(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 399 997 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
07.09.2005 Bulletin 2005/36

(21) Application number: **02767170.0**

(22) Date of filing: **20.06.2002**

(51) Int Cl.[7]: **H02G 15/013**, H02G 15/113, H02G 15/007

(86) International application number:
PCT/EP2002/007394

(87) International publication number:
WO 2003/003534 (09.01.2003 Gazette 2003/02)

(54) **CABLE CLOSURE**

KABELVERSCHLUSS

FERMETURE DE CABLE

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

(30) Priority: **29.06.2001 FR 0108598**
29.06.2001 FR 0108601

(43) Date of publication of application:
24.03.2004 Bulletin 2004/13

(60) Divisional application:
05004241.5 / 1 536 535

(73) Proprietor: **CCS Technology, Inc.**
Wilmington, DE 19803 (US)

(72) Inventors:
- **MÜLLER, Thorsten**
58708 Menden (DE)
- **DELATOUCHE, Jean-Louis**
F-28170 Chateauneuf en Thymerais (FR)
- **SCHREIBER, Yannick**
49110 Montrevault (FR)
- **RODRIGUES, Alberto**
F-45220 Herblay (FR)

(74) Representative: **Sturm, Christoph**
Quermann Sturm GbR
Patentanwälte
Unter den Eichen 7
65195 Wiesbaden (DE)

(56) References cited:
EP-A- 0 421 246
DE-A- 2 310 999
DE-A- 10 010 452
DE-C- 4 135 570
FR-A- 2 517 132

EP 1 399 997 B1

Description

[0001] The present invention relates to cable closures, especially to splice protection sleeves as part of cable closures used in the telecommunications field for the purpose of protecting a cable, especially a power cable or a telephone cable such as a fibre-optic cable.

[0002] German Patent Application DE 100 10 452 A1 discloses a splice protection sleeve comprising a shell closed by two flanges. Each flange defines a passage for a cable. The flange includes means for mechanically clamping the cable. These means are intended to be positioned around the cable once the latter has been placed in the passage and to clamp it. Independently of these clamping means, there is provided a seal interposed between two rings into which the cable is slipped. At least one of the rings can move along the cable and is displaced by means of a slide. This ensures both mechanical clamping of the cable and sealing of the splice protection sleeve.

[0003] However, this is achieved only by putting up with a lengthy fitting operation to be carried out since it is necessary, on the one hand, to put the clamping means in place and, on the other hand, to clamp the seal between the two rings.

[0004] The subject of the invention is a quick-fit splice protection sleeve.

[0005] According to the invention, the slide is a frustoconical threaded part which is screwed into the flange by being slipped into the passage via its larger transverse surface and pushing back, as it is being screwed in, directly or via the clamping means, the moveable ring towards the other ring and tightening the clamping means around the cable.

[0006] Thereafter, the clamping means are put into action and the seal is deformed between the two rings by one and the same movement of the frustoconical threaded part. There is no longer, as previously, the need to carry out two successive operations for this purpose. When the frustoconical threaded part starts to move, it pushes the moveable ring back towards the other ring, which is preferably immobilized in the flange, and then when the moveable ring is moved over a certain distance it comes into abutment, while the threaded part continues to move, tightening the clamping means around the cable, thereby ensuring that the cable is mechanically clamped.

[0007] According to an improved embodiment of the present invention the splice protection sleeve comprises a clamping device, wherey the clamping device comprises a ring on which fingers lying approximately perpendicular to the plane of the ring are each mounted in the form of a hinge on the same side of this plane. The free end of each finger terminates in a claw turned towards the axis. On the side of the plane where the fingers do not lie, there is provided a means which, by shape complementarity, is intended to cooperate with another clamping device of the same shape but having a ring diameter greater or smaller than a value equal to the largest radial dimension of the fingers.

[0008] When it is necessary to go from a small-diameter cable to a larger-diameter cable, all that is required is to remove the clamping device of the same shape but of smaller ring diameter which, by shape complementarity, cooperated with the clamping device of larger diameter that was left in place in order immediately to obtain a clamping device suitable for the larger-diameter cable.

[0009] During mounting, the fingers are pushed back inwards, that is to say towards the axis, especially by a nut, until the claws of the fingers penetrate the cable and thus immobilize it, without any possibility of the cable moving longitudinally, or of rotating either. To make it easier for the nut or other element to act by pressing on the fingers, that portion of a finger axially furthest away from the ring is bevelled, the top of the bevel being closer to the axis than the rest of the bevel. The nut thus comes into contact with the finger along an inclined surface which means that the finger is pushed back towards the axis as the nut advances.

[0010] In the appended drawing, given solely by way of example:

- Figure 1 is a view with a cutaway of a splice protection sleeve flange according to the invention before the moveable ring has been displaced by the threaded slide;
- Figure 2 is a view of a detail in Figure 1, when the moveable ring has reached the end-of-travel position,
- Figure 3 is a sectional view illustrating a variant, and
- Figure 4 is an exploded perspective view of a clamping device according to the invention.

[0011] The splice protection sleeve flange shown in Figure 1 comprises a flange body 1 defining two passages 2 for a cable C. The flange includes, as means for mechanically clamping the cable C, an annulus 3 extended by bars 4 uniformly spaced around the perimeter. These bars are resilient and each of them terminates in a claw 5 facing inwards and intended, when the bar is pushed back towards the axis XX' of the passage, to penetrate the cable C and mechanically clamp it properly.

[0012] Further inside the sleeve, a seal 6, for example made of an elastomer or of what is called a gel, is interposed between a moveable ring 7 and a fixed ring 8. The ring 8 is immobilized by penetrating a groove 9 made on the inner face of the body 1. The cable C is slipped between the two rings 7, 8. The ring 7 can move along the axis XX' as far as a stop 10 (Figure 2) made on the body 1.

[0013] A frustoconical threaded slide 11 is screwed into a tapping 12 in the body when it is slipped into the passage 2 via its larger transverse surface. It is inserted between the body 1 and the bars 4. As it is being gradually screwed in, it pushes back the annulus 3, which,

in contact with the moveable ring 7, also pushes it back towards the fixed ring 8 until this moveable ring 7 butts against the stop 10. At this moment, the seal 6 highly compressed between the two rings 7 and 8 has flowed and ensures good sealing. When the slide 11 continues to be screwed in, it pushes the claws 4 inwards, these then catching on the cable C via the claws 5 and holding it properly in place.

[0014] In Figure 3, the slide 13 comes directly into contact with the moveable ring 14 which is itself in contact with the seal 15. At the start of the movement, the slide 13 compresses the seal 15 between the moveable ring 14 and the other, fixed ring and, at the same time, the slide 13 acts, via a ramp 16, on the bars 17 of an annulus 18 for clamping the cable C.

[0015] The device shown in the figure 4 comprises a plastic ring 21 on which fingers 22, also made of plastic, are each mounted in the form of soft hinge. The free end of each finger 22 terminates in a claw 23 turned towards the axis YY' of the ring. On the side of the plane where the fingers 22 do not lie, there is provided, on the outer face of the ring, a rib 24 intended to cooperate, by shape complementarity, with a groove 25 of another ring having a diameter greater than that of the ring 21.

[0016] Each claw 22 has a bevel 26, the angle of the bevel being such that the end of the finger is approaching the axis YY'.

[0017] Of course, conversely it would be possible to provide a groove instead of the rib 24 and a rib instead of the groove 25.

Claims

1. Splice protection sleeve comprising a flange (1) defining a passage (2) for a cable (C), the flange (1) including means (3, 4) for clamping said cable (C), which means are intended to be positioned around the cable (C) placed in the passage (2) and to clamp it, and a seal (6) interposed between two rings (7, 8) into which the cable (C) is slipped and at least one (7) of which can move along the cable (C) and is displaced by means of a slide (11), **characterized in that** the slide (11) is a frustoconical threaded part (11) which is screwed into the flange (1) by being slipped into the passage (2) via its larger transverse surface and pushing back, as it is being screwed in, directly or via the clamping means (3, 4), the moveable ring (7) towards the other ring (8) and tightening the clamping means (3, 4) around the cable (C).

2. Sleeve according to Claim 1, **characterized in that** the other ring (8) is immobilized in the flange (1).

3. Sleeve according to Claim 1 or 2, **characterized in that** the moveable ring (7) is immobilized at the end of travel by a stop (10).

4. Sleeve according to Claim 1, **characterized by** a device for clamping the cable comprising a ring (21) on which fingers (22) are each mounted in the form of a hinge, the free end of each finger terminating in a claw (23) turned towards the axis YY' and, on the side of the plane where the fingers (22) do not lie, there is provided a means (24) which, by shape complementarity, is intended to cooperate with another clamping device of the same shape but having a ring diameter greater or smaller than a value equal to the largest radial dimension of the fingers (22).

5. Sleeve according to Claim 4, **characterized in that that** portion of a finger (22) axially furthest away from the ring (21) is bevelled, the top of the bevel being closer to the axis than the rest of the bevel.

Patentansprüche

1. Spleißschutzmuffe mit einem einen Durchgang (2) für ein Kabel (C) definierenden Flansch (1), wobei der Flansch (1) Mittel (3, 4) zum Festklemmen des Kabels (C) enthält, die um das im Durchgang (2) angeordnete Kabel (C) herum positioniert werden und es festklemmen sollen, und einer Dichtung (6), die zwischen zwei Ringen (7, 8) angeordnet ist, in die das Kabel (C) geschoben werden kann und von denen sich mindestens einer entlang dem Kabel (C) bewegen kann und mittels eines Schiebers (11) verschoben wird, **dadurch gekennzeichnet, dass** der Schieber (11) ein kegelstumpfförmig eingezogenes Teil (11) ist, das in den Flansch (1) geschraubt wird, indem es über die größere Querfläche des Durchgangs (2) in diesen hineingeschoben und bei seinem Einschrauben direkt oder über die Klemmmittel (3, 4) den Ring (7) in Richtung des anderen Rings (8) zurückdrückt und die Klemmmittel (3, 4) um das Kabel (C) herum festzieht.

2. Muffe nach Anspruch 1, **dadurch gekennzeichnet, dass** der andere Ring (8) im Flansch (1) festgelegt wird.

3. Muffe nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der bewegliche Ring (7) am Ende des Hubs durch einen Anschlag (10) festgelegt wird.

4. Muffe nach Anspruch 1, **gekennzeichnet durch** eine Vorrichtung zum Festklemmen des Kabels mit einem Ring (21), an dem Finger (22) jeweils in Form eines Gelenks angebracht sind, wobei das freie Ende jedes Fingers in einer Klaue (23) abschließt, die zur Achse YY' weist, und auf der Seite der Ebene, in der die Finger (22) nicht liegen, ein Mittel (24) vorgesehen ist, das **durch** komplementäre Form mit einer anderen Klemmvorrichtung mit der gleichen

Form zusammenwirken soll, aber einen Ringdurchmesser aufweist, der größer oder kleiner als ein Wert gleich der größten Radialabmessung der Finger (22) ist.

5. Muffe nach Anspruch 4, **dadurch gekennzeichnet, dass** der Teil eines Fingers (22), der axial am weitesten von dem Ring (21) entfernt liegt, abgeschrägt ist, wobei das obere Ende der Abschrägung näher an der Achse liegt als der Rest der Abschrägung.

Revendications

1. Manchon de protection d'épissure comprenant une bride (1) définissant un passage (2) pour un câble (C), la bride (1) comportant des moyens (3, 4) pour serrer ledit câble (C), lesquels moyens sont destinés à être positionnés autour du câble (C) placé dans le passage (2) et à le serrer, et un joint (6) interposé entre deux bagues (7, 8) dans lesquelles le câble (C) est glissé et dont au moins une (7) peut se déplacer le long du câble (C) et est déplacée au moyen d'une coulisse (11), **caractérisé en ce que** la coulisse (11) est une partie filetée tronconique (11) qui est vissée dans la bride (1) en la faisant glisser dans le passage (2) par sa surface transversale plus grande et en repoussant, à mesure qu'elle est vissée, directement, ou par le biais des moyens de serrage (3, 4), la bague mobile (7) vers l'autre bague (8) et en serrant les moyens de serrage (3, 4) autour du câble (C).

2. Manchon selon la revendication 1, **caractérisé en ce que** l'autre bague (8) est immobilisée dans la bride (1).

3. Manchon selon la revendication 1 ou 2, **caractérisé en ce que** la bague mobile (7) est immobilisée à la fin de sa course par une butée (10).

4. Manchon selon la revendication 1, **caractérisé par** un dispositif pour serrer le câble, comprenant une bague (21) sur laquelle des doigts (22) sont montés individuellement sous la forme d'une charnière, l'extrémité libre de chaque doigt se terminant par une griffe (23) tournée vers l'axe YY' et, du côté du plan où les doigts (22) ne se trouvent pas, il est prévu un moyen (24) qui, par complémentarité de forme, est prévu pour coopérer avec un autre dispositif de serrage de forme identique mais ayant un diamètre de bague supérieur ou inférieur à une valeur égale à la dimension radiale la plus grande des doigts (22).

5. Manchon selon la revendication 4, **caractérisé en ce que** la portion d'un doigt (22) qui est la plus éloignée de la bague (21) est biseautée, le haut du biseau étant plus proche de l'axe que le reste du biseau.

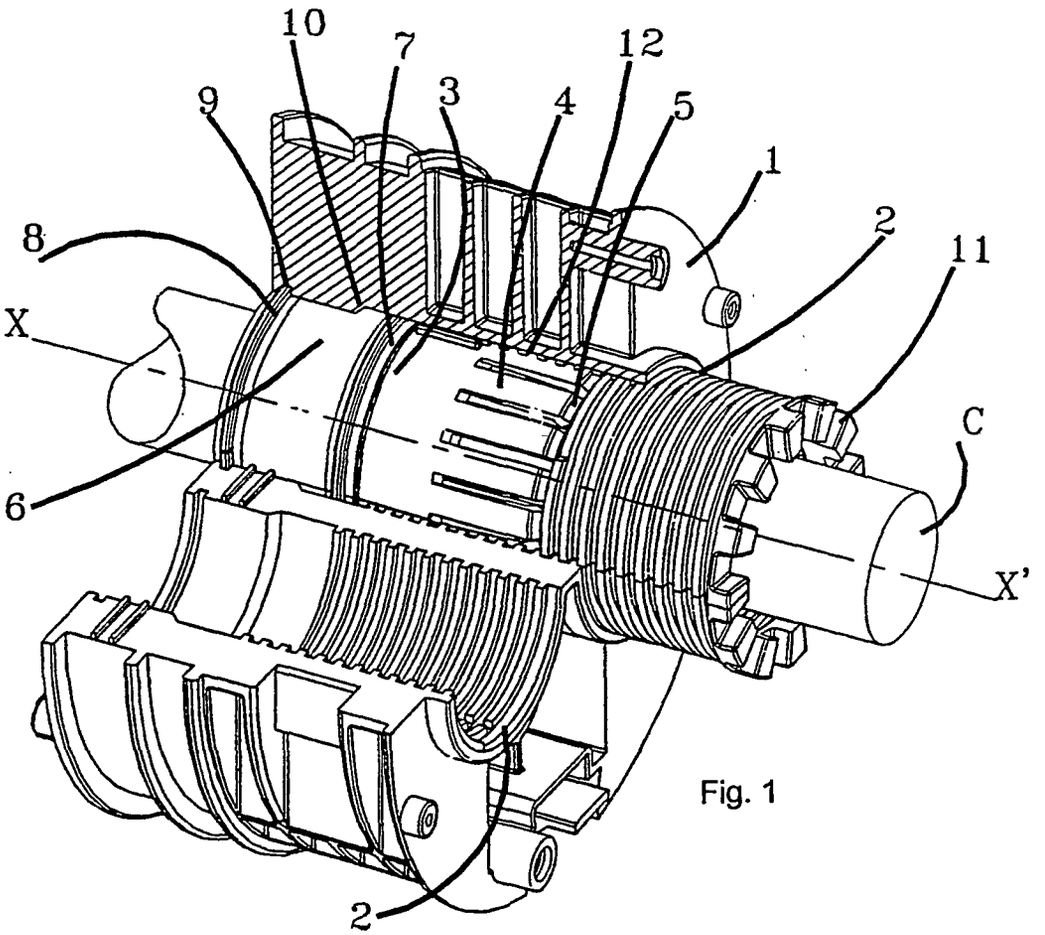

Fig. 1

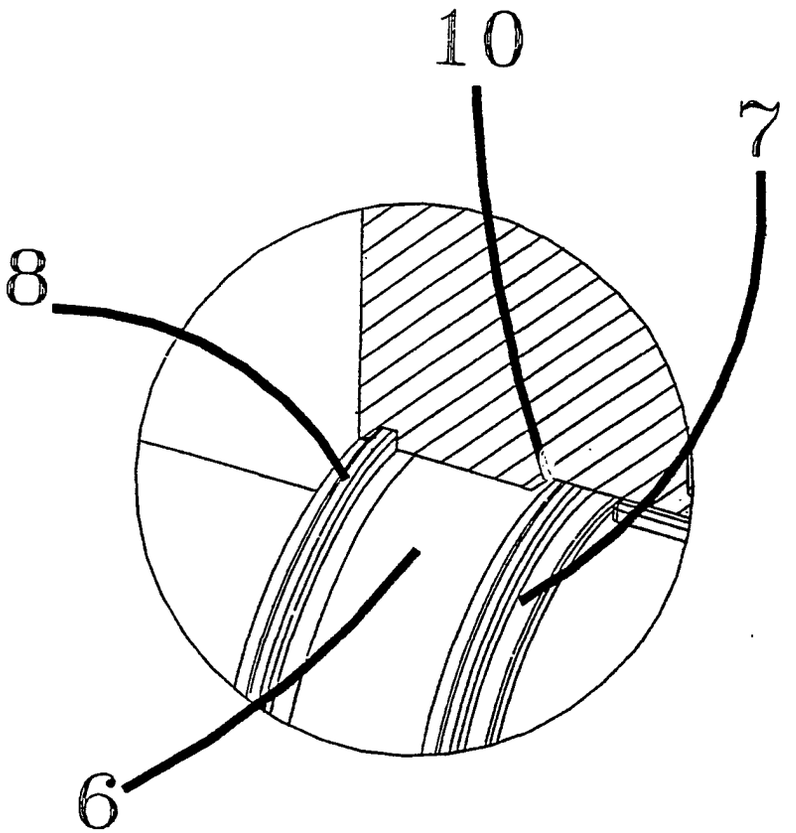

Fig. 2

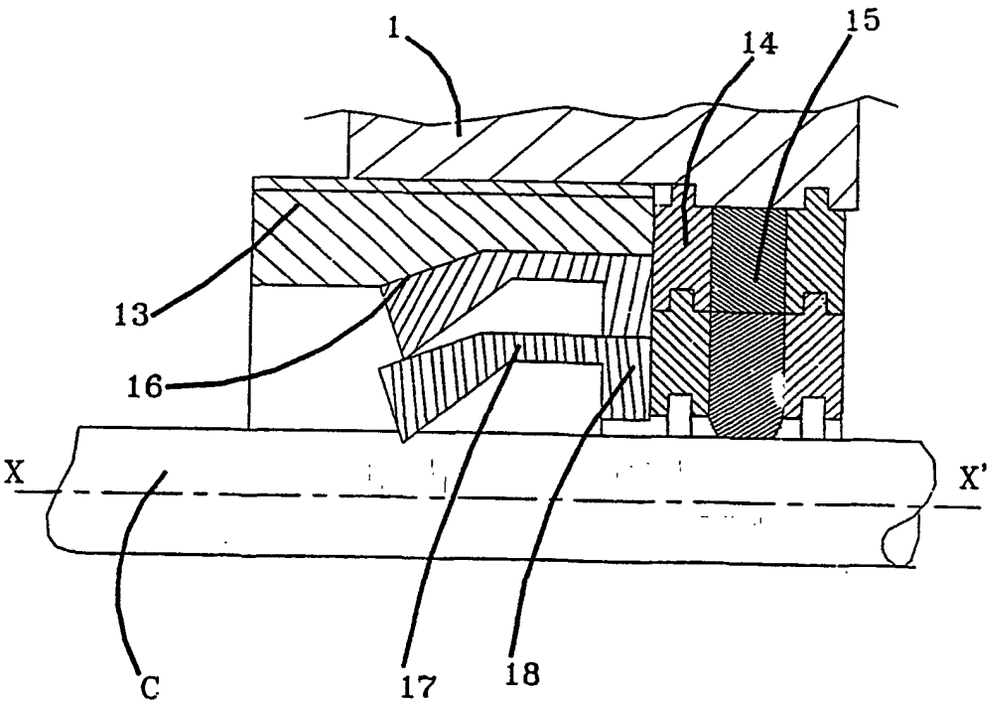

Fig. 3

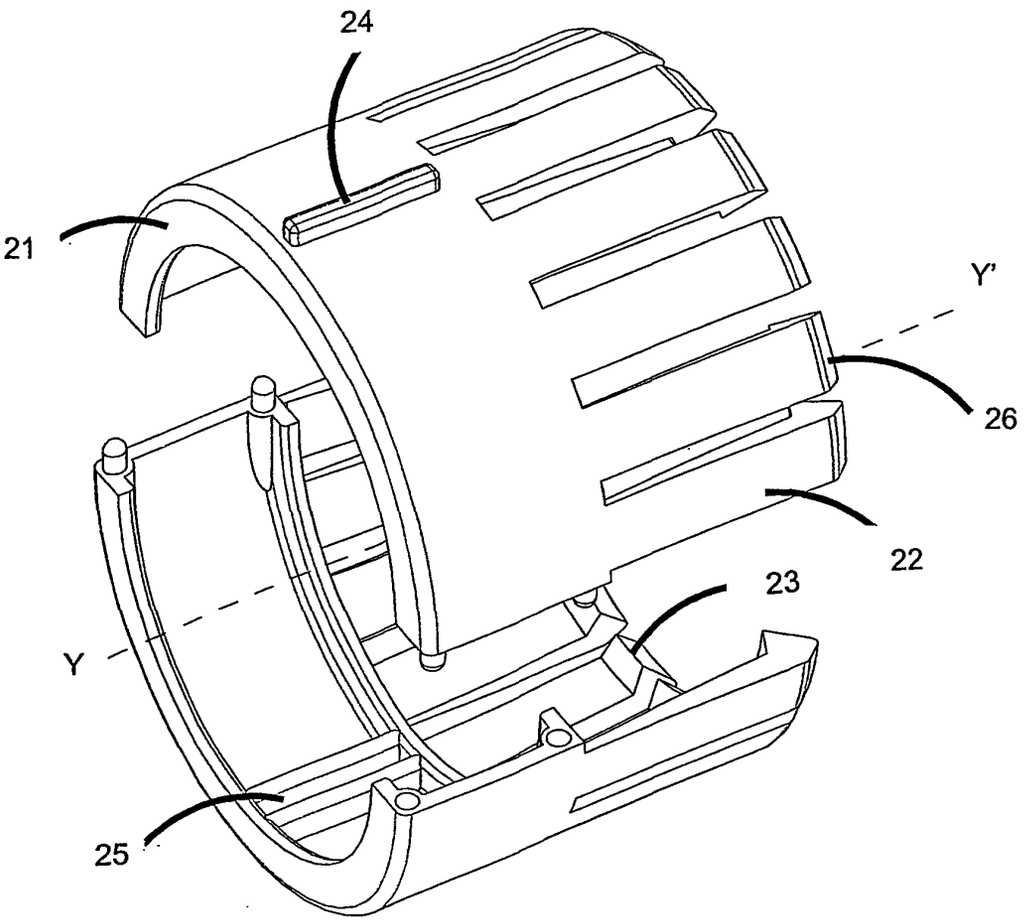

Fig. 4