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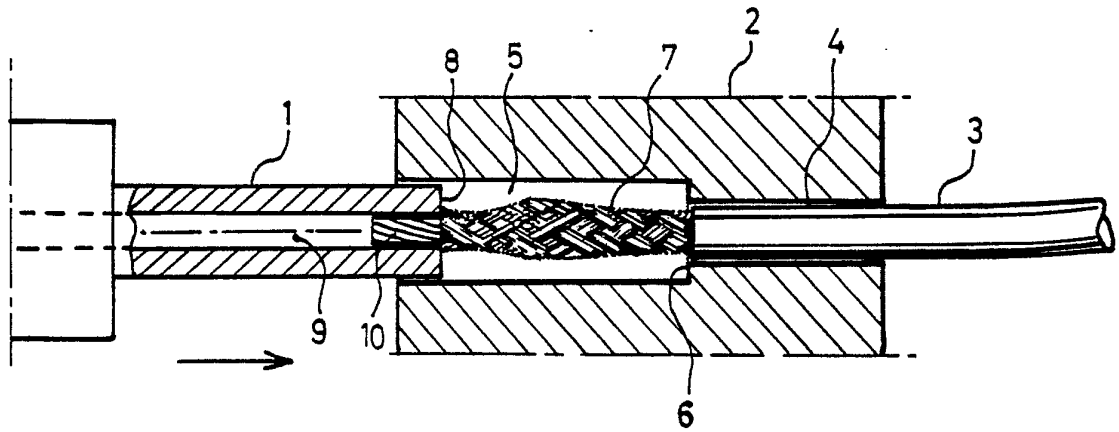
With international search report.

(54) Title: METHOD AND DEVICE TO SHAPE A BRAIDED SHEATH IN A CABLE CONSISTING OF AN OUTER COVERING, A BRAIDED SHEATH AND CONDUCTORS



(57) Abstract

Method and device in such as telecommunication or electric power systems, to form the braided sheath on a cable so that it when mounted in such as a connection box gives good contact with the casing of the box. The device is in two parts, a die (2) and a punch (1). The die has a through hole parted by a shoulder (6) into a first minor space (4) and a second larger space (5). The cable (3), the end of which is liberated from the outer covering such as expose the braided sheath (7), is inserted into die (2) through the first space (4) and is placed such that the uncovered sheath (7) is in the second space (5) of the die. The punch (1) has an outer configuration such that it can glide into the second space (5) of the die and has a central longitudinal hole (9) in which the liberated conductors (10) can glide. The punch (1) is moved into the second space (5) to press the sheath (7) under great pressure towards the shoulder (6) so that the wires of the sheath are metalically "floating" together to form a compact collar-like portion (11).

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METHOD AND DEVICE TO SHAPE A BRAIDED SHEATH IN A CABLE CONSISTING OF AN OUTER COVERING, A BRAIDED SHEATH AND CONDUCTORS.

TECHNICAL FIELD

The invention relates to a method and a device in such as telecommunication or electric power systems for the formation of the braided sheath on a cable in such a way that the sheath when mounted in such as a connection box gives good contact with the casing of the box.

BACKGROUND ART

In previously known solutions, the braiding is undone manually into its separate wires. The wires are then put together and twisted into a thick sheath conductor. The sheath conductor is then connected to such as an electrically conducting casing with the aid of soldering or screwing.

DISCLOSURE OF THE INVENTION

The known method of undoing the sheath braiding into its separate wires is thus performed manually and will therefore be time- and work- consuming as well as unfavourable as far as cost is concerned. Furthermore, there is risk of the braiding wires being torn off so that a poorer contact is obtained on connecting the sheath.

The method and device which solve the problems mentioned are characterized by the claim and involve that a braided sheath in an end of a cable is exposed and compressed together into a collar-shaped portion with the aid of a device comprising a die provided with a cavity and a punch displaceable in this cavity.

The compression takes place with a force such that the wires of the braided sheath are compressed into a compact mass without damaging the conductors.

By the method and device in accordance with the invention there is obtained a collar-shaped sheath part which is easy to connect and gives good contact with

an electrically conducting casing. In addition, the forming process can be done by machine without risk of the sheath wires being damaged. The automatized process also results in large advantages in respect of time and cost.

BRIEF DESCRIPTION OF DRAWINGS

The method and device in accordance with the invention will now be described in detail with the aid of an embodiment and with reference to the accompanying drawing, on which

Figure 1 illustrates the device in accordance with the invention before the braided sheath is pressed together.

Figure 2 illustrates the braided sheath compressed into a collar in accordance with the invention.

Figure 3 is a perspective view of the compressed braided sheath and

Figure 4 is an example of how to connect the braided sheath to an electrically conducting casing in a connection device.

BEST MODE FOR CARRYING OUT THE INVENTION

The embodiment describes a method and a device for shaping a braided sheath associated with a cable. The exemplified cable is a telephony cable comprising insulated conductors surrounded by a braided sheath and an outer covering. The cable may be a connection between two terminals in a computer system, for example.

As will be seen from Figure 1, a device in accordance with the invention comprises a punch 1 and a die 2, there being a cable 3 accommodated in a through-hole in the die.

A first space 4 of this hole has a diameter somewhat larger than that of the cable to allow its insertion. A second space 5 in the through-hole has a diameter which is larger than the diameter of the first space 4. The junction between the first space 4 and the second space 5 is taking place along a shoulder 6 having a flat surface which, according to the example, is at right angles to said through hole.

It is of course possible for the shoulder 6 to have another angle in relation to said through-hole.

The cable 3 placed in the hole is in that part comprising said second space 5 removed from its covering so that the braided sheath 7 is exposed.

The punch 1, which has a cylindrical shape and a flat end surface 8, is intended to glide into said second space 5. In its longitudinal direction the punch 1 has a central hole 9 with a diameter at least corresponding to the total diameter of the conductors 10 without the sheath.

An operational sequence in accordance with the invention will now be described with reference to Figure 1, which shows how the cable with its covering removed is placed in the die 2 and how the punch 1 of the device is moved into the second part 5 of the die simultaneously as the conductors 10 ,being liberated from the sheath, glide into the central hole 9 of the punch. The punch 1 presses the sheath 7 against the shoulder 6 of the die under great pressure, the wires of the sheath thus metalically "floating" together to form a compact collar-shaped portion 11, as will be seen in Figure 2, which illustrates how the punch 1 has pressed the sheath against the shoulder 6.

Figure 3 illustrates the cable end 3 in perspective with the sheath compressed into a compact collar-shaped portion 11 with the exposed conductors 10.

Figure 4 illustrates an application where the sheath pressed into a collar 11 is connected to an electrically conducting casing in a connection device. The casing consists of two parts, one part formed as a box 12 with edges, and the other part formed as a cover 13, which surrounds the edges of the box. In one of the sides of the casing there is a hole through which the cable can be inserted. The collar-shaped sheath connects to the casing by being placed between the edge of the box and the side of the cover.

A braided sheath formed in accordance with the invention may of course be connected to an electrically conducting casing in other applications than in the one described above.

The punch of the device can be formed to prevent the sheath from being pressed into the cable during compression. One embodiment is to provide the flat end of the punch with a projecting circular lip round the opening of the central hole. The lip glides between the cable conductors and the sheath during compression. Another embodiment is to provide the flat end of the punch with a protruding tube round the opening of the central hole such that during compression this tube is thrust in between the sheath and the cable conductors.

It is also possible to vary the shape of the collar, such as to be round, oval, rectangular, swollen etc, by giving the die and the punch, respectively, a configuration such as to agree with the desired collar shape.

CLAIMS

1 A method to shape a braided sheath in a cable consisting of an outer covering, a braided sheath and conductors, characterized in that the outer covering in the end of the cable (3) is removed and that a braided sheath (7) thus being exposed is compressed into a compact collar shaped portion (11).

2 Device for carrying out the method as claimed in claim 1 to shape a braided sheath in a cable consisting of an outer covering, a braided sheath and conductors, characterized by a die (2) with a through-hole having in a first part of its length a first space (4) with an inner configuration corresponding to the outer configuration of the cable (3) for enabling passage of the cable, and in an adjacent second part of its length having a second space (5) with an inner configuration greater than the inner configuration of said first space (4), in that a pressure means is a punch (1) with an outer configuration such that it can glide into said second space (5), in that said punch (1) has a central hole (9) in which the conductors (10) liberated from the sheath (7) can glide, and in that said punch (1) on its movement into said second space (5) presses the sheath against a shoulder (6) in the passage between said first space (4) and said second space (5).

3 Device as claimed in claim 2, characterized in that said punch (1) is provided at its end with a circular lip which during compression of the sheath (7) is inserted between the sheath and the conductors (10) of the cable such as to prevent the sheath from being pressed into the conductors.

4 Device as claimed in claim 2, characterized in that said punch (1) is provided at its end with a tube, which during compression of the sheath is inserted between the sheath (7) and the conductors (10) of the cable such as to prevent the sheath from being pressed into the conductors.

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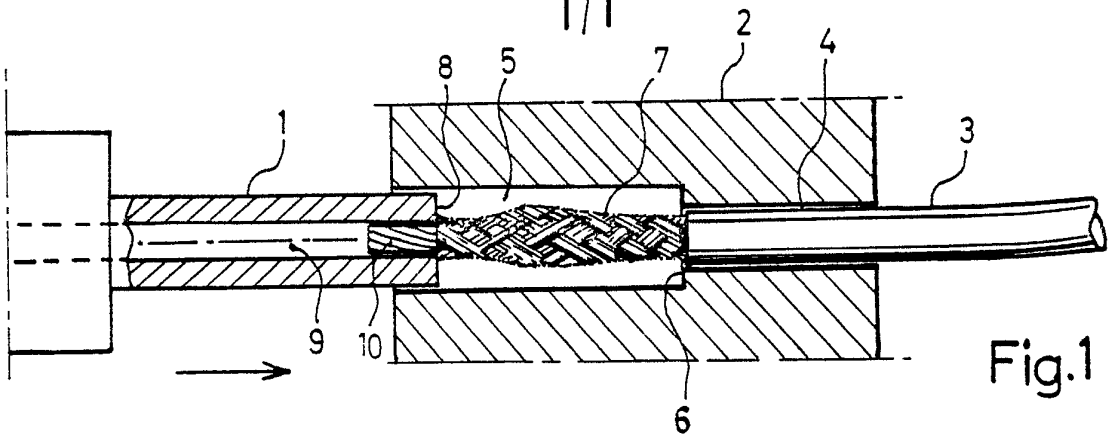

Fig.1

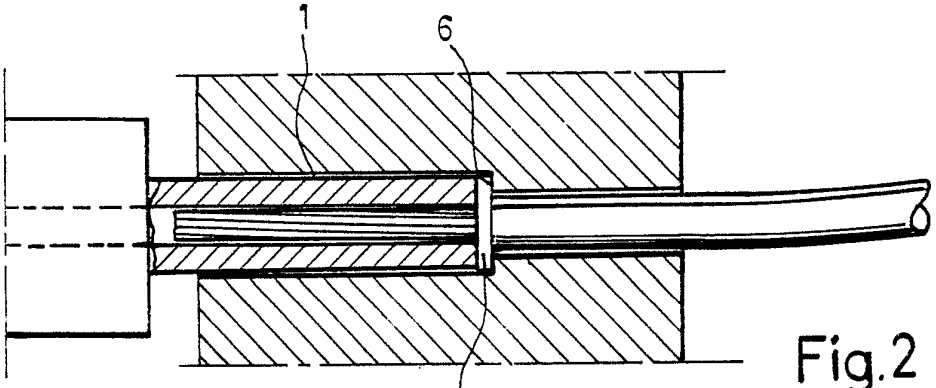

Fig.2

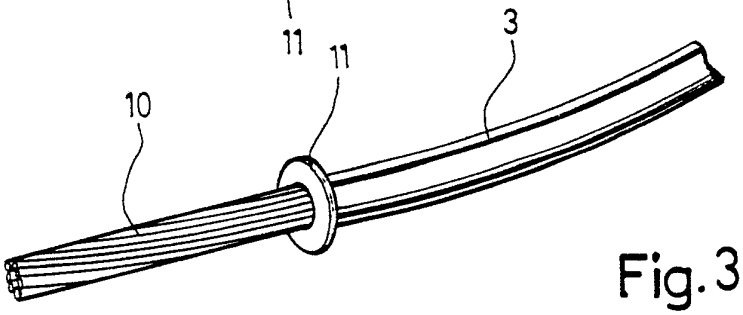

Fig.3

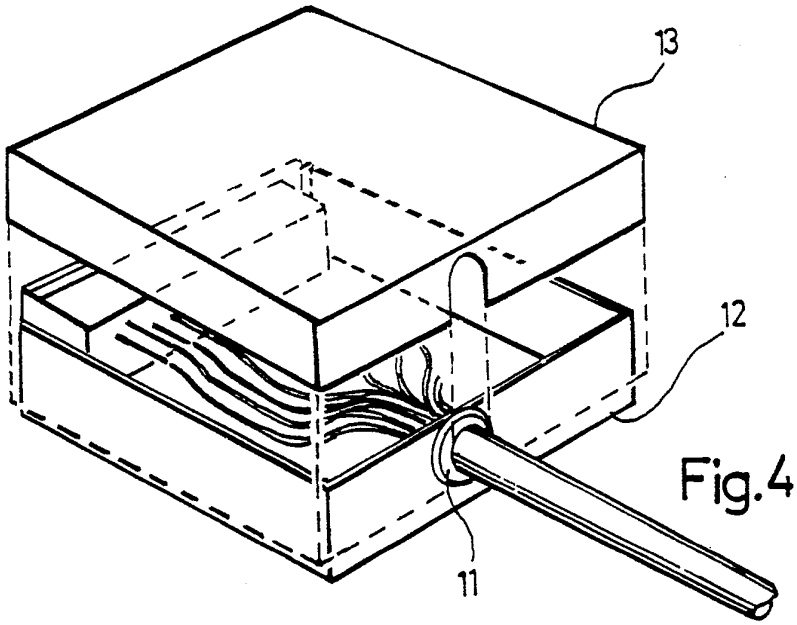

Fig.4

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE87/00106

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC [4]

H 02 G 1/14, H 01 R 43/28

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC	B 21 D 19/00, /08; B 21 F 9/02, 15/00, /06, 21/00; H 01 R 43/00, /04, /28; H 02 G 1/00, /14, 15/00, /02, /064-/076, /10-/113, /184-/196 .../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	Derwent's abstract no 84-105788/17, SU 1029-288-A	
A	FR, A, 2 141 125 (ESSEX INTERNATIONAL INC) 19 January 1973	
A	EP, A, 0 128 794 (THE BENDIX CORP) 19 December 1984 see especially fig 2A-3G	
A	DE, A, 2 339 443 (SPINNER G) 27 February 1975	
A	DE, A, 1 919 118 (PIRELLI GENERAL CABLE WORKS LTD) 18 June 1970	

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1987-05-14	1987 -05- 20
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Stefan Svahn

MJ

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields Searched (cont)

Nat Cl 21c: 23/02, /05, /06, /10

US Cl 72: 136, 368-371;
140: 93.4, 111, 117;
156: 49, 50;
174: 73, 74, 75, 78, 84, 88, 89, 106;
339: 14, 223, 276

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.