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SEALED CONNECTOR WITH INTEGRAL SEAL FOR HOUSING AND TERMINAL ASSEMBLY

Abstract

A sealed connector includes a first housing with a first containing cavity and a second housing assembly comprising a second housing body and an integral seal. The integral seal features a first seal part for sealing between the first housing and the second housing body, and a second seal part positioned within the second containing cavity of the second housing body, which communicates with the first containing cavity. A terminal assembly is positioned within the first containing cavity, with at least a portion extending into the second containing cavity. The second seal part ensures sealing between the terminal assembly and the second housing body, providing a robust and dependable seal for the connector assembly.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims benefit of priority to Chinese Patent Application No. 202410190448.8 filed on Feb. 20, 2024, the entire disclosure of which is hereby incorporated by reference.

TECHNICAL FIELD OF THE INVENTION

[0002] This application relates to the technical field of electric connector, and in particular, relates to a two-part form sealed connector.

BACKGROUND

[0003] In the prior art, a small or miniaturized sealed electric connector usually relies on multiple seals to achieve sealing between multiple connected parts, so that the connector can obtain waterproof performance. However, due to the large number of seals and parts for retaining the seals (seal retainers), the assembly process of the connector is relatively cumbersome, and the assembly efficiency is low. Also, there is room for improvement in the waterproof effect of the sealed connector.

[0004] Sealed connectors have been widely used in various industries to ensure the integrity and reliability of electrical connections in environments exposed to moisture, dust, and other contaminants. Traditional approaches to sealed connectors often involve the use of separate sealing components, such as O-rings or gaskets, which are manually assembled between the connector housings. These separate sealing components can be prone to misalignment or damage during assembly, leading to potential sealing failures and increased manufacturing complexity.

[0005] Another approach has been the use of overmolded seals, where the seal is molded directly onto one of the connector housings. This method can improve the alignment and integrity of the seal, but it often requires additional manufacturing steps and specialized equipment, increasing production costs. Additionally, overmolded seals may not provide sufficient flexibility to accommodate variations in terminal assembly sizes or configurations, limiting their applicability in diverse applications.

[0006] Some designs have incorporated multi-part housings with integrated seals, where the seal is formed as part of the housing structure. While this can simplify assembly and improve sealing performance, it often results in increased material usage and complexity in the housing design. Furthermore, these designs may not adequately address the need for sealing both the interface between the housings and the terminal assembly within the connector, potentially compromising the overall effectiveness of the seal.

[0007] However, none of these approaches have provided a comprehensive solution that combines the features described in this disclosure.

SUMMARY

[0008] This disclosure provides a sealed electric connector for solving the above listed problems.

[0009] According to one aspect of this disclosure, a sealed connector is provided. The sealed connector includes a first housing having a first containing cavity, a second housing assembly including a second housing body, and an integral seal. The integral seal includes a first seal part and a second seal part. The first seal part provides sealing between the first housing and the second

housing body. The second housing body has a second containing cavity in communication with the first containing cavity. The second seal part is arranged in the second containing cavity. A terminal assembly may be arranged in the first containing cavity. At least part of the terminal assembly is arranged in the second containing cavity. The second seal part is configured to seal the terminal assembly and the second housing body.

[0010] In the above sealed connector, the integral seal may further include a seal connection part, the second housing body may have a communication port in communication with the second containing cavity, the seal connection part may be configured to penetrate through the communication port and connected with the first seal part and the second seal part respectively.

[0011] In the above sealed connector, the connector may be a right-angle connector.

[0012] In the above sealed connector, the first housing may have an assembly port in communication with the first containing cavity and the second housing assembly may be embedded in the assembly port.

[0013] In the above sealed connector, the first containing cavity may include a first subcavity and a second subcavity which are in communication with each other, and the second housing assembly may be arranged in the second subcavity. The terminal assembly may include a contacting part and a wiring part which are connected to each other. The contacting part may be arranged in the first subcavity. The wiring part may be arranged in the second subcavity and at least part of the wiring part may be arranged in the second holding cavity. The wiring part may be used for connecting a cable.

[0014] In the above sealed connector, the contacting part and the wiring part may extend in different directions.

[0015] In the above sealed connector, optionally, the terminal assembly may be provided with a sealing groove along the circumferential direction and the second seal part may be embedded in the sealing groove.

[0016] In the above sealed connector, one of the first housing and the second housing assembly may be provided with a latching slot while the other of the first housing and the second housing assembly includes a latch. The latch is configured to latch with the latching slot to connect the first housing and the second housing assembly.

[0017] In the above sealed connector, the first seal part may include a first base portion and a first lip portion. The first base portion may be connected to the second housing body. The first lip portion may be arranged around the first base portion along the circumference of the first base portion and the first lip portion may be configured to connect with the first housing.

[0018] In the above sealed connector, the second seal part may include a second base portion and a second lip portion. The second base portion may be connected to the second housing body. The second lip portion may be connected to the second base portion and the terminal assembly and the second first lip portion may be looped on the terminal assembly.

[0019] In the above sealed connector, the second housing body may be provided with a first limiting groove. A part of the wiring part of the terminal assembly may be embedded in the first limiting groove. The first limiting groove may be used to limit the position of the connecting part along the extension direction of the contacting part.

[0020] In the above sealed connector, the first housing may have a limiting surface. The limiting surface may be used to enclose the second subcavity. The wiring part may be connected with the limiting surface. The limiting surface may be used to limit the position of the wiring part along the extension direction of the contacting part.

[0021] In the above sealed connector, the first housing may have a second limiting groove. The second limiting groove may be arranged on the limiting surface. A part of the wiring part may be embedded in the second limiting groove, which may be used to limit the position of the wiring part along the extension direction of the wiring part.

[0022] The technical benefits of this disclosure include: an integral seal including a first seal part

and a second seal part is preassembled onto the second housing assembly, so as to reduce the number of seals, and reduce the total number of parts for making the connector. Also, by providing an integral seal, there is no need to adjust the positions of separate seals during an assembly operation.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] In order to provide a clearer explanation of the embodiments of the present disclosure, a brief introduction will be given to the drawings to be used for depicting the embodiments. It is obvious that the drawings described below are only some embodiments of the present disclosure.

[0024] FIG. 1 is an exploded view of the electric connector according to some embodiments.

[0025] FIG. 2 is a cross-sectional view of the electric connector according to some embodiments.

[0026] FIG. 3 is a cross-sectional view of the first housing of the electric connector according to some embodiments.

[0027] FIG. 4 is an isometric view of the first housing of the electric connector according to some embodiments.

[0028] FIG. 5 is a cross-sectional view of a second housing assembly of the electric connector according to some embodiments.

[0029] FIG. 6 is an isometric view of the second housing assembly of the electric connector according to some embodiments.

[0030] FIG. 7 is an isometric view of the second housing assembly from another angle of the electric connector according to some embodiments.

[0031] FIG. 8 is a cross-sectional view of an integral seal including a first seal and a second seal of the electric connector according to some embodiments.

[0032] FIG. 9 is an isometric view of the integrated seal including the first seal part and the second seal part of the electric connector according to some embodiments.

[0033] FIG. 10 is a cross-sectional view of the second housing body of the electric connector according to some embodiments.

[0034] FIG. 11 is an isometric view of the second housing body of the electric connector according to some embodiments.

[0035] FIG. 12 is a cross-sectional view of the terminal assembly of the electric connector according to some embodiments.

[0036] FIG. 13 is an isometric view of the terminal assembly of the electric connector according to some embodiments.

DETAILED DESCRIPTION

[0037] The embodiments of the disclosure will be clearly and completely described below in combination with the drawings in the embodiment of the disclosure. It is appreciated the described embodiments are only part of the embodiments of the disclosure, not all of them. Based on the embodiments in the disclosure, all other embodiments obtained by those skilled in the art without creative work fall within the scope of protection of the disclosure.

[0038] In the description of this disclosure, it should be noted that, unless otherwise specified and limited, the terms “connected” and “coupled” should be understood in a broad sense, for example, it can be fixed connection, removable connection, or integrated connection. It can be mechanical connection, electrical connection, or mutual communication. It can be connected directly or indirectly through an intermediate medium. It can be the connection within two components or the interaction between two components. For those skilled in the art, the specific meaning of the above terms in the disclosure can be understood according to the specific circumstances. In the description of this disclosure, “multiple” means two or more, unless otherwise specifically defined.

In addition, the terms “first” and “second” are only used for descriptive purposes and cannot be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Thus, the features defined as “first” and “second” may explicitly or implicitly include one or more features.

[0039] The following disclosure provides many different embodiments or examples to implement different structures of the present disclosure. In order to simplify the disclosure of the present disclosure, the components and settings of specific examples are described below. Of course, they are merely examples and are not intended to limit the present disclosure.

[0040] In order to solve the technical problems of cumbersome connector assembly process and low assembly efficiency, an embodiment of the disclosure provides an electric connector (also referred to as “connector”). Please refer to FIG. 1, which is an exploded schematic diagram of the connector provided by the embodiment of the disclosure. The connector includes a first housing **1**, a second housing assembly **2**, and a terminal assembly **3**. The first housing **1** includes a first containing cavity **11**, and the terminal assembly **3** is configured to be arranged in the first containing cavity **11**. The second housing assembly **2** includes a second housing body **21**. The second housing body **21** has a second containing cavity **213** in communication with the first containing cavity **11**. The terminal assembly **3** is configured to be arranged in the first containing cavity **11**, and at least part of the terminal assembly **3** is configured to be arranged in the second containing cavity **213**. The second seal part **23** is configured to provide sealing connection between the connection terminal assembly **3** and the second housing body **21**.

[0041] In some embodiments, the configuration of the second housing assembly **2** is shown in FIGS. 5, 6 and 7. The second housing assembly **2** is a preassembled component, and an integral seal **200** is preassembled on the second housing body **21** of the second housing assembly **2** in advance. The integral seal **200** includes a first seal part **22** for sealing and connecting the second housing body **21** and the first housing **1**, and a second seal part **23** for sealing and connecting the second housing body **21** and the terminal assembly **3**. This configuration eliminates the requirement of seal retainers of two seals, reducing the number of connector parts, facilitating the transportation of connector parts, and simplifying the connector assembly process at customer end. In addition, during the assembly process, there is no need for the assembly personnel to manually adjust the position of a seal between the first housing **1** and the second housing assembly **2**, and the position of a seal between the second housing assembly **2** and the terminal assembly **3**, thus assembly error is avoided. The finished connector after assembly has better sealing and water resistance performance.

[0042] The integral seal **200** of the second housing assembly **2** further includes a seal connection part **24**. The second housing body **21** has a communication port **211** which is in communication with the second containing cavity **213**. The seal connection part **24** is configured to pass through the communication port **211** and is connected with the first seal part **22** and the second seal part **23**, respectively.

[0043] In the above embodiment, the seal connection part **24** connecting the first seal part **22** and the second seal part **23** enables the first seal part **22** and the second seal part **23** to mutually limit each other's position, avoiding the displacement of the first seal part **22** and the second seal part **23** when assembling the second housing assembly **2** and the first housing **1**, ensuring that the first seal part **22** and the second seal part **23** do not displace after assembling the connector, resulting in better sealing effect. In addition, the seal connection part **24** which can limit the position of the first seal part **22** and the second seal part **23** can eliminate the requirement of seal retainer, further reducing the number of connector parts, facilitating the transportation of connector parts, and simplifying the assembly procedure of the connector by customers.

[0044] In some embodiments, the second housing body **21** further has a seal limiting surface, and the first seal part **22** is configured to be interfaced with the seal limiting surface. When the first housing **1** is configured to be connected with the second housing assembly **2** and the second

housing body is moving towards the inside of the first containing cavity **11**, the seal limiting surface can prevent the first seal part **22** from moving towards to the second housing body **21** under the action of friction. In addition, the interaction between the seal limiting surface and the seal connection part **24** can further reduce the relative movement between the first seal part **22** and the second seal part **23**, so that the positions of the first seal part **22** and the second seal part **23** relative to the second housing body **21** are more stable and not prone to offset. Specifically, the second housing body **21** is provided with a step, which is configured to define the seal limiting surface, and the first seal part **22** is configured to be embedded in the step.

[0045] It can be understood that since the seal connection part **24** is an elastic part, the seal connection part **24** can prevent the first seal part **22** and the second seal part **23** from moving away from each other. The seal limiting surface can prevent the first seal part **22** from moving in a direction towards the second seal part **23**. Therefore, the presence of both the sealing connection part **24** and the seal limiting surface can better secure the positions of the first seal part **22** and the second seal part **23**, avoiding the offset of the first seal part **22** and the second seal part **23** during the assembling process, and making the finished connector have reliable water-proof sealing performance.

[0046] In the above embodiment, by providing the integral seal **200** consisting of the first seal part **22**, the second seal part **23** and the seal connection part **24**, the position limiting effect between the first seal part **22**, the second seal part **23** and the seal connection part **24** can be better, the connection between the first seal part **22**, the second seal part **23** and the second housing body **21**, the first housing **1** is more tight, and the sealing and waterproof effect of the connector is better.

[0047] In addition, the integral structure can make the connection performance of the first seal part **22**, the second seal part **23** and the seal connection part **24** better, as the seal connection part **24** is not prone to break with the first seal part **22** and the second seal part **23** under the condition of continuous force, so that the first seal part **22** and the second seal part **23** can still limit each other's position under the condition of continuous force, so that the connector can obtain the lasting sealing and waterproof performance, and the service life of the connector is longer and the reliability is better.

[0048] Some aspects of the embodiments are illustrated in FIGS. 2-4. The first housing **1** has an assembly port **12** in connection with the first containing cavity **11**, and the second housing assembly **2** is configured to be embedded in the assembly port **12**. Specifically, in the assembly process of the connector of the embodiment of the disclosure, the assembling of the connector can be completed by simply embedding the second housing assembly **2** into the first housing **1**. At the same time, the sealing between the first housing **1** and the second housing assembly **2** is also completed. The assembly process is simple, the assembly efficiency is higher, and it is more suitable for mass assembly. The assembled connector has better sealing and waterproof performance and higher reliability.

[0049] In some embodiments, a terminal assembly as shown in FIGS. 2, 12, and 13 is provided. Taking reference to FIG. 3, the first containing cavity **11** of the first housing **1** includes a first subcavity **111** and a second subcavity **112** which are in communication with each other, and the second housing assembly **2** is configured to be arranged in the second subcavity **112**. The terminal assembly **3** includes a contacting part **31** and a wiring part **32** which are connected together. The contacting part **31** is configured to be arranged in the first subcavity **111** of the first housing **1**, the wiring part **32** is arranged in the second subcavity **112** of the first housing **1**, and at least part of the connection part **32** is configured to be arranged in the second containing cavity **213** of the second housing assembly **2**. The wiring part **32** is used to connect the harness. The contacting part **31** and the wiring part **32** of the terminal assembly **3** may be of an integral structure.

[0050] The contacting part **31** of the terminal assembly **3** can be either a male end or a female end (a female end is shown in FIGS. 12-13), and the corresponding terminal assembly **3** can be either a male terminal assembly **3** or a female terminal assembly **3**, and the corresponding connector in this

disclosure can be either a male or a female connector.

[0051] In some embodiments, the first housing **1** includes a sidewall to enclose the first subcavity **111**. The connector also includes an anti-rotation component **6**, which is configured to avoid rotation around the extension direction of the contacting part **31** between the two connectors after the illustrated connector is connected with another connector. In particular, the end of the anti-rotation component **6** is provided with an anti-rotation groove or anti-rotation protrusion, and the other connector mated with the connector is provided with an anti-rotation protrusion or anti-rotation groove corresponding to the anti-rotation groove or anti-rotation protrusion on the anti-rotation component **6** to realize the anti-rotation function.

[0052] In some embodiments, the connector further includes a front seal **7**, which can be a sealing ring and is provided on the sidewall. The front seal **7** is used to provide inter-connector sealing when the illustrated connector is connected with another connector.

[0053] In some embodiments, the connector further includes a secondary locking component **8**, which is configured to be connected to the first housing **1**. The secondary locking component **8** is used to provide enhanced retention force when the illustrated connector is connected to another connector, so as to prevent the two connectors from moving opposite to each other along the extension direction of the contacting part **31**.

[0054] Taking reference to FIGS. **2**, **12**, and **13**, the contacting part **31** and wiring part **32** of the terminal assembly **3** extend in different directions. In some embodiments, the angle between the extension direction of the contacting part **31** and the extension direction of the wiring part **32** of the terminal assembly **3** is 90°. In other embodiments, the contacting part **31** and the wiring part **32** extend in the same direction.

[0055] In some embodiments, taking reference to FIGS. **2**, **12**, and **13**, the terminal assembly **3** is provided with a sealing groove **33** along the circumferential direction, and the second seal part **23** is embedded in the sealing groove **33**. In the above embodiment, when the terminal assembly **3** penetrates through the second seal part **23**, due to the elastic deformation of the second seal part **23**, a part of the second seal part **23** will be squeezed into the sealing groove **33**, so that the sealing effect of the second seal part **23** is better. In addition, the part of the second seal part **23** squeezed into the sealing groove **33** can also limit the position of the terminal assembly **3**, which can prevent the terminal assembly **3** from moving along the extension direction of the wiring part **32** and improve the connection stability of the connector.

[0056] In some embodiments, one of the first housing **1** and the second housing assembly **2** is provided with a latching slot **4**, and the other one has a latch **5**. The latch **5** is clamped in the latching slot **4** to connect the first housing **1** and the second housing assembly **2**. Refer to FIGS. **4**, **6** and **7**, in some embodiments, all latches **5** are provided in the second housing body **21** of the second housing assembly **2**, and all latching slots **4** are provided in the first housing **1**. In other embodiments, all the latching slots are provided in the second housing body **21**, and all the latches **5** are provided in the first housing **1**. In the above embodiment, the first housing **1** and the second housing assembly **2** are assembled together through the latches **5** and latching slots **4**.

[0057] In some embodiments, taking reference to FIG. **8**, the first seal part **22** includes a first base portion **221** and a first lip portion **222**. The first base portion **221** is configured to be connected with the second housing body **21**, and the first lip portion **222** is arranged around the first base portion **221** along the circumference of the first base portion **221**, and the first lip portion **222** is configured to be connected with the first housing **1**.

[0058] In the above embodiment, the first base portion **221** provided on the inner side is easier to be embedded in the first containing cavity **11** than the first lip portion **222** provided on the outer side. When the first base portion **221** enters the first containing cavity **11**, the first lip portion **222** can also enter the first containing cavity **11** after elastic deformation. The first lip portion **222** entering the first housing cavity **11** has a larger size than the first base portion **221**, and the first lip portion **222** has more elastic deformation than the first base portion **221**. It can be understood that

the first lip portions **222** can be a plurality, and the plurality of first lip portions **222** are spaced along the extension direction of the first base portion **221** at intervals.

[0059] In some embodiments, taking reference to FIG. **8**, the second seal part **23** includes a second base portion **231** and a second lip portion **232**. The second base portion **231** is configured to be connected to the second housing body **21**, the second lip portion **232** is configured to be connected to the second base portion **231** and the terminal assembly **3**, and the second lip portion **232** is provided around the terminal assembly **3**.

[0060] In the above embodiment, the hole surrounded by the second base portion **231** on the outside is larger, and the hole surrounded by the second lip portion **232** on the inside is smaller. Compared with the second base portion **231**, it is more difficult for the terminal assembly **3** to pass through the hole surrounded by the second lip portion **232**. When the terminal assembly **3** extends into the hole surrounded by the second base portion **231**, the second lip portion **232** produces elastic deformation, and the terminal assembly **3** can also extend into the hole surrounded by the second lip portion **232**. The second lip portion **232** can produce greater elastic deformation than the second base portion **231**, resulting in better sealing effect, so that the connector has better sealing connectivity between the second housing assembly **2** and the terminal assembly **3**.

[0061] In some embodiments, the second lip portion **232** is configured to seal the wiring part **32**. In other embodiments, the second lip portion **232** is configured to seal the cable **35** connected to the terminal assembly **3**. In other embodiments, the second lip portion **232** is configured to seal both the wiring portion **32** and the cable **35** connected to the terminal assembly **3**.

[0062] It can be understood that the second lip portions **232** can be a plurality, and the plurality of second lip portions **232** are spaced along the extension direction of the second base portions **231**.

[0063] In some embodiments, referring to FIGS. **2**, **10**, and **11**, the second housing body **21** has a first limiting slot **212**, and a part of the wiring part **32** is embedded in the first limiting slot **212**, and the first limiting slot **212** is used to limit the position of the wiring part **32** along the extension direction of the contacting part **31**.

[0064] In the above embodiment, the wiring part **32** is configured to press against the second housing body **21** at the first limiting slot **212**, and the first limiting slot **212** can limit the position of the wiring part **32** in the extension direction of the contacting part **31** and the extension direction of the wiring part **32**, so as to avoid vibration of the terminal assembly **3** when the illustrated connector is mated with another connector, resulting in unstable signal transmission. Specifically, the first limiting slot **212** is provided at an inner edge of the second housing body **21**. The first limiting slot **212** has a contact surface toward the first subcavity **111** and a contact surface toward the second containing cavity **213**. The contact surface toward the first subcavity **111** is in contact with a part of the side of the wiring part **32** away from the first subcavity **111**. The contact surface toward the first subcavity **111** can prevent the wiring part **32** from moving away from the first subcavity **111**, so as to prevent the terminal assembly **3** from moving away from the first subcavity **111** when it is connected with a terminal assembly **3** of another connector under stress. The contact surface towards the second containing cavity **213** is in contact with the end face of the wiring part **32** away from the second containing cavity **213**. The contact surface towards the second containing cavity **213** can prevent the wiring part **32** from moving away from the second containing cavity **213**, so as to prevent the terminal assembly **3** from moving away from the second containing cavity **213** when it is connected with a terminal assembly of another connector under stress.

[0065] Alternatively, the first limiting slot **212** may only one contact surface, which is obliquely arranged near the end face and side face of the wiring part **32**. The contact surface is butted with the edge at the intersection of the end face and side face, and the contact surface may also apply a force towards the first subcavity **111** and the second containing cavity **213** to the wiring part **32**, so as to prevent the terminal assembly **3** from moving away from the first subcavity **111** or the second containing cavity **213** when it is connected with a terminal assembly of another connector.

[0066] In some embodiments, taking to FIGS. **2-4**, the first housing **1** has a limiting surface **13**, the

limiting surface **13** is configured to enclose the second subcavity **112**, the wiring part **32** is configured to be connected with the limiting surface **13**, and the limiting surface **13** is configured to limit the wiring part **32** along the extension direction of the contacting part **31**. The first subcavity **111** forms an opening on the limiting surface **13**, from which the contacting part **31** extends into the first subcavity **111** from the second subcavity **112**.

[0067] In the above embodiment, the limiting surface **13** presses against the wiring part **32**, and the limiting surface **13** can limit the terminal in the extension direction of the contacting part **31**.

Specifically, the terminal assembly **3** is clamped between the first limiting slot **212** and the limiting surface **13** to prevent the terminal assembly **3** from moving along the extension direction of the contacting part **31**, so as to avoid shaking of the terminal assembly **3** when the connector is inserted with another connector, resulting in unstable signal transmission.

[0068] In some embodiments, taking reference to FIG. **3**, the first housing **1** has a second limiting slot **14**, which is arranged on the limiting surface **13**, and the part of the wiring part **32** is embedded in the second limiting slot **14** for limiting the wiring part **32** along the extension direction of the wiring part **32**.

[0069] In the embodiments shown in FIGS. **1** to **13**, the connector is described as a right-angle connector (that is, the insertion direction is perpendicular to the cable entrance direction). It should be understood that the scope of this disclosure is not limited to this.

[0070] Accordingly, other embodiments of the disclosure include a vehicle harness having the connector described above. Because the connector in the above embodiment has good sealing and waterproof performance, the vehicle harness with the connector has higher reliability under water conditions.

[0071] The above describes a connector and a vehicle harness provided by the embodiment of the disclosure. The disclosure has provided some specific examples to elaborate the principle and implementation mode of the disclosure. The description of the above embodiment is only used to help understand the technical scheme and its core idea of the disclosure. Those of ordinary skill in the art should understand that they can still modify the technical solutions recorded in the above embodiments or make equivalent replacement for some of the technical features. These modifications or substitutions do not make the essence of the corresponding technical solutions separate from the scope of the technical solutions of the embodiments of the disclosure.

REFERENCE SIGNS

[0072] **1** First Housing [0073] **11** First Containing Cavity [0074] **111** First Subcavity [0075] **112** Second Subcavity [0076] **12** Assembly Port [0077] **13** Limiting Surface [0078] **14** Second Limiting Slot [0079] **2** Second Housing Assembly [0080] **200** Integral Seal [0081] **21** Second Housing Body [0082] **211** Communication Port [0083] **212** First Limiting Slot [0084] **213** Second Containing Cavity [0085] **22** First Seal Part [0086] **221** First Base Portion [0087] **222** First Lip Portion [0088] **23** Second Seal Part [0089] **231** Second Base Portion [0090] **232** Second Lip Portion [0091] **24** Seal Connection Part [0092] **3** Terminal Assembly [0093] **31** Contacting Part [0094] **32** Wiring Part [0095] **33** Seal Groove [0096] **34** Limiting Protrusion [0097] **35** Cable [0098] **4** Latching Slot [0099] **5** Latch [0100] **6** Anti-Rotation Component [0101] **7** Front Seal [0102] **8** Secondary Locking Component

Claims

1. A sealed connector, comprising: a first housing having a first containing cavity; a second housing assembly comprising a second housing body and an integral seal, the integral seal includes a first seal part and a second seal part, the first seal part is configured to provide sealing between the first housing and the second housing body, and the second housing body has a second containing cavity in communication with the first containing cavity, and the second seal part is arranged in the second containing cavity; and a terminal assembly to be arranged in the first containing cavity, and

at least part of the terminal assembly is arranged in the second containing cavity, and the second seal part is configured to seal the terminal assembly and the second housing body.

2. The connector according to claim 1, wherein the integral seal further comprises a seal connection part and the second housing body has a communication port in communication with the second containing cavity.
3. The connector according to claim 1, wherein the seal connection part is configured to penetrate through the communication port and is connected with the first seal part and the second seal part, respectively.
4. The connector according to claim 1, wherein the connector is a right-angle connector.
5. The connector according to claim 1, wherein the first housing has an assembly port in communication with the first containing cavity, and the second housing assembly is embedded in the assembly port.
6. The connector according to claim 1, wherein the first containing cavity comprises a first subcavity and a second subcavity which are in communication with each other.
7. The connector according to claim 6, wherein the terminal assembly comprises a contacting part and a wiring part which are connected to each other.
8. The connector according to claim 6, wherein the contacting part is arranged in the first subcavity, the wiring part is arranged in the second subcavity, and at least part of the wiring part is arranged in the second containing cavity, and the wiring part is used for connecting a cable.
9. The connector according to claim 6, wherein the contacting part and the wiring part extend in different directions.
10. The connector according to claim 1, wherein the terminal assembly is provided with a sealing groove along a circumferential direction, and the second seal part is configured to be embedded in the sealing groove.
11. The connector according to claim 1, wherein one of the first housing and the second housing assembly is provided with a latching slot, and the other one comprises a latch, the latch is configured to latch with the latching slot to connect the first housing and the second housing assembly.
12. The connector according to claim 1, wherein the first seal part comprises a first base portion and a first lip portion and the first base portion is connected to the second housing body.
13. The connector according to claim 12, wherein the first lip portion is arranged around the first base portion along a circumference of the first base portion and the first lip portion is configured to connect with the first housing.
14. The connector according to claim 1, wherein the second seal part comprises a second base portion and a second lip portion and the second base portion is connected to the second housing body.
15. The connector according to claim 14, wherein the second lip portion is connected to the second base portion and the terminal assembly, and the second lip portion is looped on the terminal assembly.
16. The connector according to claim 6, wherein the second housing body is provided with a first limiting groove, wherein a part of the wiring part of the terminal assembly is embedded in the first limiting groove, and wherein the first limiting groove is used to limit a position of the connecting part along an extension direction of the contacting part.
17. The connector according to claim 6, wherein the first housing has a limiting surface, the limiting surface is used to enclose the second subcavity and the wiring part is connected with the limiting surface.
18. The connector according to claim 17, wherein the limiting surface is used to limit a position of the wiring part along an extension direction of the contacting part.
19. The connector according to claim 17, wherein the first housing has a second limiting groove, the second limiting groove is arranged on the limiting surface.

20. The connector according to claim 19, wherein a part of the wiring part is embedded in the second limiting groove, which is used to limit the position of the wiring part along the extension direction of the wiring part.
