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(54) CONNECTOR

(57) A connector, including: a housing having a first surface and a second surface opposite to each other in a thickness direction of the housing; a first foolproof installation key formed on the first surface of the housing and adapted to mate with a first foolproof installation slot formed in a mating connector; and a stop portion formed on the second surface of the housing and adapted to mate with a stop portion formed on the mating connector, wherein a hook is formed on the first foolproof installation key, and a recess, configured to mate with the hook, is formed in the stop portion of the connector, wherein the hook is adapted to be engaged into the recess, so that connectors are capable of being linked in a manner of one after another by engaging the hook of one connector to the recess of the another connector. In the present invention, the existing and necessary foolproof installation key on the connector is used as the chain structure to link connectors, the foolproof installation key is the necessary feature of the final product. Thereby, it does not need to cut off the existing and necessary foolproof installation key in the following process, simplifying the manufacturing process of the connector.

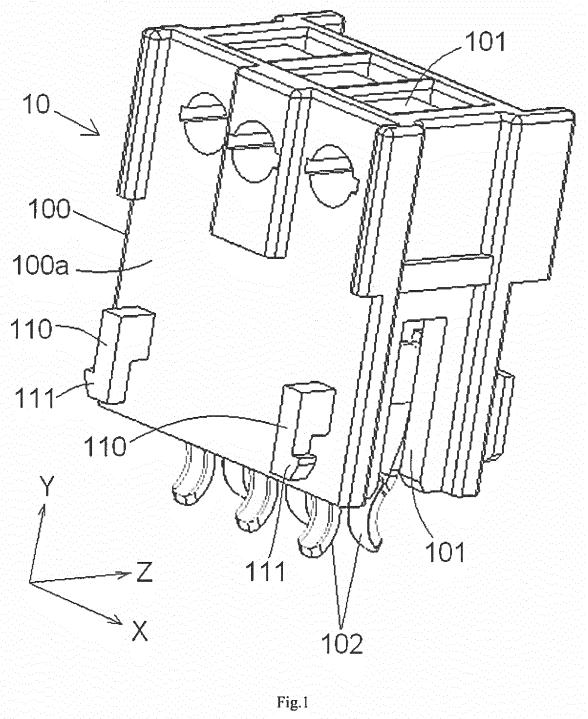

Fig.1

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of Chinese Patent Application No.CN201520475958.6 filed on June 30, 2015 in the State Intellectual Property Office of China, the whole disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a connector, more particularly, relates to a RAST connector for home appliance system.

Description of the Related Art

[0003] Currently, standardized and modularized RAST (the RAST is an abbreviation of a German phrase of "Raster Anschluss Steck Technik") connector system is widely used in home appliances. RAST connector not only has many technical advantages, but also achieves a high modularized system. With functions of household electrical appliances being increasing, the number of connectors for connecting function modules to a main controller is increased correspondingly. The standardized and modularized RAST connector system may be integrated with multiple single devices and a plurality of connectors, saving the installation time, and reducing the risk of human installation error. Meanwhile, since the number of components to be installed is reduced, it reduces the occupied space and the manufacturing cost of PCB.

[0004] In the prior art, in order to realize the automation production of RAST connector, before crimping a contact of the connector and a wire, it needs to link a plurality of connectors together, so that the connectors may be continuously transferred by a conveyor belt to a station where the contact and the wire are to be crimped together.

[0005] In order to link a plurality of RAST connectors together, in the prior art, an additional chain structure is formed on the housing of the RAST connector. The additional chain structure is only used for linking the plurality of RAST connectors together. After the contact and the wire are crimped together, the additional chain structure must be cut off from the housing of the connector. Otherwise, it will hinder the match between the connector and a mating connector. That is, the additional chain structure is not a necessary feature of the final product of the connector, but a temporary feature.

[0006] In prior art, it needs to add an additional chain structure on the housing of the RAST connector, and the additional chain structure is finally removed. Therefore, it leads to the cost rise and the manufacturing process complex.

SUMMARY OF THE INVENTION

[0007] The present invention has been made to overcome or alleviate at least one aspect of the above mentioned disadvantages.

[0008] It would be advantageous to provide a connector, in which an existing and necessary foolproof installation key on the connector is used as a chain structure to link connectors.

[0009] According to an aspect of the present invention, there is provided a connector, comprising: a housing having a first surface and a second surface opposite to each other in a thickness direction of the housing; a first foolproof installation key formed on the first surface of the housing and adapted to mate with a first foolproof installation slot formed in a mating connector; and a stop portion formed on the second surface of the housing and adapted to mate with a stop portion formed on the mating connector, wherein a hook is formed on the first foolproof installation key, and a recess, configured to mate with the hook, is formed in the stop portion of the connector, wherein the hook is adapted to be engaged into the recess, so that connectors are capable of being linked in a manner of one after another by engaging the hook of one connector to the recess of the another connector.

[0010] According to an exemplary embodiment of the present invention, the housing has a first end and a second end opposite to each other in a length direction thereof, an insertion slot extending in the length direction is formed in the housing, the connector comprises a contact located at the first end of the housing and held in the insertion slot, and a wire to be crimped with the contact together is inserted into the insertion slot from the second end of the housing.

[0011] According to another exemplary embodiment of the present invention, the first foolproof installation key is formed at a location on the first surface of the housing adjacent to the first end of the housing; and the stop portion of the connector is formed at a location on the second surface of the housing adjacent to the second end of the housing.

[0012] According to another exemplary embodiment of the present invention, a second foolproof installation key is formed on the second surface of the housing and adapted to mate with a second foolproof installation slot of the mating connector.

[0013] According to another exemplary embodiment of the present invention, the second foolproof installation key is formed at a location on the second surface of the housing adjacent to the first end of the housing.

[0014] According to another exemplary embodiment of the present invention, a plurality of first foolproof installation keys are formed on the first surface of the housing, and the plurality of first foolproof installation keys are same to or different from each other in size and/or shape.

[0015] According to another exemplary embodiment of the present invention, a plurality of second foolproof installation keys are formed on the second surface of the

housing, and the plurality of second foolproof installation keys are same to or different from each other in size and/or shape.

[0016] According to another exemplary embodiment of the present invention, the plurality of first foolproof installation keys are arranged on the first surface of the housing in a width direction of the housing; and the plurality of second foolproof installation keys are arranged on the second surface of the housing in the width direction of the housing.

[0017] According to another exemplary embodiment of the present invention, the stop portion of the connector comprises a stopping face, when the connector and the mating connector are mated together, the stopping face of the stop portion of the connector abuts against a stopping face of the stop portion of the mating connector, so as to prevent one of the connector and the mating connector from being excessively inserted into the other.

[0018] According to another exemplary embodiment of the present invention, the connector and the mating connector are not capable of being mated together if the first foolproof installation key and the second foolproof installation key of the connector are not aligned to the first foolproof installation slot and the second foolproof installation slot of the mating connector, respectively.

[0019] According to another exemplary embodiment of the present invention, the connector is a RAST connector.

[0020] In the above various exemplary embodiments of the present invention, the existing and necessary foolproof installation key on the connector is used as the chain structure to link connectors, instead of providing an additional and unnecessary chain structure. Thereby, it saves the cost. Furthermore, the foolproof installation key is used as the necessary feature of the final product; it does not need to cut off the existing and necessary foolproof installation key in the following process, simplifying the manufacturing process of the connector.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The above and other features of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

Fig.1 is an illustrative perspective view of a connector viewed from a first surface thereof according to an exemplary embodiment of the present invention;

Fig.2 is an illustrative perspective view of the connector viewed from a second surface thereof according to the exemplary embodiment of the present invention;

Fig.3 is an illustrative view of linking the connectors of Figs.1-2 by means of chain structures formed thereon; and

Fig.4 is an illustrative perspective view of a mating connector, adapted to be mated with the connector of Figs.1-2, according to an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE IVENTION

[0022] Exemplary embodiments of the present disclosure will be described hereinafter in detail with reference to the attached drawings, wherein the like reference numerals refer to the like elements. The present disclosure may, however, be embodied in many different forms and should not be construed as being limited to the embodiment set forth herein; rather, these embodiments are provided so that the present disclosure will be thorough and complete, and will fully convey the concept of the disclosure to those skilled in the art.

[0023] In the following detailed description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the disclosed embodiments. It will be apparent, however, that one or more embodiments may be practiced without these specific details. In other instances, well-known structures and devices are schematically shown in order to simplify the drawing.

[0024] According to a general concept of the present invention, there is provided a connector, comprising: a housing having a first surface and a second surface opposite to each other in a thickness direction of the housing; a first foolproof installation key formed on the first surface of the housing and adapted to mate with a first foolproof installation slot formed in a mating connector; and a stop portion formed on the second surface of the housing and adapted to mate with a stop portion formed on the mating connector, wherein a hook is formed on the first foolproof installation key, and a recess, configured to mate with the hook, is formed in the stop portion of the connector, wherein the hook is adapted to be engaged into the recess, so that connectors are linked in a manner of one after another by engaging the hook of one connector to the recess of the another connector.

[0025] Fig.1 is an illustrative perspective view of a connector 10 viewed from a first surface 100a thereof according to an exemplary embodiment of the present invention; Fig.2 is an illustrative perspective view of the connector 10 viewed from a second surface 100b thereof according to the exemplary embodiment of the present invention.

[0026] As shown in Figs. 1-2, the connector 10 mainly comprises a housing 100 and a contact 102.

[0027] As shown in Figs.1-2, in an embodiment, the housing 100 has a first end and a second end opposite to each other in a length direction Y of the housing 100. An insertion slot 101 extending in the length direction Y is formed in the housing 100. The connector 10 comprises a contact 102 located at the first end (lower end in Figs.1-2) of the housing 100 and held in the insertion slot 101. A wire (not shown) to be crimped with the contact 102 together is inserted into the insertion slot 101 from

the second end (upper end in Figs. 1-2) of the housing 100. In an embodiment, during crimping the wire and the contact 102 together, the contact 102 may puncture an insulation layer of the wire and electrically contact a conductor core of the wire.

[0028] Fig.4 is an illustrative perspective view of a mating connector 10', adapted to be mated with the connector 10 of Figs. 1-2, according to an exemplary embodiment of the present invention.

[0029] As shown in Figs.1-2 and 4, in an embodiment, the housing 100 has a frst surface (for example, back surface) 100a and a second surface (for example, front surface) 100b opposite to each other in a thickness direction Z of the housing 100. A pair of first foolproof installation keys 110 are formed on the first surface 100a of the housing 100 and adapted to mate with a pair of first foolproof installation slots 110' formed in a mating connector 10' (see Fig.4). In this way, the first foolproof installation keys 110 of the connector 10 must be aligned to the first foolproof installation slots 110' of the mating connector 10' before mating the connector 10 and the mating connector 10' together; otherwise, the connector 10 and the mating connector 10' cannot be mated together. Thereby, the first foolproof installation keys 110 may prevent the connector 10 from being incorrectly connected, for example, connected to the mating connector 10' in an incorrect posture or connected to a mismatched connector.

[0030] Referring to Figs.1-2 and 4, in an embodiment, a pair of stop portions 130 are formed on the second surface 100b of the housing 100 and adapted to mate with a pair of stop portions 130' formed on the mating connector 10' (see Fig.4). In this way, when the connector 10 and the mating connector 10' are mated together, the stop portions 130 of the connector 10 abut against the stop portions 130' of the mating connector 10', so as to prevent one of the connector 10 and the mating connector 10' from being excessively inserted into the other.

[0031] In an embodiment, as shown in Figs.1-2 and 4, the stop portion 130 of the connector 10 comprises a stopping face 132. When the connector 10 and the mating connector 10' are mated together, the stopping face 132 of the stop portion 130 of the connector 10 abuts against a stopping face 132' of the stop portion 130' of the mating connector 10', so as to prevent one of the connector 10 and the mating connector 10' from being excessively inserted into the other.

[0032] In an embodiment, during mating the connector 10 and the mating connector 10', as shown in Figs. 1-2 and 4, the first end of the housing 100 of the connector 10 is inserted into an insertion chamber of the housing 100' of the mating connector 10', and a plug 101' of the mating connector 10' is inserted into the insertion slot 101 of the connector 10. As a result, a contact 102' on the plug 101' of the mating connector 10' electrically contacts the contact 102 in the insertion slot 101 of the connector 10.

[0033] It is noted that the above first foolproof installation key 110 and the stop portion 130 both are necessary structure features of the connector 10. Thereby, it does not need to cut off these necessary structure features after crimping the wire and the contact 102 together. According to the embodiments of the present invention, these necessary structure features are constructed to be used as chain structures to link a plurality of connectors 10. Hereafter, it will describe it in detail with reference to drawings.

[0034] As shown in Fig.1, in an embodiment, a hook 111 is formed on the first foolproof installation key 110. As shown in Fig.2, a recess 131, configured to mate with the hook 111, is formed in the stop portion 130 of the connector 10. The hook 111 is adapted to be engaged into the recess 131, so that a plurality of connectors 10, 10, 10 (see Fig.3) are linked in a manner of one after another by engaging the hook 111 of one connector 10 to the recess 130 of the another connector 10.

[0035] Fig.3 is an illustrative view of linking the connectors 10 of Figs. 1-2 by means of chain structures formed thereon.

[0036] As shown in Figs.1-3, a plurality of connectors 10, 10, 10 are linked together in a manner of one after another by engaging the hook 111 of one connector 10 to the recess 130 of the another connector 10. In this way, the plurality of connectors 10, 10, 10 linked together may be continuously transferred, by a conveyor belt, to a station, where the contact 102 and the wire are to be crimped together, along a transport direction indicated by an arrow S in Fig.3.

[0037] As shown in Fig.1, the first foolproof installation key 110 is formed at a location on the first surface 100a of the housing 100 adjacent to the first end of the housing 100. The stop portion 130 of the connector 10 is formed at a location on the second surface 100b of the housing 100 adjacent to the second end of the housing 100.

[0038] In an embodiment, as shown in Fig.2, a second foolproof installation key 120 is formed on the second surface 100b of the housing 100 and adapted to mate with a second foolproof installation slot 120' of the mating connector 10'. Thereby, the first foolproof installation key 110 and the second foolproof installation key 120 of the connector 10 must be aligned to the first foolproof installation slot 110' and the second foolproof installation slot 120' of the mating connector 10', respectively, before mating the connector 10 and the mating connector 10' together; Otherwise, the connector 10 and the mating connector 10' cannot be mated together. That is, the connector 10 and the mating connector 10' are not capable of being mated together if the first foolproof installation key 110 and the second foolproof installation key 120 of the connector 10 are not aligned to the first foolproof installation slot 110' and the second foolproof installation slot 120' of the mating connector 10', respectively. In this way, it may further ensure the foolproof installation effect of the connector 10.

[0039] In an embodiment, a plurality of first foolproof installation keys 110 may be formed on the first surface

100a of the housing 100, for example, three or more first foolproof installation keys 110 are formed on the first surface 100a of the housing 100. Also, the plurality of first foolproof installation keys 110 may be same to or different from each other in size and/or shape. When the plurality of first foolproof installation keys 110 are different from each other in size and/or shape, it may further ensure the foolproof installation effect of the connector 10.

[0040] In an embodiment, a plurality of second foolproof installation keys 120 may be formed on the second surface 100b of the housing 100, for example, two, three or more second foolproof installation keys 120 are formed on the second surface 100b of the housing 100. Also, the plurality of second foolproof installation keys 120 may be same to or different from each other in size and/or shape. When the plurality of second foolproof installation keys 120 are different from each other in size and/or shape, it may further ensure the foolproof installation effect of the connector 10.

[0041] In an embodiment, as shown in Fig.2, four second foolproof installation keys 120 are formed on the second surface 100b of the housing 100. Three of the second foolproof installation keys 120 are same to each other in size and/or shape, and the rest one of the second foolproof installation keys 120 is different from the three second foolproof installation keys 120 in size and/or shape.

[0042] As shown in Figs.1-2, in an embodiment, the plurality of first foolproof installation keys 110 are arranged on the first surface 100a of the housing 100 in a width direction X of the housing 100. The plurality of second foolproof installation keys 120 are arranged on the second surface 100b of the housing 100 in the width direction X of the housing 100.

[0043] In an embodiment, the connector 10 may be a RAST connector. However, the present invention is not limited to the illustrated embodiment, and the connector 10 may be other types of connectors used in other fields.

[0044] It should be appreciated for those skilled in this art that the above embodiments are intended to be illustrated, and not restrictive. For example, many modifications may be made to the above embodiments by those skilled in this art, and various features described in different embodiments may be freely combined with each other without conflicting in configuration or principle.

[0045] Although several exemplary embodiments have been shown and described, it would be appreciated by those skilled in the art that various changes or modifications may be made in these embodiments without departing from the principles and spirit of the disclosure, the scope of which is defined in the claims and their equivalents.

[0046] As used herein, an element recited in the singular and proceeded with the word "a" or "an" should be understood as not excluding plural of said elements or steps, unless such exclusion is explicitly stated. Furthermore, references to "one embodiment" of the present invention are not intended to be interpreted as excluding the existence of additional embodiments that also incorporate the recited features. Moreover, unless explicitly stated to the contrary, embodiments "comprising" or "having" an element or a plurality of elements having a particular property may include additional such elements not having that property.

Claims

1. A connector, comprising:

   a housing having a first surface and a second surface opposite to each other in a thickness direction of the housing;
   a first foolproof installation key formed on the first surface of the housing and adapted to mate with a first foolproof installation slot formed in a mating connector; and
   a stop portion formed on the second surface of the housing and adapted to mate with a stop portion formed on the mating connector,
   wherein a hook is formed on the first foolproof installation key, and a recess, configured to mate with the hook, is formed in the stop portion of the connector,
   wherein the hook is adapted to be engaged into the recess, so that connectors are linked in a manner of one after another by engaging the hook of one connector to the recess of the another connector.

2. The connector according to claim 1,
   wherein the housing has a first end and a second end opposite to each other in a length direction thereof, an insertion slot extending in the length direction is formed in the housing,
   wherein the connector comprises a contact located at the first end of the housing and held in the insertion slot, and
   wherein a wire to be crimped with the contact together is inserted into the insertion slot from the second end of the housing.

3. The connector according to claim 2,
   wherein the first foolproof installation key is formed at a location on the first surface of the housing adjacent to the first end of the housing; and
   wherein the stop portion of the connector is formed at a location on the second surface of the housing adjacent to the second end of the housing.

4. The connector according to claim 3,
   wherein a second foolproof installation key is formed on the second surface of the housing and adapted to mate with a second foolproof installation slot of the mating connector.

5. The connector according to claim 4,

wherein the second foolproof installation key is formed at a location on the second surface of the housing adjacent to the first end of the housing.

6. The connector according to claim 5, wherein a plurality of first foolproof installation keys are formed on the first surface of the housing, and wherein the plurality of first foolproof installation keys are the same to or different from each other in size and/or shape.

7. The connector according to claim 6, wherein a plurality of second foolproof installation keys are formed on the second surface of the housing, and wherein the plurality of second foolproof installation keys are the same to or different from each other in size and/or shape.

8. The connector according to claim 7, wherein the plurality of first foolproof installation keys are arranged on the first surface of the housing in a width direction (X) of the housing; and wherein the plurality of second foolproof installation keys are arranged on the second surface of the housing in the width direction of the housing.

9. The connector according to claim 8, wherein the stop portion of the connector comprises a stopping face, when the connector and the mating connector are mated together, the stopping face of the stop portion of the connector abuts against a stopping face of the stop portion of the mating connector, so as to prevent one of the connector and the mating connector from being excessively inserted into the other.

10. The connector according to claim 9, wherein the connector and the mating connector are not capable of being mated together if the first foolproof installation key and the second foolproof installation key of the connector are not aligned to the first foolproof installation slot and the second foolproof installation slot of the mating connector, respectively.

11. The connector according to claim 1, wherein the connector is a RAST connector.

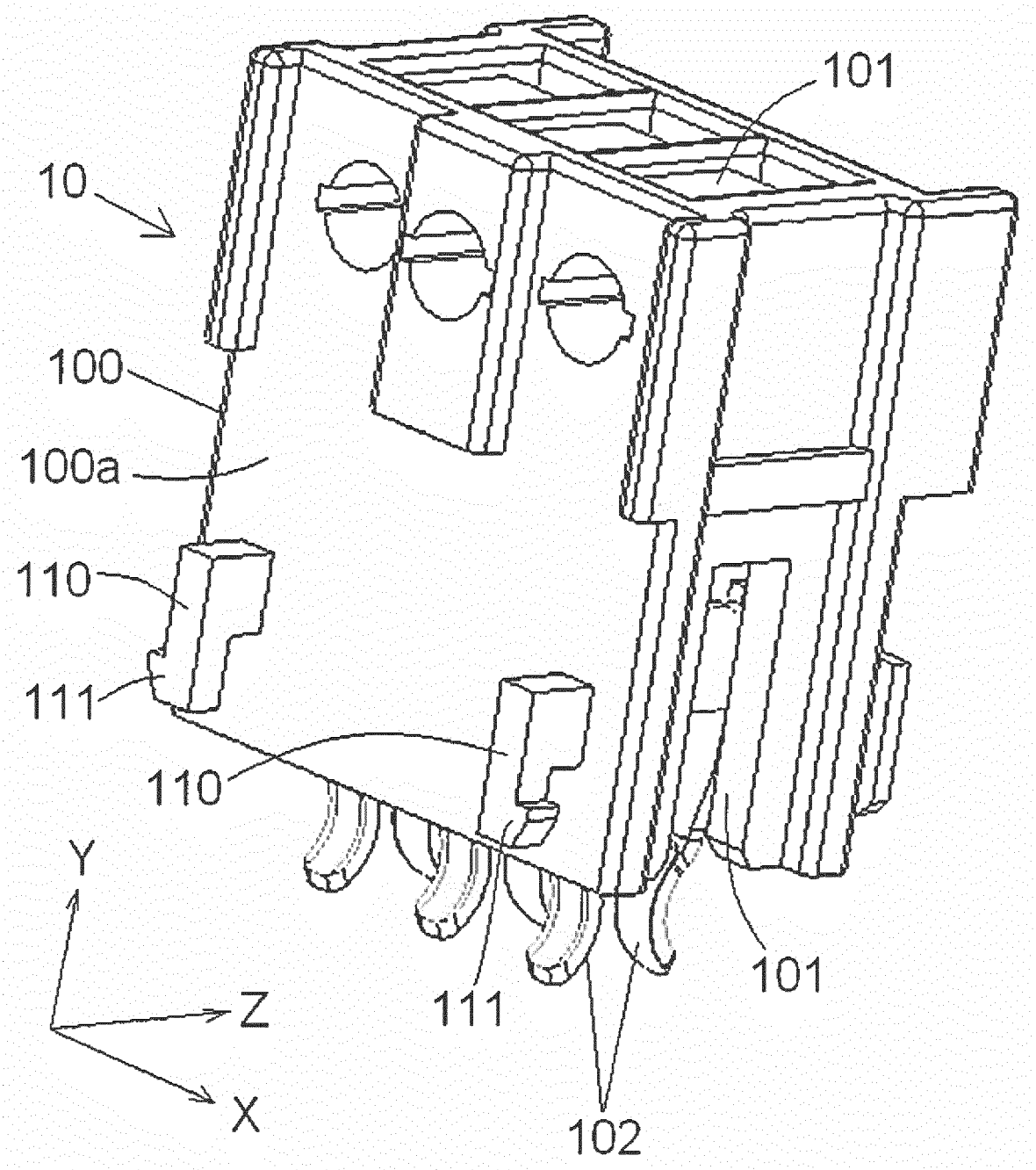

Fig.1

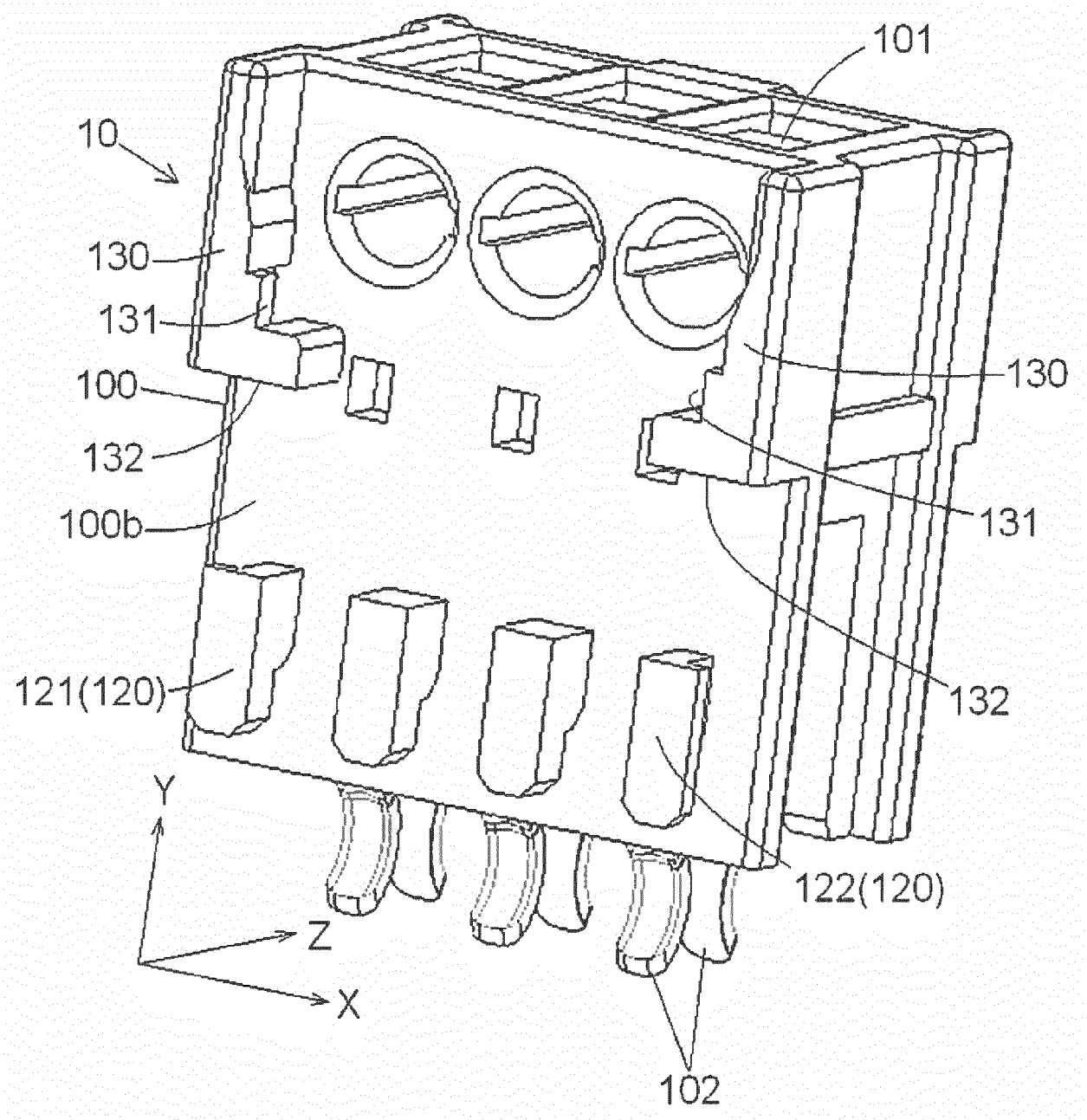

Fig.2

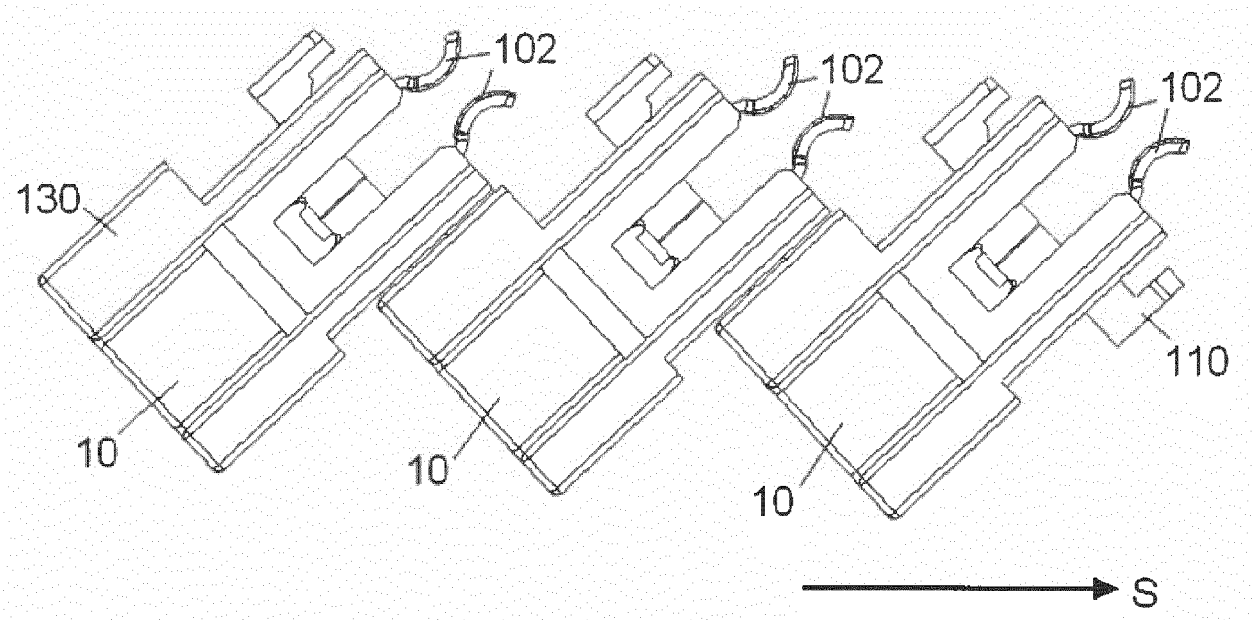

Fig.3

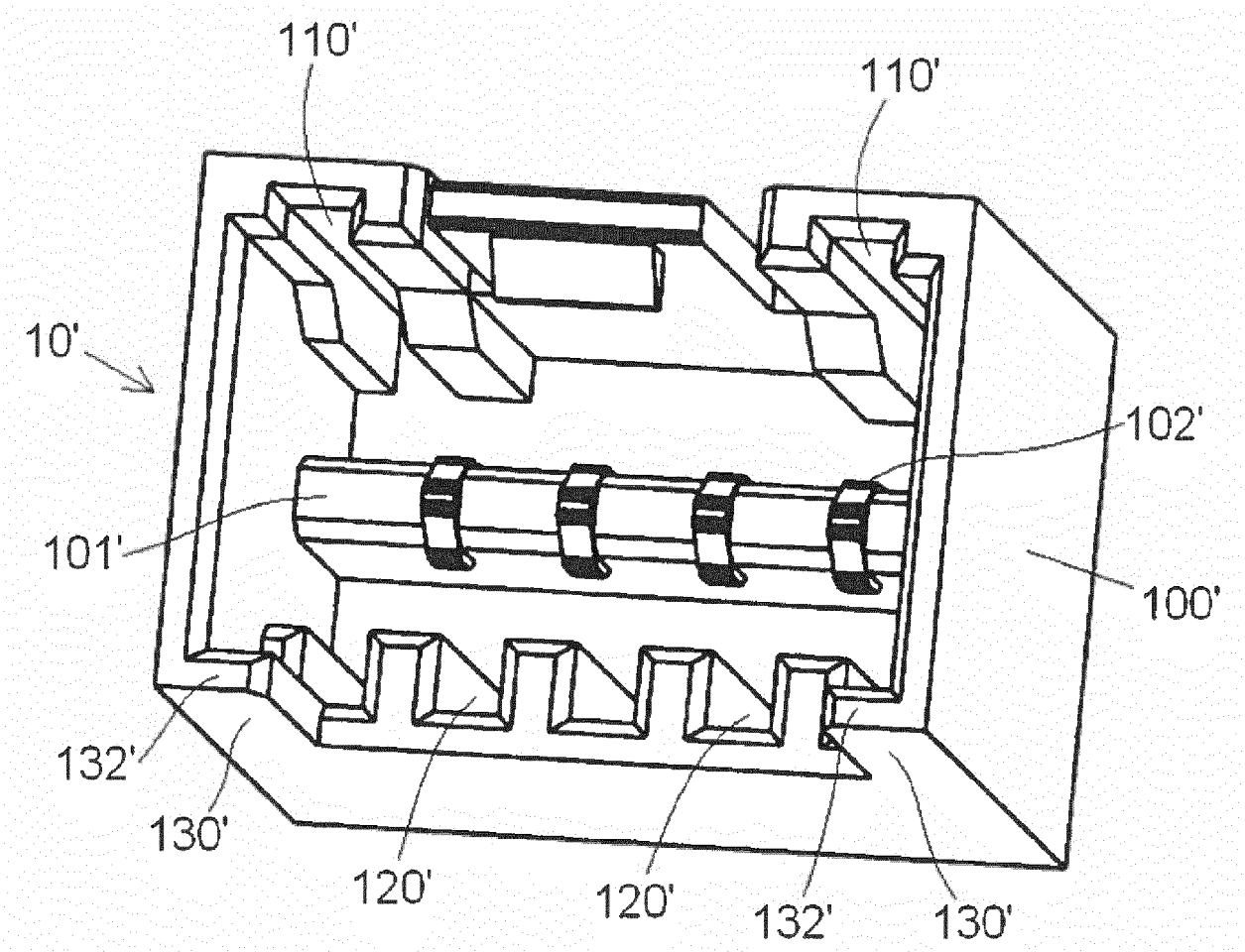

Fig.4

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 6593

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 October 2016	Georgiadis, Ioannis

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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E : earlier patent document, but published on, or after the filing date
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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