



- (51) **International Patent Classification:**
H01R 13/633 (2006.01)
- (21) **International Application Number:**
PCT/IB2015/057191
- (22) **International Filing Date:**
18 September 2015 (18.09.2015)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
201410482109.3
19 September 2014 (19.09.2014) CN
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(81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,

[Continued on next page]

(54) **Title:** ELECTRICAL CONNECTOR AND ELECTRICAL CONNECTOR ASSEMBLY

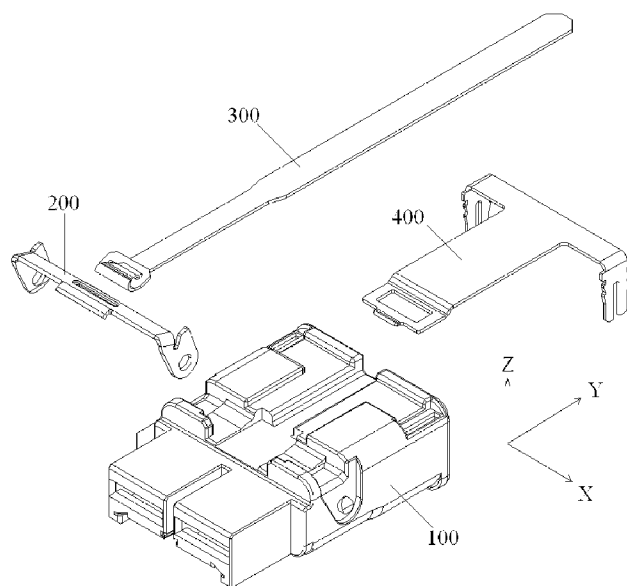


Fig. 1

(57) **Abstract:** The present invention discloses an electrical connector, comprising: a housing; a lock mechanism mounted on the housing and having a locking feature for locking the electrical connector to a mating electrical connector; a trigger pivotally mounted on the housing; and a strap connected to the trigger. The lock mechanism is configured to be movable between a locking position where the locking feature is engaged to the mating electrical connector and an unlocking position where the locking feature is disengaged from the mating electrical connector. The trigger is configured to be able to be moved from an original position to an activated position and push the lock mechanism to move from the locking position to the unlocking position upon an activation force is exerted on the trigger by pulling the strap. The lock mechanism maybe released by pulling the operation member in a horizontal direction, reducing an operation space for releasing the lock mechanism. The electrical connectors maybe arranged in high density, and the distance between adjacent electrical connectors may become very small.



TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

ELECTRICAL CONNECTOR AND ELECTRICAL CONNECTOR ASSEMBLY

BACKGROUND OF THE INVENTION

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Field of the Invention

The present invention relates to an electrical connector and an electrical connector assembly comprising the electrical connector.

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Description of the Related Art

In prior art, in order to prevent a plug electrical connector from being accidentally disengaged from the receptacle electrical connector after the plug and receptacle electrical connectors are coupled together, a lock mechanism is generally formed on the plug electrical connector. When the plug electrical connector is inserted into the receptacle electrical connector, the plug electrical connector and the receptacle electrical connector are locked by the lock mechanism, so as to effectively prevent the plug electrical connector from being accidentally disengaged from the receptacle electrical connector.

20 In the prior art, it is necessary to release the lock mechanism before pulling the plug electrical connector out of the receptacle electrical connector. Otherwise, the plug electrical connector cannot be pulled out of the receptacle electrical connector.

In the prior art, the lock mechanism generally comprises a horizontal elastic piece. When an operator presses the horizontal elastic piece downward in a vertical direction by his/her fingers or a tool, the lock mechanism is released. However, releasing the lock mechanism by pressing the horizontal elastic piece in the vertical direction needs a large operation space for the operator's fingers, especially, in the vertical direction. In some conditions where the electrical connectors are arranged in a high density, there is not enough operation space between adjacent electrical connectors in the vertical direction, and releasing the lock mechanism by pressing the horizontal elastic piece in the vertical direction becomes very difficult or even impossible. Thereby, in the prior art, the electrical connectors cannot be arranged in high density, and there is a large distance between the adjacent electrical connectors in the vertical direction.

35 Furthermore, in the prior art, the lock mechanism of the electrical connector is often very complicated, increasing the cost of the electrical connector.

SUMMARY OF THE INVENTION

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

It would be advantageous to provide an electrical connector adapted to be arranged in high density.

5 It would also be advantageous to provide an electrical connector having simple locking and unlocking mechanisms and low cost.

According to an aspect of the present invention, there is provided an electrical connector, comprising: a housing; a lock mechanism mounted on the housing and having a locking feature for locking the electrical connector to a mating electrical connector; a trigger
10 pivotally mounted on the housing; and a strap connected to the trigger. The lock mechanism is configured to be movable between a locking position where the locking feature is engaged to the mating electrical connector and an unlocking position where the locking feature is disengaged from the mating electrical connector. The trigger is configured to be able to be moved from an original position to an activated position and push the lock mechanism to
15 move from the locking position to the unlocking position upon an activation force is exerted on the trigger by pulling the strap.

According to an exemplary embodiment of the present invention, the lock mechanism is configured to be able to automatically move from the unlocking position to the locking position upon the activation force is removed from the trigger by loosening the strap.

20 According to another exemplary embodiment of the present invention, the lock mechanism comprises an elastic arm on which the locking feature is formed; the trigger pushes the elastic arm to move to the unlocking position upon the activation force is exerted on the trigger by pulling the strap; and the elastic arm automatically returns back to the locking position upon the activation force is removed from the trigger by loosening the
25 strap.

According to another exemplary embodiment of the present invention, the elastic arm presses against the trigger, and the trigger automatically pivots from the activated position to the original position under an elastic restoring force of the elastic arm upon the activation force is removed from the trigger by loosening the strap.

30 According to another exemplary embodiment of the present invention, the trigger comprises a lateral beam and a pair of end plates located at both ends of the lateral beam, respectively; the end plates are pivotally connected to the housing, so that the trigger is rotatable about an axis in a width direction of the housing.

According to another exemplary embodiment of the present invention, the end plates
35 are pivotally mounted on the housing in a shaft-hole mating manner.

According to another exemplary embodiment of the present invention, a hole is formed in the end plate, and a shaft, for mating with the hole, is formed on the housing.

According to another exemplary embodiment of the present invention, a pushing

protrusion is formed on the lateral beam of the trigger; the elastic arm of the lock mechanism is located above the lateral beam of the trigger; and when the activation force is exerted on the trigger by pulling the strap, the pushing protrusion on the trigger is rotated about the axis and raised to push the elastic arm upward, so as to activate the locking feature of the elastic arm to disengage from the mating electrical connector.

According to another exemplary embodiment of the present invention, a first slot is formed in one end of the strap; a second slot is formed in the lateral beam of the trigger; and the strap is connected to the lateral beam of the strap by passing the other end of the strap through the first slot and the second slot.

According to another exemplary embodiment of the present invention, the strap is a flexible belt made of a flexible material.

According to another exemplary embodiment of the present invention, the elastic arm of the lock mechanism extends in a length direction of the housing, and the locking feature is formed on one end of the elastic arm; and the lock mechanism further comprising: a lateral connection arm extending in the width direction of the housing and connected to the other end of the elastic arm; and a pair of connection pegs extending downward from both ends of the lateral connection arm, respectively, and configured to be inserted into slots formed in the housing.

According to another exemplary embodiment of the present invention, a slit is formed in the connection peg; and projections are formed on both sides of the connection peg and configured to be engaged to respective recesses formed in inner wall of the slots of the housing.

According to another exemplary embodiment of the present invention, the mating electrical connector comprises a mating locking feature for mating with the locking feature of the lock mechanism; and one of the locking feature and the mating locking feature is configured to be a protrusion, and the other of the locking feature and the mating locking feature is configured to be an opening.

According to another exemplary embodiment of the present invention, the locking feature of the lock mechanism is configured to be an opening, and the mating locking feature is configured to be a protrusion.

According to another exemplary embodiment of the present invention, a first groove, for receiving the trigger therein, is formed in the housing; a second groove, for receiving a portion of the strap therein, is formed in the housing; and a third groove, for receiving the lock mechanism therein, is formed in the housing.

According to another exemplary embodiment of the present invention, the second groove extends in the length direction of the housing.

According to another exemplary embodiment of the present invention, a fourth groove, for receiving the one end of the elastic arm therein, is formed in the mating electrical

connector; and the mating locking feature is formed on bottom wall of the fourth groove.

According to another exemplary embodiment of the present invention, the housing of the electrical connector has a front end and a rear end in a length direction thereof; and the strap extends beyond the rear end of the housing in the length direction.

5 According to another exemplary embodiment of the present invention, the front end of the housing of the electrical connector is adapted to be inserted into a port of the mating electrical connector.

 According to an aspect of the present invention, there is provided an electrical connector assembly, comprising: a first electrical connector according to any one of the
10 preceding embodiments; and a second electrical connector mating with the first electrical connector.

 In the electrical connector according to above various exemplary embodiments of the present invention, the trigger for releasing the lock mechanism is connected to the operation member. Thereby, the lock mechanism may be released by pulling the operation member in
15 a horizontal direction, instead of pressing the trigger in a vertical direction. Accordingly, the present invention can reduce an operation space for releasing the lock mechanism, and the electrical connectors of the present invention may be arranged in high density, and the distance between adjacent electrical connectors may become very small.

 Furthermore, in the electrical connector according to above various exemplary
20 embodiments of the present invention, the locking and unlocking mechanisms of the electrical connector is very simple, decreasing the cost of the electrical connector.

BRIEF DESCRIPTION OF THE DRAWINGS

25 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 shows an illustrative exploded perspective view of an electrical connector according to an exemplary embodiment of the present invention;

30 Fig.2 shows an illustrative enlarged view of a housing of the electrical connector of Fig.1;

 Fig.3 shows an illustrative enlarged view of a trigger of the electrical connector of Fig.1;

 Fig.4 shows an illustrative enlarged view of a strap of the electrical connector of Fig.1;

35 Fig.5 shows an illustrative enlarged view of a lock mechanism of the electrical connector of Fig.1;

 Fig.6 shows an illustrative perspective view of an electrical connector according to an exemplary embodiment of the present invention, wherein a lock mechanism is not mounted

on a housing of the electrical connector, and a trigger and a strap are mounted on the housing of the electrical connector;

Fig.7 shows an illustrative assembled perspective view of an electrical connector according to an exemplary embodiment of the present invention;

5 Fig.8 shows an illustrative perspective view of a mating electrical connector for mating with the electrical connector of the Fig.7 viewed from a direction; and

Fig.9 shows an illustrative perspective view of a mating electrical connector for mating with the electrical connector of the Fig.7 viewed from another direction.

10 **DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION**

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
15 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.

In the following detailed description, for purposes of explanation, numerous specific
20 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.

According to a general concept of the present invention, there is provided an electrical
25 connector, comprising: a housing; a lock mechanism mounted on the housing and having a locking feature for locking the electrical connector to a mating electrical connector; a trigger pivotally mounted on the housing; and an operation member connected to the trigger. The lock mechanism is configured to be movable between a locking position where the locking feature is engaged with the mating electrical connector to lock an engagement of the
30 electrical connector and the mating electrical connector and an unlocking position where the locking feature is disengaged from the mating electrical connector to allow to release the engagement of the electrical connector and the mating electrical connector. The trigger is configured to be able to be moved from an original position to an activated position and push the lock mechanism to move from the locking position to the unlocking position upon an
35 activation force is exerted on the trigger by pulling the operation member.

Fig.1 shows an illustrative exploded perspective view of an electrical connector according to an exemplary embodiment of the present invention.

As shown in Fig.1, in an exemplary embodiment of the present invention, the

electrical connector mainly comprises a housing 100, a trigger 200, a strap 300 used as an operation member, a lock mechanism 400 and conductive contacts (not shown) received in the housing 100.

Fig.7 shows an illustrative assembled perspective view of an electrical connector 10 according to an exemplary embodiment of the present invention.

As shown in Fig.7, in an exemplary embodiment of the present invention, the trigger 200 is pivotally mounted on the housing 100. One end of the strap 300 is connected to the trigger 200. The lock mechanism 400 is mounted on the housing 100 and configured to lock the electrical connector 10 to a mating electrical connector 20 (see Figs.8-9), so that disengagement of the electrical connector 10 and the mating electrical connector 20 is prevented.

Fig.5 shows an illustrative enlarged view of the lock mechanism 400 of the electrical connector 10 of Fig.1; Fig.8 shows an illustrative perspective view of the mating electrical connector 20 for mating with the electrical connector 10 of the Fig.7 viewed from a direction; and Fig.9 shows an illustrative perspective view of the mating electrical connector 20 for mating with the electrical connector 10 of the Fig.7 viewed from another direction.

As shown in Figs.5, 7-9, in an exemplary embodiment of the present invention, the housing 100 of the electrical connector 10 has a front end and a rear end opposite to the front end in a length direction Y thereof. The front end of the housing 100 of the electrical connector 10 is adapted to be inserted into a port 23 of the mating electrical connector 20, so that the conductive contacts in the electrical connector 10 electrically contact with conductive contacts 24 in the mating electrical connector 20.

In the illustrated embodiments, the mating electrical connector 20 is configured to be a receptacle electrical connector. The electrical connector 10 is configured to be a plug electrical connector. The mating electrical connector 20 may be mounted on a panel, for example, a circuit board 1. The electrical connector 10 may be electrically connected to ends of wires of a cable(not shown).

In an exemplary embodiment of the present invention, the electrical connector 10 and the mating electrical connector 20 may be a pair of power connectors for transmitting electric power. But the present invention is not limited to this, the electrical connector 10 and the mating electrical connector 20 may be connectors for transmitting signals or other types of connectors.

As shown in Figs.5, 7-9, in an exemplary embodiment of the present invention, the lock mechanism 400 is configured to have a locking feature 421 for locking the electrical connector 10 to the mating electrical connector 20.

In the illustrated embodiments shown in Figs.5, 7-9, the lock mechanism 400 is configured to be movable between a locking position and an unlocking position. In the locking position, the locking feature 421 of the lock mechanism 400 is engaged to a mating

locking feature 21 of the mating electrical connector 20, so that the electrical connector 10 is locked to the mating electrical connector 20 and cannot be separated from the mating electrical connector 20. In the unlocking position, the locking feature 421 of the lock mechanism 400 is disengaged from the mating locking feature 21 of the mating electrical connector 20, so that the electrical connector 10 is allowed to be pulled out of the mating electrical connector 20.

As shown in Figs.5, 7-9, in an exemplary embodiment of the present invention, when an activation force is exerted on the trigger 200 by pulling the strap 300, the trigger 200 is moved from an original position to an activated position and pushes the lock mechanism 400 to move from the locking position to the unlocking position, so that the locking feature 421 of the lock mechanism 400 is disengaged from the mating locking feature 21 of the mating electrical connector 20.

In an exemplary embodiment of the present invention, as shown in Figs.5 and 7, the lock mechanism 400 is configured to be able to automatically move from the unlocking position to the locking position upon the activation force is removed from the trigger 200 by loosening the strap 300.

Referring to Figs.5 and 7 again, in the illustrated embodiments, the lock mechanism 400 comprises an elastic arm 420, and the locking feature 421 is formed on the elastic arm 420. When the activation force is exerted on the trigger 200 by pulling the strap 300, the trigger 200 pivots and pushes the elastic arm 420 in a height direction Z (Fig. 1) to move to the unlocking position. When the activation force is removed from the trigger 200 by loosening the strap 300, the elastic arm 420 automatically returns back to the locking position.

As shown in Figs.5, 7-9, in an exemplary embodiment of the present invention, one of the locking feature 421 of the lock mechanism 400 and the mating locking feature 21 of the mating electrical connector 20 is configured to be a protrusion, and the other of the locking feature 421 and the mating locking feature 21 is configured to be an opening for mating with the protrusion.

As shown in Figs.5, 7-9, in an exemplary embodiment of the present invention, the locking feature 421 of the lock mechanism 400 is configured to be an opening, and the mating locking feature 21 of the mating electrical connector 20 is configured to be a protrusion for mating with the opening. When the electrical connector 10 is inserted into the mating electrical connector 20, the protrusion (mating locking feature 21) of the mating electrical connector 20 is snapped into the opening (locking feature 421) formed in one end of the elastic arm 420 of the electrical connector 10. In this way, the electrical connector 10 is locked to the mating electrical connector 20.

As shown in Figs.5 and 7, in an exemplary embodiment of the present invention, the elastic arm 420 is constructed to press against the trigger 200. When the activation force is

removed from the trigger 200 by loosening the strap 300, the trigger 200 automatically pivots from the activated position to the original position under an elastic restoring force of the elastic arm 420.

Fig.2 shows an illustrative enlarged view of the housing 100 of the electrical connector 10 of Fig.1; Fig.3 shows an illustrative enlarged view of the trigger 200 of the electrical connector 10 of Fig.1; Fig.6 shows an illustrative perspective view of an electrical connector 10 according to an exemplary embodiment of the present invention, wherein a lock mechanism 400 is not mounted on a housing 100 of the electrical connector 10, and a trigger 200 and a strap 300 are mounted on the housing 100 of the electrical connector 10.

As shown in Figs.2-3 and 6, in an exemplary embodiment of the present invention, the trigger 200 comprises a lateral beam 210 and a pair of end plates 220 located at both ends of the lateral beam 210, respectively. In the illustrated embodiments, the entire trigger 200 exhibits a substantial U-shape. The end plates 220 are pivotally connected to the housing 100, so that the trigger 200 is rotatable about an axis in a width direction X of the housing 100.

In an exemplary embodiment of the present invention, the end plates 220 may be pivotally mounted on the housing 100 in a shaft-hole mating manner.

As shown in Figs.2-3 and 6, in the illustrated embodiments, a hole 221 is formed in the end plate 220, and a shaft 121, for mating with the hole 221, is formed on the housing 100.

As shown in Figs.3, 5-7, in an exemplary embodiment of the present invention, a pushing protrusion 212 is formed on the lateral beam 210 of the trigger 200. The elastic arm 420 of the lock mechanism 400 is located above the lateral beam 210 of the trigger 200. In this way, when the activation force is exerted on the trigger 200 by pulling the strap 300, the pushing protrusion 212 on the trigger 200 is rotated about the axis and raised to push the elastic arm 420 upward, so as to activate the locking feature 421 of the elastic arm 420 to disengage from the mating electrical connector 20. In this case, the electrical connector 10 is allowed to be pulled out from the mating electrical connector 20.

Fig.4 shows an illustrative enlarged view of the strap 300 of the electrical connector 10 of Fig.1.

As shown in Fig.4, in an exemplary embodiment of the present invention, the strap 300 comprises a tape-like body 310 and an enlarged end portion 320 at one end of the tape-like body 310. A first slot 321 is formed in the enlarged end portion 320 of the strap 300.

As shown in Fig.3, in an exemplary embodiment of the present invention, a second slot 211 is formed in the lateral beam 210 of the trigger 200.

As shown in Figs.3-4 and 6, in the illustrated embodiments, the other end of the strap 300 opposite to the enlarged end portion 320 passes through the second slot 211 and then the

first slot 321. In this way, the strap 300 is connected to the lateral beam 210 of the trigger 200.

In an exemplary embodiment of the present invention, the strap 300 may be a flexible belt made of a flexible material. In this case, the strap 300 is placed on top surface of the housing 100 of the electrical connector 10 and horizontally extends beyond the rear end of the housing 100 in the length direction Y of the housing 100. In an alternative embodiment, the operation member may be a flexible rope made of a flexible material, and one end of the rope is tied to the lateral beam 210 of the trigger 200, for example, to the second slot 211. In a further alternative embodiment, the operation member may be a strap or rod made of a rigid material.

Referring to Figs.2, 5 and 7, in an exemplary embodiment of the present invention, the elastic arm 420 of the lock mechanism 400 extends in the length direction Y of the housing 100, and the locking feature (opening) 421 is formed in one end (front end in Fig.5) of the elastic arm 420. In the illustrated embodiments, the lock mechanism 400 further comprises a lateral connection arm 410 and a pair of connection pegs 441. The lateral connection arm 410 extends in the width direction X of the housing 100 and is connected to the other end (rear end in Fig.5) of the elastic arm 420. The pair of connection pegs 441 extend downward from both ends of the lateral connection arm 410, respectively, and are adapted to be inserted into slots 141 formed in the housing 100. In the illustrated embodiments, the other end of the elastic arm 420 is connected to the middle of the lateral connection arm 410, and the entire lock 400 exhibits a substantial T-shape in a plan view.

In the illustrated embodiments, as shown in Figs.2, 5 and 7, a slit 442 is formed in the connection peg 441, so as to increase the flexibility of the connection peg 441. In this way, the connection peg 441 may be easily inserted into the slot 141 formed in the housing 100.

In an exemplary embodiment of the present invention, as shown in Figs.2, 5 and 7, projections 441a are formed on both sides of the connection peg 441 and configured to be engaged to respective recesses (not shown) formed in inner wall of the slots 141 of the housing 100.

As shown in Figs.2, 6-7, in an exemplary embodiment of the present invention, a first groove 120, for receiving the trigger 200 therein, is formed in the housing 100. A second groove 130, for receiving a portion of the strap 300 therein, is formed in the housing 100. A third groove 140, for receiving the lock mechanism 400 therein, is formed in the housing 100. With this configuration, the trigger 200, the strap 300 and the lock mechanism 400 can be positioned and received in the first, second and third grooves formed in the housing 100, without occupying any additional space outside the top surface of the housing 100. In this way, the size of the entire electrical connector 10 can be reduced, and the electrical connectors can be arranged in higher density.

In the illustrated embodiments, as shown in Figs.2, 6-7, the second groove 130 extends

in the length direction Y of the housing 100. The first groove 120, the second groove 130 and the third groove 140 are shaped to be adapted to the trigger 200, the strap 300 and the lock mechanism 400, respectively.

5 As shown in Figs. 7-9, in an exemplary embodiment of the present invention, a fourth groove 22, for receiving the one end (front end in Fig. 5) of the elastic arm 420 therein, is formed in the mating electrical connector 20, and the mating locking feature (protrusion) 21 is formed on bottom wall of the fourth groove 22.

10 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.

15 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.

20 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.

What is claimed is,

1. An electrical connector, comprising:
a housing (100);
5 a lock mechanism (400) mounted on the housing (100) and having a locking feature (421) for locking the electrical connector (10) to a mating electrical connector (20);
a trigger (200) pivotally mounted on the housing (100); and
an operation member (300) connected to the trigger (200),
wherein the lock mechanism (400) is configured to be movable between a locking
10 position where the locking feature (421) is engaged to the mating electrical connector (20) and an unlocking position where the locking feature (421) is disengaged from the mating electrical connector (20);
wherein the trigger (200) is configured to be able to be moved from an original position to an activated position and push the lock mechanism (400) to move from the locking
15 position to the unlocking position upon an activation force is exerted on the trigger (200) by pulling the operation member (300).
2. The electrical connector according to claim 1,
wherein the lock mechanism (400) is configured to automatically move from the
20 unlocking position to the locking position upon the activation force is removed from the trigger (200) by loosening the operation member (300).
3. The electrical connector according to claim 2,
wherein the lock mechanism (400) comprises an elastic arm (420) on which the
25 locking feature (421) is formed;
wherein the trigger (200) is configured to push the elastic arm (420) to move to the unlocking position upon the activation force is exerted on the trigger (200) by pulling the is operation member (300); and
wherein the elastic arm (420) is configured to automatically return back to the locking
30 position upon the activation force is removed from the trigger (200) by loosening the operation member (300).
4. The electrical connector according to claim 3,
wherein the elastic arm (420) is configured to press against the trigger (200), and
35 wherein the trigger (200) automatically pivots from the activated position to the original position under an elastic restoring force of the elastic arm (420) upon the activation force is removed from the trigger (200) by loosening the operation member (300).

5. The electrical connector according to claim 4,
wherein the trigger (200) comprises a lateral beam (210) and a pair of end plates (220)
located at both ends of the lateral beam (210), respectively;

wherein the end plates (220) are pivotally connected to the housing (100), so that the
5 trigger (200) is rotatable about an axis in a width direction (X) of the housing (100).

6. The electrical connector according to claim 5,
wherein the end plates (220) are pivotally mounted on the housing (100) in a
shaft-hole mating manner.

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7. The electrical connector according to claim 6,
wherein a hole (221) is formed in the end plate (220), and a shaft (121), for mating
with the hole (221), is formed on the housing (100).

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8. The electrical connector according to claim 5,
wherein a pushing protrusion (212) is formed on the lateral beam (210) of the trigger
(200);

wherein the elastic arm (420) of the lock mechanism (400) is located above the lateral
beam (210) of the trigger (200); and

20

wherein when the activation force is exerted on the trigger (200) by pulling the
operation member (300), the pushing protrusion (212) on the trigger (200) is rotated about
the axis and raised to push the elastic arm (420) upward, so as to activate the locking feature
(421) of the elastic arm (420) to disengage from the mating electrical connector (20).

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9. The electrical connector according to claim 8,
wherein the operation member comprises a strap, a first slot (321) being formed in one
end of the strap (300);

wherein a second slot (211) is formed in the lateral beam (210) of the trigger (200);
and

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wherein the strap (300) is connected to the lateral beam (210) of the strap (300) by
passing the other end of the strap (300) through the second slot (211) and then the first slot
(321) .

10. The electrical connector according to claim 9, wherein the strap (300) is a flexible
35 belt made of a flexible material.

11. The electrical connector according to claim 10,
wherein the elastic arm (420) of the lock mechanism (400) extends in a length

direction (Y) of the housing (100), and the locking feature (421) is formed on one end of the elastic arm (420); and

wherein the lock mechanism (400) further comprising:

a lateral connection arm (410) extending in the width direction (X) of the housing (100)

5 and connected to the other end of the elastic arm (420); and

a pair of connection pegs (441) extending downward from both ends of the lateral connection arm (410), respectively, and configured to be inserted into slots (141) formed in the housing (100).

10 12. The electrical connector according to claim 11,

wherein a slit (442) is formed in the connection peg (441); and

wherein projections (441a) are formed on both sides of the connection peg (441) and configured to be engaged to respective recesses formed in inner wall of the slots (141) of the housing (100).

15

13. The electrical connector according to claim 12,

wherein the mating electrical connector (20) comprises a mating locking feature (21) for mating with the locking feature (421) of the lock mechanism (400); and

wherein one of the locking feature (421) and the mating locking feature (21) is

20 configured to be a protrusion, and the other of the locking feature (421) and the mating locking feature (21) is configured to be an opening mated with the protrusion.

14. The electrical connector according to claim 12,

wherein the locking feature (421) of the lock mechanism (400) is configured to be an opening, and the mating locking feature (21) is configured to be a protrusion.

25

15. The electrical connector according to claim 14,

wherein a first groove (120), for receiving the trigger (200) therein, is formed in the housing (100);

30 wherein a second groove (130), for receiving a portion of the strap (300) therein, is formed in the housing (100); and

wherein a third groove (140), for receiving the lock mechanism (400) therein, is formed in the housing (100).

35 16. The electrical connector according to claim 15,

wherein the second groove (130) extends in the length direction (Y) of the housing (100).

17. The electrical connector according to claim 15,
wherein a fourth groove (22), for receiving the one end of the elastic arm (420) therein,
is formed in the mating electrical connector (20); and
wherein the mating locking feature (21) is formed on bottom wall of the fourth groove
5 (22).

18. The electrical connector according to claim 1,
wherein the housing (100) of the electrical connector (10) has a front end and a rear
end in a length direction (Y) thereof; and
10 wherein the operation member (300) extends beyond the rear end of the housing (100)
in the length direction (Y).

19. The electrical connector according to claim 18,
wherein the front end of the housing (100) of the electrical connector (10) is adapted
15 to be inserted into a port (23) of the mating electrical connector (20).

20. An electrical connector assembly, comprising:
a first electrical connector according to any one of the preceding claims; and
a second electrical connector mated with the first electrical connector.

20

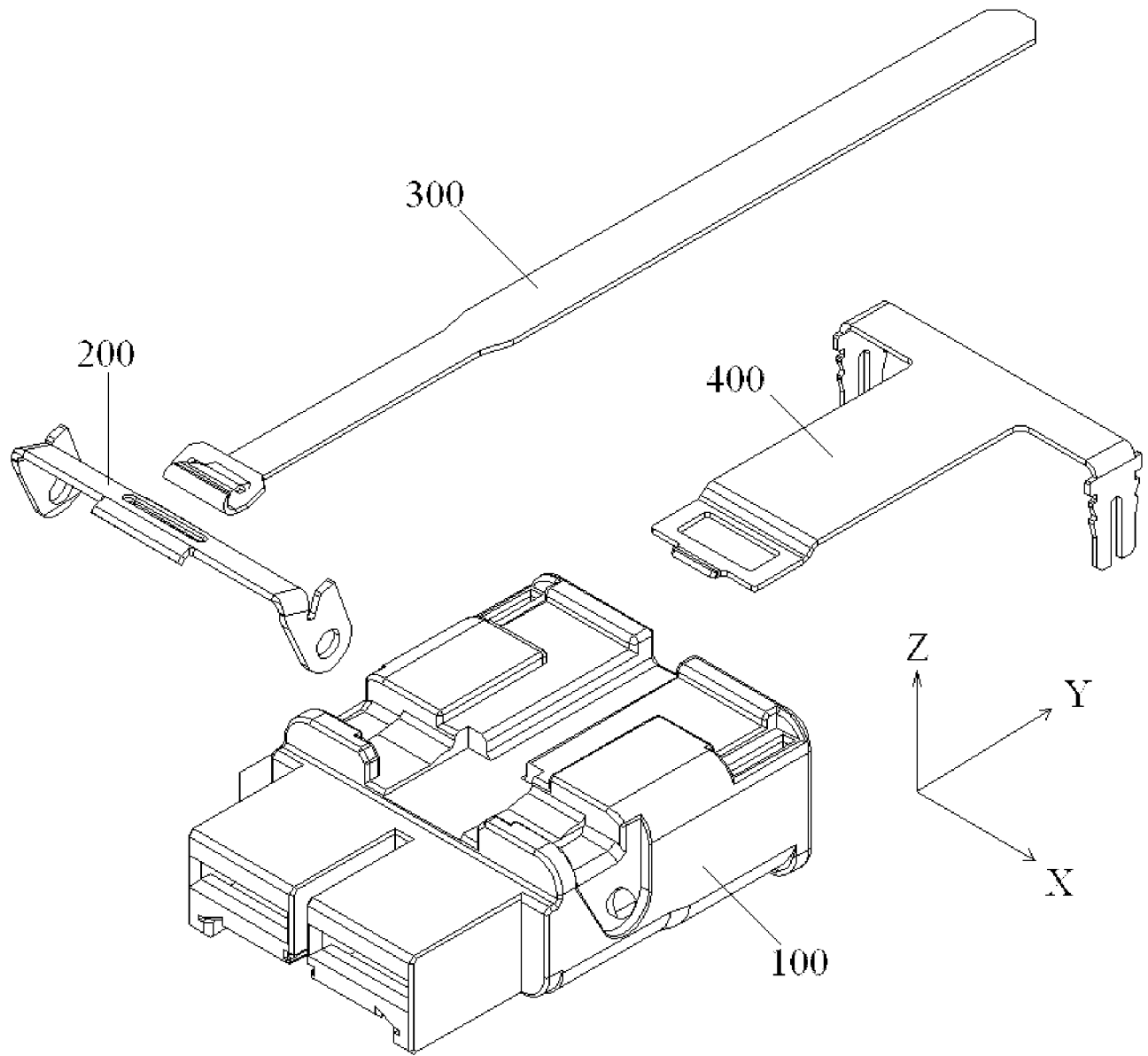


Fig. 1

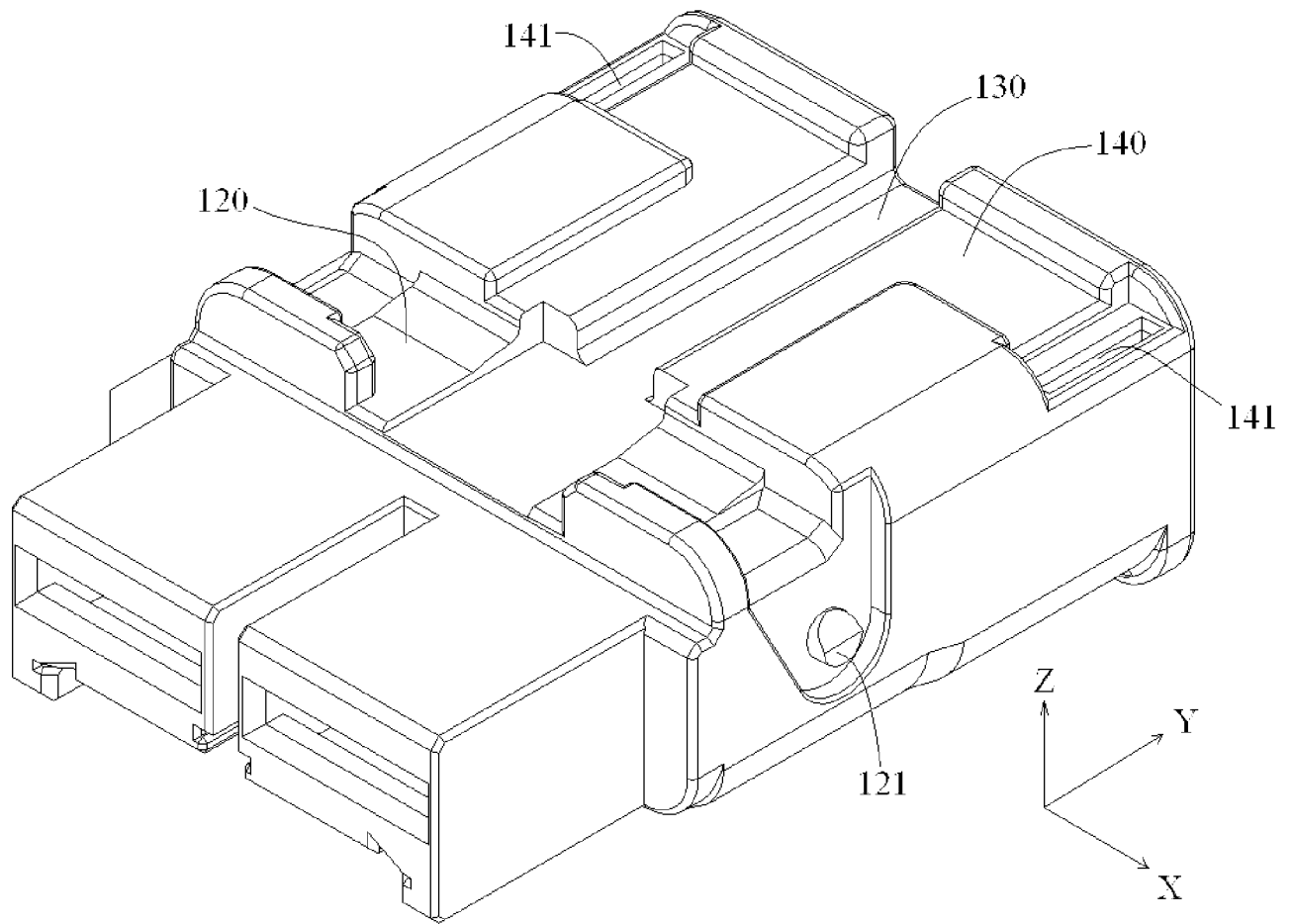


Fig.2

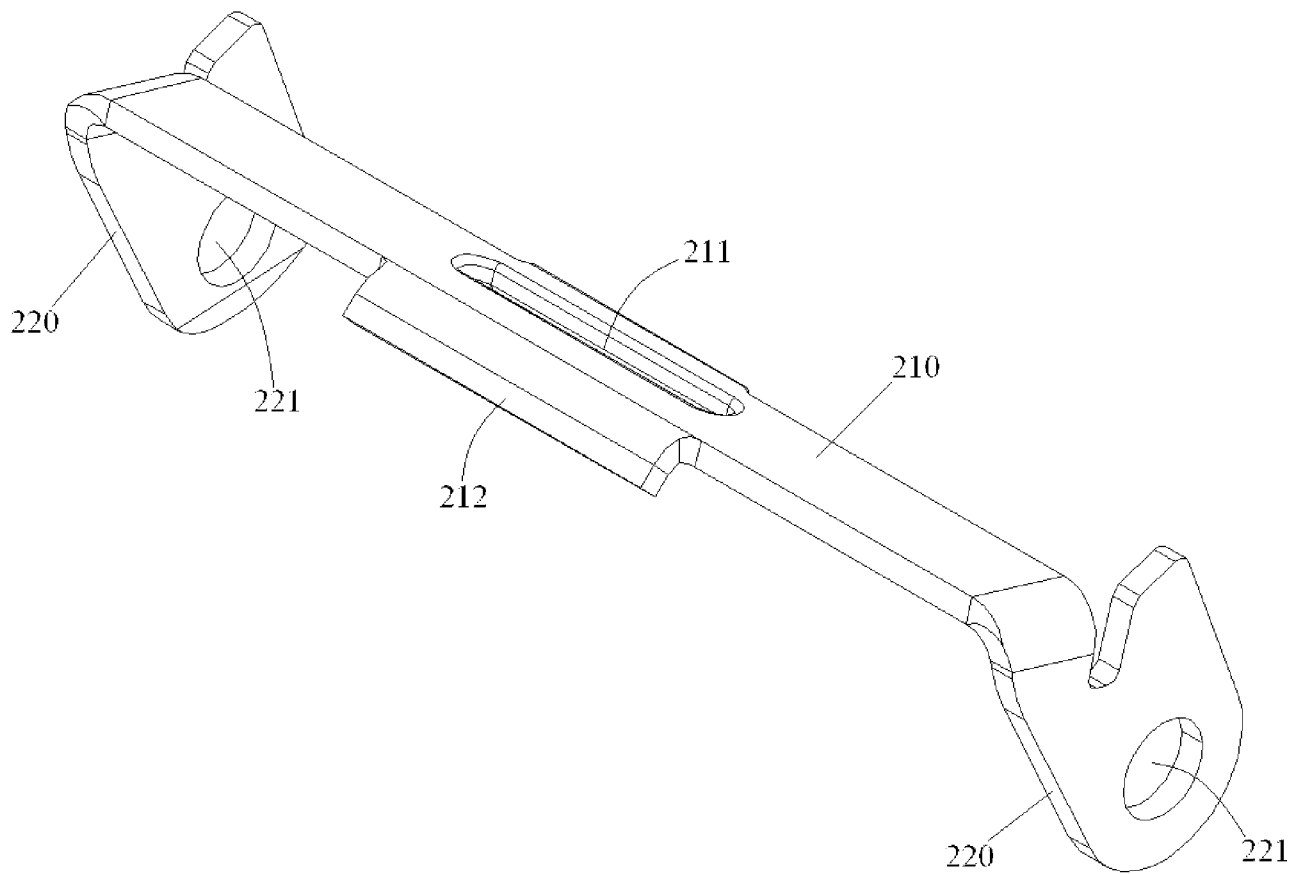


Fig.3

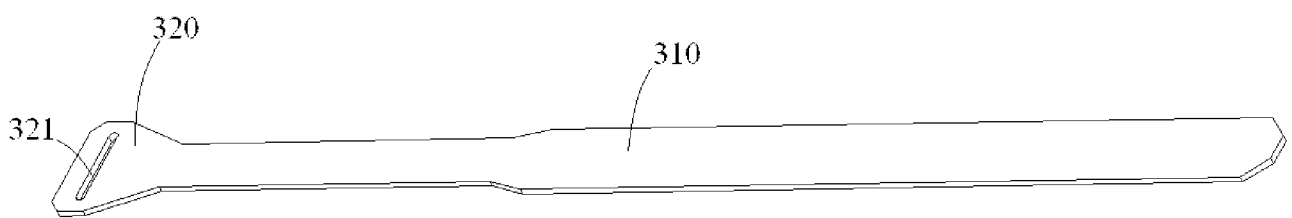


Fig.4

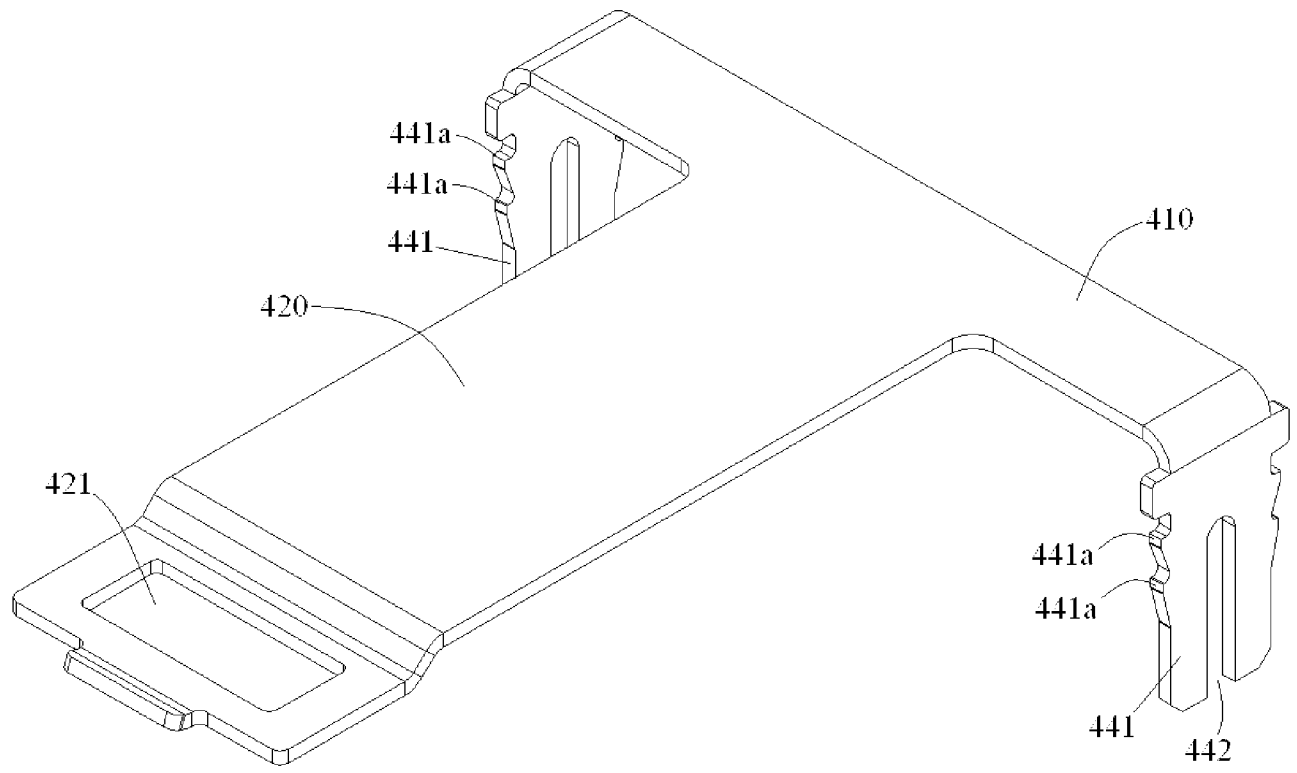


Fig. 5

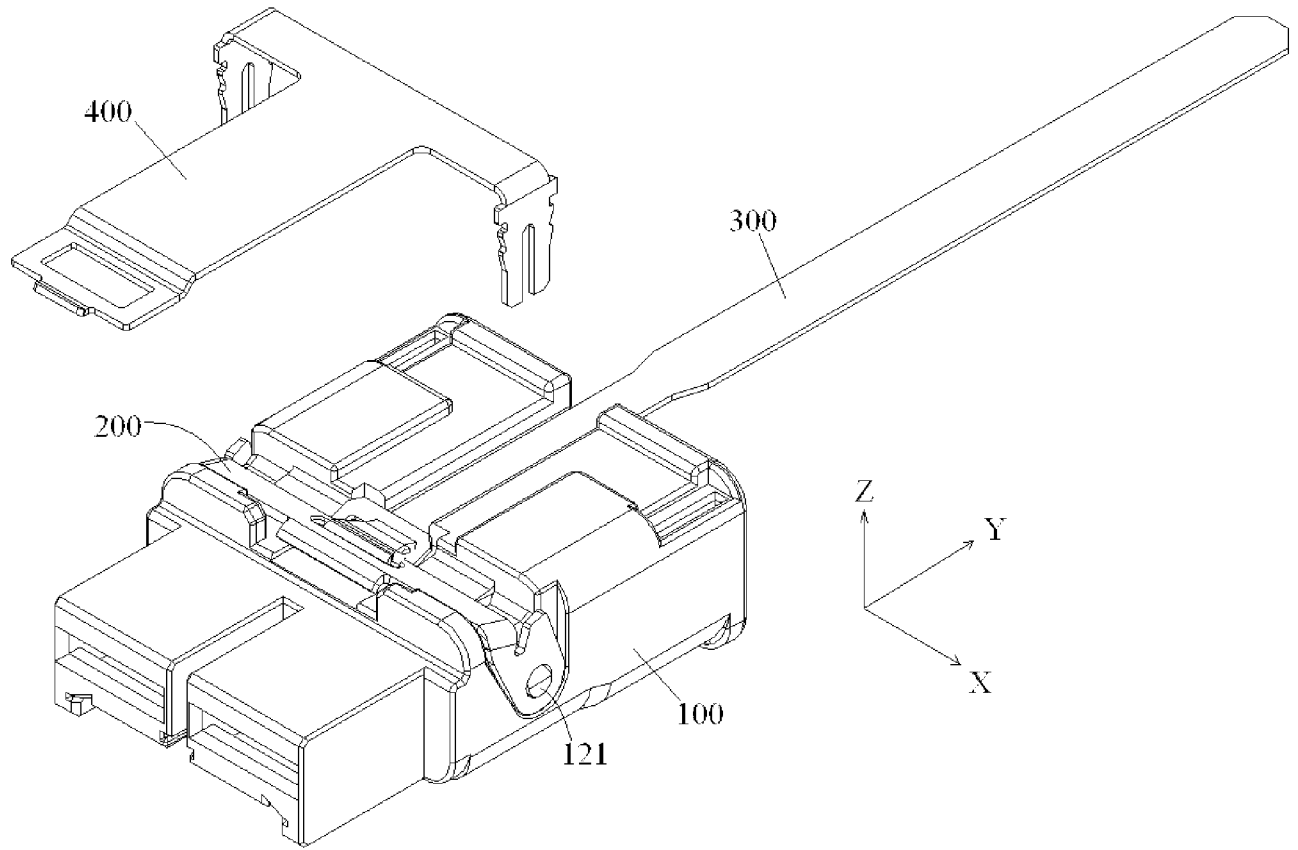


Fig.6

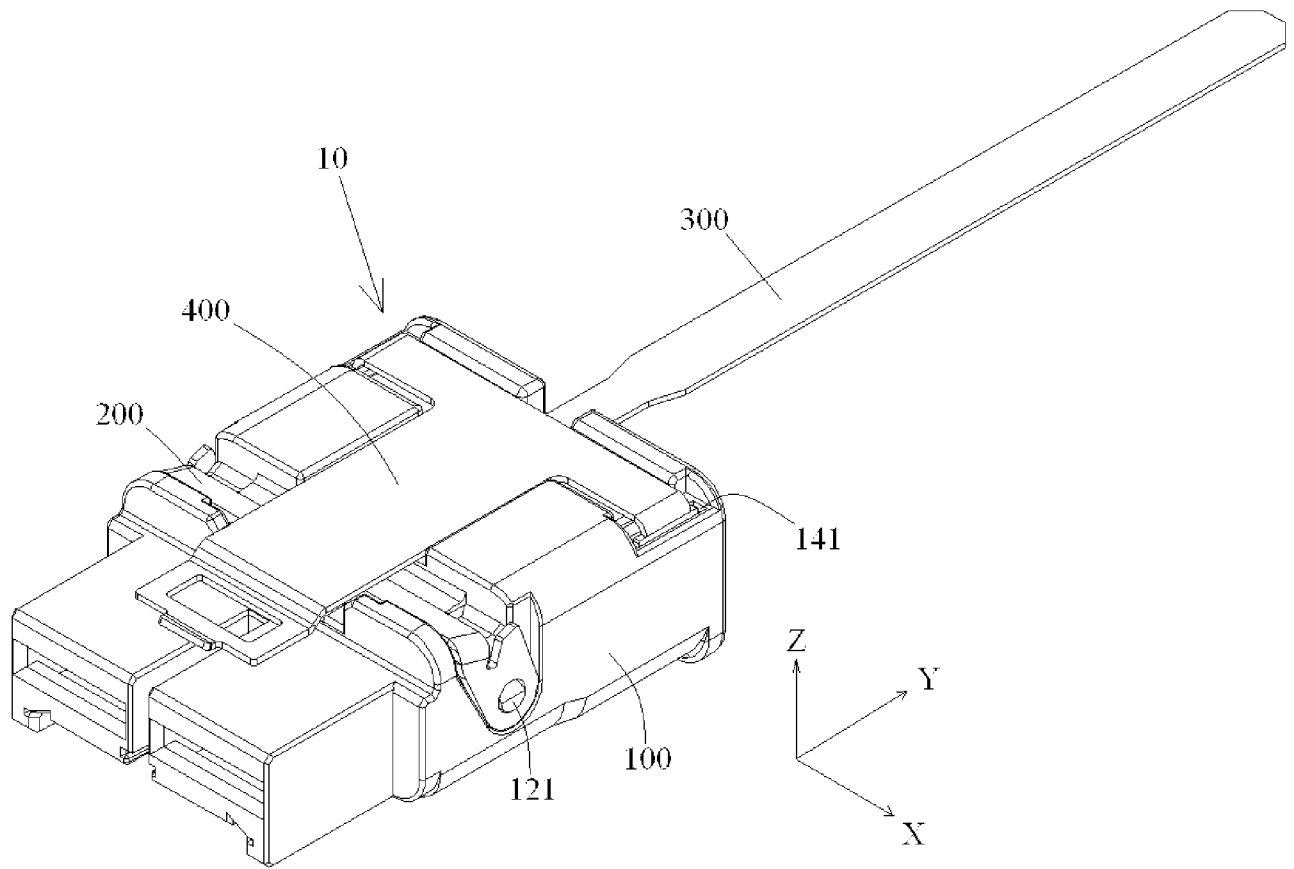


Fig.7

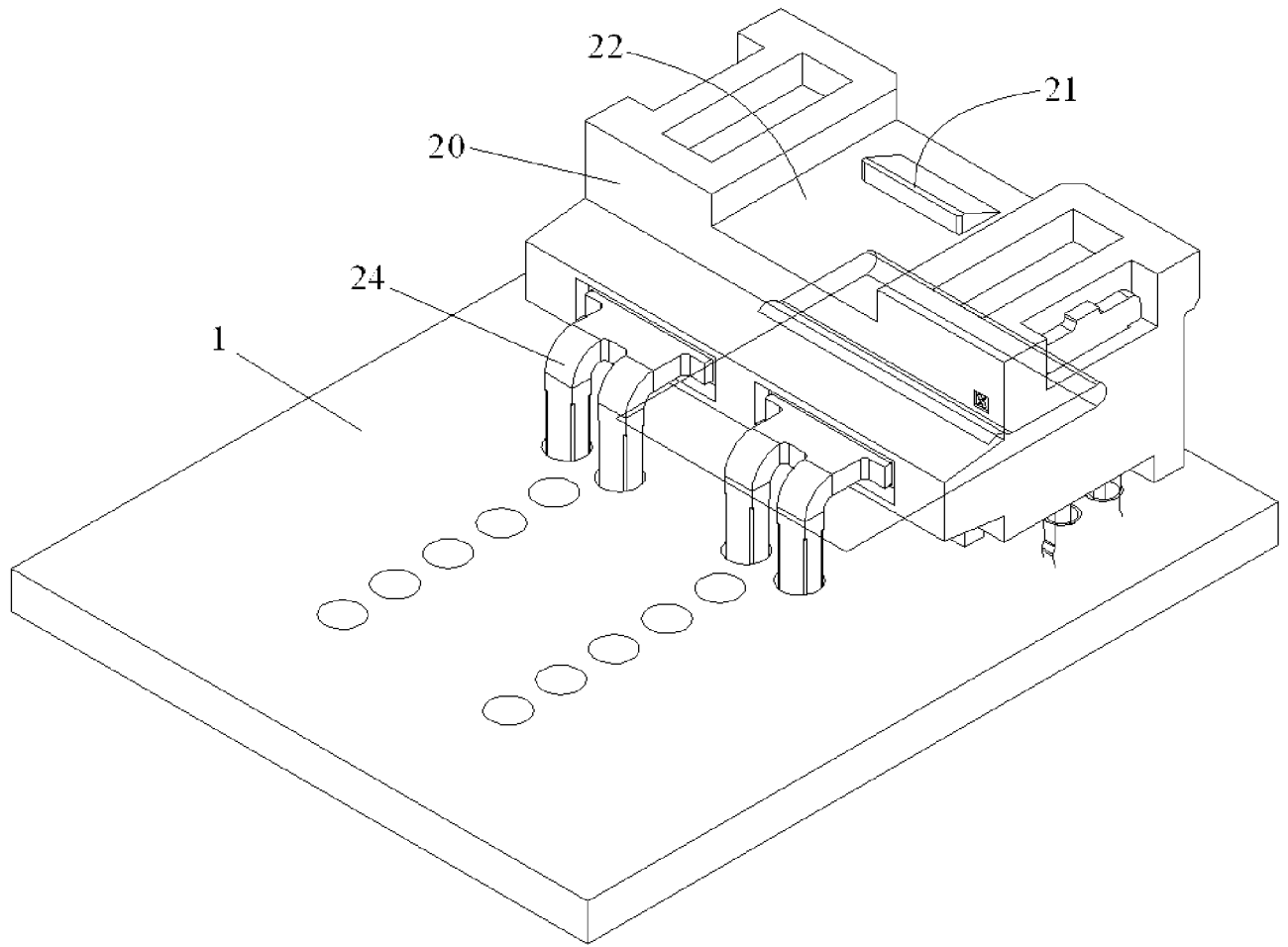


Fig.8

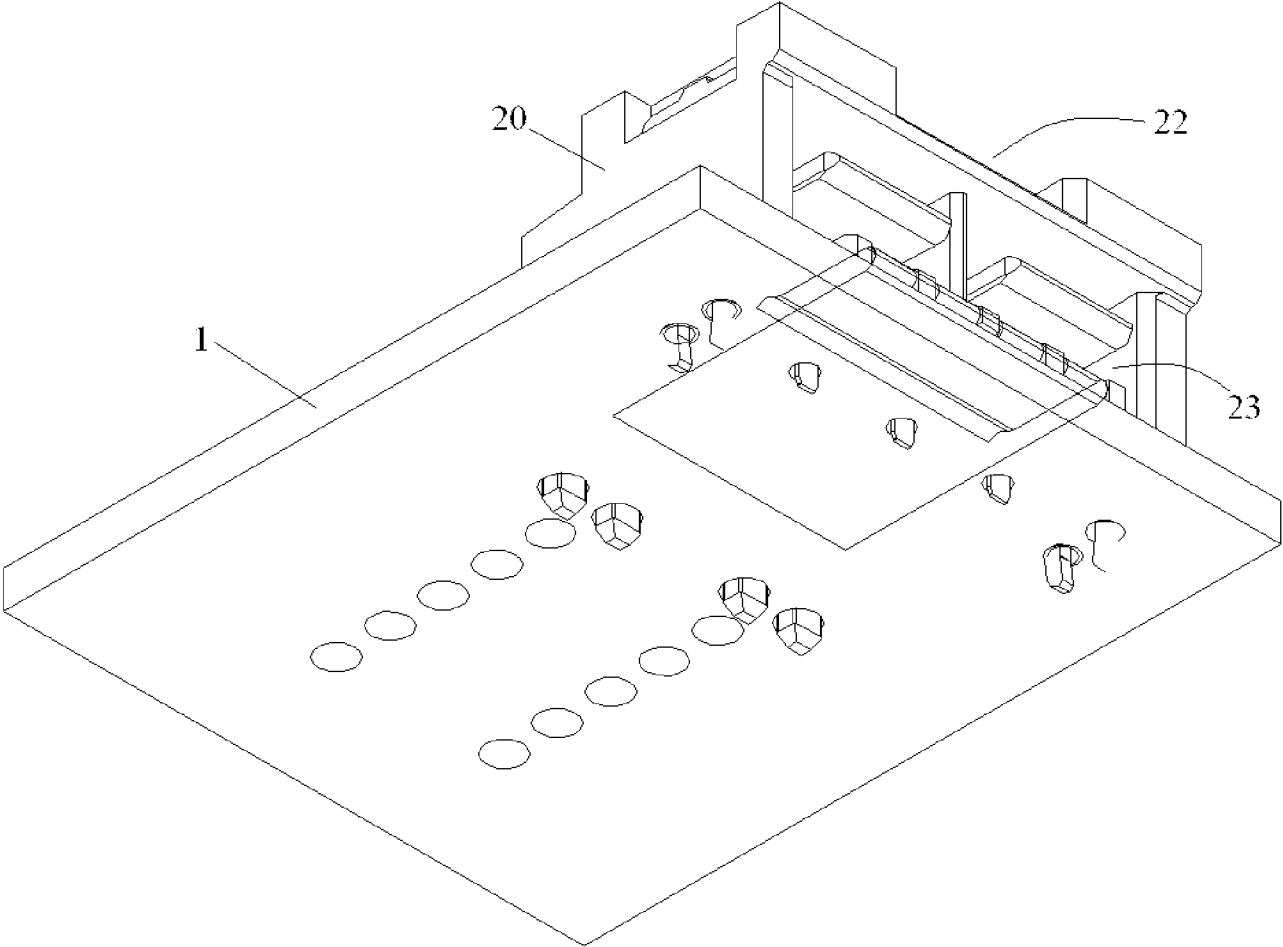


Fig.9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2015/057191

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01R13/633
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	----- US 2010/248522 A1 (CROFOOT LARRY M [US] ET AL) 30 September 2010 (2010-09-30) figures 1-4, 9, 12, 13 paragraphs [0037], [0039] ----- -/-	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

23 October 2015

Date of mailing of the international search report

19/11/2015

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Authorized officer

Kandyla, Maria

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/057191

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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International application No

PCT/IB2015/057191

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