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(54) MULTIPOLE CONNECTOR FOR THE ELECTRICAL INTERCONNECTION OF ELECTRICAL CABLES

MEHRPOLIGER STECKVERBINDER ZUR ELEKTRISCHEN VERBINDUNG VON ELEKTRISCHEN KABELN

CONNECTEUR MULTIPOLAIRE POUR L'INTERCONNEXION ÉLECTRIQUE DE CÂBLES ÉLECTRIQUES

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Description

Technical Field

[0001] The present invention relates to a multipole connector for the electrical interconnection of electrical cables.

Background Art

[0002] To connect two electrical cables two terminals are generally used, a male and a female one mutually coupleable.

[0003] The extremity of each electrical cable, stripped of its insulating sheathing, is inserted into an appropriate housing of the relative terminal where, by means of a screw or spring mechanical system, the electrical cable is locked mechanically whilst ensuring, at the same time, the closure of the relative electrical circuit.

[0004] The terminals having a screw clamping mechanism are the most common connection method wherein the electrical cable stripped of its insulating sheathing is secured to the terminal by means of a screw.

[0005] The screw tightening and loosening operations are practical and easy and are performed with the aid of a screwdriver or the like.

[0006] The terminals with a spring mechanism generally consist of a first portion provided with a spring, for the connection to the electrical cable, and of a second portion provided with a pin (in case of male terminals) or a pit (in case of female terminals), for the connection to the other terminal.

[0007] In the event of several electrical cables having to be placed in electrical interconnection at the same time, the use is known of multipole connectors wherein, e.g., a first multipole connector internally contains a plurality of male terminals and a second multipole connector internally contains a plurality of female terminals.

[0008] Each connector has a series of hollow portions inside which the terminals are housed and, when two connectors are coupled, the hollow portions of one mate by interlocking with the hollow portions of the other connector so that the male terminals come into contact with the female terminals by closing the various electrical circuits corresponding to the relative electrical cables.

[0009] For the wiring of the electrical cables and their connection to the terminals contained inside the connectors, the conventional multipole connectors have suitable openings wherein the electrical cables are inserted as far as its extremity is interlocked inside the terminals by means of clamping springs or screws.

[0010] These connectors of known type have several drawbacks.

[0011] The absence of an adequate protection at the coupling of two multipole connectors, comprising male terminals and female terminals respectively, to which the electrical cables under tension are connected, contributes to the formation of moisture caused by the temper-

ature variations due to the current flowing along the cables.

[0012] These temperature variations result in pressure variations that allow moisture that is formed at the coupling of the connectors to transfer along the cables, generating over-currents that reach the devices connected to them, thus causing damages and/or breakages of the same.

[0013] To obviate at least in part to these drawbacks, a type of connector is known which provides for the filling by means of a sealing substance inside each hollow portion of the connectors containing the individual terminals.

[0014] The sealing substance, in practice, forms a barrier layer at the coupling of the connectors that prevents the moisture from being transferred towards the devices connected to them.

[0015] This embodiment has the drawback of having to fill each single hollow portion of the connectors, with a related complexity of the filling operations. Alternatively it is known to entirely wrap the connectors at the outside which are connected to each other with a layer of sealing substance that prevents the moisture from passing and propagating along the electrical cables.

[0016] In this case the wrapping operation with the sealing substance is faster than the previously described solution, but has the drawback of having to strip the entire layer of sealing substance any time one needs to disconnect the connectors, with a certain waste of time and costs tied to the new material used.

[0017] Other connectors are known from US 5 630 732, which discloses a multipole connector according to the preamble of claim 1, WO 2012/050238, JP 2012 089340 and DE 10 2011 006928.

Description of the Invention

[0018] The main aim of the present invention is to provide a multipole connector for the electrical interconnection of electrical cables with a structure such as to protect the connectors from the effects of moisture that forms inside them and propagates along the cables connected to them.

[0019] One object of the present invention is to simplify the manufacture and assembly of the connectors, thus reducing the difficulties of installation and wiring of the electrical cables.

[0020] Another object of the present invention is to provide a multipole connector for the electrical interconnection of electrical cables which allows to overcome the mentioned drawbacks of the prior art within the ambit of a simple, rational, easy, effective to use and affordable solution.

[0021] The above mentioned objects are achieved by the present multipole connector for the electrical interconnection of electrical cables having the characteristics of claim 1.

Brief Description of the Drawings

[0022] Other characteristics and advantages of the present invention will become better evident from the description of a preferred, but not exclusive, embodiment of a multipole connector for the electrical interconnection of electrical cables, illustrated by way of an indicative, but non-limiting, example in the accompanying drawings, wherein:

Figure 1 is an exploded view of the connector according to the invention;
 Figure 2 is an exploded view, from another angle, of the connector according to the invention;
 Figure 3 is an axonometric view of the connector according to the invention in an assembly configuration;
 Figure 4 is a sectional view of the connector according to the invention in an assembly configuration.

Embodiments of the Invention

[0023] With particular reference to such figures, reference number 1 globally indicates a multipole connector for the electrical interconnection of electrical cables.

[0024] The connector 1 comprises a containment body 2 made of an electrically insulating material able to house a plurality of terminals 3 made of an electrically conductive material which are connectable to a corresponding plurality of electrical cables 4.

[0025] The electrically insulating material of which the containment body 2 is made is a plastic material, e.g. of the polyamide type or the like; the electrically conductive material of which the terminals 3 are made, instead, is e.g. phosphor bronze or nickel-plated brass.

[0026] The containment body 2 comprises a plurality of housing cavities 5 able to insert the terminals 3 inside them and is, furthermore, coupleable to the containment body 2 of another connector 1.

[0027] Conveniently, the housing cavities 5 are communicating with each other.

[0028] The connector 1 comprises at least a closing element 6 made of an electrically insulating material able to close the containment body 2 after the terminals 3 have been inserted. According to the present invention, at least one of the containment body 2 and the closing element 6 comprises at least a through hole 7 able to communicate with at least one of the housing cavities 5 for the introduction of at least a sealing substance S for sealing the housing cavities 5.

[0029] In the embodiment shown in the figures, the through hole 7 is formed on the closing element 6 in a substantially central position.

[0030] The containment body 2 has a substantially tubular shape and comprises a central axis A that extends longitudinally to the entire containment body itself, a first open axial extremity 8, a second open axial extremity 9 and at least a median plane B, arranged transversely to

the central axis A, arranged between the first open axial extremity 8 and the second open axial extremity 9 and on which is formed a transversal base 10 having passage openings 11.

[0031] The terminals 3 are inserted into the housing cavities 5 through the first open axial extremity 8 making them slide along a direction of insertion parallel to the central axis A, and are positionable in an assembly configuration wherein they pass through the passage openings 11.

[0032] In the embodiment shown in the figures, the terminals 3 comprise at least a first end portion 12 and a second end portion 13.

[0033] In particular, the first end portion 12 comprises at least an inlet seat 14 associable with one of the electrical cables 4, while the second end portion 13 is able to couple to the second end portion 13 of the terminals 3 of another connector 1.

[0034] More in detail, the electrical connection of a single electrical cable 4 to the first end portion 12 is by means of a fixing element 15 which is associated by screwing with the inlet seat 14, maintaining a fixed and stable connection between the electrical cable 4 and the first end portion 12.

[0035] Preferably, the fixing element 15 is made up e.g. of a tightening screw. Alternative embodiments cannot however be ruled out wherein the fixing element 15 has a different structure, e.g. of the type of a spring fixing element. In the embodiment shown in the figures, the containment body 2 comprises a plurality of lateral openings 16.

[0036] Conveniently, each of the lateral openings 16 is formed at each housing cavity 5 to allow lateral access to the housing cavities themselves and to the first end portions 12 housed in them.

[0037] In particular, each of the lateral openings 16 allows the insertion of the fixing element 15 along a direction transversal to the central axis A, which associates by screwing with the inlet seat 14.

[0038] The containment body 2 comprises at least a housing seat 17 at least partially hollow able to house at least partially the closing element 6.

[0039] Advantageously, the housing seat 17 has a tubular shape and is placed substantially at the center of the containment body 2 along the central axis A. The housing seat 17 extends substantially between the first open axial extremity 8 and the transversal base 10.

[0040] In the embodiment shown in the figures, the housing seat 17 comprises at least a slit 18 able to put the housing seat 17 in communication with the housing cavities 5.

[0041] Conveniently, the slit 18 extends along the entire length of the housing seat 17. In the embodiment shown in the figures, the housing seat 17 comprises a plurality of slits 18.

[0042] In particular, the housing seat 17 has a slit 18 for each housing cavity 5, by doing so the housing cavities 5 communicate with each other thanks to the housing

seat 17 and to the slits 18.

[0043] Similarly to the housing seat 17, the housing cavities 5 also extend longitudinally to the central axis A and are defined between the transversal base 10 and the first open axial extremity 8.

[0044] More in detail, the housing seat 17 is located at the center of the housing cavities 5, which are arranged circularly around the housing seat itself. Alternative embodiments cannot however be ruled out wherein the housing seat 17 and the housing cavities 5 are arranged differently.

[0045] The passage openings 11 are formed at the housing cavities 5 and, in the assembly configuration, the first end portions 12 are arranged inside the housing cavities 5 and the second end portions 13 are arranged through the passage openings 11.

[0046] The containment body 2 comprises at least a protrusion 19 defined between the transversal base 10 and the second open axial extremity 9 and able to contain at least one of the second end portions 13.

[0047] In the particular embodiment shown in the figures, the containment body 2 comprises a plurality of protrusions 19, which extend longitudinally to the central axis A, and each housing cavity 5 is communicating with a relative protrusion 19 by means of the passage openings 11.

[0048] More in detail, the protrusions 19 have a tubular shape and are substantially hollow to contain the second end portions 13.

[0049] The protrusions 19 are intended to couple to the protrusions 19 of another connector 1 and which have a complementary shape, to allow a prismatic coupling.

[0050] In practice, the connection between a first connector 1 and a second connector 1 consists both in the coupling between the second end portions 13 of the first connector 1 and the second end portions 13 of the second connector 1 and in the interlocking coupling of the protrusions 19 of the first connector 1 to the protrusions 19 of the second connector 1, obtaining in this way the electrical and mechanical connection between the connectors 1.

[0051] The closing element 6 comprises at least a transversal partition 20 for closing the first open axial extremity 8 and at least an elongated body 21 which is insertable inside the housing seat 17 and along which the through hole 7 is formed.

[0052] Conveniently, the transversal partition 20 has an orientation substantially orthogonal to the central axis A and has a substantially circular shape with dimensions substantially coincident with the dimensions of the first open axial extremity 8 and the containment body 2.

[0053] Advantageously, in the embodiment shown in the figures, the transversal partition 20 comprises a plurality of slots 22, each of which is positionable at a housing cavity 5.

[0054] In particular, the slots 22 are openings of the transversal partition 20 which allow the passage of the electrical cables 4 inside the housing cavities 5 for the

connection of the electrical cables themselves to the first end portions 12.

[0055] The elongated body 21 is substantially hollow and the through hole 7, which is located in its interior, extends along the entire length of the elongated body itself.

[0056] In the embodiment shown in the figures, the elongated body 21 comprises an end side 23 and the length of the elongated body 21 is defined between the transversal partition 20 and the end side 23.

[0057] In particular, the length of the elongated body 21 has a smaller extension than the extension of the housing seat 17 and, in the assembly configuration, this difference defines a containing space 24, which extends between the end side 23 and the transversal base 10, communicating with the through hole 7.

[0058] The elongated body 21 comprises at least an abutment rib 25 insertable into the slits 18.

[0059] The abutment rib 25 has a substantially parallelepiped shape and extends along almost the entire length of the elongated body 21.

[0060] In the embodiment shown in the figures, the elongated body 21 comprises a plurality of abutment ribs 25, each of which is insertable into a corresponding slit 18.

[0061] The containment body 2 comprises a plurality of spacing elements 26 able to come into contact with the terminals 3.

[0062] In the embodiment shown in the figures, the spacing elements 26 are arranged on the transversal base 10 and at each housing cavity 5.

[0063] More in detail, inside each housing cavity 5 there is a plurality of spacing elements 26 arranged on the transversal base 10 and around the passage openings 11 so as not to obstruct the passage openings themselves.

[0064] In the assembly configuration the first end portions 12 rest on the spacing elements 26 and, remaining spaced away from the transversal base 10, define a sealing interspace 27 communicating with the through hole 7.

[0065] The sealing interspace 27 consists in practice in a substantially empty space that extends inside the housing cavities 5 and its dimensions are defined by the thickness of the spacing elements 26.

[0066] Conveniently, inside the through hole 7 is introduced the sealing substance S, substantially of the type of an artificial resin in the liquid state, which deposits inside the sealing interspace 27.

[0067] More in detail, through the solidification of the sealing substance S, the sealing of the housing cavities 5 is obtained and, at least, of their part arranged in the proximity of the transversal base 10 so as to seal the passage openings 11.

[0068] The operation of the present invention is as follows.

[0069] Each terminal 3 is inserted inside a housing cavity 5 along a direction of insertion longitudinal to the central axis A, wherein the first end portions 12 are in contact

with the spacing elements 26 in the assembly configuration.

[0070] Once the terminals 3 have been inserted, the closing element 6 is positioned at the first open axial extremity 8 and the elongated body 21 is inserted inside the housing seat 17 along a direction longitudinal to the central axis A.

[0071] This way, the terminals 3 are locked inside the housing cavities 5 in a fixed position.

[0072] At this point, the sealing substance S is injected inside the through hole 7, flows into the containing space 24 and spreads in the sealing interspace 27.

[0073] After the sealing substance S has solidified, the electrical cables 4 can be connected to the terminals 3 through the screwing of the fixing elements 15 inside each inlet seat 14 of the terminals 3.

[0074] It has in practice been found how the described invention achieves the intended objects and in particular the fact is underlined that the structure of the multipole connector introduced in the present invention is more effective both in terms of protection from moisture at the coupling between male connectors and female connectors, and in terms of reduction in the manufacturing time of the protection itself, which is obtained by performing a single injection of the sealing substance in the liquid state inside the through hole.

[0075] In particular, there is a considerable reduction in the time and complexity of the sealing substance insertion operations inside the housing cavities, also improving the performance of the connectors themselves.

[0076] Furthermore, the invention described above allows to intervene on the electrical cable connections with the terminals, without the need to replace the connector in case of malfunctioning.

Claims

1. Multipole connector (1) for the electrical interconnection of electrical cables (4) comprising:

- a containment body (2) made of an electrically insulating material able to house a plurality of terminals (3) made of an electrically conductive material connectable to a corresponding plurality of electrical cables (4), said containment body (2) comprising a plurality of housing cavities (5) able to insert said terminals (3) and being coupleable to the containment body (2) of another connector (1);
- at least a closing element (6) made of an electrically insulating material able to close said containment body (2) after said terminals (3) have been inserted;

wherein:

- said housing cavities (5) are communicating

with each other;

- at least one of said containment body (2) and said closing element (6) comprises at least a through hole (7) able to communicate with at least one of said housing cavities (5) for the introduction of at least a sealing substance (S) for sealing said housing cavities (5);

- said containment body (2) comprises a central axis (A), a first open axial extremity (8), a second open axial extremity (9) and at least a median plane (B) positioned between said first open axial extremity (8) and said second open axial extremity (9) and on which is formed a transversal base (10) having passage openings (11), said terminals (3) being insertable into said housing cavities (5) through said first open axial extremity (8) and being positionable in an assembly configuration wherein they pass through said passage openings (11); and

- said containment body (2) comprises at least a housing seat (17) at least partially hollow able to house at least partially said closing element (6);

characterized by the fact that said closing element (6) comprises at least a transversal partition (20) for closing said first open axial extremity (8) and at least an elongated body (21) which is insertable into said housing seat (17) and along which said through hole (7) is formed.

2. Connector (1) according to claim 1, **characterized by** the fact that said terminals (3) comprise at least a first end portion (12) and a second end portion (13), said first end portion (12) comprising at least an inlet seat (14) associable with one of said electrical cables (4) and said second end portion (13) being able to couple to the second end portion (13) of the terminals (3) of said other connector (1).

3. Connector (1) according to one or more of the preceding claims, **characterized by** the fact that said housing seat (17) comprises at least a slit (18) able to put said housing seat (17) in communication with said housing cavities (5).

4. Connector (1) according to one or more of the preceding claims, **characterized by** the fact that said housing seat (17) and said housing cavities (5) extend longitudinally along said central axis (A) and are defined between said transversal base (10) and said first open axial extremity (8).

5. Connector (1) according to one or more of the preceding claims from 2 to 4, **characterized by** the fact that said passage openings (11) are arranged at said housing cavities (5), in said assembly configuration said first end portions (12) being arranged in said

housing cavities (5) and said second end portions (13) being arranged through said passage openings (11).

6. Connector (1) according to one or more of the preceding claims from 2 to 5, **characterized by** the fact that said containment body (2) comprises at least a protrusion (19) defined between said transversal base (10) and said second open axial extremity (9) and able to contain at least one of said second end portions (13). 5 10
7. Connector (1) according to one or more of the preceding claims from 3 to 6, **characterized by** the fact that said elongated body (21) comprises at least an abutment rib (25) insertable into said slit (18). 15
8. Connector (1) according to one or more of the preceding claims from 2 to 7, **characterized by** the fact that said containment body (2) comprises a plurality of spacing elements (26) able to come into contact with said terminals (3), in said assembly configuration said first end portions (12) resting on said spacing elements (26) and remaining spaced away from said transversal base (10) to define a sealing inter-space (27) communicating with said through hole (7). 20 25

Patentansprüche

1. Mehrpoliger Verbinder (1) für die elektrische Verbindung von elektrischen Kabeln (4), umfassend: 30

- einen Containment-Körper (2) aus einem elektrisch isolierenden Material, der in der Lage ist, eine Vielzahl von Anschlüssen (3) aus einem elektrisch leitfähigen Material aufzunehmen, die mit einer entsprechenden Vielzahl von elektrischen Kabeln (4) verbindbar sind, wobei der Containment-Körper (2) eine Vielzahl von Gehäusehohlräumen (5) umfasst, die in der Lage sind, die Anschlüsse (3) einzusetzen, und mit dem Containment-Körper (2) eines anderen Verbinders (1) koppelbar sind; 35 40
- mindestens ein Verschlusselement (6) aus einem elektrisch isolierenden Material, das in der Lage ist, den Containmentkörper (2) nach dem Einsetzen der Anschlüsse (3) zu schließen; 45

wobei:

- die Gehäusehohlräume (5) miteinander in Verbindung stehen; 50
- mindestens einer von den Containment-Körpern (2) und dem Verschlusselement (6) mindestens ein Durchgangsloch (7) aufweist, das mit mindestens einem der Gehäusehohlräume (5) zum Einbringen mindestens einer Dich-

tungssubstanz (S) zum Abdichten der Gehäusehohlräume (5) in Verbindung gebracht werden kann;

- der Containment-Körper (2) eine Mittelachse (A), ein erstes offenes axiales Ende (8), ein zweites offenes axiales Ende (9) und mindestens eine mittlere Ebene (B) umfasst, die zwischen dem ersten offenen axialen Ende (8) und dem zweiten offenen axialen Ende (9) angeordnet ist und auf der eine Querbasis (10) mit Durchgangsöffnungen (11) ausgebildet ist, wobei die Anschlüsse (3) in die Gehäusehohlräume (5) durch das erste offene axiale Ende (8) einsetzbar sind und in einer Montagekonfiguration positionierbar sind, in der sie durch die Durchgangsöffnungen (11) verlaufen; und
- der Containment-Körper (2) mindestens einen Gehäusesitz (17) umfasst, der mindestens teilweise hohl ist und in der Lage ist, das Verschlusselement (6) mindestens teilweise aufzunehmen;

dadurch gekennzeichnet, dass das Verschlusselement (6) mindestens eine transversale Partition (20) zum Schließen des ersten offenen axialen Endes (8) und mindestens einen länglichen Körper (21) umfasst, der in den Gehäusesitz (17) einsetzbar ist und entlang dem das Durchgangsloch (7) ausgebildet ist.

2. Verbinder (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Anschlüsse (3) mindestens einen ersten Endabschnitt (12) und einen zweiten Endabschnitt (13) umfassen, wobei der erste Endabschnitt (12) mindestens einen Einlasssitz (14) umfasst, der mit einem der elektrischen Kabel (4) verbunden werden kann, und der zweite Endabschnitt (13) in der Lage ist, an den zweiten Endabschnitt (13) der Anschlüsse (3) des anderen Verbinders (1) ankoppelt zu werden.
3. Verbinder (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Gehäusesitz (17) mindestens einen Schlitz (18) umfasst, der in der Lage ist, den Gehäusesitz (17) in Verbindung mit den Gehäusehohlräumen (5) zu bringen.
4. Verbinder (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** sich der Gehäusesitz (17) und die Gehäusehohlräume (5) in Längsrichtung entlang der Mittelachse (A) erstrecken und zwischen der Querbasis (10) und dem ersten offenen axialen Ende (8) definiert sind.
5. Verbinder (1) nach einem oder mehreren der vorhergehenden Ansprüche von 2 bis 4, **dadurch ge-**

kennzeichnet, dass die Durchgangsöffnungen (11) an den Gehäusehohlräumen (5) angeordnet sind, wobei in der Montagekonfiguration die ersten Endabschnitte (12) in den Gehäusehohlräumen (5) und die zweiten Endabschnitte (13) durch die Durchgangsöffnungen (11) angeordnet sind.

6. Verbinder (1) nach einem oder mehreren der vorhergehenden Ansprüche von 2 bis 5, **dadurch gekennzeichnet, dass** der Containment-Körper (2) mindestens einen Vorsprung (19) umfasst, der zwischen der Querbasis (10) und dem zweiten offenen axialen Ende (9) definiert ist und mindestens einen der zweiten Endabschnitte (13) aufnehmen kann.

7. Verbinder (1) nach einem oder mehreren der vorhergehenden Ansprüche von 3 bis 6, **dadurch gekennzeichnet, dass** der längliche Körper (21) mindestens eine Widerlagerrippe (25) umfasst, die in den Schlitz (18) einsetzbar ist.

8. Verbinder (1) nach einem oder mehreren der vorhergehenden Ansprüche von 2 bis 7, **dadurch gekennzeichnet, dass** der Containment-Körper (2) eine Vielzahl von Abstandelementen (26) umfasst, die in der Lage sind, mit den Anschlüssen (3) in Kontakt zu kommen, wobei in der Montagekonfiguration die ersten Endabschnitte (12) auf den Abstandelementen (26) aufliegen und von der Querbasis (10) beabstandet bleiben, um einen mit dem Durchgangsloch (7) verbundenen Dichtungszwischenraum (27) zu definieren.

Revendications

1. Connecteur multipolaire (1) pour l'interconnexion électrique de câbles électriques (4) comprenant :

- un corps de confinement (2) réalisé en un matériau électriquement isolant capable de loger une pluralité de bornes (3) réalisées en un matériau électriquement conducteur pouvant être connectées à une pluralité correspondante de câbles électriques (4), ledit corps de confinement (2) comprenant une pluralité de cavités de logement (5) capables d'insérer lesdites bornes (3) et pouvant être accouplées au corps de confinement (2) d'un autre connecteur (1) ;
- au moins un élément de fermeture (6) réalisé en un matériau électriquement isolant capable de fermer ledit corps de confinement (2) après que lesdites bornes (3) ont été insérées ;

dans lequel :

- lesdites cavités de logement (5) communiquent les unes avec les autres ;

- au moins l'un dudit corps de confinement (2) et dudit élément de fermeture (6) comprend au moins un trou traversant (7) capable de communiquer avec au moins l'une desdites cavités de logement (5) pour l'introduction d'au moins une substance d'étanchéité (S) pour étanchéifier lesdites cavités de logement (5) ;

- ledit corps de confinement (2) comprend un axe central (A), une première extrémité axiale ouverte (8), une seconde extrémité axiale ouverte (9) et au moins un plan médian (B) positionné entre ladite première extrémité axiale ouverte (8) et ladite seconde extrémité axiale ouverte (9) et sur lequel est formée une base transversale (10) ayant des ouvertures de passage (11), lesdites bornes (3) pouvant être insérées dans lesdites cavités de logement (5) par ladite première extrémité axiale ouverte (8) et pouvant être positionnées dans une configuration d'assemblage dans laquelle elles passent à travers lesdites ouvertures de passage (11) ; et

- ledit corps de confinement (2) comprend au moins un siège de logement (17) au moins partiellement creux capable de loger au moins partiellement ledit élément de fermeture (6) ;

caractérisé par le fait que ledit élément de fermeture (6) comprend au moins une paroi transversale (20) pour fermer ladite première extrémité axiale ouverte (8) et au moins un corps allongé (21) qui peut être inséré dans ledit siège de logement (17) et le long duquel ledit trou traversant (7) est formé.

2. Connecteur (1) selon la revendication 1, **caractérisé par le fait que** lesdites bornes (3) comprennent au moins une première portion d'extrémité (12) et une seconde portion d'extrémité (13), ladite première portion d'extrémité (12) comprenant au moins un siège d'entrée (14) pouvant être associé à l'un desdits câbles électriques (4) et ladite seconde portion d'extrémité (13) étant capable de s'accoupler à la seconde portion d'extrémité (13) des bornes (3) dudit autre connecteur (1).

3. Connecteur (1) selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait que** ledit siège de logement (17) comprend au moins une fente (18) capable de mettre ledit siège de logement (17) en communication avec lesdites cavités de logement (5).

4. Connecteur (1) selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait que** ledit siège de logement (17) et lesdites cavités de logement (5) s'étendent longitudinalement selon ledit axe central (A) et sont définis entre ladite base transversale (10) et ladite première extrémité axiale

ouverte (8).

5. Connecteur (1) selon l'une ou plusieurs des revendications 2 à 4 précédentes, **caractérisé par le fait que** lesdites ouvertures de passage (11) sont agencées au niveau desdites cavités de logement (5), dans ladite configuration d'assemblage lesdites premières portions d'extrémité (12) étant agencées dans lesdites cavités de logement (5) et lesdites secondes portions d'extrémité (13) étant agencées à travers lesdites ouvertures de passage (11). 5
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6. Connecteur (1) selon l'une ou plusieurs des revendications 2 à 5 précédentes, **caractérisé par le fait que** ledit corps de confinement (2) comprend au moins une protubérance (19) définie entre ladite base transversale (10) et ladite seconde extrémité axiale ouverte (9) et capable de contenir au moins l'une desdites secondes portions d'extrémité (13). 15
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7. Connecteur (1) selon l'une ou plusieurs des revendications 3 à 6 précédentes, **caractérisé par le fait que** ledit corps allongé (21) comprend au moins une nervure de butée (25) pouvant être insérée dans ladite fente (18). 25

8. Connecteur (1) selon l'une ou plusieurs des revendications 2 à 7 précédentes, **caractérisé par le fait que** ledit corps de confinement (2) comprend une pluralité d'éléments d'espacement (26) capables de venir en contact avec lesdites bornes (3), dans ladite configuration d'assemblage lesdites premières portions d'extrémité (12) reposant sur lesdits éléments d'espacement (26) et restant espacées de ladite base transversale (10) pour définir un espace intermédiaire d'étanchéité (27) communiquant avec ledit trou traversant (7). 30
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50
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Fig. 1

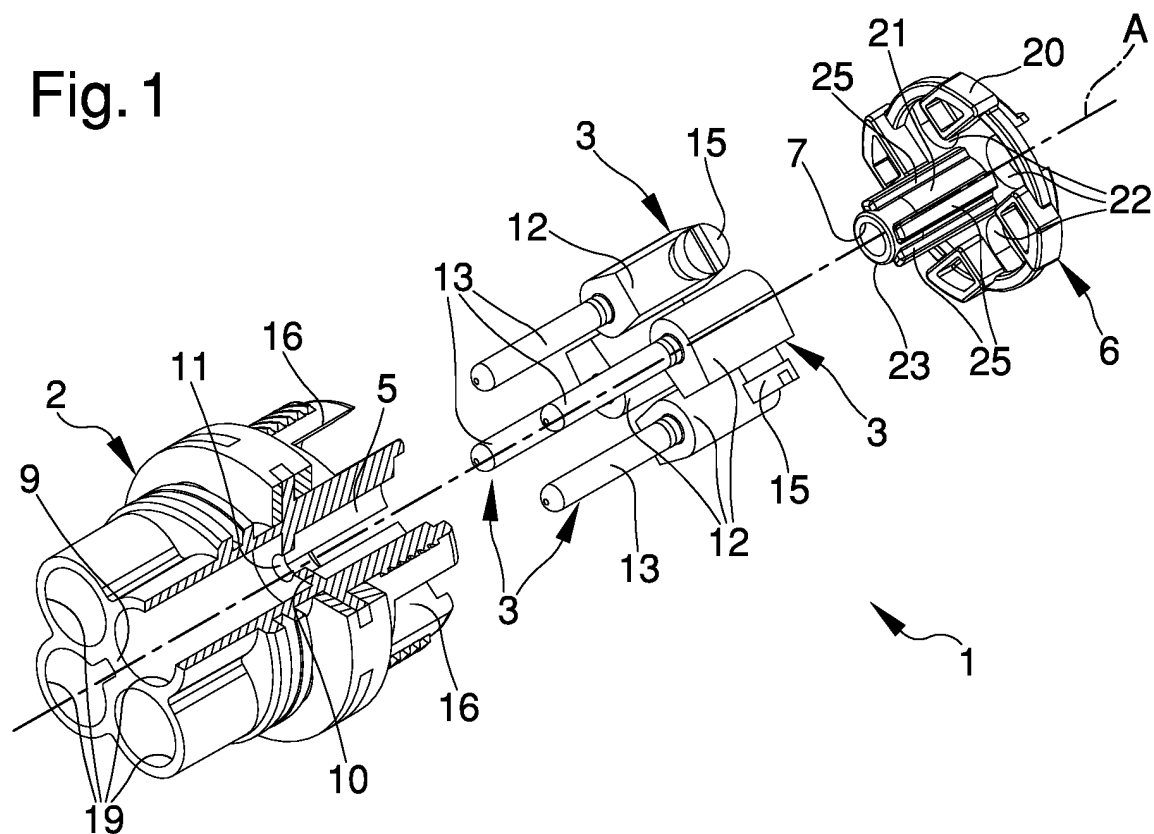
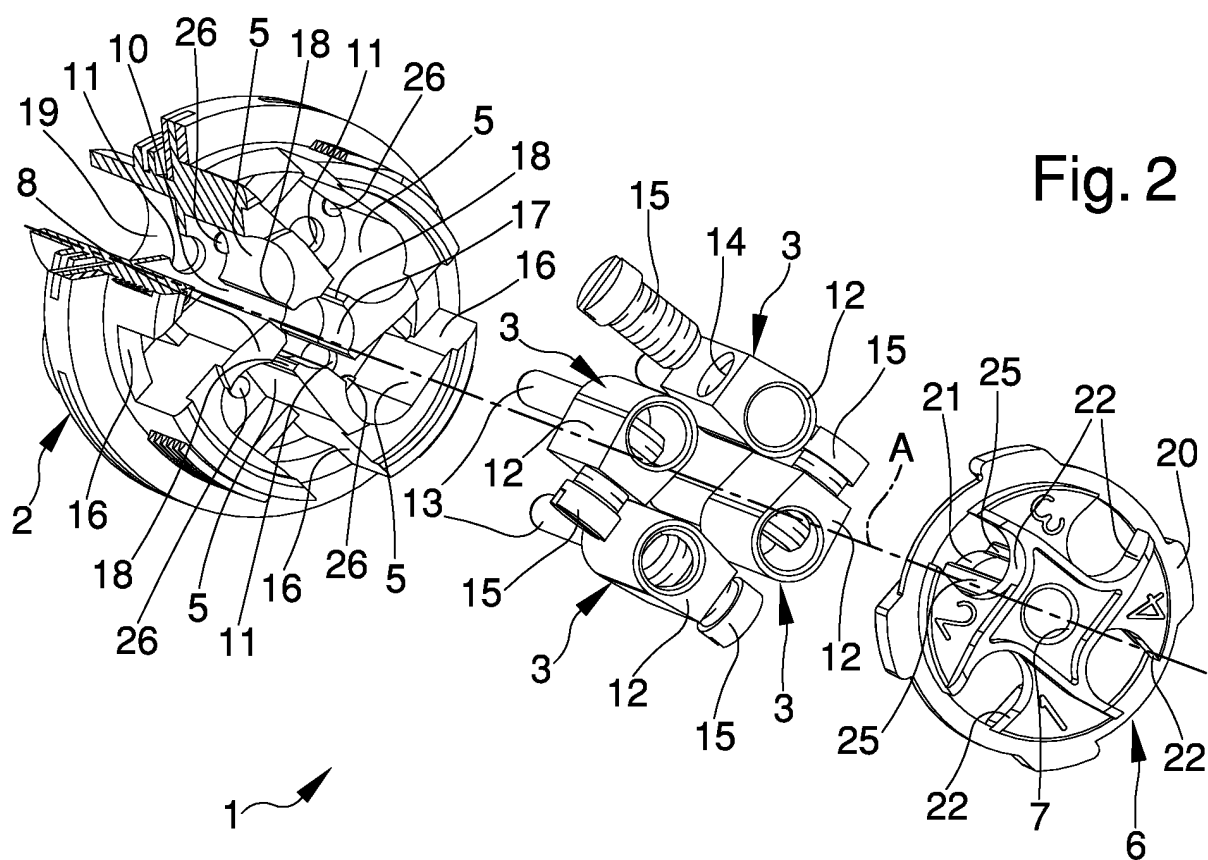


Fig. 2



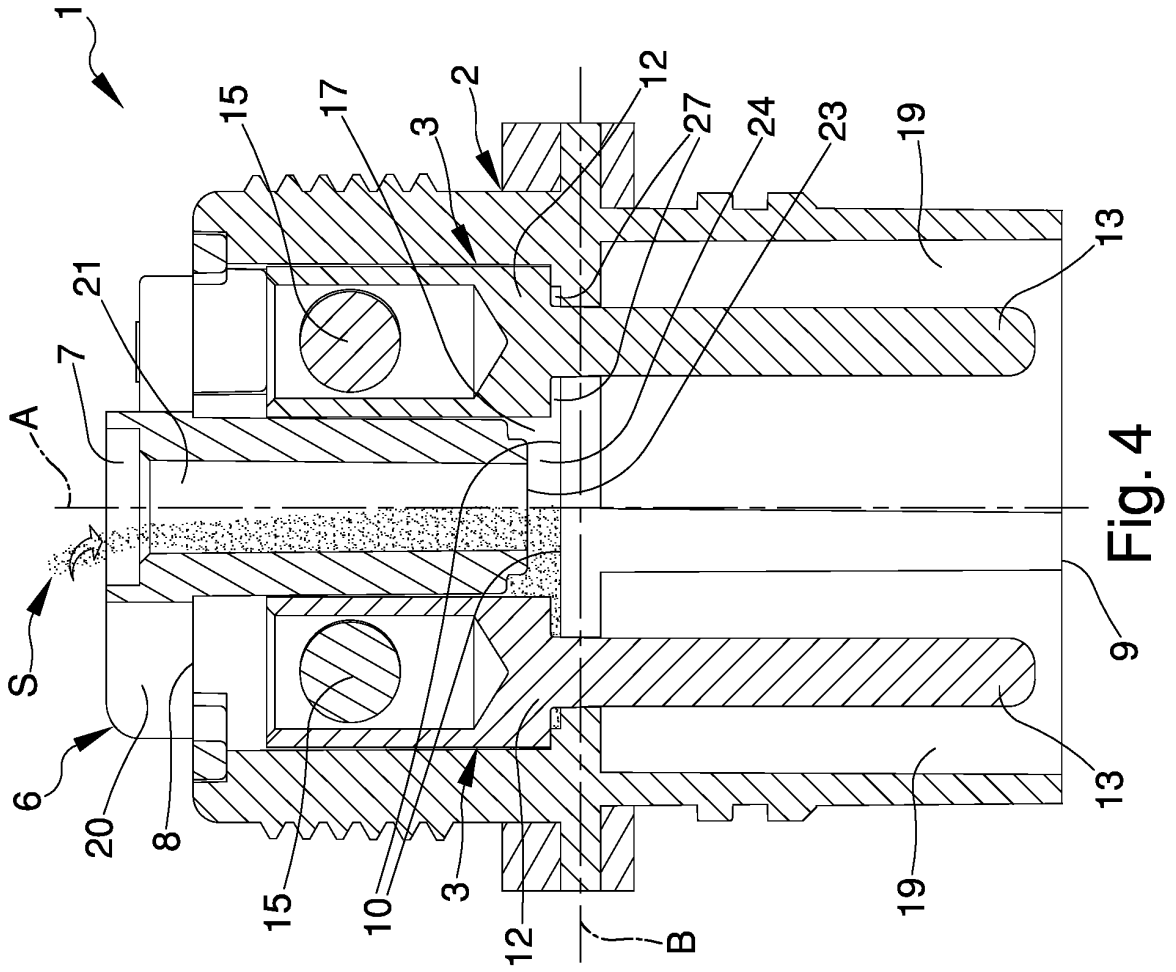


Fig. 4

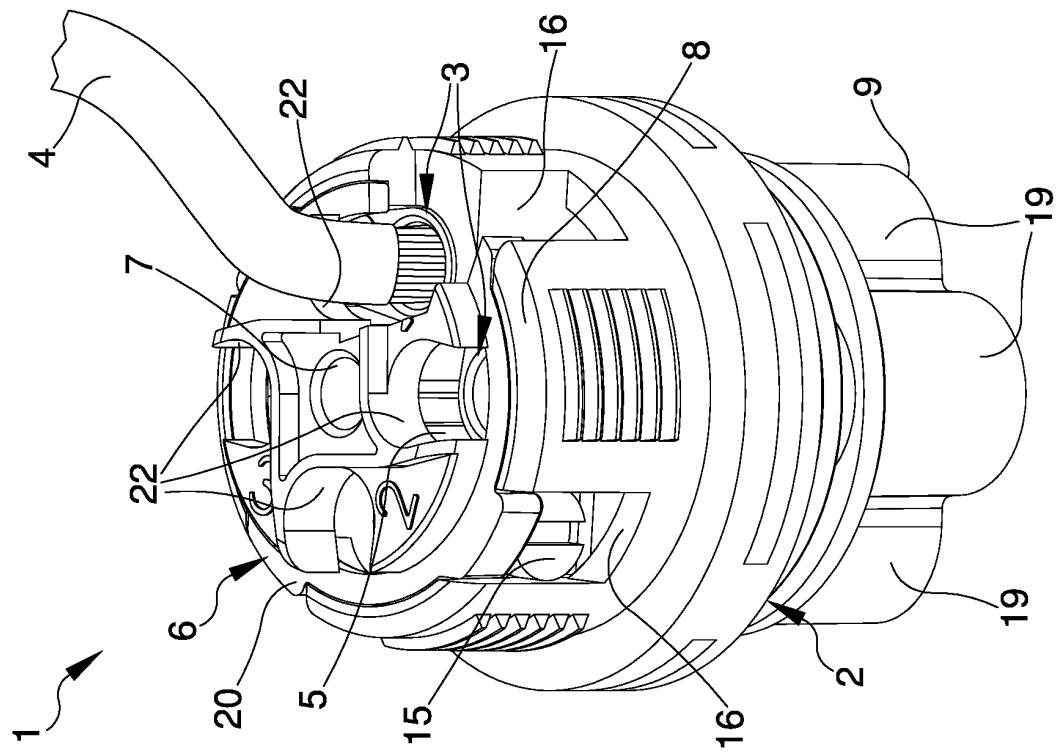


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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