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(54) **A method for connecting together contact surfaces for electric connections**

Verfahren zum Verbinden von Kontaktflächen für elektrische Verbindungen

Une méthode pour connecter entre elles des surfaces de contact pour des raccordements électriques

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**EP 1 973 199 B1**

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## Description

### OBJECT OF THE INVENTION

**[0001]** The present invention has as its object a method for connecting together contact surfaces for electric connections.

### FIELD OF THE INVENTION

**[0002]** This invention has been devised for carrying out the mutual connection between contact surfaces of two pieces of different nature (materials, shape, dimensions, etc.) in order to thus make up electric connectors.

### BACKGROUND OF THE INVENTION

**[0003]** Said mutual connection for the formation of electric connectors has been carried out so far by welding through a supply of heat and fusible material or by friction welding through heat generation, this being a drawback.

**[0004]** GB 2 328 804 A discloses a method for connecting together contact surfaces for electric connections in the formation of electric connectors being made up of two pieces of different nature as regards mainly the type of material, the shape, the dimensions and other aspects, wherein one of the pieces is tubular and effects the connection of the electrical lead of the corresponding cable and the other piece is elongated and effects the contact for establishing the connection of items of equipment of the type of transformers, electrical switchboards and the like; the method comprising the following stages: aligning the two pieces in such a way as to have the tubular piece and the elongated piece positioned in a coaxial arrangement; riveting the elongated piece against the tubular piece.

### SUMMARY OF THE INVENTION

**[0005]** The invention is a method according to claim 1.

**[0006]** With the method of the invention it is not necessary to carry out a weld of any description whatsoever, whether through a supply of fusible material or by friction, since the mutual connection is carried out by means of a riveting operation.

**[0007]** The respective surfaces of the elongated piece and the introduction end of the tubular piece may be smooth and the fitting and introduction of the elongated piece into the inside of the tubular piece through said end may be carried out by snugly sliding it thereinto.

**[0008]** The method may incorporate an intermediary piece between the portion of the elongated piece being located in the inside of the tubular piece and the cavity of the tubular piece adjacent to the introduction end and effects the riveting of said intermediary piece between the two pieces namely being the elongated one and the tubular one.

**[0009]** These and other characterising features will be

best made apparent by the following detailed description whose understanding will be made easier by the accompanying sheet of drawings showing a practical embodiment being cited only by way of example not limiting the scope of the present invention.

### DESCRIPTION OF THE DRAWINGS

**[0010]** In the drawings:

Each of Figs. 1 through 3 illustrates a respective longitudinal section of the mutual connection of two elements of an electric connector as per the method in question.

Fig. 4 is an enlarged detail of the area IV of Fig. 3. Fig. 5 shows a perspective view of the electric connector with its two elements mutually connected.

### DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

**[0011]** According to such figures a connector (1) being known in the corresponding art is illustrated in them, this type of connectors comprising a tubular body (2) one of whose ends forms an open end (4), and a connecting element (5) being formed by an elongated piece as a by way of stud having an intermediary annular stop collar (7).

**[0012]** According to the method of the invention this connecting element (5) is previously arranged (see Fig. 1) in an aligned arrangement with respect to the tubular body (2), with its threaded back end (5') facing the also threaded open end (4) of the body (2), to thereupon and in a second stage (Fig. 2) have it threadingly engaged into said open end till the stop collar (7) comes into abutment with it.

**[0013]** The end (5') of the connecting element (5) is sufficiently long as from the stop collar (7) as to once having been fitted to the body (2) project in its inside from the back portion of the open end (4) so as to in a third and last stage (Fig. 3) be riveted against this latter, the body (2) and the element (5) thus being perfectly and solidly connected together.

**[0014]** The detail IV of Fig. 4 illustrates the riveted mutual connection of the method of the present invention.

**[0015]** The tubular body (2) conventionally has in its cylindrical surface a threaded hole (8) with a countersunk outer opening for the fitting of a screw (not shown) preferentially being of the dynamometric screw type and having a predetermined torque for its rupture when being tightened, for the fastening of the electrical lead of the cable to the electric connector, all this in order to prevent any tampering after the fitting operation, said screw being operable for gripping against the inner portion of the body (2) the pertinent electrical lead of the cable (neither shown) being introduced into said body through the free open end being opposite to the open end (4).

**[0016]** The invention provides if necessary for the use of an intermediary piece between the elongated connect-

ing element (5) and the tubular body (2), said intermediary piece being subjected to a riveting operation and being thus deformed and thus connecting together the contact surfaces of both pieces or elements namely being the elongated one (5) and the tubular one (2).

## Claims

1. A method for connecting together contact surfaces for electric connections in the formation of electric connectors being made up of two pieces of different nature as regards mainly the type of material, the shape, the dimensions and other aspects, wherein one of the pieces (2) is tubular and effects the connection of the electrical lead of the corresponding cable and the other piece (5) is elongated and effects the contact for establishing the connection of items of equipment of the type of transformers, electrical switchboards and the like; **characterised in that** it comprises the following stages:

- aligning the two pieces in such a way as to have the tubular piece and the elongated piece positioned in a coaxial arrangement;
- introducing a portion of the elongated piece through an end of the tubular piece up to an intermediary stop collar (7) being provided on the elongated piece; and
- riveting the portion of the elongated piece being located in the inside of the tubular piece against the cavity of said tubular piece adjacent to the introduction end; and

both pieces are threaded at the mutual contact surfaces, the elongated piece being introduced through an end of the tubular piece by threadingly engaging it into this latter.

2. A method as per claim 1, **characterised in that** the respective surfaces of the elongated piece and the introduction end of the tubular piece are smooth and the fitting and introduction of the elongated piece into the inside of the tubular piece through said end is carried out by snugly sliding it thereinto.
3. A method as per any of claims 1 and 2, **characterised by** incorporating an intermediary piece between the portion of the elongated piece being located in the inside of the tubular piece and the cavity of the tubular piece adjacent to the introduction end and effecting the riveting of said intermediary piece between the two pieces.

## Patentansprüche

1. Verfahren zum gegenseitigen Verbinden von Kon-

taktflächen für elektrische Anschlüsse bei der Ausbildung von elektrischen Verbindern, die aus zwei unterschiedlichen Teilen bestehen, was hauptsächlich die Art des Materials, die Form, die Abmessungen und andere Aspekte betrifft, wobei eines der Teile (2) röhrenförmig ist und die Verbindung der elektrischen Ader des entsprechenden Kabels bewirkt und das andere Teil (5) länglich ist und den Kontakt zur Herstellung der Verbindung von Ausrüstungsgegenständen, wie Transformatoren, elektrische Schalttafeln und dergleichen, bewirkt, **dadurch gekennzeichnet, dass** es folgende Schritte umfasst:

- Ausrichten beider Teile in einer Weise, sodass das röhrenförmige Teil und das längliche Teil koaxial angeordnet sind;
- Einführen eines Teilbereichs des länglichen Teils durch ein Ende des röhrenförmigen Teils bis zu einem dazwischenliegenden Anschlagbund (7), der am länglichen Teil vorgesehen ist; und
- Vernieten des Teilbereichs des sich im Inneren des röhrenförmigen Teils befindlichen länglichen Teils an der Aussparung, die an das Einführungsende des röhrenförmigen Teils angrenzt; und

beide Teile sind an den gegenseitigen Kontaktflächen mit einem Gewinde versehen, wobei das längliche Teil durch ein Ende des röhrenförmigen Teils eingeführt und mit diesem durch Schraubbewegungen verbunden wird.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die jeweiligen Flächen des länglichen Teils und das Einführungsende des röhrenförmigen Teils glatt sind und das Einpassen und Einführen des länglichen Teils in das Innere des röhrenförmigen Teils durch das besagte Ende dadurch erfolgt, dass es passgenau in dieses hineingeschoben wird.
3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** zwischen den Teilbereich des im Inneren des röhrenförmigen Teils befindlichen länglichen Teils und die an das Einführungsende angrenzende Aussparung des röhrenförmigen Teils ein Zwischenstück eingefügt und die Vernietung dieses Zwischenstücks zwischen den beiden Teilen bewirkt wird.

## Revendications

1. Une méthode pour connecter ensemble des surfaces de contact pour des connexions électriques dans la formation de connecteurs électriques fabriqués de deux pièces de nature différente en ce qui concerne

principalement les types de matériaux, la forme, les dimensions et d'autres aspects, où l'une des pièces (2) est tubulaire et effectue la connexion du conducteur électrique du câble correspondant et l'autre pièce (5) est allongée et effectue le contact pour établir la connexion des éléments d'un équipement du type transformateurs, tableaux électriques et similaires ; **caractérisé en ce qu'elle** comprend les étapes suivantes :

- alignement de deux pièces de sorte à avoir la pièce tubulaire et la pièce allongée placées dans une disposition coaxiale ;
- introduction d'une portion de la pièce allongée à travers une extrémité de la pièce tubulaire jusqu'à une bride d'arrêt intermédiaire (7) située sur la pièce allongée ; et
- rivetage de la portion de la pièce allongée placée à l'intérieur de la pièce tubulaire contre la cavité de ladite pièce tubulaire adjacente à l'extrémité d'introduction ; et

les deux pièces sont filetées aux surfaces de contact mutuelles, la pièce allongée étant introduite à travers une extrémité de la pièce tubulaire en l'engageant par vissage dans cette dernière.

2. Une méthode comme indiqué dans la revendication 1, **caractérisée en ce que** les surfaces respectives de la pièce allongée et l'extrémité d'introduction de la pièce tubulaire sont lisses et l'adaptation et l'introduction de la pièce allongée à l'intérieur de la pièce tubulaire à travers cette extrémité est réalisée en l'emboîtant par coulissement.
3. Une méthode comme indiqué dans n'importe laquelle des revendications 1 et 2, **caractérisée par** l'incorporation d'une pièce intermédiaire entre la portion de la pièce allongée placée à l'intérieur de la pièce tubulaire et la cavité de la pièce tubulaire adjacente à l'extrémité d'introduction et effectuant le rivetage de ladite pièce intermédiaire entre les deux pièces.

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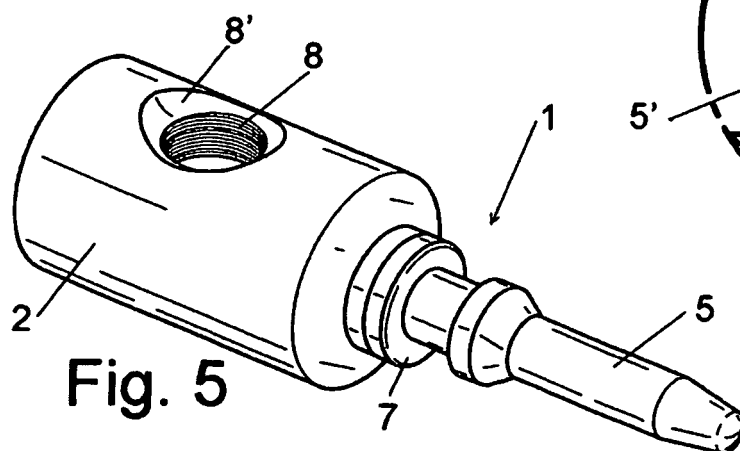
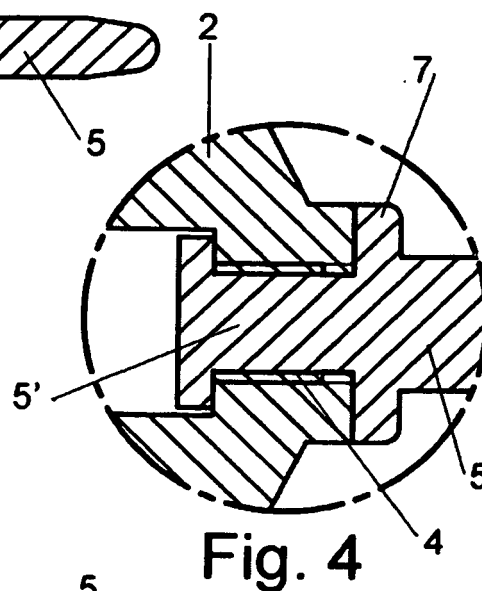
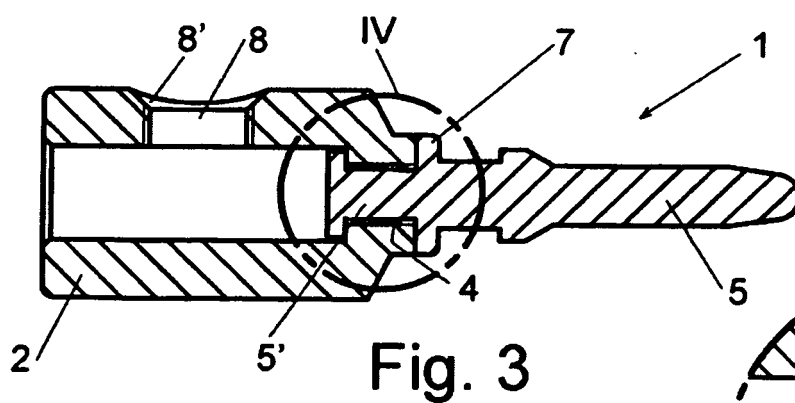
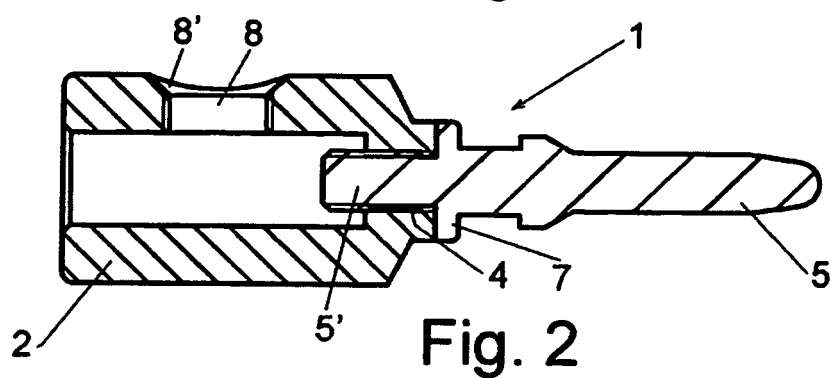
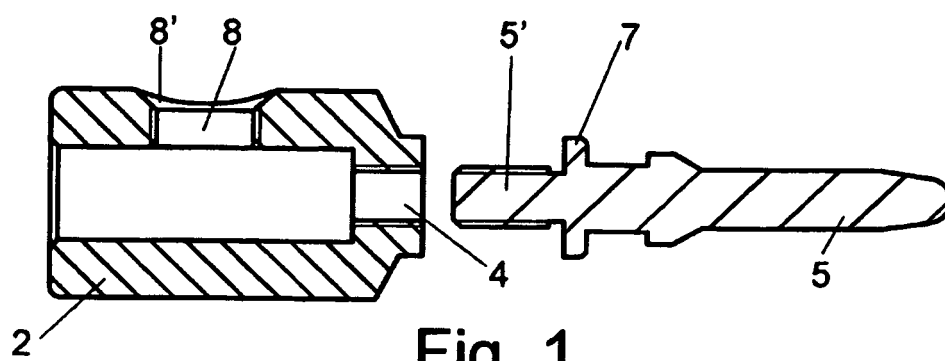
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**REFERENCES CITED IN THE DESCRIPTION**

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