

Description

CONNECTOR HOUSING AND ELECTRIC CONNECTOR

5 Technical Field

[0001]

The present disclosure relates to a connector housing including an electric wire retaining portion that retains a covered electric wire, and an electric connector including such a connector housing.

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Background Art

[0002]

Conventionally, a connector housing having an electric wire retaining portion and an electric connector is known. For example, PTL 1 discloses an electric connector including a connector housing including an electric wire retaining portion and a contact having an insulation displacement blade that cuts the outer jacket of a covered electric wire for electrical continuity with a core wire. The electric wire retaining portion of the electric connector disclosed in PTL 1 is provided with standing walls standing on both sides of a receiving groove across the receiving groove from each other, and electric wire holders hanging down from the standing walls into the receiving groove in directions toward each other. The electric wire holders allow the reception of the covered electric wire into the receiving groove by elastically deforming when the covered electric wire is received into the receiving groove. Moreover, these electric wire holders prevent the covered electric wire from being pulled out upward from the receiving groove after the covered electric wire has been received.

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Citation List

Patent Literature

[0003]

30 PTL 1: JP2005-108650A

Summary of Invention

Technical Problem

[0004]

In such a connector housing having an electric wire retaining portion and such an electric connector, the covered electric wires must be arrayed at narrower pitches without changing the thicknesses of the covered electric wires. In such case, the thicknesses of the standing walls must be made thinner in order to narrow the array pitches. Making the thickness of the standing walls thinner would make each of the standing walls to bend outward when a force is applied to the covered electric wire in the receiving groove in a direction for the covered electric wire to be pulled out upward. Hence, compared to a case where the thicknesses of the standing walls are thick, there is a risk that the covered electric wires may come out of the receiving groove with a weaker force.

[0005]

The present disclosure has as an object to provide a connector housing structured such that a covered electric wire is not easily pulled out from a receiving groove when a force is applied to the covered electric wire in such a direction that the covered electric wire may be pulled out upward, and an electric connector including such a connector housing.

Solution to Problems

[0006]

In order to attain the object, a connector housing of the present disclosure is a connector housing including an electric wire retaining portion including a receiving groove that opens upward and that receives a covered electric wire, standing walls that form the receiving groove by standing across the receiving groove from each other and that extend in a front-back direction, and electric wire holders that extend in a front-back direction to hang down from upper parts of the standing walls into the receiving groove in directions toward each other, that allow reception of the covered electric wire into the receiving groove by elastically deforming when the covered electric wire is received into the receiving groove, and that prevent the covered electric wire from being pulled out upward from the receiving groove after the covered electric wire has been received,

wherein the standing walls extend backward beyond back ends of the electric wire holders.

[0007]

In the connector housing of the present disclosure, the back end portions of the standing walls, which form the receiving groove, extend backward beyond the back ends of the electric wire holders. For this reason, when a force is applied to the covered electric wire in such a direction that the covered electric wire is pulled out upward, the covered electric wire is more strongly prevented from being pulled out from the receiving groove than in a case where the back ends of the electric wire holders are located in the same location as the back ends of the standing walls.

[0008]

Note here that in the connector housing of the present disclosure, it is preferable that each of the standing walls has a backward obliquely upward slope between the back end of a corresponding one of the electric wire holders and a back end of the standing wall.

[0009]

Provision of the slope reduces the risk of damaging the covered electric wire in fitting the covered electric wire into the connector housing. This reduces the risk of an accident such as cutting of the covered electric wire or peeling of the outer jacket.

[0010]

Further, in order to attain the object, an electric connector of the present disclosure includes: the connector housing of any aspect of the present disclosure; and a contact having an insulation displacement blade that cuts an outer jacket of the covered electric wire for electrical continuity with a core wire, the contact being supported in such a position in the connector housing that the insulating displacement blade is located ahead of the electric wire retaining portion and cuts the outer jacket of the covered electric wire when the covered electric wire is retained in the electric wire retaining portion.

[0011]

The present disclosure is suitably applied to an electric connector including an insulation displacement contact.

Advantageous Effects of Invention

[0012]

The present disclosure prevents the covered electric wire from being easily pulled out from the receiving groove when a force is applied to the covered electric wire in such a direction that the covered electric wire is pulled out upward.

Brief Description of Drawings

[0013]

Figure 1 is an isometric view of an electric connector according to an embodiment of the present disclosure.

Figure 2 illustrates three side views of the electric connector of Figure 1.

Figure 3 illustrates an enlarged view (A) of an encircled portion R1 of Figure 1 and an enlarged view (B) of an encircled portion R2 of Figure 2.

Figure 4 is an isometric view of an electric connector according to a comparative example.

Figure 5 illustrates three side views of the electric connector of Figure 4.

Figure 6 illustrates an enlarged view (A) of an encircled portion R3 of Figure 4 and an enlarged view (B) of an encircled portion R4 of Figure 5.

Figure 7 illustrates explanatory diagrams showing a difference in action due to a difference in location of formation of electric wire holders.

Description of Embodiments

[0014]

The following describes an embodiment of the present disclosure.

[0015]

Figure 1 is an isometric view of an electric connector according to an embodiment of the present disclosure.

[0016]

Further, Figure 2 illustrates three side views of the electric connector of Figure 1.

Note here that Figure 2(A) is a top view, that Figure 2(B) is a side view, and that Figure 2(C) is a back view.

[0017]

Furthermore, Figure 3 illustrates an enlarged view (A) of an encircled portion R1 of Figure 1 and an enlarged view (B) of an encircled portion R2 of Figure 2.

[0018]

This electric connector 10A is provided with a connector housing 20 and a contact. While the contact has an insulation displacement blade 31 illustrated, the other portions of the contact are hidden in the housing 20 and do not appear in the drawing. This electric connector 10 has an array of thirteen of these contacts. Moreover, each contact has two of these insulation displacement blades 31 provided at the front and back thereof, respectively. Into this electric connector 10, thirteen covered electric wires 50 (see Figure 7) are fitted. Moreover, the insulation displacement blades 31 cut the covered electric wires 50 thus fitted for electrical continuity with a core wire.

[0019]

Further, the connector housing 20 has an electric wire retaining portion 21, formed behind the insulation displacement blade 31 of a contact, that retains a covered electric wire 50. As many of these electric wire retaining portions 21 as the contacts are arrayed. Each electric wire retaining portion 21 has a receiving groove 22 that opens upward and that receives a covered electric wire. This receiving groove 22 is formed by standing walls 23 standing on both sides of the receiving groove 22 across the receiving groove 22 from each other and extending in a front-back direction. Further, this electric wire retaining portion 21 has electric wire holders 24 formed on both sides of the receiving groove 22. These electric wire holders 24 have such shapes as to extend in a front-back direction to hang down from the standing walls 23 into the receiving groove 22 in directions toward each other. Moreover, these electric wire holders 24 allow the reception of the covered electric wire 50 into the receiving groove 22 by elastically deforming when the covered electric wire 50 is received into the receiving groove 22. Further, these electric wire holders 24 prevent the covered electric wire 50 from being pulled out upward from the receiving groove 22 when an upward force is applied to the covered electric wire 50 after the covered electric wire 50 has been received.

[0020]

Note here that in the present embodiment, as shown in Figure 3(B), each of the standing walls 23 has its back end located in the same location E1 as a back end of the

connector housing 20. Meanwhile, each of the electric wire holders 24 has its back end located in a location E2 that is ahead of the location E1 by a distance d. That is, the standing wall 23 extends backward beyond the back end of the electric wire holder 24. This electric wire holder 24 has a length L in a front-back direction.

5 [0021]

Further, the standing wall 23 has a backward obliquely upward slope 231 between the back end (location E2) of the electric wire holder 24 and the back end (location E1) of the standing wall 23.

[0022]

10 The action brought about by the standing wall 23 extending backward beyond the back end of the electric wire holder 24 and the action of the slope 231 will be described after a comparative example has been described.

[0023]

Figure 4 is an isometric view of an electric connector according to a comparative example.

[0024]

Further, Figure 5 illustrates three side views of the electric connector of Figure 4. Note here that Figure 5(A) is a top view, that Figure 5(B) is a side view, and that Figure 5(C) is a back view.

20 [0025]

Furthermore, Figure 6 illustrates an enlarged view (A) of an encircled portion R3 of Figure 4 and an enlarged view (B) of an encircled portion R4 of Figure 5.

[0026]

25 Elements of the electric connector 10B according to the comparative example shown in Figures 4 to 6 that correspond to those of the electric connector 10A according to the embodiment of the present disclosure shown in Figures 1 to 3 are assigned the same signs as those assigned in Figures 1 to 3. Moreover, in this comparative example, only points needed for comparison with the electric connector 10A according to the embodiment of the present disclosure are described, and other points are not described.

30 [0027]

In the electric connector 10B according to this comparative example, each of the electric wire holders 24 has its back end located in the same location E1 as the back end

of a corresponding one of the standing walls 23. The length L of this electric wire holder 24 is identical to the length L of each of the electric wire holders 24 of the electric connector 10A according to the embodiment. That is, in the case of the electric connector 10B according to the comparative example, other elements are identical to those of the electric connector 10A according to the embodiment, and only the electric wire holder 24 is formed in a location near the location E1.

[0028]

Figure 7 illustrates explanatory diagrams showing a difference in action due to a difference in location of formation of electric wire holders. Note here that Figure 7(A) is an explanatory diagram of the present embodiment and that the Figure 7(B) is an explanatory diagram of the comparative example.

[0029]

Figure 7 shows a state where a covered electric wire 50 has been received into the receiving groove 22 of an electric wire retaining portion 21. Assume here that such an upward force is applied to the covered electric wire 50 that the covered electric wire 50 is pulled out from the receiving groove 22. The application of the upward force to the covered electric wire 50 means that as shown in Figure 2(C) and Figure 5(C), a portion of the covered electric wire 50 that extends backward (downward in Figure 7) from the connector housing 20 is lifted. In this case, forces are applied to the back ends of the electric wire holders 24 in the directions of dotted arrows D illustrated. Then, forces are applied to the standing walls 23 in the directions of the arrows D, too, so that the standing walls 23 will open rightward and leftward.

[0030]

Note here that in the case of the present embodiment (Figure 7(A)), each of the standing walls 23 has its back end (location E1) located behind the back end (location E2) of a corresponding one of the electric wire holders 24. For this reason, when a force is applied to the back end (location E2) of the electric wire holder 24, this standing wall 23 acts like a beam with both ends built-in the back end of which in the location E1 and the front end of which in a location E3 are both fixed. On the other hand, in the case of the comparative example (Figure 7(B)), each of the electric wire holders 24 has its back end located in the same location E1 as the back end (location E1) of a corresponding one of the standing walls 23. For this reason, when a force is applied to

the back end (location E1) of the electric wire holder 24, the standing wall 23 behaves like a cantilever only the front end of which in the location E3 is fixed. This difference causes the displacements of the standing walls 23 under the same force to greatly vary as indicated by the difference in size of the arrows D between Figure 7(A) and Figure 7(B).

5 That is, in the case of the present embodiment, as compared with the comparative example, the formation of the electric wire holders 24 ahead by the distance d makes the displacements of the standing walls 23 small and, accordingly, prevents the covered electric wire 50 from being pulled out from the receiving groove 22.

[0031]

10 It is conceivable here that the length L of the electric wire holders 24 in a front-back direction may be lengthened as a means of strongly preventing the covered electric wire 50 from being pulled out from the receiving groove 22. Lengthening this length L makes it possible to strongly prevent a pullout even if the electric wire holder 24 have their back ends located in the same location as the back ends of the standing walls 23.

15 Note, however, lengthening the length L of the electric wire holders 24 in a front-back direction requires a stronger force for the reception of the covered electric wire 50 into the receiving groove 22, increasing the risk of damaging the covered electric wire 50. For this reason, in the present embodiment, the length L of the electric wire holders 24 in a front-back direction is the same as that of the comparative example, and the locations
20 of formation of the electric wire holders 24 are moved forward.

[0032]

Further, in the case of the present embodiment, each of the standing walls 23 is provided with a slope 231. This is compared with a standing wall 23, provided with no slope 231, whose back end rises perpendicularly. Provision of the slope 231 reduces
25 the risk of damaging the covered electric wire 50 in fitting the covered electric wire 50 into the connector housing 20. This reduces the risk of an accident such as cutting of the covered electric wire 50 or peeling of the outer jacket. Further, provision of this slope 231 reduces thin wall sections of the standing wall 23, preventing the standing wall 23 from being broken or cracked when an external force is applied.

30 [0033]

It should be noted that in the example described here, the present disclosure is applied to an electric connector 10A including a contact having an insulation

displacement blade 31. Note, however, that a contact constituting an electric connector of the present disclosure does not necessarily need to be a contact having an insulation displacement blade, but may include, for example, a contact press-bonded to an electric wire.

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Reference Signs List

[0034]

	10A, 10B...electric connector
	20...connector housing
10	21...electric wire retaining portion
	22...receiving groove
	23...standing wall
	231...slope
	24...electric wire holder
15	31...insulation displacement blade
	50...covered electric wire

{CLAIMS}

1. A connector housing comprising an electric wire retaining portion including a receiving groove that opens upward and that receives a covered electric wire, standing
5 walls that form the receiving groove by standing across the receiving groove from each other and that extend in a front-back direction, and electric wire holders that extend in a front-back direction to hang down from upper parts of the standing walls into the receiving groove in directions toward each other, that allow reception of the covered
10 electric wire into the receiving groove by elastically deforming when the covered electric wire is received into the receiving groove, and that prevent the covered electric wire from being pulled out upward from the receiving groove after the covered electric wire has been received,

wherein the standing walls extend backward beyond back ends of the electric wire holders.

2. The connector housing according to claim 1, wherein each of the standing walls has a backward obliquely upward slope between the back end of a corresponding one of the electric wire holders and a back end of the standing wall.

3. An electric connector comprising:
the connector housing according to claim 1 or 2; and
a contact having an insulation displacement blade that cuts an outer jacket of the covered electric wire for electrical continuity with a core wire, the contact being supported in such a position in the connector housing that the insulating displacement
25 blade is located ahead of the electric wire retaining portion and cuts the outer jacket of the covered electric wire when the covered electric wire is retained in the electric wire retaining portion.