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(54) **CONNECTOR ASSEMBLY WITH SEAL PROTECTION CAP**

VERBINDERANORDNUNG MIT DICHTUNGSSCHUTZKAPPE

ENSEMBLE CONNECTEUR MUNI DE CAPUCHON DE PROTECTION DE JOINT D'ÉTANCHÉITÉ

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Description

[0001] The present invention relates to a connector assembly with a sealing member for sealing the connector assembly against environmental influences, as in particular moisture, when connected to a corresponding counter-connector and, in particular, to a seal protection cap for the protection of the sealing member, for example during handling and transport of the connector assembly.

[0002] Connector assemblies with sealing members and seal protection members are known in the prior art. For example, the document US 7,044,762 B1 discloses a waterproof electrical connector that includes a main body housing with a through hole and a tubular connector seal made of an elastic member fitted around the circumference of the main body housing. The seal is pressed against the inner circumference wall of the housing of the counter-connector when the waterproof connector is mated. Further, a tubular sliding hood is installed to protect the seal during transport and handling before mating. The hood is slidable in the main body housing and is pushed away from the seal in the process of mating, such that the seal can come into contact with the housing of the counter-connector. This construction is rather complex and requires that the hood is arranged slidable. This can lead to problems during assembly, for example when the hood gets stuck.

[0003] In addition, the document US 2001/024908 A1 discloses a cap-shaped dustproof cover for a connector which is fitted over an outer periphery of a connector from a front side of the connector, so as to cover a front-end fitting surface of the connector. The cover basically encases the whole connector housing and is therefore relatively big and expensive to produce.

[0004] Another example is disclosed in the document US 2009/275227 A1. Therein, a cylindrical electrical connector is disclosed including a connector body and a seal protection cap. The connector body includes a cap housing, a body and a concave fitting section provided with a circular seal. The seal protection cap includes a front face plate and a protection section. The front face plate is provided with an opening in order to allow a continuity check from a front face of the fitting section. The protection section extends cylindrically from a peripheral edge of the front face plate along a side face of the fitting section, so as to cover the seal. The seal protection cap is applied to the fitting section of the connector body so as to cover the seal.

[0005] Although the seal protection members of the prior art connector assemblies function generally satisfactory, there is still room for improvement. For example, the mating of the connector assembly with the corresponding counter-connector needs to be facilitated, in particular for large, complex and tight connector assemblies and corresponding counter-connectors. Further, it is generally preferred that a correct, complete and reliable mating of the connector assembly with the corresponding counter-connector needs is ensured. Another

important aspect is that, in the art, it often happens that the protection members are not removed before mating of the connector, whereby then forced mating of the connector and the corresponding counter-connector leads to damages on the seal protection cap, the seal and/or the connector assembly.

[0006] Therefore, it is an object of the present invention to provide an improved connector assembly with a seal protection cap which facilitates and ensures a correct mating of all kinds of connector assemblies with the corresponding counter-connectors. It is a further object of the present invention to provide an improved connector assembly, by which it is made impossible to forget the removal of the seal protection cap before the mating of the connector assembly and the corresponding counter-connector.

[0007] These and further objects, which become apparent upon reading the following description, are solved by a connector assembly according to claim 1.

[0008] According to the invention, a connector assembly is provided, comprising a connector housing, a sealing member, a mate assist member, and a seal protection cap. Preferably, the connector assembly is an electrical connector assembly and the mating face is preferably provided in a rectangular shape.

[0009] The sealing member is provided for sealing the connector housing, for example against moisture, when connected to a corresponding counter-connector. Other environmental influences for which the sealing member may or may not provide protection may be liquids, humidity, fine particles, dirt or the like. The sealing member may have all kinds of shapes, cross sections and materials, but is preferably provided with one or more elastic sealing lips that are pressed against a corresponding surface of the counter-connector. The sealing member is preferably made from an inexpensive material, as for example a thermoplastic elastomer.

[0010] The mate assist member is associated with the connector housing for facilitating a mating of the connector housing with the corresponding counter-connector and can, for example, be provided in form of a mate assist lever or a mate assist slider or similar as it is known to the skilled person.

[0011] Typical examples of such mate assist members can be found, for example, in US 7384285 B2 US 2006/211286 A1 or US 2006/040535 A1 or DE19844689A1.

[0012] The mate assist member preferably comprises at least one cam recess adapted for cooperation with at least one cam protrusion of the counter-connector. A mating between the connector assembly and the corresponding counter-connector can preferably be completed by actuating the mate assist member relative to the connector assembly. Thereby, the cam protrusion of the corresponding counter-connector moves in the cam recess of the mate assist member. The cam recess is preferably shaped, and in particular inclined, so as to pull the corresponding counter-connector in the direction of the

connector assembly and, thereby into the direction of a correct, complete and reliable mating of the connector assembly with the corresponding counter-connector. Thereby, in particular, the mating of large, complex and tight connector assemblies with the corresponding counter-connectors is facilitated.

[0013] Further preferably, the cam recess is a cam groove, so that an actuating of the mate assist member leads to a directed movement of the cam protrusion of the counter-connector in the cam groove to approach the connector assembly and the corresponding counter-connector.

[0014] The mate assist member is preferably a mate assist slider having a generally U-shaped configuration with two legs joined by a common web, whereby each leg is provided with two cam recesses for cooperation with corresponding cam protrusions provided on opposing sides of the counter-connector. The mate assist slider is, preferably, also guided in at least one channel of the connector housing. However, alternatively the mate assist member can also be a mate assist lever.

[0015] The cam recess of the mate assist member is preferably further provided for cooperation with at least one retaining means of the seal protection cap to provide a blocking function, as later described.

[0016] The seal protection cap is mountable to the connector assembly for protecting the sealing member, for example during transport, against environmental influences and, in particular, against mechanical damages. Therefore, the seal protection cap comprises a channel-shaped configuration adapted to, at least partially, receive the sealing member therein. Further, when mounted, the seal protection cap preferably completely covers a mating face of the connector housing.

[0017] According to the invention, the seal protection cap is further provided with retaining means for blocking the mate assist member in a pre-closed position, such that the mate assist member cannot be moved into its final closed position, i.e. the position into which the mate assist member has to be moved for a mating of connector and counter-connector. The pre-closed position denotes a not closed transport position of the mate assist member. Thereby, when mounted, the seal protection cap preferably blocks, i.e. prevents, a mating of the connector housing with the counter-connector. Thus, the seal protection cap has a secondary function, namely a blocking function, in addition to its primary function, namely to protect the sealing member from being damaged during handling or transport.

[0018] Thereby, the mate assist member can only be moved in its final closed position in the connector assembly, when the seal protection cap is removed from the connector assembly. By removing the seal protection cap, the retaining means are no longer engaging the mate assist member and the blocking thereof is released. Thus, the connector housing and the corresponding counter-connector can be completely mated. In other words, the seal protection cap prevents that the connec-

tor and the counter-connector are mated when the seal protection cap is still attached to the connector housing. This is a third function of the seal protection cap.

[0019] The retaining means of the seal protection cap comprise, preferably, at least one latch tongue adapted to cooperate with a latching shoulder provided on the connector housing to latch the seal protection cap onto the connector housing. The latch tongue, in a mounted condition, preferably protrudes, at least partially, into the cam recess of the mate assist member. The mate assist member is preferably adapted to block the latching of the latch tongue when the mate assist member is not correctly mounted in its pre-closed position. Thereby, the seal protection cap can preferably only be positioned in the connector assembly, when the mate assist member is in the pre-closed position. Further preferably, the latch tongue, in a latched condition, provides the blocking function and is, preferably, the only fastening means for the seal protection cap on the connector housing.

[0020] In the following, the invention is described exemplarily with reference to the enclosed figures in which:

- Figure 1 shows a three dimensional cross-section of a connector assembly comprising a mate assist slider, a sealing member and a seal protection cap,
- Figure 2 shows a cross-section of the connector assembly in a longitudinal direction,
- Figure 3 shows a schematic illustration of the seal protection cap from a first perspective,
- Figure 4 shows the seal protection cap of Figure 3 turned by 180°, and
- Figure 5 shows a schematic illustration of the connector assembly.

[0021] Figures 1 and 2 show cross sections of a connector assembly 1 in a lateral and in a longitudinal cut direction. In this example, the connector assembly 1 is an electrical connector assembly and is provided in a rectangular shape, although also other shapes are possible. The connector assembly 1 comprises a connector housing 20 made from injection moulded plastic and a sealing member 30 for sealing the connector assembly 1 against environmental influences when connected to a corresponding counter-connector (not shown). The sealing member 30 is a closed rectangular "ring" and comprises two elastic sealing lips 31 and 32. In a mated condition with the counter-connector, these elastic sealing lips 31 and 32 are pressed against a corresponding surface of the counter-connector, thereby providing a tight seal against, in particular, moisture.

[0022] These lips 31 and 32 are relatively delicate and easily damaged during handling and transport.

[0023] The connector assembly 1 further comprises a mate assist member 40 in form of a mate assist slider associated with the connector housing 20 for facilitating a mating of the connector housing 20 with the corresponding counter-connector.

[0024] Mounted to the connector assembly 1, a seal

protection cap 50 is provided for protecting the sealing member 30. The cap 50 is provided with retaining means 51 for blocking the mate assist member 40 in a pre-position, respectively a pre-closed position, as shown on the top of Figure 2, such that the mate assist member 40 cannot be moved into its final closed position. In a preferred embodiment, the mate assist member 40 is in form of a slider.

[0025] This can best be derived from Figure 2, where the slider 40 is shown in its pre-closed position. As the skilled person recognizes, the slider 40 can be pushed to the left, in the figure 2, into the connector housing 20. Upon mating with a corresponding counter-connector, the slider 40 will engage a member of the counter-connector and pull the connector and the counter-connector towards each other. When the slider 40 is in its final closed position, the mating process is completed.

[0026] As shown in Figures 1, 2 and 5, the mate assist member 40 is shaped, in this example, as a mate assist slider having a U-shaped configuration with two legs 42 joined by a common web 43, as particularly shown on Figure 5, whereby each leg 42 is provided with two cam recesses 41, as shown on Figure 2, for cooperation with corresponding cam protrusions provided on opposing sides of the counter-connector. This function of the slider 40 is generally known to the skilled person. The slider 40 is further guided in two channels 21 of the connector housing 20.

[0027] Alternatively, the mate assist member 40 can also be provided in other forms, as for example in form of a mate assist lever or in a combination of slider and lever, wherein the lever actuates the slider.

[0028] The mate assist member 40 is associated to the connector housing 20 for facilitating a mating of the connector housing 20 with the corresponding counter-connector.

[0029] As shown in Figures 1 and 2, for this purpose, the mate assist member 40 comprises therefore, in this example, four cam recesses 41, two in each leg 42, adapted for cooperation with four cam protrusion (not shown) of the counter-connector. A mating between the connector assembly 1 and the corresponding counter-connector is completed by pushing the mate assist member 40 into the connector assembly 1. Then, the cam protrusions of the corresponding counter-connector slide in the cam recesses 41 of the mate assist member 40. The cam recesses 41 are shaped, in this example, as cam grooves and are inclined in the direction to the connector assembly 1, so as to pull the corresponding counter-connector in the direction of the connector assembly 1 and thereby into the direction of a correct, complete and reliable mating of the connector assembly 1 with the corresponding counter-connector.

[0030] In other words, the actuating of the mate assist member 40 leads to a directed movement of the cam protrusions of the counter-connector in the cam recesses 41 or grooves to approach the connector assembly 1 and the corresponding counter-connector.

[0031] As also shown in Figures 1 and 2, the sealing member 30 fits around an outer wall of the connector housing 20 and is thus removably attached to the connector assembly 1. When the connector assembly 1 is connected to the corresponding counter-connector, the sealing member 30 is pressed against a surface of the counter-connector. The sealing member 30 can be provided in all kinds of shapes and cross sections.

[0032] As also shown in Figures 1 and 2, and in detail in Figures 3 and 4, the seal protection cap 50 therefore comprises a channel-shaped configuration to receive the sealing member 30 therein. In the shown embodiment, the seal protection cap 50 allows access to the interior of the connector.

[0033] In an alternative embodiment (not shown), the seal protection cap 50, when mounted completely, covers a mating face 23 of the connector housing 20 for protecting the mating face 23, respectively the interior of the connector housing 20.

[0034] Figures 3 and 4 show schematic illustrations of the seal protection cap 50 from two opposite sides. The seal protection cap 50 is provided with a front side 53, as shown on Figure 3, facing away from the connector housing 20 when attached thereto, and a rear side 54 opposite the front side 53, as shown on Figure 4.

[0035] The rear side 54 is provided with a circumferential channel 55 being formed by two essentially parallel channel walls 56 and 57. The channel 55 is adapted to receive the sealing member 30. The seal protection cap 50 allows an access to the interior of connector housing 20, for example, to check the function of electrical terminals arranged therein.

[0036] Preferably, the seal protection cap 50 is one integral part made from injection moulded plastics. In alternative embodiments, the seal protection cap 50 may be assembled from several components.

[0037] Referring back to Figure 2, the cam recesses 41 of the mate assist member 40 are adapted to cooperate with four retaining means 51 of the seal protection cap 50 to provide a blocking. By means of the retaining means 51, the mate assist member 40 is blocked in a pre-closed position, such that the mate assist member 40 cannot be moved into its final closed position in the connector assembly 1.

[0038] As also shown in Figures 1 and 2, the four retaining means 51 are; in this example; evenly distributed on the two longitudinal walls of the seal protection cap 50. The retaining means 51 can also be evenly distributed around the entire circumference wall of the seal protection cap 50.

[0039] In the shown embodiment, four retaining means 51 are used. However, generally one retaining means 51 is sufficient. In general, an arbitrary number of retaining means 51 can be arbitrarily arranged at the seal protection cap 50 according to varying outer conditions.

[0040] The four retaining means 51 of the seal protection cap 50 each comprise a latch tongue 52 to cooperate with a latching shoulder 22 provided on the connector

housing 20 to latch the seal protection cap 50 onto the connector housing 20. The four latch tongues 52, in a mounted condition, protrude, in the shown preferred embodiment, at the same time partially into four cam recesses 41 of the mate assist member 40, thereby blocking the mate assist member 40.

[0041] Due to this double function, it is secured that, as long as the seal protection cap 50 is mounted, it is not possible to actuate the mate assist member 40, i.e. to move it into its closed position.

[0042] As also shown in Figures 1 and 2, the four cam recesses 41 are, in this example, evenly distributed on the two longitudinal walls of the mate assist member 40. In general, an arbitrary number of cam recesses 41 can be arbitrarily arranged at walls of the mate assist member 40 according to varying outer conditions.

[0043] In the shown configuration, the mate assist member 40 blocks the latching of the latch tongues 52, when the mate assist member 40 is not correctly mounted in its pre-closed position. Thereby, the seal protection cap 50 can only be mounted to the connector assembly 1, when the mate assist member 40 is in the correct pre-closed position. This is a further security means provided by the invention.

[0044] Generally, preferably, the latch tongues are the only fastening means for the seal protection cap 50 on the connector housing 20.

[0045] The skilled person will understand that, when mounted, the seal protection cap 50 prevents a mating of the connector housing 20 with the counter-connector by blocking the mate assist member 40. This function of the seal protection cap 50 is called "blocking function" or "third function", in addition to protecting the sealing member 30 and holding the mate assist member 40 in the pre-closed position before mating. The third function assures that a removal of the seal protection cap 50 is done before mating.

[0046] Figure 5 shows the mating side of the connector assembly 1 in a schematic illustration. As one can see, the seal protection cap 50 allows access to the interior of the connector housing 20 and, in particular to any electrical contacts or terminals arranged therein. The connector assembly 1 can be shaped as female or male part of a female/male connection with the corresponding counter-connector.

[0047] The components of the connector assembly 1 and the corresponding counter-connector can be made of plastic, ceramic, metallic or compound materials, or any other materials.

[0048] However, most preferably, the connector housing 20 is an injection moulded plastic part. At least the sealing member 30 and/or the seal protection cap 50 can be made of elastic materials.

Claims

1. Connector assembly (1) comprising:

- a connector housing (20),
- a sealing member (30), for sealing the connector housing (20), when connected to a corresponding counter-connector,
- a mate assist member (40), associated to the connector housing (20) for facilitating a mating of the connector housing (20) with the corresponding counter-connector, and
- a seal protection cap (50), being mountable to the connector assembly (1), for protecting the sealing member (30),

the seal protection cap (50) being provided with retaining means (51) for blocking the mate assist member (40) in a pre-closed position, being a not closed transport position, such that the mate assist member (40) cannot be moved into its final closed position, being the position into which the mate assist member has to be moved for a mating of connector and counter-connector, **characterized in that**, the seal protection cap (50) comprises a channel-shaped configuration adapted to, at least partially, receive the sealing member (30) therein.

2. Connector assembly (1) according to claim 1, wherein the seal protection cap (50), when mounted, prevents a mating of the connector housing (20) with the counter-connector.
3. Connector assembly (1) according to one of the preceding claims, wherein the seal protection cap (50), when mounted, completely covers a mating face (23) of the connector housing (20), for protecting the mating face (23) against environmental influences.
4. Connector assembly (1) according to claim 3, wherein the mating face (23) of the connector housing (20) is provided in a rectangular shape.
5. Connector assembly (1) according to one of the preceding claims, wherein the mate assist member (40) comprises at least one cam recess (41) and the retaining means (51) of the seal protection cap (50) is/are adapted for cooperation with said cam recess (41) of the mate assist member (40) to provide a blocking function.
6. Connector assembly (1) according to one of the preceding claims, wherein the retaining means (51) comprises at least one latch tongue (52) adapted to cooperate with a latching shoulder (22) provided on the connector housing (20) to latch the seal protection cap (50) onto the connector housing (20).
7. Connector assembly (1) according to claims 5 and 6, wherein the at least one latch tongue (52), in a mounted condition, protrudes, at least partially, into the cam recess (41) of the mate assist member (40).

8. Connector assembly (1) according to one of the preceding claims 6 or 7, wherein the mate assist member (40) is adapted to block the latching of the latch tongue (52), when the mate assist member (40) is not correctly mounted in its pre-locked position. 5
9. Connector assembly (1) according to one of the preceding claims 6 to 8, wherein the latch tongue (52), in a latched condition, provides said blocking function. 10
10. Connector assembly (1) according to one of the preceding claims 6 to 9, wherein the latch tongue (52) is the only fastening means for the seal protection cap (50) on the connector housing (20). 15
11. Connector assembly (1) according to one of the preceding claims 5 to 10, wherein the cam recess (41) of the mate assist member (40) is provided for cooperation with at least one cam protrusion of the counter-connector for facilitating a mating of the connector housing (20) with the counter-connector. 20
12. Connector assembly (1) according to one of the preceding claims 5 to 11, wherein the cam recess (41) is a cam groove, so that an actuating of the mate assist member (40) leads to a directed movement of the cam protrusion of the counter-connector in the cam groove to approach the connector assembly (1) and the corresponding counter-connector. 25
13. Connector assembly (1) according to one of the preceding claims, wherein the mate assist member (40) is a slider having a generally u-shaped configuration with two legs (42) joined by a common web (43) and whereby each leg (42) is provided with two cam recesses (41) for cooperation with corresponding cam protrusions provided on opposing sides of the counter-connector. 30
14. Connector assembly (1) according to the preceding claim, wherein the slider (40) is guided in at least one channel (21) of the connector housing (20). 35
15. Connector assembly (1) according to one of the claims 1 to 12, wherein the mate assist member (40) is a lever. 40
16. Connector assembly (1) according to one of the preceding claims, wherein the sealing member (30) and/or the seal protection cap (50) are made from thermoplastic elastomer (TPE). 45

Patentansprüche

1. Verbinderanordnung (1), die aufweist: 55
- ein Verbindergehäuse (20),
 - ein Dichtungselement (30) zum Abdichten des Verbindergehäuses (20), wenn mit einem entsprechenden Gegenverbinder verbunden,
 - ein Zusammenfügen-Unterstützungselement (40), das mit dem Verbindergehäuse (20) assoziiert ist, zum Erleichtern eines Zusammenfügens des Verbindergehäuses (20) mit dem entsprechenden Gegenverbinder, und
 - eine Dichtungsschutzkappe (50), die an der Verbinderanordnung (1) angebracht werden kann, zum Schützen des Dichtungselements (30),
- wobei die Dichtungsschutzkappe (50) mit Haltemitteln (51) vorgesehen ist zum Blockieren des Zusammenfügen-Unterstützungselements (40) in einer vorgeschlossenen Position, die eine nicht-geschlossene Transportposition ist, derart, dass das Zusammenfügen-Unterstützungselement (40) nicht in seine endgültige geschlossene Position bewegt werden kann, die die Position ist, in die das Zusammenfügen-Unterstützungselement für ein Zusammenfügen des Verbinders und Gegenverbinders bewegt werden muss, **dadurch gekennzeichnet, dass** die Dichtungsschutzkappe (50) eine kanalförmige Konfiguration aufweist, die ausgebildet ist zum zumindest teilweisen Aufnehmen des Dichtungselements (30) darin.
2. Verbinderanordnung (1) gemäß Anspruch 1, wobei die Dichtungsschutzkappe (50), wenn angebracht, ein Zusammenfügen des Verbindergehäuses (20) mit dem Gegenverbinder verhindert.
3. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche, wobei die Dichtungsschutzkappe (50), wenn angebracht, eine Zusammenfügen-Fläche (23) des Verbindergehäuses (20) vollständig abdeckt, um die Zusammenfügen-Fläche (23) gegen Umwelteinflüsse zu schützen.
4. Verbinderanordnung (1) gemäß Anspruch 3, wobei die Zusammenfügen-Fläche (23) des Verbindergehäuses (20) in einer rechteckigen Form vorgesehen ist.
5. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche, wobei das Zusammenfügen-Unterstützungselement (40) zumindest eine Nockenaussparung (41) aufweist und das/die Haltemittel (51) der Dichtungsschutzkappe (50) ausgebildet ist/sind zur Kooperation mit der Nockenaussparung (41) des Zusammenfügen-Unterstützungselements (40), um eine Blockierfunktion vorzusehen.
6. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche, wobei das Haltemittel (51) zu-

- mindest eine Verriegelungszunge (52) aufweist, die ausgebildet ist zur Kooperation mit einer Verriegelungsschulter (22), die an dem Verbindergehäuse (20) vorgesehen ist, um die Dichtungsschutzkappe (50) an dem Verbindergehäuse (20) zu verriegeln. 5
7. Verbinderanordnung (1) gemäß den Ansprüchen 5 und 6, wobei die zumindest eine Verriegelungszunge (52), in einem angebrachten Zustand, zumindest teilweise in die Nockenaussparung (41) des Zusammenfügen-Unterstützungselements (40) ragt. 10
8. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche 6 oder 7, wobei das Zusammenfügen-Unterstützungselement (40) ausgebildet ist zum Blockieren des Verriegelns der Verriegelungszunge (52), wenn das Zusammenfügen-Unterstützungselement (40) nicht korrekt in seiner vorverriegelten Position angebracht ist. 15
9. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche 6 bis 8, wobei die Verriegelungszunge (52) in einem verriegelten Zustand die Blockierfunktion vorsieht. 20
10. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche 6 bis 9, wobei die Verriegelungszunge (52) das einzige Befestigungsmittel für die Dichtungsschutzkappe (50) an dem Verbindergehäuse (20) ist. 25
11. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche 5 bis 10, wobei die Nockenaussparung (41) des Zusammenfügen-Unterstützungselements (40) zur Kooperation mit zumindest einem Nockenvorsprung des Gegenverbinders vorgesehen ist zum Erleichtern eines Zusammenfügens des Verbindergehäuses (20) mit dem Gegenverbinder. 30
12. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche 5 bis 11, wobei die Nockenaussparung (41) eine Kurvennut ist, so dass ein Betätigen des Zusammenfügen-Unterstützungselements (40) zu einer gerichteten Bewegung des Nockenvorsprungs des Gegenverbinders in der Kurvennut führt zum Annähern der Verbinderanordnung (1) und des entsprechenden Gegenverbinders. 35
13. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche, wobei das Zusammenfügen-Unterstützungselement (40) ein Schieber ist, der eine allgemein U-förmige Konfiguration mit zwei Schenkeln (42) hat, die durch einen gemeinsamen Steg (43) verbunden sind, und wobei jeder Schenkel (42) mit zwei Nockenaussparungen (41) zur Kooperation mit entsprechenden Nockenvorsprüngen vorgesehen ist, die auf gegenüberliegenden Seiten des 40

Gegenverbinders vorgesehen sind.

14. Verbinderanordnung (1) gemäß dem vorhergehenden Anspruch, wobei der Schieber (40) in zumindest einem Kanal (21) des Verbindergehäuses (20) geführt wird. 5
15. Verbinderanordnung (1) gemäß einem der Ansprüche 1 bis 12, wobei das Zusammenfügen-Unterstützungselement (40) ein Hebel ist. 10
16. Verbinderanordnung (1) gemäß einem der vorhergehenden Ansprüche, wobei das Dichtungselement (30) und/oder die Dichtungsschutzkappe (50) aus thermoplastischem Elastomer (TPE - thermoplastic elastomer) hergestellt sind. 15

Revendications

1. Ensemble connecteur (1) comprenant :

- un boîtier de connecteur (20),
- un élément d'étanchement (30) pour étancher le boîtier de connecteur (20) lorsqu'il est connecté à un connecteur antagoniste correspondant,
- un élément d'assistance à l'accouplement (40), associé au boîtier de connecteur (20) pour faciliter un accouplement du boîtier de connecteur (20) avec le connecteur antagoniste correspondant, et
- un capuchon de protection d'étanchéité (50), susceptible d'être monté sur l'ensemble connecteur (1), pour protéger l'élément d'étanchement (30), 25

le capuchon de protection d'étanchéité (50) étant doté d'un moyen de retenue (51) pour bloquer l'élément d'assistance à l'accouplement (40) dans une position pré-fermée, qui est une position de transport non fermée, de telle façon que l'élément d'assistance à l'accouplement (40) ne peut pas être déplacé jusqu'à sa position fermée finale, qui est la position dans laquelle l'élément d'assistance à l'accouplement doit être déplacé pour un accouplement du connecteur et du connecteur antagoniste, 30

caractérisé en ce que le capuchon de protection d'étanchéité (50) comprend une configuration en forme de canal adaptée à recevoir au moins partiellement l'élément d'étanchement (30) à l'intérieur. 35

2. Ensemble connecteur (1) selon la revendication 1, dans lequel le capuchon de protection d'étanchéité (50), lorsqu'il est monté, empêche un accouplement du boîtier de connecteur (20) avec le connecteur antagoniste. 40

3. Ensemble connecteur (1) selon l'une des revendications précédentes, dans lequel le capuchon de protection d'étanchéité (50), lorsqu'il est monté, couvre complètement une face d'accouplement (23) du boîtier de connecteur (20), pour protéger la face d'accouplement (23) à l'encontre d'influences environnementales. 5
4. Ensemble connecteur (1) selon la revendication 3, dans lequel la face d'accouplement (23) du boîtier de connecteur (20) est prévue sous une forme rectangulaire. 10
5. Ensemble connecteur (1) selon l'une des revendications précédentes, dans lequel l'élément d'assistance à l'accouplement (40) comprend au moins un évidement à came (41) et le moyen de retenue (51) du capuchon de protection d'étanchéité (50) est adapté à coopérer avec ledit évidement à came (41) de l'élément d'assistance à l'accouplement (40) pour assurer une fonction de blocage. 20
6. Ensemble connecteur (1) selon l'une des revendications précédentes, dans lequel le moyen de retenue (51) comprend au moins une languette de verrouillage (52) adaptée à coopérer avec un épaulement de verrouillage (22) prévu sur le boîtier de connecteur (20) pour verrouiller le capuchon de protection d'étanchéité (50) sur le boîtier de connecteur (20). 25
7. Ensemble connecteur (1) selon les revendications 5 et 6, dans lequel ladite au moins une languette de verrouillage (52), dans une condition montée, se projette au moins partiellement dans l'évidement à came (41) de l'élément d'assistance à l'accouplement (40). 30
8. Ensemble connecteur (1) selon l'une des revendications précédentes 6 ou 7, dans lequel l'élément d'assistance à l'accouplement (40) est adapté à bloquer le verrouillage de la languette de verrouillage (52) quand l'élément d'assistance à l'accouplement (40) n'est pas correctement monté dans sa position prébloquée. 35
9. Ensemble connecteur (1) selon l'une des revendications précédentes 6 à 8, dans lequel la languette de verrouillage (52), dans une condition verrouillée, assure ladite fonction de blocage. 40
10. Ensemble connecteur (1) selon l'une des revendications précédentes 6 à 9, dans lequel la languette de verrouillage (52) est le seul moyen de fixation pour le capuchon de protection d'étanchéité (50) sur le boîtier de connecteur (20). 45
11. Ensemble connecteur (1) selon l'une des revendications précédentes 5 à 10, dans lequel l'évidement à came (41) de l'élément d'assistance à l'accouplement (40) est prévu pour coopérer avec au moins une projection à came du connecteur antagoniste pour faciliter un accouplement du boîtier de connecteur (20) avec le connecteur antagoniste. 50
12. Ensemble connecteur (1) selon l'une des revendications précédentes 5 à 11, dans lequel l'évidement à came (41) est une rainure à came, de sorte qu'un actionnement de l'élément d'assistance à l'accouplement (40) mène un mouvement dirigé de la projection à came du connecteur antagoniste dans la rainure à came pour approcher l'ensemble connecteur (1) et le connecteur antagoniste correspondant. 55
13. Ensemble connecteur (1) selon l'une des revendications précédentes, dans lequel l'élément d'assistance à l'accouplement (40) est un coulisseau ayant une configuration généralement en forme de U avec deux jambes (42) réunies par une âme commune (43), et dans lequel chaque jambe (42) est dotée de deux évidements à came (41) pour coopérer avec des projections à came correspondantes prévues sur des côtés opposés du connecteur antagoniste.
14. Ensemble connecteur (1) selon la revendication précédente, dans lequel le coulisseau (40) est guidé dans au moins un canal (21) du boîtier de connecteur (20).
15. Ensemble connecteur (1) selon l'une des revendications 1 à 12, dans lequel l'élément d'assistance à l'accouplement (40) est un levier.
16. Ensemble connecteur (1) selon l'une des revendications précédentes, dans lequel l'élément d'étanchéité (30) et/ou le capuchon de protection d'étanchéité (50) sont réalisés en élastomère thermoplastique (TPE).

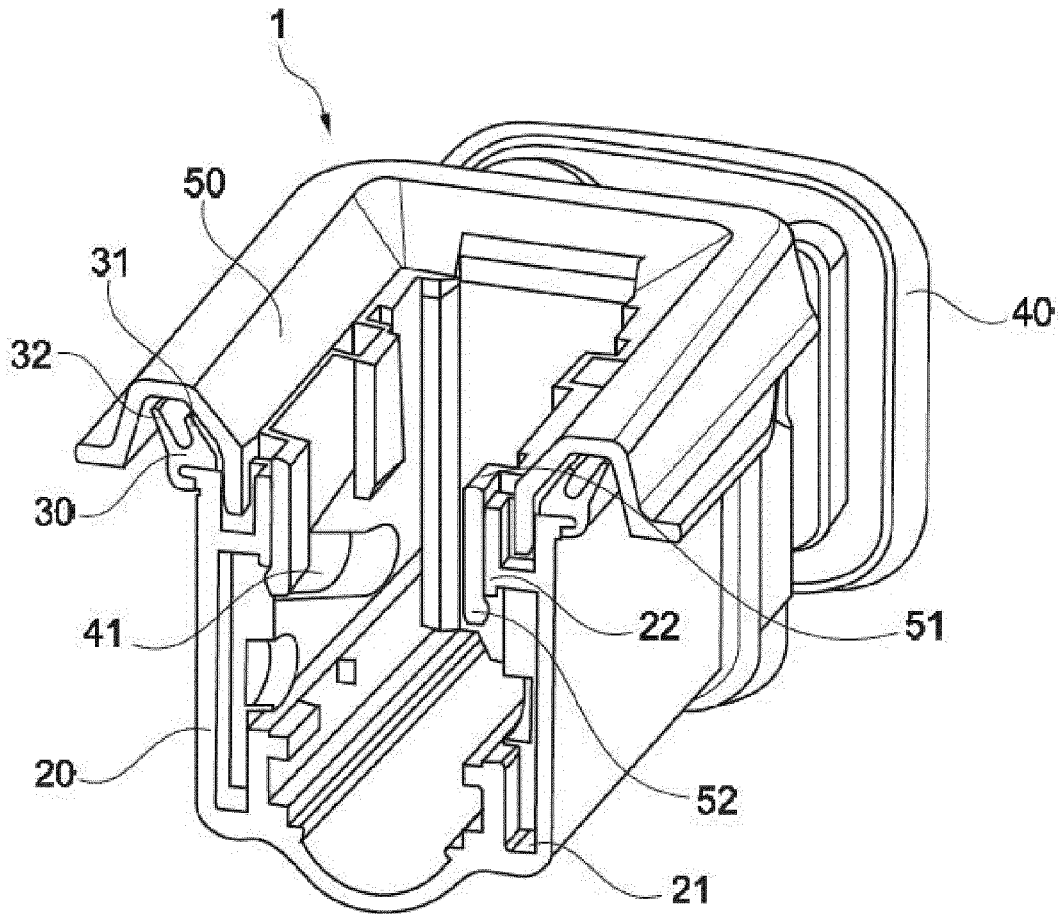


Figure 1

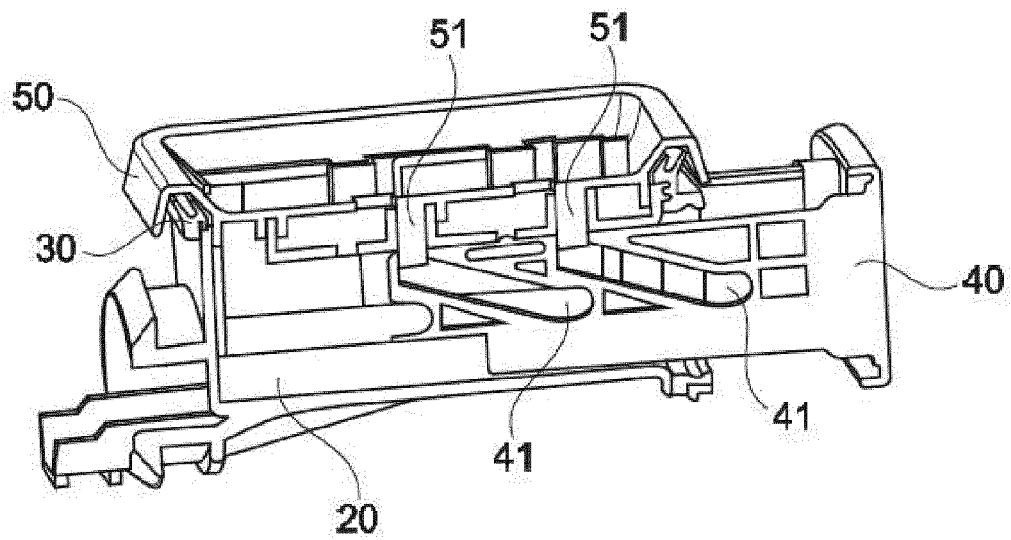


Figure 2

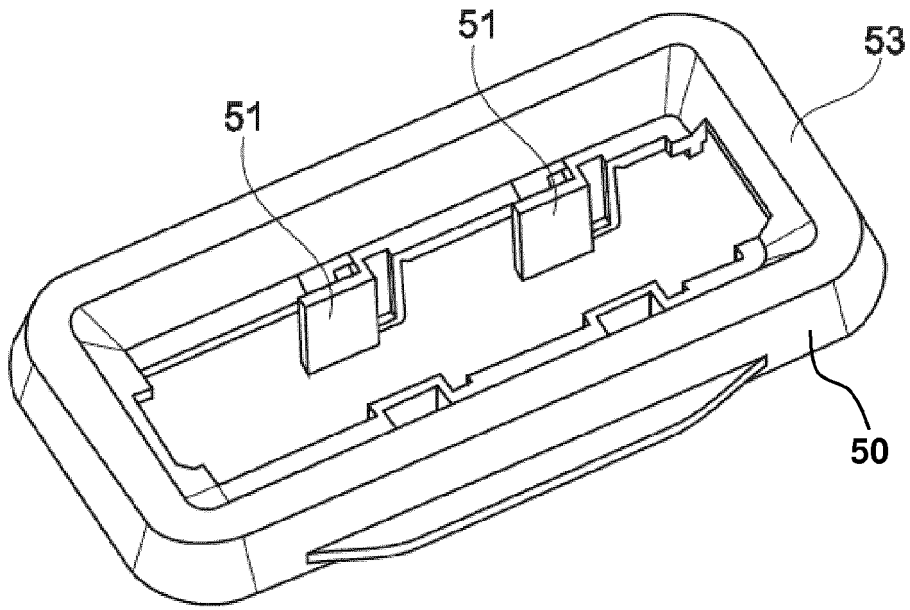


Figure 3

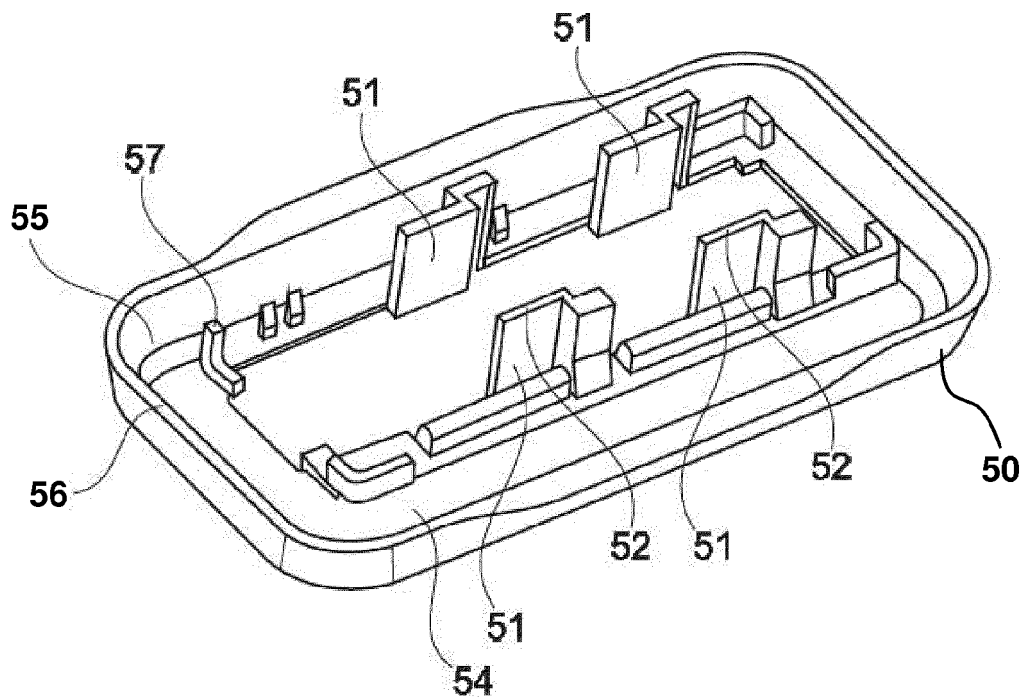


Figure 4

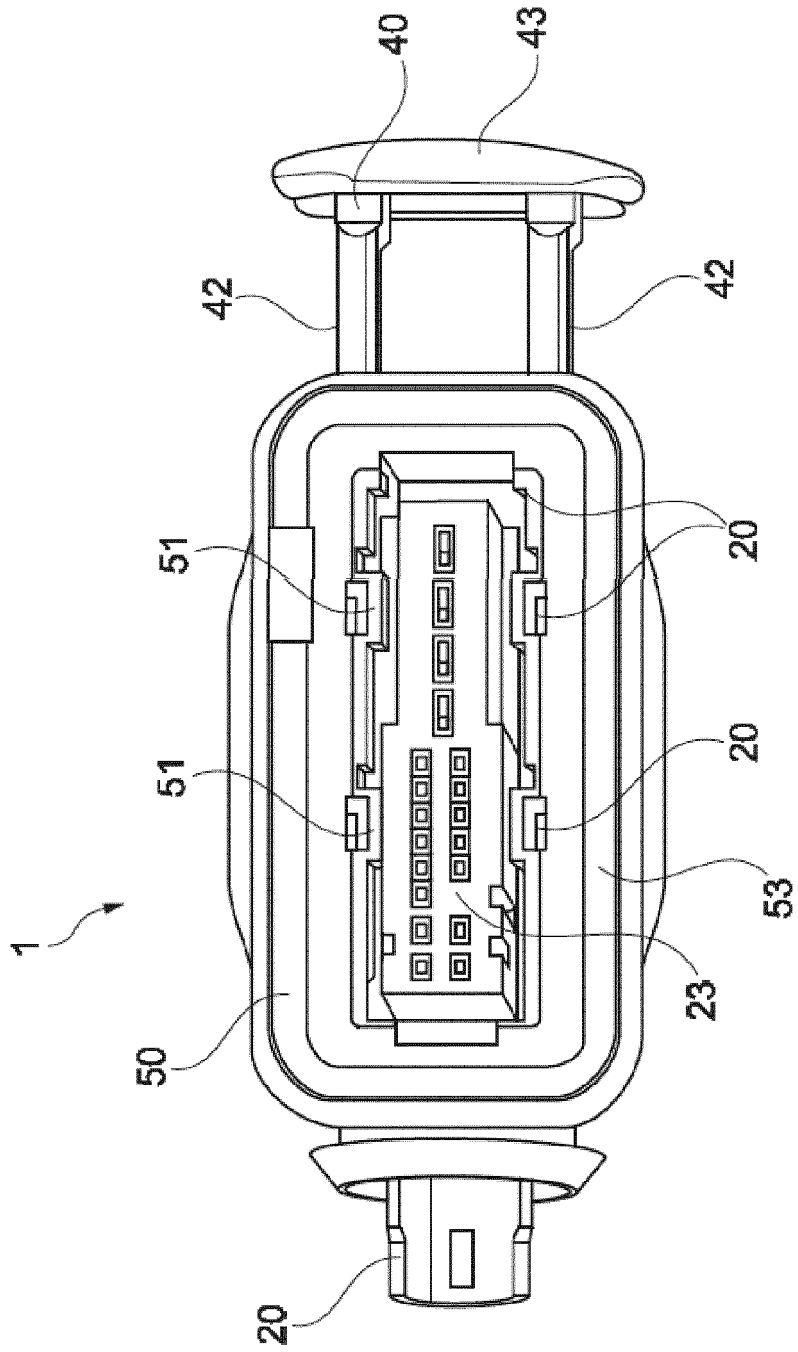


Figure 5

REFERENCES CITED IN THE DESCRIPTION

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