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(54) **WIRE TO WIRE CONNECTOR AND METHOD FOR PROVIDING THE WIRE TO WIRE CONNECTOR**

**DRAHT-ZU-DRAHT VERBINDER UND VERFAHREN ZUR HERSTELLUNG DES DRAHT-ZU-DRAHT
VERBINDERS**

CONNECTEUR DE FIL À FIL ET PROCÉDÉ POUR FOURNIR LE CONNECTEUR DE FIL À FIL

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Description

Technical field

[0001] The present invention relates to a wire to wire connector, and a method for providing the wire to wire connector.

Background art

[0002] A wire to wire connector is used to realize a permanent connection between two single wires, or between corresponding conductors in two cables, and is widely used in fields such as motor vehicles, communications, consumer electronics, data processing and industrial machinery.

[0003] A wire to wire connector generally comprises a connector casing, and a wire or cable extending into the connector casing; a conductive core, i.e. conductor of the wire or cable is electrically connected to a conductive pin of the wire to wire connector. In general, it is necessary to ensure that there is a certain amount of stress cushioning for the wire or cable at the position where the wire or cable extends into the connector casing, to prevent excessive bending of the wire or cable at this position. In addition, there must be water resistance at the position where the wire or cable extends into the connector casing, to prevent water or moisture from entering the connector casing and affecting the electrical connection. Furthermore, a region of joining between a cable outer sheath and the connection casing must have a certain degree of visibility.

[0004] However, there is no wire to wire connector capable of meeting all three of these requirements in the prior art; some have water resistance, but lack visibility and stress release capability. Wire to wire connectors which meet the requirements for visibility and stress release capability lack sufficient water resistance, or their design does not even take this characteristic into consideration. In addition, it is not possible to ensure reliable fixing of the position, within the connector casing, of a conductive core and conductive pin of a wire or cable of a wire to wire connector in the prior art, and shifting of either one of the two in the connector casing will cause a bad electrical connection.

[0005] US 2011/0045696 A1 describes a connector comprising an inner casing, an outer casing, and a cable, wherein a female connector terminal is crimped to a conductor of the cable with an open wire barrel, and wherein an insulation wire barrel is crimped to an outer circumference of a rubber stopper fitted around an end of the cable. The outer casing is mechanically interlocked with the inner housing by means of locking protrusions provided at the inner housing. The rubber stopper includes a sealing part having lips, and a cushion extending from the sealing part, wherein sealing part and cushion are formed as one single piece. A similar connector is disclosed in WO 2015/142094 A1.

[0006] US 2015/0263445 A1 describes a connector comprising a plug housing and a cable extending into the plug housing. A conical element being composed of two half shells that surround the cable is arranged within the plug housing.

[0007] Further, EP 2 161 788 A1 discloses connector assembly including a boot body, a contact housing, and a contact. The boot body extends between a boot coupling end and a boot back end. The back end receives a cable that includes a conductor. The boot body defines an internal chamber. The contact housing extends between a housing mating end and a housing back end. The contact housing includes a housing coupling element between the housing mating end and the housing back end. The housing back end is coupled to the boot coupling end. The housing mating end is configured to mate with a mating connector to electrically connect the connector assembly and the mating connector. The contact is held in the housing and electrically connected to the conductor. An adhesive is disposed in the internal chamber to secure the boot body and the contact housing together.

[0008] It is hoped that a new wire to wire connector structure which solves the abovementioned technical problems can be provided.

Content of the invention

[0009] An object of the present invention is to provide a new wire to wire connector structure, which can not only ensure that there is sufficient water resistance at a position where a cable enters a connector casing, but can also prevent excessive bending of a wire or cable entering the connector casing at said position, as well as being able to ensure sufficient visibility of a region of joining between an outer sheath and the casing, and enables the positions of a conductive core of the cable and a pin in the connector casing to be fixed reliably so as to be unable to shift.

[0010] To this end, the present invention provides a wire to wire connector in accordance with claim 1.

[0011] The wire to wire connector of the invention comprises: a cable, comprising at least one conductive core and an insulator surrounding the at least one conductive core, with a core seal and a core plug being fitted round the insulator of each conductive core in an interference fit; a connector casing, defining a pin hole, with the cable extending into the connector casing from a near side of the connector casing in a longitudinal direction, and the core seal and core plug of the conductive core being fitted in an interfering manner to an inner surface, defining the pin hole, of the connector casing; and at least one pin, the pin comprising a pin body, a first crimping structure crimped to the core seal, a second crimping structure crimped to a conductive outer surface of the conductive core, and a stop structure preventing the pin from moving in the longitudinal direction. The wire to wire connector of the present invention further comprises an overmould-

ed casing that is overmoulded on at least a part of the connector casing and on a part of an outer sheath of the cable

[0012] According to the invention, the core seal has a length so as to overlap the corresponding conductive core, and so as to be located with its entire length within the connector casing with respect to the longitudinal direction. The core plug of the conductive core is closer than the core seal is to the near side of the connector casing in the longitudinal direction. The core plug has a first part fitted into the pin hole in an interfering manner, and a second part abutting an end face of the near side of the connector casing.

[0013] Preferably, each of the first crimping structure and the second crimping structure is at least one crimping clamping jaw projecting from the pin body. The stop structure comprises a first stop structure for preventing movement of the pin from a far side of the connector casing towards the near side in the longitudinal direction, and a second stop structure for preventing movement of the pin in the opposite direction, and correspondingly, the connector casing comprises a first stop protruding part and a second stop protruding part adapted to abut the first stop structure and the second stop structure respectively.

[0014] The present invention also provides a method in accordance with claim 6 for providing the wire to wire connector described above.

[0015] The provision of the crimping structure for the pin ensures the electrical connection between the pin and the conductive core and the firmness of the relationship therebetween; the provision of the stop structure for the pin ensures that the pin will not shift relative to the connector casing; the provision of the core seal and core plug on the conductive core ensures that external water and moisture will not enter the connector casing and so will not destroy the internal electrical connection, and also ensures that when overmoulding is performed, high pressure liquid will not enter the interior of the connector casing and cause shifting of the pin and the conductive core of the cable; and the provision of the overmoulded casing separate from the connector casing ensures the necessary visibility of the region of joining between the outer sheath and the casing, and ensures that there will not be excessive bending of the cable at the position of entry to the connector casing.

Description of the accompanying drawings

[0016] A more complete understanding of and familiarity with the abovementioned and other aspects of the present invention will be acquired through the following detailed explanation, which makes reference to the accompanying drawings, wherein:

Fig. 1 is a three-dimensional drawing of a wire to wire connector according to the present invention as a whole.

Fig. 2 is an exploded view of the wire to wire connector of fig. 1.

Fig. 3 is a front view of the wire to wire connector of fig. 1.

Fig. 4 is an enlarged longitudinal sectional view, obtained long line A-A, of a part of the wire to wire connector of fig. 3.

Figs. 5a - 5e are schematic diagrams of the steps of the method for providing a wire to wire connector according to the present invention.

Particular embodiments

[0017] A wire to wire connector according to the present invention is described below with reference to the accompanying drawings.

[0018] The wire to wire connector of the present invention may be a wire to wire connector for an eBike adapter, or may be used in various fields such as motor vehicles, electronics or machinery, as stated in the prior art. In addition, it should be understood that the figures merely show one example of the structure of the wire to wire connector of the present invention, and are not intended to limit the scope of protection of the present invention.

[0019] Referring to figs. 1 - 4, a wire to wire connector 100 of the present invention mainly comprises a connector casing 10, an overmoulded casing 20, a cable 30, and an internal conductive pin 70 (as shown in figs. 2 and 4). The cable 30 may be an optical cable or electrical cable of any form.

[0020] The connector casing 10 comprises a first connector casing part 110 and a second connector casing part 120. An outer profile of the second connector casing part 120 is contracted inwards in comparison with an outer profile of the first connector casing part 110. The connector casing 10 comprises a near side 125, close to the cable 30 and defined by the second connector casing part 120, and a far side 115, far from the cable 30 and defined by the first connector casing part 110; the near side 125 and far side 115 are opposite one another in a longitudinal direction L. A pin hole 15 (as shown in fig. 2) runs through the connector casing 10.

[0021] The cable 30 comprises an outer sheath 32, at least one e.g. multiple conductive cores 34 accommodated in the outer sheath 32, and an insulator 36 in which each conductive core 34 is sheathed. At one end of the cable 30 which enters the second connector casing part 120, a certain length of the outer sheath 32 is removed. On an electric cable section from which the outer sheath 32 has been removed, a shorter length of the insulator 36 is removed so as to reveal an exposed section of each conductive core 34, in preparation for making an electrical connection.

[0022] A core seal 40 and a core plug 50 are disposed on each conductive core 34. The core seal 40 and core

plug 50 are made of an insulating material, and not only form an interference fit with the insulator 36 of the conductive core 34, but also form an interference fit with an inner surface, defining the pin hole 15, of the second connector casing part 120. This structure not only fixes the conductive core 34 firmly in the connector casing 10, but can also have the effect of sealing the insulator 36 of the conductive core 34 against the inner surface of the connector casing 10.

[0023] Preferably, in order to enhance the fixing and sealing effects mentioned above, and furthermore prevent water or moisture from entering an electrical connection point of the conductive core 34 and the pin 70, the core seal 40 has a certain length overlapping both the conductive core 34 and the connector casing 10 in the longitudinal direction L, as shown in the exploded view of fig. 2 and in the sectional view of fig. 4, and this entire length is located in the connector casing 10, specifically in the second connector casing part 120. More preferably, the core seal 40 comprises an outwardly protruding interference part 46 forming an interference fit with the inner surface defining the pin hole 15 (fig. 2) and an inwardly protruding interference part 48 forming an interference fit with the conductive core 34 (fig. 4).

[0024] The core plug 50 has a first part 52 adapted to fit into the inner surface defining the pin hole 15 in an interfering manner, and a second part 54 adapted to abut an end face of the near side 125 of the second connector casing part 120. An outer profile of the first part 52 is smaller in dimensions than an outer profile of the second part 54.

[0025] The structures described above of the core plug 50 and the core seal 40 ensure the water resistance of electrical connection points inside the wire to wire connector 100 according to the present invention, and resolve the problem of possible shifting of the conductive core 34 of the cable 30 in the connector casing 10.

[0026] The interference fit structure and abutment structure of the core plug 50 also ensure that injection liquid does not enter the pin hole 15 of the connector casing 10 in the process of forming the overmoulded casing 20, thereby solving the technical problem that high liquid injection pressure during forming of the overmoulded casing 20 will cause shifting of the pin 70 and the conductive core 34, as stated in the prior art. The positions of the pin 70 and conductive core 34 in the pin hole 15 can be fixed reliably, so an electrical connection therebetween is more reliable.

[0027] According to the present invention, the pin 70 of the wire to wire connector 100 has a crimping structure for fixing the position of the pin 70 and realizing an electrical connection between the pin and the conductive core 34.

[0028] Specifically, as shown in figs. 2 and 4, the pin 70 comprises a pin body 75, a first crimping structure 72 for crimping to the core seal 40 of the conductive core 34, a second crimping structure 74 for crimping to the conductive core 34, a first stop structure 76 for preventing

shifting of the pin 70 from the far side 115 of the connector casing 10 towards the near side 125 in the longitudinal direction L, and a second stop structure 78 for preventing shifting of the pin 70 from the near side 125 of the connector casing 10 towards the far side 115 in the longitudinal direction L.

[0029] More specifically, the first crimping structure 72 is adapted to be crimped to a peripheral surface of the core seal 40 between a peripheral surface of the core seal 40 and the inner surface defining the pin hole 15. For example, the first crimping structure 72 may take the form of at least one clamping jaw projecting transversely from the pin body 75; for example, two, three or more clamping jaws are provided, in order to be reliably fixed in a press-fit to the peripheral surface of the core seal 40.

[0030] The second crimping structure 74 is crimped directly to a conductive outer surface of the conductive core 34, thereby establishing an electrical connection between the two. Similarly to the first crimping structure 72, the second crimping structure 74 may also take the form of at least one clamping jaw projecting transversely from the pin body 75; for example, two, three or more clamping jaws are provided, in order to be reliably fixed in a press-fit to a peripheral surface of the conductive core 34. In order to make the electrical connection between the pin 70 and the conductive core 34 firmer and more reliable, the dimensions of the second crimping structure 74 are designed so that there is a sufficiently large crimping area between the second crimping structure and the conductive core 34.

[0031] As shown in the figures, the first stop structure 76 is a stop arm structure which extends radially outwards and obliquely in the longitudinal direction L from the far side 115 towards the near side 125, starting at a peripheral surface of the pin 70. For example, there may be one, two or more stop arms. Correspondingly, the inner surface of the connector casing 10 that defines the pin hole 15 comprises an inwardly protruding part 66, and an end face 68 thereof is adapted to engage the first stop structure 76.

[0032] The second stop structure 78 takes the form of an inwardly protruding inclined face, adapted to abut an inwardly protruding inclined face 62 on the inner surface defining the pin hole 15.

[0033] Of course, those skilled the art will understand that the crimping structures and stop structures of the pin 70 are not limited to the specific structural forms described above and shown in the figures. On the contrary, any crimping structure and stop structure capable of realizing an expected function may be used.

[0034] According to the present invention, the provision of two crimping structures can ensure the correct position of the pin 70 of the wire to wire connector 100 according to the present invention in the pin hole 15, and a reliable electrical connection between the pin 70 and the conductive core 34 of the cable 30. The provision of two stop structures ensures that the pin 70 can be accurately mounted to the connector casing 10 and ensures

that the pin 70 cannot shift in the connector casing 10 in the longitudinal direction L.

[0035] A method for providing the wire to wire connector 100 according to the present invention is described below with reference to figs. 5a - 5e.

[0036] Fig. 5a shows a first step of the method, removing a certain length of the outer sheath 32 from the cable 30, and removing a shorter length of the insulator 36 on an electric cable section from which the outer sheath 32 has been removed, such that each conductive core 34 exposes a section of conductor in preparation for making an electrical connection.

[0037] In a second step shown in fig. 5b, a core seal 40 and a core plug 50 are fitted round each conductive core 34, specifically on the insulator 36 thereof.

[0038] Then, as shown in fig. 5c, the conductive core 34 is electrically connected to the pin 70. This step includes crimping the first crimping structure 72 of the pin 70 to the peripheral surface of the core seal 40 of the conductive core 34, and crimping the second crimping structure 74 to the conductive peripheral surface of the conductive core 34. In this way, an installation sub-assembly is formed.

[0039] In fig. 5d, the abovementioned sub-assembly A is mounted into the connector casing 10 from the near side 125 of the connector casing 10 in the longitudinal direction L. In this step, the entire sub-assembly A is moved into the pin hole 15 in the longitudinal direction L, until the second stop structure 78 of the pin 70 abuts the corresponding inclined face 62 of the connector casing 10; at the same time, the second stop structure 76, as an extending arm structure, engages the end face 68 of the inwardly protruding part 66. Due to this installation requirement, apart from the outer profile dimensions of the extending arm 76 of the pin 70, the outer profile dimensions of other parts of sub-assembly A should be smaller than the smallest inner profile dimensions of the inwardly protruding part 66 of the connector casing 10.

[0040] In a fifth step of the method shown in fig. 5e, each core plug 50 is moved towards the connector casing 10 along the insulator 36 of the conductive core 34, such that the first part 52 of the core plug 50 is fitted to an inner surface of the second connector casing part 120 in an interfering manner and such that the second part 54 of the core plug abuts an end face 122 of the near side 125 of the second connector casing part 120 (fig. 4).

[0041] Finally, as shown in fig. 5f, using overmoulding technology, the overmoulded casing 20 is formed on at least a part of the second connector casing part 120 and on a part of the cable 30, specifically the outer sheath 32. This step realizes reliable sealing between the connector casing 10, specifically the second connector casing part 120, and the outer sheath 32 of the cable 30; in addition, the injection moulded casing 20 can have the effect of stress release, such that the cable 30 will not be subjected to excessive bending stress, and at the same time, the visibility of the region of joining between the outer sheath and the casing is increased.

[0042] The present invention has been illustrated and described above with reference to multiple particular embodiments, but is not intended to be restricted to the details shown in the drawings.

Claims

1. Wire to wire connector (100), comprising:

a cable (30), comprising at least one conductive core (34), an insulator (36) surrounding the at least one conductive core (34) and an outer sheath (32), with a core seal (40) and a core plug (50) being fitted round the insulator (36) of each conductive core (34) in an interference fit; a connector casing (10), defining a pin hole (15), with the cable (30) extending into the connector casing (10) from a near side (125) of the connector casing (10) in a longitudinal direction (L), and the core seal (40) and the core plug (50) of the conductive core (34) being fitted in an interfering manner to an inner surface defining the pin hole (15) of the connector casing (10), wherein the core seal (40) has a length so as to overlap the corresponding conductive core (34) in the longitudinal direction (L) and so as to be located with its entire length within the connector casing (10) with respect to the longitudinal direction (L), wherein the core plug (50) of the conductive core (34) is closer than the core seal (40) is to the near side (125) of the connector casing (10) in the longitudinal direction (L), and wherein the core plug (50) has a first part (52) fitted into the pin hole (15) in an interfering manner, and a second part (54) abutting an end face (122) of the near side (125) of the connector casing (10), wherein the core seal (40) and the core plug (50) are made of an insulating material; at least one pin (70), the pin (70) comprising a pin body (75), a first crimping structure (72) crimped to the core seal (40), a second crimping structure (74) crimped to a conductive outer surface of the conductive core (34), and a stop structure preventing the pin (70) from moving in the longitudinal direction (L); and an overmoulded casing (20) that is overmoulded on at least a part of the connector casing (10) and on a part of the outer sheath (32) of the cable (30).

2. Wire to wire connector (100) according to any one of Claim 1, wherein each of the first crimping structure (72) and the second crimping structure (74) is at least one crimping clamping jaw projecting from the pin body (75).

3. Wire to wire connector (100) according to any one

of Claims 1 or 2, wherein the stop structure comprises a first stop structure (76) for preventing movement of the pin (70) from a far side (115) of the connector casing (10) towards the near side (125) in the longitudinal direction (L), and a second stop structure (78) for preventing movement of the pin (70) in the opposite direction, and correspondingly, the connector casing (10) comprises a first stop protruding part and a second stop protruding part adapted to abut the first stop structure (76) and the second stop structure (78) respectively.

4. Wire to wire connector (100) according to any one of Claims 1-3, wherein the connector casing (10) has a first connector casing part (110) defining the far side (115), and a second connector casing part (120) defining the near side (125) and the pin hole (15), wherein the second connector casing part (120) has an outer profile that defines an outer diameter that is smaller than an outer diameter defined by an outer profile of the first casing part (110).

5. Method for providing the wire to wire connector (100) according to any one of Claims 1 - 4, comprising:

removing a certain length of the outer sheath (32) and the insulator (36) from the cable (30), such that each conductive core (34) exposes a section of conductor in preparation for making an electrical connection;

fitting the core seal (40) and the core plug (50) round the insulator (36) of the conductive core (34), wherein the core seal (40) and the core plug (50) are made of an insulating material; crimping the conductive core (34) to the pin (70) so as to fix the two together and establish an electrical connection therebetween;

mounting the connector casing (10) from the near side (125) of the connector casing (10) in the longitudinal direction (L), until the pin (70) and the connector casing (10) cannot move further relative to each other;

moving the core plug (50) towards the connector casing (10) along the insulator (36) of the conductive core (34), until the core plug (50) cannot move further; and

forming the overmoulded casing (20) by overmoulding on at least a part of the connector casing (10) and on a part of the outer sheath (32) of the cable (30).

6. Method according to Claim 5, wherein a crimping step comprises crimping a first crimping structure (72) of the pin (70) onto a peripheral surface of the core seal (40) of the conductive core (34), and crimping a second crimping structure (74) onto a conductive peripheral surface of the conductive core (34).

Patentansprüche

1. Draht-zu-Draht-Verbinder (100), der Folgendes umfasst:

ein Kabel (30), umfassend zumindest einen leitfähigen Kern (34), einen Isolator (36), der den zumindest einen leitfähigen Kern (34) umgibt, und eine äußere Ummantelung (32), mit einer Kernabdichtung (40) und einem Kernstopfen (50), die rund um den Isolator (36) jedes leitfähigen Kerns (34) in einer Übermaßpassung angebracht sind;

ein Verbindergehäuse (10), ein Stiftloch (15) definierend, wobei sich das Kabel (30) von einer nahen Seite (125) des Verbindergehäuses (10) in einer Längsrichtung (L) in das Verbindergehäuse (10) erstreckt, und wobei die Kernabdichtung (40) und der Kernstopfen (50) des leitfähigen Kerns (34) in einer überlagernden Weise an einer inneren Oberfläche eingepasst werden, das Stiftloch (15) des Verbindergehäuses (10) definierend, wobei die Kernabdichtung (40) eine Länge aufweist, um den entsprechenden leitfähigen Kern (34) in der Längsrichtung (L) zu überlappen und um so mit seiner gesamten Länge innerhalb des Verbindergehäuses (10) bezüglich der Längsrichtung (L) befindlich zu sein, wobei der Kernstopfen (50) des leitfähigen Kerns (34) näher als die Kernabdichtung (40) an der nahen Seite (125) des Verbindergehäuses (10) in der Längsrichtung (L) ist und wobei der Kernstopfen (50) einen ersten Teil (52), der in einer überlagernden Weise im Stiftloch (15) eingepasst ist, und einen zweiten Teil (54), der an einer Endfläche (122) der nahen Seite (125) des Verbindergehäuses (10) anliegt, aufweist, wobei die Kernabdichtung (40) und der Kernstopfen (50) aus einem isolierenden Material gefertigt sind;

zumindest einen Stift (70), wobei der Stift (70) einen Stiftkörper (75), eine erste Verpressstruktur (72), an der Kernabdichtung (40) verpresst, eine zweite Verpressstruktur (74), an einer leitfähigen äußeren Oberfläche des leitfähigen Kerns (34) verpresst, und eine Anschlagstruktur, die den Stift (70) daran hindert, sich in Längsrichtung (L) zu bewegen, umfasst; und ein überformtes Gehäuse (20), das an zumindest einem Teil des Verbindergehäuses (10) und an einem Teil der äußeren Ummantelung (32) des Kabels (30) überformt ist.

2. Draht-zu-Draht-Verbinder (100) nach Anspruch 1, wobei jede aus der ersten Verpressstruktur (72) und der zweiten Verpressstruktur (74) zumindest eine verpressende Klemmbacke ist, die aus dem Stiftkörper (75) herausragt.

3. Draht-zu-Draht-Verbinder (100) nach einem der Ansprüche 1 oder 2, wobei die Anschlagsstruktur eine erste Anschlagsstruktur (76) zum Verhindern von Bewegung des Stifts (70) von einer fernen Seite (115) des Verbindergehäuses (10) hin zur nahen Seite (125) in der Längsrichtung (L) und eine zweite Anschlagsstruktur (78) zum Verhindern von Bewegung des Stifts (70) in der entgegengesetzten Richtung umfasst, und wobei, entsprechend, das Verbindergehäuse (10) einen ersten herausragenden Anschlagsteil und einen zweiten herausragenden Anschlagsteil umfasst, die dazu angepasst sind, an der ersten Anschlagsstruktur (76) bzw. der zweiten Anschlagsstruktur (78) anzuliegen.
4. Draht-zu-Draht-Verbinder (100) nach einem der Ansprüche 1-3, wobei das Verbindergehäuse (10) einen ersten Verbindergehäuseteil (110), der die ferne Seite (115) definiert, und einen zweiten Verbindergehäuseteil (120), der die nahe Seite (125) und das Stiffloch (15) definiert, aufweist, wobei der zweite Verbindergehäuseteil (120) ein äußeres Profil aufweist, das einen äußeren Durchmesser definiert, der kleiner als ein äußerer Durchmesser ist, der durch ein äußeres Profil des ersten Verbindergehäuseteils (110) definiert ist.
5. Verfahren zum Bereitstellen des Draht-zu-Draht-Verbinders (100) nach einem der Ansprüche 1-4, das Folgendes umfasst:
- Entfernen einer gewissen Länge der äußeren Ummantelung (32) und des Isolators (36) vom Kabel (30), sodass jeder leitfähige Kern (34) einen Abschnitt von Leiter exponiert in Vorbereitung der Herstellung einer elektrischen Verbindung;
- Anbringen der Kernabdichtung (40) und des Kernstopfens (50) rund um den Isolator (36) des leitfähigen Kerns (34), wobei die Kernabdichtung (40) und der Kernstopfen (50) aus einem isolierenden Material gefertigt sind;
- Verpressen des leitfähigen Kerns (34) mit dem Stift (70), um die beiden zusammen zu fixieren und eine elektrische Verbindung dazwischen herzustellen;
- Montieren des Verbindergehäuses (10) von der nahen Seite (125) des Verbindergehäuses (10) in der Längsrichtung (L), bis der Stift (70) und das Verbindergehäuse (10) sich nicht weiter relativ zueinander bewegen können;
- Bewegen des Kernstopfens (50) hin zum Verbindergehäuse (10) entlang des Isolators (36) des leitfähigen Kerns (34), bis der Kernstopfen (50) sich nicht weiter bewegen kann; und
- Bilden des überformten Gehäuses (20) durch Überformen an zumindest einem Teil des Verbindergehäuses (10) und an einem Teil der äu-

ßeren Ummantelung (32) des Kabels (30).

6. Verfahren nach Anspruch 5, wobei ein Verpressungsschritt Verpressen einer ersten Verpressstruktur (72) des Stifts (70) an einer peripheren Oberfläche der Kernabdichtung (40) des leitfähigen Kerns (34) und Verpressen einer zweiten Verpressstruktur (74) an einer leitfähigen peripheren Oberfläche des leitfähigen Kerns (34) umfasst.

Revendications

1. Connecteur de fil à fil (100), comprenant :

un câble (30), comprenant au moins une âme conductrice (34), un isolant (36) entourant l'au moins une âme conductrice (34) et une gaine externe (32), avec un joint d'âme (40) et une fiche d'âme (50) étant disposés autour de l'isolant (36) de chaque âme conductrice (34) dans un ajustement avec serrage ;

un boîtier de connecteur (10), définissant un trou de broche (15), avec le câble (30) s'étendant dans le boîtier de connecteur (10) depuis un côté proche (125) du boîtier de connecteur (10) dans une direction longitudinale (L), et le joint d'âme (40) et la fiche d'âme (50) de l'âme conductrice (34) étant ajustés de manière serrée avec une surface interne définissant le trou de broche (15) du boîtier de connecteur (10), dans lequel le joint d'âme (40) a une longueur de manière à chevaucher l'âme conductrice (34) correspondante dans la direction longitudinale (L) et de manière à être situé dans toute sa longueur à l'intérieur du boîtier de connecteur (10) par rapport à la direction longitudinale (L), dans lequel la fiche d'âme (50) de l'âme conductrice (34) est plus proche que le joint d'âme (40) du côté proche (125) du boîtier de connecteur (10) dans la direction longitudinale (L), et dans lequel la fiche d'âme (50) a une première partie (52) ajustée dans le trou de broche (15) de manière serrée, et une seconde partie (54) en butée contre une face d'extrémité (122) du côté proche (125) du boîtier de connecteur (10), dans lequel le joint d'âme (40) et la fiche d'âme (50) sont constitués d'un matériau isolant ;

au moins une broche (70), la broche (70) comprenant un corps de broche (75), une première structure de sertissage (72) sertie au joint d'âme (40), une seconde structure de sertissage (74) sertie à une surface externe conductrice de l'âme conductrice (34), et une structure d'arrêt empêchant la broche (70) de se déplacer dans la direction longitudinale (L) ; et

un boîtier surmoulé (20) qui est surmoulé sur au moins une partie du boîtier de connecteur (10)

- et sur une partie de la gaine externe (32) du câble (30).
2. Connecteur de fil à fil (100) selon l'une quelconque de la revendication 1, dans lequel chacune de la première structure de sertissage (72) et de la seconde structure de sertissage (74) est au moins une mâchoire de serrage par sertissage faisant saillie depuis le corps de broche (75). 5
 3. Connecteur de fil à fil (100) selon l'une quelconque des revendications 1 ou 2, dans lequel la structure d'arrêt comprend une première structure d'arrêt (76) pour empêcher un déplacement de la broche (70) d'un côté éloigné (115) du boîtier de connecteur (10) vers le côté proche (125) dans la direction longitudinale (L), et une seconde structure d'arrêt (78) pour empêcher un déplacement de la broche (70) dans la direction opposée, et de manière correspondante, le boîtier de connecteur (10) comprend une première partie saillante d'arrêt et une seconde partie saillante d'arrêt adaptées pour venir en butée contre la première structure d'arrêt (76) et la seconde structure d'arrêt (78) respectivement. 10 20 25
 4. Connecteur de fil à fil (100) selon l'une quelconque des revendications 1 à 3, dans lequel le boîtier de connecteur (10) a une première partie de boîtier de connecteur (110) définissant le côté éloigné (115), et une seconde partie de boîtier de connecteur (120) définissant le côté proche (125) et le trou de broche (15), dans lequel la seconde partie de boîtier de connecteur (120) a un profil externe qui définit un diamètre externe qui est inférieur à un diamètre externe défini par un profil externe de la première partie de boîtier (110). 30 35
 5. Procédé pour fournir le connecteur de fil à fil (100) selon l'une quelconque des revendications 1 à 4, comprenant : 40

le retrait d'une certaine longueur de la gaine externe (32) et de l'isolant (36) du câble (30), de telle sorte que chaque âme conductrice (34) expose une section de conducteur en préparation d'une connexion électrique ; 45

l'ajustement du joint d'âme (40) et de la fiche d'âme (50) autour de l'isolant (36) de l'âme conductrice (34), dans lequel le joint d'âme (40) et la fiche d'âme (50) sont constitués d'un matériau isolant ; 50

le sertissage de l'âme conductrice (34) à la broche (70) de manière à fixer les deux ensemble et à établir une connexion électrique entre elles ; 55

le montage du boîtier de connecteur (10) depuis le côté proche (125) du boîtier de connecteur (10) dans la direction longitudinale (L), jusqu'à ce que la broche (70) et le boîtier de connecteur

(10) ne puissent pas se déplacer davantage l'un par rapport l'autre ;

le déplacement de la fiche d'âme (50) vers le boîtier de connecteur (10) le long de l'isolant (36) de l'âme conductrice (34), jusqu'à ce que la fiche d'âme (50) ne puisse pas se déplacer davantage ; et

la formation du boîtier surmoulé (20) par surmoulage sur au moins une partie du boîtier de connecteur (10) et sur une partie de la gaine externe (32) du câble (30).

6. Procédé selon la revendication 5, dans lequel une étape de sertissage comprend le sertissage d'une première structure de sertissage (72) de la broche (70) sur une surface périphérique du joint d'âme (40) de l'âme conductrice (34), et le sertissage d'une seconde structure de sertissage (74) sur une surface périphérique conductrice de l'âme conductrice (34).

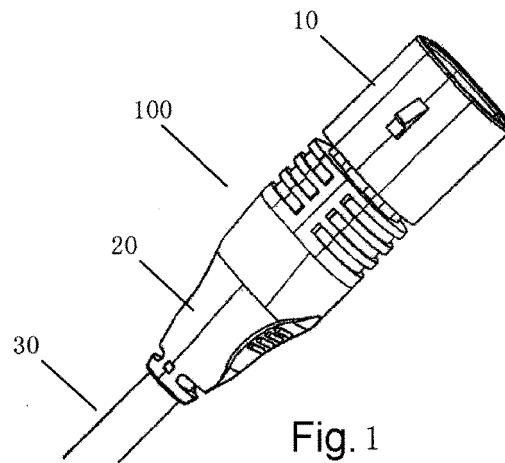


Fig. 1

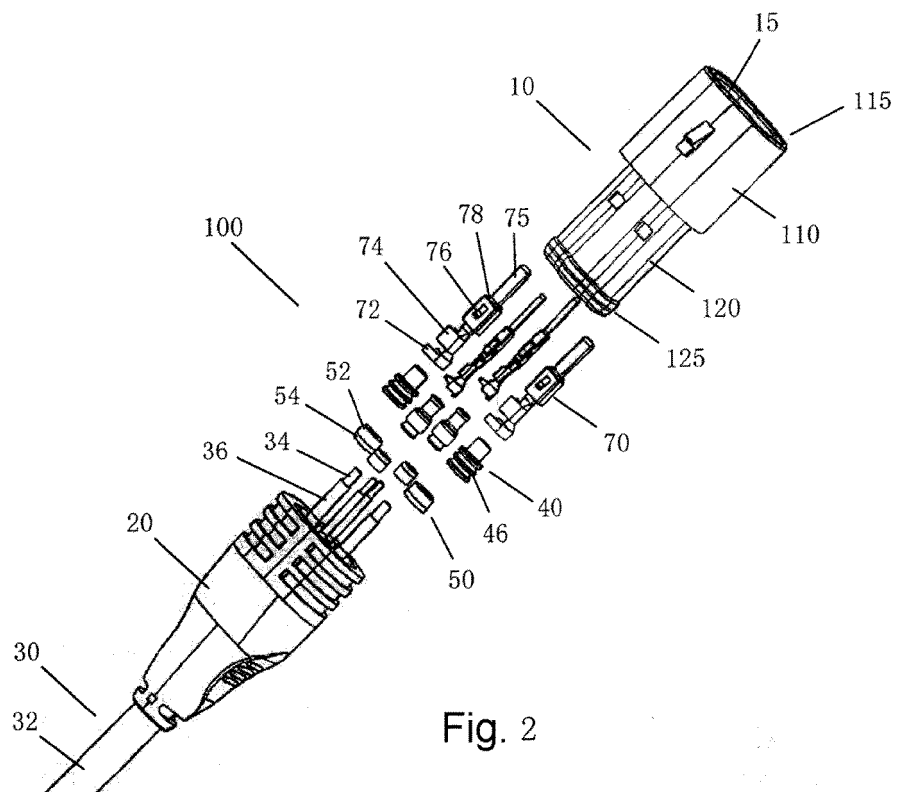


Fig. 2

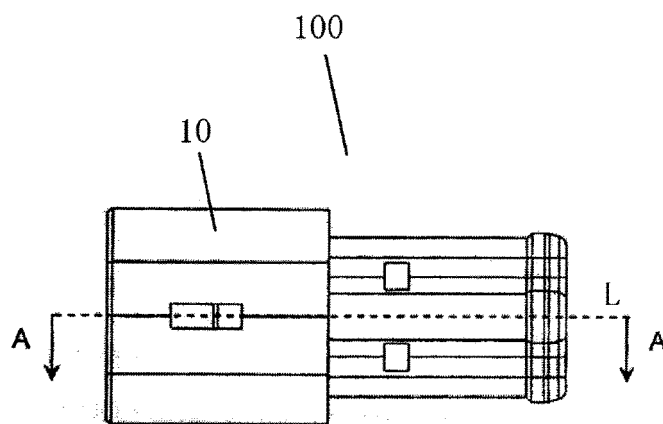


Fig. 3

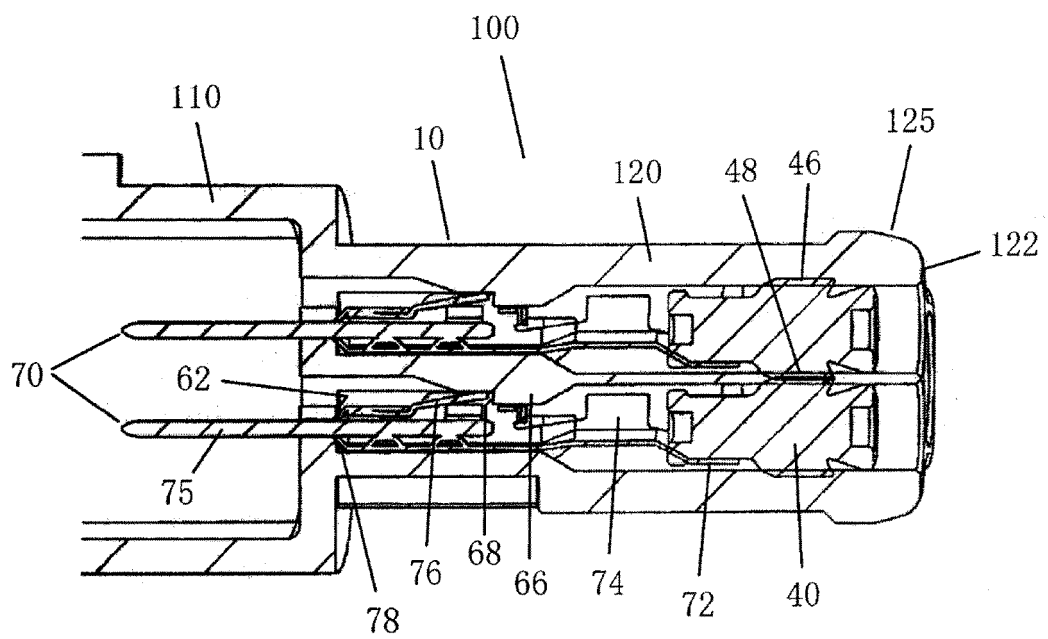


Fig. 4

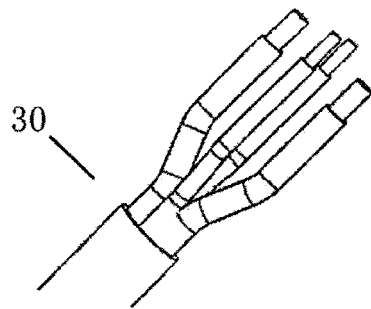


Fig. 5a

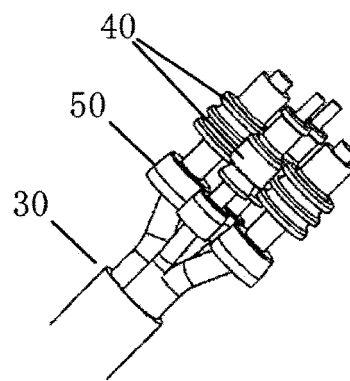


Fig. 5b

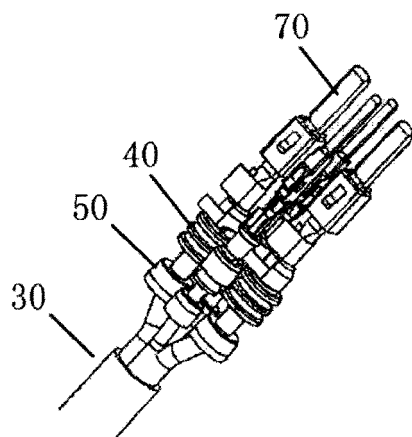


Fig. 5c

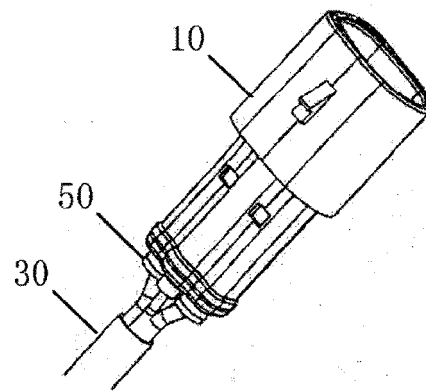


Fig. 5d

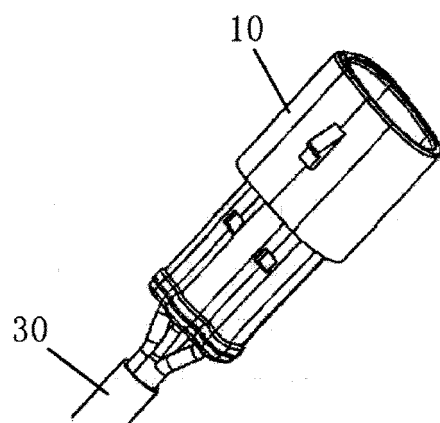


Fig. 5e

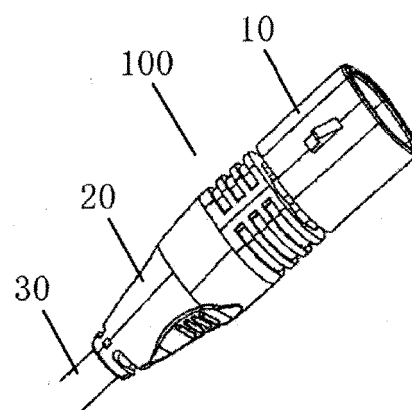


Fig. 5f

REFERENCES CITED IN THE DESCRIPTION

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