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United States Patent Application Publication

20250266636

Kind Code

A1

Publication Date

August 21, 2025

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CONNECTOR AND CONNECTOR ASSEMBLY

Abstract

A female connector **31** includes a female terminal **33** having an insertion portion **33a** into which a male terminal **23** is to be inserted, an insulating housing **34** that houses the female terminal **33**, an insulating housing **34** that houses the female terminal **33**, and a shield shell that covers the insulating housing **34**. The insulating housing **34** includes a housing body **50** and a cover **60**. The housing body **50** includes a first opening **51** to which the female terminal **33** is inserted and the second opening **52** separate from the first opening **51**. The cover **60** is attached to the housing body **50** so as to cover the second opening **52**. The cover **60** includes a first locking portion **63** that locks to the female terminal **33** to prevent the female terminal **33** from coming out from a first opening **51**.

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Family ID: 1000008450078

Appl. No.: 19/051382

Filed: February 12, 2025

Foreign Application Priority Data

JP 2024-023558

Feb. 20, 2024

Publication Classification

Int. Cl.: H01R13/424 (20060101); H01R13/6581 (20110101)

U.S. Cl.:

CPC H01R13/424 (20130101); H01R13/6581 (20130101); H01R2201/26 (20130101)

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and claims priority from Japanese Patent Application No. 2024-023558, filed on Feb. 20, 2024, with the Japan Patent Office, the disclosure of which is incorporated herein in its entirety by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to a connector and a connector assembly.

BACKGROUND

[0003] Conventionally, as a connector mounted in the vehicle, for example, a connector is known that is provided with a female terminal having an insertion portion into which a male terminal of a partner connector is to be inserted, an insulating housing that houses the female terminal, and a shield shell that covers the insulating housing (e.g., see JP 2018-055833 A). The female terminal housed in the insulating housing is prevented from coming out from the insulating housing by being locked by a flexible locking portion formed on the insulating housing. When attaching the female terminal to the insulating housing, the flexible locking portion comes into contact with the female terminal and bends so as to retract. Then, when the female terminal is inserted into a proper position, the flexible locking portion returns to the original position due to its elasticity, and thus the flexible locking portion is locked to the female terminal.

SUMMARY

[0004] In the connector as described above, it is necessary to secure a space in which the flexible locking portion can move in the insulating housing, which is disadvantageous in terms of downsizing the insulating housing.

[0005] An object of the present disclosure is to provide a connector and a connector assembly that can be downsized.

[0006] A connector according to the present disclosure is a connector including: a female terminal having an insertion portion into which a male terminal of a partner connector is to be inserted; an insulating housing that houses the female terminal; and a shield shell that covers the insulating housing, and the insulating housing includes a housing body and a cover, the housing body includes a first opening into which the female terminal is inserted and a second opening separate from the first opening, the cover is attached to the housing body so as to cover the second opening, and the cover includes a first locking portion that locks to the female terminal to prevent the female terminal from coming out from the first opening.

[0007] With the connector and the connector assembly according to the present disclosure, downsizing can be achieved.

[0008] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is an exploded perspective view of a connector assembly according to an embodiment.

[0010] FIG. 2 is an exploded perspective view of the connector assembly according to the embodiment.

[0011] FIG. 3 is an exploded side view of the connector assembly according to the embodiment.

[0012] FIG. 4 is an exploded perspective view of a female connector according to the embodiment.
[0013] FIG. 5 is an exploded perspective view of an insulating housing according to the embodiment.
[0014] FIG. 6 is a side view of the insulating housing according to the embodiment.
[0015] FIG. 7 is a cross-sectional view taken along line 7-7 in FIG. 6.
[0016] FIG. 8 is a cross-sectional view taken along line 8-8 in FIG. 6.

DETAILED DESCRIPTION

[0017] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented here.

Description of Embodiments of the Present Disclosure

[0018] First, aspects of the present disclosure will be listed and described. [0019] [1] A connector according to the present disclosure includes: a female terminal having an insertion portion into which a male terminal of a partner connector is to be inserted; an insulating housing that houses the female terminal; and a shield shell that covers the insulating housing, and the insulating housing includes a housing body and a cover, the housing body includes a first opening into which the female terminal is inserted and a second opening separate from the first opening, the cover is attached to the housing body so as to cover the second opening, and the cover includes a first locking portion that locks to the female terminal to prevent the female terminal from coming out from the first opening.

[0020] According to this configuration, the first locking portion of the cover can prevent the female terminal from coming out from the insulating housing. Here, since the insulating housing includes two components, i.e., the housing body and the cover, it is not necessary to configure the first locking portion to be elastically bendable for attaching of the female terminal. That is, the first locking portion can be locked to the female terminal by inserting the female terminal into the housing body and then attaching the cover to the housing body. Therefore, it is not necessary to secure a space in which the first locking portion can move and be elastically bent, and as a result, the configuration is advantageous in downsizing the insulating housing. [0021] [2] In the above [1], a configuration is also possible in which the female terminal is inserted into the first opening along a length direction of the female terminal, the female terminal has a lock portion, the cover includes the first locking portion and a second locking portion separate from the first locking portion, and the first locking portion and the second locking portion are locked to the lock portion on both sides of the lock portion in the length direction.

[0022] According to this configuration, the female terminal can be positioned in the length direction thereof by the first locking portion and the second locking portion of the cover. [0023] [3] A connector assembly according to the present disclosure includes: a female connector which is the connector according to the above [1] or [2]; and a male connector which is the partner connector that is connected to the female connector.

[0024] According to this configuration, it is possible to achieve the same effects as the above-described connector. [0025] [4] In the above [3], a configuration is also possible in which the male connector includes a connector housing fittable to the shield shell, and the male terminal that is held by the connector housing, the connector housing includes a touch prevention wall extending along the male terminal at least partially in a circumstantial direction around the male terminal, and in a state where the shield shell of the female connector and the connector housing of the male connector are fitted together and the male terminal is inserted into the insertion portion of the female terminal, the touch prevention wall is inserted into the insulating housing and located between the insertion portion and an inner surface of the insulating housing.

[0026] With this configuration, by the touch prevention wall located between the insertion portion

of the female terminal and the inner surface of the insulating housing, it is possible to secure the creepage distance from the female terminal to the shield shell. As a result, the insulation performance of the connector assembly can be improved.

Details of Embodiments of the Present Disclosure

[0027] Specific examples of a connector and a connector assembly according to the present disclosure will be described below with reference to the drawings. In the drawings, the configurations may be partially exaggerated or simplified for convenience in the description. Also, the dimensional ratios of various portions may differ among the drawings. The drawings show an X axis, a Y axis, and a Z axis that are orthogonal to each other. As used herein, a direction extending along the X axis is referred to as an X-axis direction, a direction extending along the Y axis is referred to as a Y-axis direction, and a direction extending along the Z axis is referred to as a Z-axis direction. The terms “parallel” and “orthogonal” in this specification include not only strictly parallel and orthogonal relationships, but also approximately parallel and orthogonal relationships to the extent that effects of the present embodiment are achieved. The term “tubular” as described herein includes not only a shape with a peripheral wall continuously formed around the entire circumference in a circumferential direction, but also a tubular shape formed by a combination of a plurality of components, and a tubular shape having a partially cut-out portion or the like in a circumferential direction thereof, such as a C-shape. Also, the “tubular” shape includes a circular shape, an elliptic shape, and a polygonal shape having pointed or rounded corners. The term “opposed” as used herein refers to surfaces or members that are located in front of each other, and includes not only a case where they are located fully in front of each other, but also a case where they are located partially in front of each other. In addition, “opposed” as used herein includes both a case where two portions are opposed with a portion other than the two portions interposed therebetween, and a case where two portions are opposed with nothing interposed therebetween. As used herein, the terms “first”, “second”, and the like are used to simply differentiate objects, and are not to be construed as ranking objects. It should be noted that the present invention is not limited to these examples but is indicated by the scope of the claims, and is intended to include all changes within the meaning and scope equivalent to the scope of the claims.

(Connector Assembly **11**)

[0028] As shown in FIGS. **1** and **2**, a connector assembly **11** includes a male connector **21**, and a female connector **31** that is connectable to the male connector **21**. The connector assembly **11** is configured to be provided in a vehicle. For example, the male connector **21** is to be fixed to a metal case **41** in the vehicle. For example, the female connector **31** is to be fixed to end portions of two wires **42**.

(Male Connector **21**)

[0029] As shown in FIG. **1**, the male connector **21** has a connector housing **22** and, for example, two male terminals **23** held by the connector housing **22**. The connector housing **22** is formed by an insulating body such as a synthetic resin. The connector housing **22** is moved relative to a shield shell **32** (described later) constituting the female connector **31** along a fitting direction **D1** extending along the Y axis and fitted to the shield shell **32**.

[0030] The connector housing **22** includes a base portion **22a**, a fixing portion **22b**, the touch prevention walls **22c**, a tube portion **22d**, and a pair of guide walls **22f**, for example.

[0031] The base portion **22a** of the connector housing **22** is formed in a plate shape. The base portion **22a** has a quadrangular shape elongated in the width direction as viewed in the Y-axis direction, for example, and the corners thereof are chamfered in arc shapes. For example, the two male terminals **23** are arranged in the X-axis direction and held by the base portion **22a**. The male terminals **23** extend linearly along the fitting direction **D1** extending along the Y axis. A cap **23a** made of resin or rubber is fixed to a front end portion of each of the male terminals **23** in the fitting direction **D1**, for example.

[0032] A pair of fixing portions **22b** of the connector housing **22** extend from, for example, a

portion of the outer edge of the base portion **22a**. Each of the fixing portions **22b** has a through hole **22e** extending through the fixing portion **22b** in the Y-axis direction. The connector housing **22** is fixed to the metal case **41** using fixing bolts **24** configured to pass through the corresponding through holes **22e** and be threadably engaged with female threads (not shown) provided in the metal case **41**.

[0033] Touch prevention walls **22c** are provided at the base portion **22a** and protrude from the surroundings of the respective male terminals **23** in the fitting direction **D1**. The touch prevention walls **22c** extend along the corresponding male terminal **23** in a portion in the circumferential direction around the male terminal **23**. That is, the touch prevention walls **22c** linearly extend in the fitting direction **D1** along the Y axis. A pair of touch prevention walls **22c** are provided around each of the male terminals **23**, for example. The pair of touch prevention walls **22c** are provided on both sides of each male terminal **23** in the X-axis direction. Each pair of touch prevention walls **22c** partially cover the surroundings of the corresponding male terminal **23** while being slightly spaced apart from the male terminal **23**. The position of the leading end of each male terminal **23** in the X-axis direction and the position of the leading end of each touch prevention wall **22c** in the X-axis direction are set at the same position, for example. The distance from the corresponding male terminal **23**, strength, and the like of each touch prevention wall **22c** are set so as to satisfy the safety requirements against touch, as required by, for example, "JIS C 0920-2003".

[0034] The tube portion **22d** of the connector housing **22** has a tubular shape centered about an axis extending in parallel to the X axis. The tube portion **22d** extends from, for example, the entire circumference of the outer edge of the base portion **22a** along the fitting direction **D1**. The pair of guide walls **22f** of the connector housing **22** are formed as one piece with the tube portion **22d**. The two guide walls **22f** are respectively provided on opposite sides of the tube portion **22d** in the X-axis direction so as to be opposed to each other in the X-axis direction. The two guide walls **22f** have shapes that are symmetrical to each other, for example. The male terminals **23** and the touch prevention walls **22c** are provided between the two guide walls **22f** in the X-axis direction. The guide walls **22f** are inserted into the shield shell **32** of the female connector **31** to guide the fitting of the connector housing **22** to the shield shell **32**.

(Female Connector **31**)

[0035] As shown in FIGS. **3** and **4**, the female connector **31** includes the shield shell **32** made of metal, female terminals **33** located inside the shield shell **32**, and insulating housings **34** that each houses the female terminal **33**, for example. The shield shell **32** is attached to the connector housing **22** fixed to the metal case **41** in the X axis direction (specifically, the opposite direction to the fitting direction **D1**).

[0036] The shield shell **32** is, for example, a metal shell having an electromagnetic shielding function. The shield shell **32** is formed so as to cover the insulating housings **34**. The shield shell **32** is formed in a shape that conforms to the shape of the insulating housings **34** such that the shield shell can house the insulating housings **34** substantially without a gap. The insulating housings **34** and the female terminals **33** housed therein are inserted into the shield shell **32** in the insertion direction **D2** along the Z-axis. The insulating housings **34** are formed in a tubular shape so as to cover the female terminals **33**.

[0037] The female terminals **33** extend along the Z-axis direction, and in the present embodiment, two female terminals **33**, which correspond to the number of wires **42**, are provided. The two female terminals **33** are provided side by side in the X-axis direction. The two insulating housings **34** for housing the female terminals **33** are provided corresponding to the number of the female terminals **33**. That is, two insulating housings **34** are provided to house the two female terminals **33**, respectively.

[0038] Each of the female terminals **33** includes an insertion portion **33a** into which the corresponding male terminal **23** are inserted along the fitting direction **D1**, and a wire connecting portion **33b** to which the corresponding wire **42** is connected. The wire connecting portion **33b** is

formed at one end portion in the Z-axis direction of each female terminal **33**. The female terminals **33** have a shape extending from the corresponding insertion portion **33a** toward both sides in the Z-axis direction. In a state where the male terminals **23** are respectively inserted into the insertion portions **33a** of the female terminals **33**, the portions in the female terminals **33** that extend on both sides in the Z-axis direction from the insertion portion **33a** are also located between the pair of touch prevention walls **22c** together with the insertion portion **33a**. Although formed by bending a metal plate material, the female terminals **33** are schematically illustrated in the drawings without being illustrated in detail. Further, in the present embodiment, the wire connecting portions **33b** and the wires **42** are resistance-welded, for example.

[0039] As shown in FIG. 3, the female connector **31** further includes rubber plugs **35**, retainers **36**, and a metal bracket **37**.

[0040] Each rubber plug **35** is formed in a tubular shape and is interposed between the wire **42** and the shield shell **32**. In this manner, the rubber plugs **35** prevent intrusion of liquid into the shield shell **32**.

[0041] The retainers **36** are made of resin. The retainers **36** are locked to the shield shell **32**, and prevents the rubber plugs **35** from coming out from the shield shell **32**.

[0042] The metal bracket **37**, to which a collective shield member S serving as a shield member covering the wires **42** is connected, is connected to the shield shell **32**. Specifically, the shield member of the present embodiment is a tubular collective shield member S that collectively covers the plurality of wires **42**. Also, the collective shield member S of the present embodiment is a braided member obtained by braiding conductive elemental wires made of a copper alloy, an aluminum alloy, or the like into a tubular shape. The entire circumference of the collective shield member S is connected to the metal bracket **37**, and the metal bracket **37** is connected to the shield shell **32**. The metal bracket **37** is fastened and fixed to the shield shell **32** with a screw **38**.

[0043] The collective shield member S is electrically connected to the metal case **41** via the metal bracket **37**, the shield shell **32**, and a bolt **43**, and is grounded. Therefore, the radiation of electromagnetic noise from the wires **42** and the female terminals **33** covered by the collective shield member S, the metal bracket **37**, and the shield shell **32** is favorably suppressed.

[0044] As shown in FIG. 4, the shield shell **32** is provided with a fixing hole **32a** extending through the shield shell **32** along the X-axis. The shield shell **32** is configured to be fixed to the metal case **41** by the bolt **43** that passes through the fixing hole **32a** and is screwed into a female screw **41a** provided in the metal case **41** (see FIG. 3).

(Configuration of Insulating Housing **34**)

[0045] As shown in FIG. 5, each insulating housing **34** includes a housing body **50** and a cover **60** to be attached to the housing body **50**.

[0046] As shown in FIG. 7, the housing body **50** has an elongated shape along the length direction (Z-axis direction) of the female terminal **33**. The housing body **50** has a first opening **51** into which the female terminal **33** is inserted along the Z-axis. The first opening **51** is provided in a base end portion of the housing body **50** in the Z-axis direction. The female terminal **33** is inserted into the housing body **50** through the first opening **51**.

[0047] As shown in FIGS. 5 and 8, the housing body **50** has a second opening **52** that is different from the first opening **51**. The second opening **52** is formed in a lower surface of the housing body **50** in the Y-axis direction. The second opening **52** is open in the Y-axis direction. Also, the housing body **50** has a pair of side walls **53** that oppose each other in the X-axis direction. The female terminal **33** is housed between the pair of side walls **53**.

[0048] As shown in FIGS. 5, 6 and 7, the side walls **53** have elastic fixing pieces **54**. The elastic fixing pieces **54** are respectively provided on the two side walls **53**. Each elastic fixing piece **54** is formed on the corresponding side wall **53** so as to be bendable in the X-axis direction. The elastic fixing pieces **54** are locked to the inner surface of the shield shell **32** in the Z-axis direction. Thus, the insulating housing **34** is prevented from coming out from the shield shell **32**.

[0049] Each side wall **53** has locking protrusions **55** protruding in the X-axis direction from the outer side surface of the side wall **53**. A pair of locking protrusions **55** are provided on each of the side walls **53**, for example.

[0050] The cover **60** is attached to the housing body **50** so as to cover the second opening **52**. As shown in FIGS. **5** and **6**, the cover **60** includes a cover body **61** for covering the second opening **52** and lock portions **62** provided on the cover body **61**. A pair of lock portions **62** are provided on both edges of the cover body **61** in the X-axis direction so as to correspond to the locking protrusions **55** of the housing body **50**. The lock portions **62** are locked to the respective locking protrusion **55** in the Y-axis direction. In this manner, the cover **60** is fixed to the housing body **50**.

[0051] As shown in FIGS. **5** and **7**, the cover **60** includes a first locking portion **63**, a second locking portion **64**, and a support wall **65**, which are provided on the cover body **61**. The first locking portion **63**, the second locking portion **64**, and the support wall **65** protrude from the cover body **61** toward the inside of the housing body **50** along the Y-axis. Each of the first locking portions **63** and the second locking portions **64** are configured to be locked in the Z-axis direction with respect to a lock portion **33c** provided in the female terminals **33**. The lock portion **33c** is disposed between the first locking portion **63** and the second locking portion **64** in the Z-axis direction. The first locking portion **63** is provided at a position closer to the first opening **51** than the second locking portion **64**. The lock portion **33c** is locked to the first locking portion **63** in a coming-out direction **D3** (a direction toward the first opening **51**) along the Z-axis. Further, the lock portion **33c** is locked to the second locking portion **64** in a direction **D4** that is an opposite direction to the coming-out direction **D3**. In this manner, the lock portion **33c** is locked to the first locking portion **63** and the second locking portion **64**, so that the female terminals **33** are positioned in the Z-axis direction. In a state where the cover **60** is not attached to the housing body **50**, the insertion portion **33a** and the lock portion **33c** of each of the female terminals **33** are exposed through the second opening **52**.

[0052] The support wall **65** of the cover **60** is provided so as to face the second locking portion **64** in the X-axis direction. The female terminal **33** is disposed so as to extend between the second locking portion **64** and the support wall **65**. The second locking portion **64** and the support wall **65** position the female terminal **33** in the X-axis direction.

[0053] As shown in FIG. **8**, each cover body **61** includes a terminal insertion hole **66** and a pair of wall insertion holes **67**. The terminal insertion hole **66** and the wall insertion holes **67** extend through the cover body **61** in the Y-axis direction.

[0054] In a state where the shield shell **32** and the connector housing **22** are fitted to each other, the male terminals **23** of the male connector **21** are respectively inserted into the terminal insertion holes **66** along the Y-axis. That is, each male terminal **23** is inserted into the corresponding housing body **50** via the terminal insertion hole **66**. Each male terminal **23** is inserted along the Y-axis into the insertion portion **33a** of the corresponding female terminal **33** inside the corresponding housing body **50**.

[0055] In a state where the shield shell **32** and the connector housing **22** are fitted to each other, the pair of touch prevention walls **22c** of the male connector **21** are inserted into the pair of wall insertion holes **67** of the cover body **61** along the Y-axis. That is, the touch prevention walls **22c** are inserted into the housing body **50** via the wall insertion holes **67**. The touch prevention walls **22c** are located between the insertion portion **33a** of the female terminal **33** and the inner surface of the insulating housing **34**. The touch prevention walls **22c** are disposed between the insertion portion **33a** and the inner surface of the insulating housing **34** in the X-axis direction, for example.

(Operations of Embodiment)

[0056] The following describes operations of the present embodiment.

[0057] When attaching the female terminals **33** to the insulating housings **34**, first, the female terminals **33** are inserted into the respective housing bodies **50** via the first openings **51**. In this state, the insertion portions **33a** and the lock portions **33c** of the female terminals **33** are exposed

through the second openings **52** of the housing body **50**.

[0058] Thereafter, the covers **60** are attached to the second openings **52** of the housing bodies **50**, respectively. At this time, each lock portion **33c** of the female terminal **33** enters between the first locking portion **63** and the second locked portion **64** of the cover **60**. As a result, each lock portion **33c** becomes capable of being locked to the first locking portion **63** in the coming-out direction **D3**. Therefore, the first locking portion **63** can prevent the female terminal **33** from coming out from the first opening **51**.

[0059] After the female terminals **33** are attached to the insulating housings **34**, the insulating housings **34** are attached to the shield shell **32**. The insulating housings **34** are fixed to the inner surface of the shield shell **32** by the elastic fixing pieces **54** of the housing body **50**.

[0060] When the male connector **21** and the female connector **31** are fitted to each other, the male terminals **23** and the touch prevention walls **22c** of the male connector **21** are inserted into the insulating housings **34**. Each male terminal **23** is inserted into the insertion portion **33a** of the corresponding female terminal **33**, and electrically connected thereto.

[0061] In a state where each male terminal **23** is inserted into the insertion portion **33a** of the corresponding female terminal **33**, the touch prevention walls **22c** of the male connector **21** are inserted into the insulating housing **34** of the female connector **31** and is located between the insertion portion **33a** and the inner surface of the insulating housing **34**. In this manner, the creepage distance from the female terminal **33** to the shield shell **32** can be secured. In particular, in the present embodiment, since the elastic fixing pieces **54** are formed on the side walls **53**, gap extending through the side walls **53** are formed near the elastic fixing pieces **54**. The touch prevention walls **22c** cover the gap from the inner side of the housing body **50**. And thus the creepage distance from the female terminals **33** to the shield shell **32** can be secured.

(Effects of Present Embodiment)

[0062] The following describes effects of the present embodiment. [0063] (1) Each insulating housing **34** for housing the female terminal **33** includes the housing body **50** and the cover **60**. The housing body **50** includes the first opening **51** into which the female terminal **33** is to be inserted and the second opening **52** that is separate from the first opening **51**. The cover **60** is attached to the housing body **50** so as to cover the second opening **52**. The cover **60** includes the first locking portion **63** that locks to the female terminal **33** to prevent the female terminal **33** from coming out from the first opening **51**. With this configuration, since the insulating housing **34** includes two components, namely, the housing body **50** and the cover **60**, a configuration is no longer necessary in which the first locking portion **63** can be elastically bent for attachment of the female terminal **33**. That is, after the female terminal **33** is inserted into the housing body **50**, the cover **60** is attached to the housing body **50**. In this manner, the first locking portion **63** can be locked to the female terminal **33**. Accordingly, it is no longer necessary to ensure a space in which the first locking portion **63** can be elastically bent, and as a result, a configuration that is advantageous for downsizing the insulating housing **34** is realized. [0064] (2) Each female terminal **33** is inserted into the first opening **51** along the length direction (Z axis direction) of the female terminal **33**. The female terminal **33** includes the lock portion **33c**. The cover **60** includes the first locking portion **63** and the second locking portion **64** that is separate from the first locking portion **63**. The first locking portion **63** and the second locking portion **64** are locked to the lock portions **33c** on both sides of the lock portion **33c** in the length direction (Z axis direction) of the female terminal **33**. With this configuration, the first locking portion **63** and the second locking portion **64** of the cover **60** make it possible to position the female terminal **33** in the length direction thereof. [0065] (3) Each male connector **21** includes the connector housing **22** that is fittable to the shield shell **32** and the male terminal **23** held by the connector housing **22**. The connector housing **22** includes the touch prevention walls **22c** that extend along the male terminal **23** at least partially in the circumferential direction of the male terminal **23**. In the state where the shield shell **32** is fitted to the connector housing **22** and the male terminals **23** are inserted into the insertion portions **33a** of

the corresponding female terminals **33**, the touch prevention walls **22c** are inserted into the insulating housings **34** and located between the insertion portion **33a** and the inner surface of the insulating housing **34**. With this configuration, due to the touch prevention walls **22c** located between the insertion portion **33a** of the female terminal **33** and the inner surface of the insulating housing **34**, the creepage distance from the female terminal **33** to the shield shell **32** can be secured. As a result, the insulation performance of the connector assembly **11** can be improved.

(Other Embodiments)

[0066] The present embodiment can be implemented with modifications such as the following. The present embodiment and the following variations can be implemented in combination with each other as long as no technical contradiction arises. [0067] The second locking portion **64** and the support wall **65** can be omitted from the above-described cover **60**. [0068] In the above embodiment, the touch prevention walls **22c** are inserted into each insulating housing **34**, but the present disclosure is not limited thereto. The touch prevention walls **22c** may be located outside of each insulating housing **34**. [0069] In the above-described embodiment, each male terminal **23** is inserted to the insertion portion **33a** of the female terminal **33** in the Y-axis direction orthogonal to the length direction (Z-axis direction) of the corresponding female terminal **33**, but the present disclosure is not limited thereto. For example, each male terminal **23** may be inserted into the insertion portion **33a** in the length direction (Z-axis direction) of the corresponding female terminal **33**. In this case, the touch prevention walls **22c** of the male connectors **21** may be formed into a tubular shape surrounding the entirety of the male terminal **23**. [0070] The number of the male terminals **23** in each male connector **21** is not limited to two as in the above embodiments, and may be one or three or more. Also, in accordance with the change of the number of the male terminals **23**, the number of the female terminals **33** and wires **42** may be changed as appropriate. [0071] Although the above embodiment describes that the male connector **21** is fixed to the metal case **41**, another configuration is possible such as that in which the male connector **21** is fixed to the vehicle panel. [0072] The embodiments disclosed herein are illustrative in all respects, and the present invention is not limited to these illustrations. The scope of the present invention is indicated by the scope of the claims, and is intended to include all changes within the meaning and scope equivalent to the scope of the claims.

[0073] From the foregoing, it will be appreciated that various exemplary embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. Accordingly, the various exemplary embodiments disclosed herein are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

Claims

1. A connector comprising: a female terminal having an insertion portion into which a male terminal of a partner connector is to be inserted; an insulating housing that houses the female terminal; and a shield shell that covers the insulating housing, wherein the insulating housing includes a housing body and a cover, the housing body includes a first opening into which the female terminal is inserted and a second opening separate from the first opening, the cover is attached to the housing body so as to cover the second opening, and the cover includes a first locking portion that locks to the female terminal to prevent the female terminal from coming out from the first opening.
2. The connector according to claim 1, wherein the female terminal is inserted into the first opening along a length direction of the female terminal, the female terminal has a lock portion, the cover includes the first locking portion and a second locking portion separate from the first locking portion, and the first locking portion and the second locking portion are locked to the lock portion on both sides of the lock portion in the length direction.

3. A connector assembly comprising: a female connector which is the connector according to claim 1; and a male connector which is the partner connector that is connected to the female connector.
4. The connector assembly according to claim 3, wherein the male connector includes a connector housing fittable to the shield shell, and the male terminal that is held by the connector housing, the connector housing includes a touch prevention wall extending along the male terminal at least partially in a circumstantial direction around the male terminal, and in a state where the shield shell of the female connector and the connector housing of the male connector are fitted together and the male terminal is inserted into the insertion portion of the female terminal, the touch prevention wall is inserted into the insulating housing and located between the insertion portion and an inner surface of the insulating housing.
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