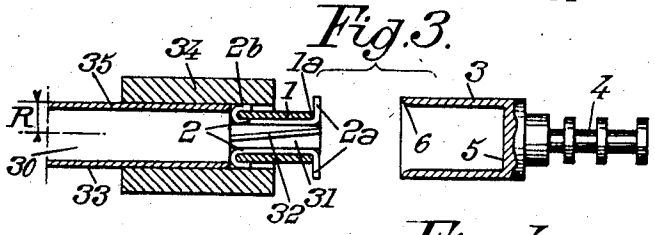


Fig. 4.

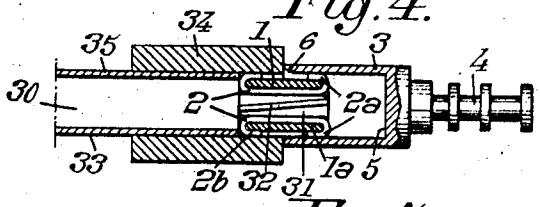


Fig. 5.

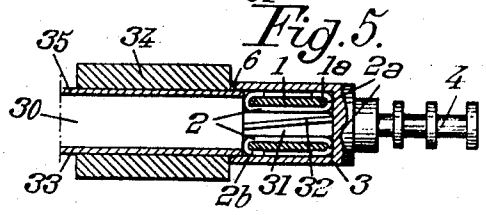
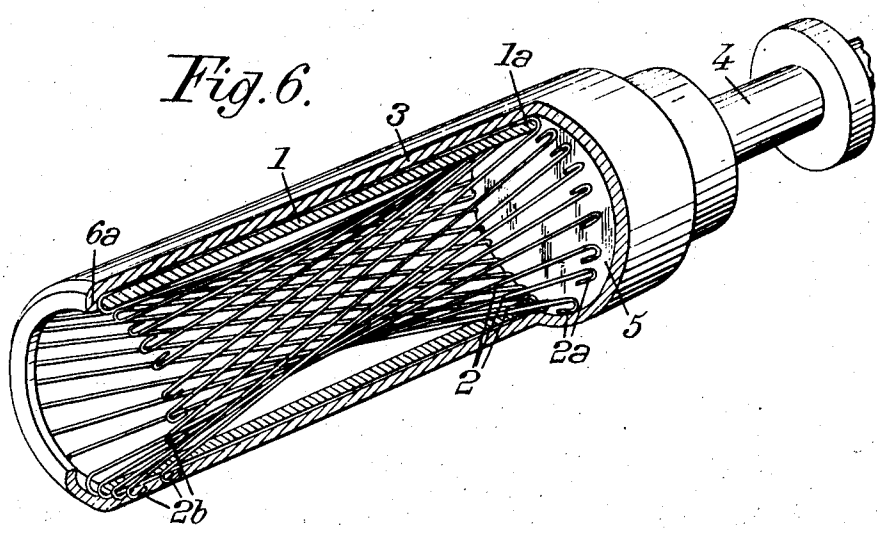


Fig. 6.



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ELECTRICAL CONNECTOR SOCKET

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Claims priority, application France, June 23, 1965, 21,986
Int. Cl. H01r 13/24
U.S. Cl. 339—256 1 Claim

ABSTRACT OF THE DISCLOSURE

An electrical connector socket having an inner tubular sleeve of conducting material and an outer tubular piece coaxially surrounding this sleeve. At least one resilient conducting wire having its ends carried by the respective ends of the tubular sleeve extends obliquely to the longitudinal axis of this sleeve, this wire being able to resiliently engage a plug as it is inserted into the sleeve. The wire is secured in position at its ends by the cooperation of the tubular sleeve and the tubular piece.

The present invention relates to electric connector sockets intended to cooperate with corresponding plugs, said sockets comprising, inside a rigid tubular sleeve, at least one resilient conducting wire which, in the absence of a plug, is rectilinear and oblique with respect to the axis of said sleeve without intersecting said axis, the ends of said wire being secured by setting to the respective ends of said sleeve. The invention is more particularly, but not exclusively, concerned with sockets of this type comprising a multiplicity of such wires forming the generatrices of a hyperboloid of revolution about the above mentioned axis.

The object of the present invention is to provide improvements in such sockets concerning simplicity, cost of manufacture and transverse overall dimensions of such sockets.

According to the present invention, the sockets in question are arranged in such manner that both ends of the wire or wires are set by pinching between the respective ends of the above mentioned tubular sleeve and of the inner wall of a single tubular piece surrounding said sleeve.

The method for making such a socket comprises disposing the wire, or each of the wires, in the tubular sleeve, bending one of the ends of said wire, or wires, against one end edge of the tubular sleeve, slipping the latter with said edge thereof ahead into the tubular piece until said end of the wire or wires is caught between the end edge of the tubular sleeve and a transverse wall of the external tubular piece, and in deforming the end of said piece that is at the greater distance from said transverse wall so as to catch the other end of the wire, or the other ends of the wires against the tubular sleeve.

The machine for making such socket comprises a support including a first cylindrical portion the radius of which is substantially equal (with the necessary clearance) to the inner radius of the tubular sleeve and which is provided with positioning slots for the wire, and a second cylindrical portion adjacent to the first one and the radius of which is equal (also with the provision of the necessary clearance) to the sum of the external radius of the tubular sleeve and of the diameter of the wires, a tube slidable on said second cylindrical portion, and means for displacing said last mentioned tube into overhanding position around the first cylindrical portion, then for pushing said tubular piece until it bears against said tube and causes it to move backward so as to be located

entirely around the second cylindrical portion of the support.

A preferred embodiment of the present invention will be hereinafter described with reference to the appended drawing, given merely by way of example, and in which:

FIGS. 1 to 5 diagrammatically illustrate the successive operations for making a connector socket according to the present invention; and

FIG. 6 is a perspective view, with parts cut away, of a socket made as illustrated by FIGS. 1 to 5.

It is desired to make an electric connector socket comprising, inside a rigid tubular sleeve **1**, several rectilinear wires extending along the generatrices of a hyperboloid of revolution.

The socket (as shown in particular by FIG. 6) is arranged so that both ends **2***a* and **2***b* of every wire **2** are secured by wedging or pinching between the respective ends of sleeve **1** and a tubular piece **3** surrounding said sleeve **1**. Piece **3** is metallic and includes an extension **4** serving for the fixation of an electric conductor (not shown) which, together with the conductor secured to the plug (not shown) intended to be inserted in the socket, is capable of ensuring the continuity of an electric circuit.

This construction permits obtaining a mechanical continuity of the socket which makes it more resistant when a plug is inserted thereinto in a direction which is not quite axial.

In order to manufacture such a socket, as shown by FIGS. 1 to 5, wires **2** are disposed inside tubular sleeve **1** (FIGS. 1 and 2), the ends **2***a* of said wires being applied against the portion of sleeve **1** adjoining said edge **1***a* thereof (FIG. 3). Sleeve **1** is slipped into tubular piece **3**, with edge **1***a* ahead (FIG. 4), until the ends **2***a* of wires **2** are caught between the edge **1***a* of sleeve **1** and a transverse partition **5** of piece **3**. The end **6** of said piece **3** is bent or set in such manner as to apply against sleeve **1** the other ends **2***b* of wires **2** (FIG. 6 where the end **6** of tubular piece **3**, after its deformation, is designated by reference numeral **6***a*).

In order to apply this method the following machine may be used.

This machine comprises a support **30** including on the one hand a first cylindrical portion **31** the radius *r* of which (FIG. 1) is equal to the inner radius of tubular sleeve **1**, said cylindrical portion **31** being provided with slots **32** for positioning wires **2** (only one of said slots has been shown in FIGS. 1 to 5 but of course there are as many slots as there are wires) and, on the other hand, a second cylindrical portion **33** adjacent to the first one **31**, and the radius R (FIG. 3) which is equal to the sum of the external radius of sleeve **1** and of the diameter of wires **2**.

A tube **34** is mounted slidable on the above mentioned second portion **33**.

Means (not shown by the drawings) are provided for moving tube **34** into overhanging position around the first cylindrical portion **31** (as shown by FIG. 3) then for pushing tubular piece **3** toward the left until it comes to bear against tube **34** (FIG. 4) and causes it to move back toward the left to be located wholly about the second cylindrical portion **33** (FIG. 5). As shown by FIGS. 1 to 5, the cylindrical portion **33** of greater diameter may consist of a tube **35** carried by the body of support **30** and slidable thereon.

The operation of the machine of FIGS. 1 to 5 is as follows:

First a sleeve **1** is slipped over the portion **31** of support **30**. Then wires **2** are inserted into the slots **32** of said portion **31** (FIG. 1) the ends **2***a* and **2***b* of wires **2** being bent, for instance at right angles. Then tube **34**

(FIG. 2) is moved toward the right until it folds the ends 2*b* of wires 2 between the inner wall of said tube 34 and the outer wall of sleeve 1 (FIG. 3). During this step, tube 35 is pushed toward the right and keeps the ends 2*b* of wires 2 applied against element 1, preventing said ends 2*b* from moving during the subsequent operations. Then piece 3 is moved toward the left, which folds the ends 2*a* of the wires between the inner wall of piece 3 and the outer wall of sleeve 1. Piece 3 comes into contact with tube 34 and keeps moving toward the left until the ends 2*a* of the wires are caught between the edge 1*a* of element 1 and the transverse wall 5 of piece 3 (FIG. 5). As the inner diameter of tube 34 is very slightly greater than the inner diameter of piece 3 the wires cannot move during the operation illustrated by FIGS. 4 and 5. In order to finish the socket, it suffices to set the ends 2*b* of the wires by deformation of piece 3 as shown at 6*a* in FIG. 6.

What I claim is:

1. An electrical connector socket intended to cooperate with a connector plug which comprises, in combination,

an inner rigid tubular sleeve of conducting material,

at least one resilient conducting wire having ends carried by respective ends of said tubular sleeve so as to extend obliquely to the longitudinal axis of said sleeve in a position where it can have limited area, resilient pressure, contact engagement with said plug as it is inserted into said sleeve, said wire having each of its ends hooked around the corresponding ends respectively of said sleeve and being straight when not in engagement with said plug,

and an outer, integral, tubular piece coaxially surrounding said sleeve, of an inner diameter slightly greater than the outer diameter of said sleeve and of a length a little greater than the length of said sleeve,

said outer tubular piece having, at one end thereof and integral therewith, and in the vicinity of one end of said inner sleeve, a deformed portion directed radially inwards, and said outer tubular piece having, integral therewith and in the vicinity of the other end of said inner sleeve, a transverse partition, said outer tubular piece cooperating with the inner tubular sleeve on the one hand radially to hold the ends of the wire between the inner circumference of the outer piece and the outer circumference of the inner sleeve, and on the other hand axially to hold the ends of said wire between the ends of the inner sleeve and respectively the deformed portion and the transverse partition of the outer piece, whereby to hold said wire in said position.

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U.S. Cl. X.R.

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