



(11) **EP 2 822 109 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
27.02.2019 Bulletin 2019/09

(51) Int Cl.:
H01R 27/00 ^(2006.01) **H01R 13/627** ^(2006.01)

(21) Application number: **13175151.3**

(22) Date of filing: **04.07.2013**

(54) **Multi-type receptacle connector and plug connector applied thereto**

Mehrfach-Anschlussteckverbinder und Steckverbinder dafür

Connecteur femelle de plusieurs types et connecteur à fiche qui lui est appliqué

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
07.01.2015 Bulletin 2015/02

(73) Proprietor: **Ls Mtron Ltd.**
Anyang-si, Gyeonggi-do 431-848 (KR)

(72) Inventors:
• **Choi, Jung-Hoon**
150-752 SEOUL (KR)
• **Choi, Kyung-Hae**
443-751 Gyeonggi-do (KR)
• **Kim, Dong-Hee**
440-842 Gyeonggi-do (KR)

(74) Representative: **Lavoix**
Bayerstrasse 83
80335 München (DE)

(56) References cited:
EP-A1- 2 453 275 WO-A1-2013/071512
US-A1- 2005 059 301 US-A1- 2008 261 448
US-A1- 2013 115 822 US-A1- 2013 149 915
US-A1- 2013 164 993

- **"Universal Serial Bus Cables and Connectors Class Document", , 10 August 2007 (2007-08-10), XP055087263, Retrieved from the Internet: URL:http://www.usb.org/developers/devclass_docs/CabConn20.pdf [retrieved on 2013-11-07]**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

BACKGROUND OF THE DISCLOSURE

5 Field of the Disclosure

[0001] The present disclosure relates to a connector, and more particularly, to a multi-type receptacle connector having a sub contact in addition to a main contact to provide an additional connection module, and a plug connector applied thereto.

10 Description of the Related Art

[0002] Recently, the use of portable electronic devices such as cellular phones, notebooks, PMP, portable game players, MP3 players and smart phones, are gradually increasing in terms of kinds and functions. In particular, portable electronic devices have a connector unit for data communication. The connector unit includes a receptacle connector mounted on a printed circuit board (PCB) in the portable electronic device and a plug connector coupled thereto and is used for data communication or connected to a power device for supply of power.

[0003] Lately, as the connector unit, a micro USB is widely used. The micro USB includes five contacts, an insulator for mounting the contacts by insert molding, and a shell surrounding the insulator.

[0004] However, since the micro USB is configured only in a five-pin type having five contacts, this may be limited to only being used for connecting a connector designed according to USB standards. Accordingly, in order to connect an additional connection module to a small-size portable electronic device, an additional connector should be prepared separately.

[0005] Document US 2013/0149915 A1 relates to a connection plug for portable terminal.

[0006] Document EP 2 453 275 A1 pertains to a connector for electrical and optical data circuits.

SUMMARY OF THE DISCLOSURE

[0007] The present disclosure is designed to solve the problems of the prior art, and therefore it is an object of the present disclosure to provide a multi-type receptacle connector which may provide an additional connection module by including a sub contact in addition to a main contact and may also prevent an inferior connection while ensuring compatibility with an existing plug connector, and a plug connector applied thereto.

[0008] In one aspect of the present disclosure, there is provided a multi-type receptacle connector according to claim 1.

[0009] In another aspect of the present disclosure, there is also provided a multi-type plug connector according to claim 8.

[0010] Preferred embodiments are detailed in the dependent claims.

[0011] According to the present disclosure, since the receptacle connector may include a sub contact in addition to a main contact, the space of the connector may be efficiently used. In addition, it is possible to prevent an inferior connection while ensuring compatibility with an existing plug connector. Accordingly, the connector of the present disclosure may be simultaneously used as an interface connector of a portable electronic device such as a cellular phone to serve as a micro USB port and a predetermined additional connection module.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The accompanying drawings illustrate preferred embodiments of the present disclosure and, together with the foregoing disclosure, serve to provide further understanding of the technical spirit of the present disclosure. However, the present disclosure is not to be construed as being limited to the drawings in which:

Fig. 1 is an exploded perspective view showing a multi-type receptacle connector according to the present disclosure;

Fig. 2 is a perspective view showing a contact before being insert-molded to the insulator of Fig. 1;

Fig. 3 is a front view showing the multi-type receptacle connector according to the present disclosure;

Fig. 4 is a plane view showing an arrangement of contacts in the multi-type receptacle connector according to the present disclosure;

Fig. 5 is an exploded perspective view showing a multi-type plug connector according to the present disclosure;

Fig. 6 is a front view showing the multi-type plug connector according to the present disclosure;

Fig. 7 is a plane view showing the multi-type plug connector according to the present disclosure;

Fig. 8 is a partial perspective view showing a lower surface of the multi-type plug connector according to the present disclosure;

Fig. 9 is a perspective view showing a universal plug connector coupled to the multi-type receptacle connector according to the present disclosure;

Fig. 10 is a diagram for illustrating the coupling state of Fig. 9;

Fig. 11 is a cross-sectional view taken along the line of A-A' of Fig. 9;

Fig. 12 is a perspective view showing a coupling state of the multi-type receptacle connector and the plug connector according to the present disclosure;

Fig. 13 is a diagram for illustrating the coupling state of Fig. 12; and

Fig. 14 is a cross-sectional view taken along the line B-B' of Fig. 12.

Reference Symbols

[0013]

100: receptacle connector	200: plug connector
110: receptacle contact	210: plug contact
111: main receptacle contact	211: main plug contact
112a, 111b: sub receptacle contact	212a, 212b: sub plug contact
120: receptacle insulator	220: plug insulator
130: receptacle shell	230: plug shell

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] Hereinafter, preferred embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. Prior to the description, it should be understood that the terms used in the specification and the appended claims should not be construed as limited to general and dictionary meanings, but interpreted based on the meanings and concepts corresponding to technical aspects of the present disclosure on the basis of the principle that the inventor is allowed to define terms appropriately for the best explanation. Therefore, the description proposed herein is just a preferable example for the purpose of illustrations only, not intended to limit the scope of the disclosure, so it should be understood that other equivalents and modifications could be made thereto without departing from the spirit and scope of the disclosure.

[0015] Fig. 1 is an exploded perspective view showing a multi-type receptacle connector according to the present disclosure, Fig. 2 is a perspective view showing a contact before being insert-molded to the insulator of Fig. 1, Fig. 3 is a front view showing the multi-type receptacle connector according to the present disclosure, and Fig. 4 is a plane view showing an arrangement of contacts in the multi-type receptacle connector according to the present disclosure.

[0016] Referring to Figs. 1 to 4, a multi-type receptacle connector 100 according to the present disclosure includes a receptacle insulator 120 having a plurality of contacts 110 arranged therein and a receptacle shell 130 for surrounding and shielding at least a part of the receptacle insulator 120.

[0017] The plurality of contacts 110 is accommodated in the receptacle insulator 120 by means of insert molding. At this time, in order to fix the arrangement of the plurality of contacts 110 and reinforce the strength thereof, a support plate 125 may be further provided. In this case, the plurality of contacts 110 and the support plate 125 are inserted into and fixed in a mold for insert molding, and then a plastic resin is injected into the mold for insert molding to form the receptacle insulator 120 in which the plurality of contacts 110 are molded.

[0018] The plurality of contacts 110 includes main receptacle contacts 111 arranged with regular pitches and sub receptacle contacts 112a, 112b arranged at both sides of the main receptacle contacts 111, as shown in Fig. 2.

[0019] The main receptacle contacts 111 are arranged at the receptacle insulator 120 and give an electric contact point corresponding to a universal plug connector (for example, a micro USB). For example, as shown in Fig. 4, five-pin contacts may be arranged with regular pitches to satisfy pin standards of the micro USB.

[0020] The sub receptacle contacts 112a, 112b are additionally installed at both sides of the main receptacle contacts 111 and gives an additional contact point. The sub receptacle contacts 112a, 112b are used when an additional connection module is to be connected separately from the main receptacle contacts 111. The sub receptacle contacts 112a, 112b are arranged to have a contact point at the same height as the main receptacle contacts 111 and disposed relatively inwards in the inserting direction of a plug connector in comparison to the main receptacle contacts 111. In other words, the sub receptacle contacts 112a, 112b have a relatively shorter length in comparison to the main receptacle contacts 111. In addition, the sub receptacle contacts 112a, 112b may have at least one contact at each of both sides of the main receptacle contacts 111 in order to occupy a space of the receptacle insulator 120 which remains after the main receptacle contacts 111 are disposed. At this time, the sub receptacle contacts 112a, 112b may be arranged at both sides with the same number or different numbers. For example, as shown in Fig. 4, the sub receptacle contacts 112a, 112b may include

three-pin contacts 112a at the left side and two-pin contacts 112b at the right side, which are arranged with regular pitches, based on the center of the main receptacle contacts 111. However, the present disclosure is not limited thereto, and various modifications can be made, as obvious to those skilled in the art.

[0021] The receptacle shell 130 plays a role of surrounding and shielding a part of the receptacle insulator 120. In addition, the receptacle shell 130 plays a role of helping coupling with a plug connector 200 corresponding to the receptacle connector 100.

[0022] The receptacle shell 130 includes a first locking member 131 for fixing a general coupled universal plug connector and a second locking member 132 for fixing a coupled multi-type plug connector 200, at an upper portion thereof.

[0023] The first locking member 131 has a locking structure applied to a general universal receptacle connector and a plug connector and has a hole structure corresponding to a latch of the universal plug connector.

[0024] The second locking member 132 has an elastic piece protruding inwards at the upper portion of the receptacle shell 130 in order to fix the coupled multi-type plug connector 200. The multi-type plug connector 200 has a hole structure corresponding to the second locking member 132, and the plug connector 200 inserted into the receptacle connector 100 is fixed by means of coupling between them. Since the multi-type receptacle connector 100 has a longer length than an existing universal receptacle connector and the multi-type plug connector 200 corresponding thereto also has a longer length, a locking position may be located inwards so that the receptacle connector and the plug connector are coupled and fixed more stably.

[0025] As shown in Fig. 3, the receptacle shell 130 includes a first stopper 133 for preventing a general universal plug connector from being excessively inserted at the lower portion thereof and a second stopper 134 for preventing the multi-type plug connector 200, described later, from being excessively inserted.

[0026] When a general universal plug connector having only contact points with the main receptacle contacts 111 is coupled, the first stopper 133 presents the universal plug connector from being excessively inserted after deviating from a contact range with the main receptacle contacts 111. In other words, the first stopper 133 has a protrusion structure protruding at a location capable of preventing the universal plug connector coming into contact with the main receptacle contacts 111 from advancing further. At this time, the multi-type plug connector 200 preferably has an escape slot 235 which allows the first stopper 133 to escape.

[0027] When the multi plug connector 200 having contact points with the main receptacle contacts 111 and the sub receptacle contacts 112a, 112b is coupled, the second stopper 134 prevents the multi plug connector 200 from being excessively inserted after deviating from a contact range with the main receptacle contacts 111 and the sub receptacle contacts 112a, 112b.

[0028] Fig. 5 is an exploded perspective view showing a multi-type plug connector according to the present disclosure, Fig. 6 is a front view showing the multi-type plug connector according to the present disclosure, Fig. 7 is a plane view showing the multi-type plug connector according to the present disclosure, and Fig. 8 is a partial perspective view showing a lower surface of the multi-type plug connector according to the present disclosure.

[0029] Referring to Figs. 5 to 8, the multi-type plug connector 200 according to the present disclosure includes a plug insulator 220 having a plurality of contacts 210 arranged therein and a plug shell 230 for surrounding and shielding at least a part of the plug insulator 220.

[0030] The plurality of contacts 210 are inserted into and coupled to the plug insulator 220, and the plug insulator 220 may have a plurality of slots in which the plurality of contacts 210 may be inserted and arranged.

[0031] The plurality of contacts 210 include main plug contacts 211 arranged with pitches corresponding to the main receptacle contacts 111 of the multi-type receptacle connector 100 and sub plug contacts 212a, 212b arranged with pitches corresponding to the sub receptacle contacts 112a, 112b at each of both sides of the main plug contacts 211.

[0032] The main plug contacts 211 are arranged at the plug insulator 220 and gives connection pins corresponding to the main receptacle contacts 111 of the multi-type receptacle connector 100. For example, as shown in Fig. 7, five-pin contacts may be arranged with regular pitches to satisfy pin standards of the micro USB.

[0033] The sub plug contacts 212a, 212b gives connection pins corresponding to the sub receptacle contacts 112a, 112b of the multi-type receptacle connector 100. The sub plug contacts 212a, 212b are used to connect an additional connection module separately from the main plug contacts 211. The sub plug contacts 212a, 212b are arranged to have contact points at the same height as the main plug contacts 211 and disposed to relatively protrude forwards in comparison to the main plug contacts 211. In other words, the sub plug contacts 212a, 212b have a relatively longer length in comparison to the main plug contacts 211. In addition, the sub plug contacts 212a, 212b may have at least one contact at each of both sides of the main plug contacts 111 so as to occupy a space of the plug insulator 220 which remains after the main plug contacts 211 are disposed. At this time, the sub plug contacts 212a, 212b may be arranged at both sides with the same number or different numbers. For example, as shown in Fig. 7, the sub plug contacts 212a, 212b may have three-pin contacts 212a at the left side and two-pin contacts 212b at the right sides, arranged with regular pitches, based on the center of the main plug contacts 211. This arrangement may be changed according to the arrangement of the corresponding sub receptacle contacts 112a, 112b of the multi-type receptacle connector 100. However, the present disclosure is not limited thereto, and various modifications can be made, as obvious to those skilled in the art.

[0034] The plug shell 230 plays a role of surrounding and shielding a part of the plug insulator 220. In addition, the plug shell 230 plays a role of helping the coupling with the receptacle connector 100 corresponding to the plug connector 200.

[0035] The plug shell 230 has a locking hole 232 used for being coupled and fixed to the receptacle connector 100 when the plug shell 230 is inserted into the receptacle connector 100. The locking hole 232 has a hole structure which may be coupled corresponding to a locking member made of an elastic piece protruding inwards at the upper portion of the receptacle connector 100 and allows the plug shell 230 to be inserted into and fixed to the receptacle connector 100. Since the multi-type plug connector 200 has a longer structure than an existing universal plug connector and the corresponding receptacle connector 100 also has a longer structure, a locking position may be located inwards so that the plug connector may be coupled and fixed to the plug connector more stably.

[0036] As shown in Fig. 6, the plug shell 230 has an escape slot 235 for escaping without being hooked to the first stopper 133 which prevents a general universal plug connector from being excessively inserted into the receptacle connector 100. By doing so, the multi-type plug connector 200 is not hooked by the first stopper 133, and all of the main plug contacts 211 and the sub plug contacts 212a, 212b may be connected to the main receptacle contacts 111 and the sub receptacle contacts 112a, 112b of the receptacle connector 100.

[0037] Fig. 9 is a perspective view showing a universal plug connector coupled to the multi-type receptacle connector according to the present disclosure, Fig. 10 is a diagram for illustrating the coupling state of Fig. 9, Fig. 11 is a cross-sectional view taken along the line of A-A' of Fig. 9, Fig. 12 is a perspective view showing a coupling state of the multi-type receptacle connector and the plug connector according to the present disclosure, Fig. 13 is a diagram for illustrating the coupling state of Fig. 12, and Fig. 14 is a cross-sectional view taken along the line B-B' of Fig. 12.

[0038] Hereinafter, a process of using the receptacle connector according to the present disclosure will be described.

[0039] First, referring to Figs. 9 to 11, it will be described that a universal plug connector 300 is compatibly applied to the multi-type receptacle connector 100 of the present disclosure.

[0040] If the universal plug connector 300 is inserted into and coupled to the receptacle connector 100, as shown in Figs. 9 and 11, a latch 310 of the universal plug connector 300 is coupled and fixed to the first locking member 131 of the receptacle connector 100.

[0041] In addition, as shown in Figs. 10 and 11, the universal plug connector 300 inserted into the receptacle connector 100 is blocked by the first stopper 133 of the receptacle connector 100, thereby preventing excessive insertion at which the contact of the plug connector 300 is inserted to a location capable of coming into contact with the sub receptacle contacts 112a, 112b and thus causes inferior contact.

[0042] Moreover, referring to Figs. 12 to 14, mutual coupling between the multi-type receptacle connector 100 according to the present disclosure and the plug connector 200 will be described.

[0043] If the plug connector 200 is inserted into and coupled to the receptacle connector 100, as shown in Figs. 12 and 14, the second locking member 132 of the receptacle connector 100 is coupled and fixed to the locking hole 232 of the plug connector 200.

[0044] In addition, as shown in Figs. 13 and 14, the plug connector 200 inserted into the receptacle connector 100 avoids the first stopper 133 of the receptacle connector 100 by means of the escape slot 235, is inserted into a location of the second stopper 134 and then is blocked by the second stopper 134, thereby preventing excessive insertion which causes the connector to break down.

Claims

1. A multi-type receptacle connector (100), comprising:

- a receptacle insulator (120);
- main receptacle contacts (111) arranged at the receptacle insulator (120) to provide an electric contact point for a first plug connector (300);
- sub receptacle contacts (112a, 112b) additionally installed at both sides of the main receptacle contacts (111) to give an additional contact point for a second plug connector (200); and
- a receptacle shell (130) surrounding at least a part of the receptacle insulator (120),

wherein the sub receptacle contacts (112a, 112b) are arranged at the same height as the main receptacle contacts (111) and disposed at a relatively inner side in the insertion direction of the first plug connector (300) or the second plug connector (200) in comparison to the main receptacle contacts (111),

characterized in that the receptacle shell (130) includes:

- a first stopper (133) for preventing the first plug connector (300) having only contact points with the main

receptacle contacts (111) from being excessively inserted; and
a second stopper (134) for preventing the second plug connector (200) having contact points with the main receptacle contacts (111) and sub receptacle contacts (112a, 112b) from being excessively inserted,

the first stopper (133) and the second stopper (134) having a protruding structure.

2. The multi-type receptacle connector (100) according to claim 1, wherein the sub receptacle contacts (112a, 112b) have a relatively shorter length in comparison to the main receptacle contacts (111).

3. The multi-type receptacle connector (100) according to claim 1, wherein the sub receptacle contacts (112a, 112b) include at least one contact at each of both sides of the main receptacle contacts (111), and the contacts (112a, 112b) disposed at both sides may be arranged with the same number or different numbers.

4. The multi-type receptacle connector (100) according to claim 1, wherein the first stopper (133) is located at a relatively front side in the insertion direction of the first plug connector (300) or the second plug connector (200) in comparison with the second stopper (134).

5. The multi-type receptacle connector (100) according to claim 4, wherein the receptacle shell (130) includes:

a first locking member (131) for fixing the first plug connector (300); and
a second locking member (132) for fixing the second plug connector (200).

6. The multi-type receptacle connector (100) according to claim 5, wherein the second locking member (132) includes an elastic piece protruding inwards at an upper portion of the receptacle shell (130).

7. The multi-type receptacle connector (100) according to claim 1, wherein the main receptacle contacts (111) and the sub receptacle contacts (112a, 112b) are accommodated in the receptacle insulator (130) in an insertion-molding fashion.

8. A multi-type plug connector (200), comprising:

main plug contacts (211) and sub plug contacts (212a, 212b) respectively corresponding to the main receptacle contacts (111) and the sub receptacle contacts (112a, 112b) of a multi-type receptacle connector (100) comprising a receptacle shell (130), the sub receptacle contacts (112a, 112b) being arranged at the same height as the main receptacle contacts (111) and disposed at a relatively inner side in the insertion direction of a first plug connector (300) or a second plug connector (200) in comparison to the main receptacle contacts (111);
a plug insulator (220) for accommodating the main plug contacts (211) and the sub plug contacts (212a, 212b);
and

a plug shell (230) surrounding at least a part of the plug insulator (220), wherein the sub plug contacts (212a, 212b) are arranged at the same height as the main plug contacts (211) and disposed to protrude relatively forwards in comparison to the main plug contacts (211),

characterized in that the plug shell (230) has an escape slot (235) for escaping without being hooked to a protruding structure of the receptacle shell so that all of the main plug contacts (211) and the sub plug contacts (212a, 212b) are connectable to the main receptacle contacts (111) and the sub receptacle contacts (112a, 112b) of the multi-type receptacle connector (100).

9. The multi-type plug connector (200) according to claim 8, wherein the sub plug contacts (212a, 212b) have a relatively longer length in comparison to the main plug contacts (211).

10. The multi-type plug connector (200) according to claim 8, wherein the sub plug contacts (212a, 212b) include at least one contact at each of both sides of the main plug contacts (211), and the contacts (212a, 212b) disposed at both sides may be arranged with the same number or different numbers.

11. The multi-type plug connector (200) according to claim 8, wherein the plug shell (230) has a locking hole (232) to be coupled and fixed to the multi-type receptacle connector (100).

Patentansprüche

1. Mehrfach-Anschlusssteckverbinder (100), umfassend:

einen Anschlussisolator (120);
 Hauptanschlusskontakte (111), die am Anschlussisolator (120) angeordnet sind, um einen elektrischen Kontaktpunkt für einen ersten Steckverbinder (300) bereitzustellen;
 Unteranschlusskontakte (112a, 112b), die zusätzlich auf beiden Seiten der Hauptanschlusskontakte (111) installiert sind, um einen zusätzlichen Kontaktpunkt für einen zweiten Steckverbinder (200) bereitzustellen; und
 ein Anschlussgehäuse (130), das mindestens einen Teil des Anschlussisolators (120) umgibt,

wobei die Unteranschlusskontakte (112a, 112b) auf der gleichen Höhe wie die Hauptanschlusskontakte (111) angeordnet sind und sich an einer relativ inneren Seite in der Einführungsrichtung des ersten Steckverbinders (300) oder des zweiten Steckverbinders (200) im Vergleich zu den Hauptanschlusskontakten (111) befinden,

dadurch gekennzeichnet, dass das Anschlussgehäuse (130) Folgendes umfasst:

eine erste Stoppvorrichtung (133), um zu verhindern, dass der erste Steckverbinder, (300) der nur Kontaktpunkte mit den Hauptanschlusskontakten (111) aufweist, übermäßig eingeführt wird, und
 eine zweite Stoppvorrichtung (134), um zu verhindern, dass der zweite Steckverbinder (200), der Kontaktpunkte mit den Hauptanschlusskontakten (111) und Unteranschlusskontakten (112a, 112b) aufweist, übermäßig eingeführt wird,

wobei die erste Stoppvorrichtung (133) und die zweite Stoppvorrichtung (134) eine vorspringende Struktur aufweisen.

2. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 1, wobei die Unteranschlusskontakte (112a, 112b) eine relativ kürzere Länge im Vergleich zu den Hauptanschlusskontakten (111) aufweisen.

3. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 1, wobei die Unteranschlusskontakte (112a, 112b) mindestens einen Kontakt auf jeder von beiden Seiten der Hauptanschlusskontakte (111) einschließen und die Kontakte (112a, 112b), die sich an beiden Seiten befinden, in der gleichen Anzahl oder in verschiedenen Anzahlen angeordnet sein können

4. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 1, wobei die erste Stoppvorrichtung (133) an einer relativ vorderen Seite der Einführungsrichtung des ersten Steckverbinders (300) oder des zweiten Steckverbinders (200) im Vergleich mit der zweiten Stoppvorrichtung (134) liegt.

5. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 4, wobei das Anschlussgehäuse (130) Folgendes umfasst:

ein erstes Verriegelungselement (131), um den ersten Steckverbinder (300) zu fixieren,
 ein zweites Verriegelungselement (132), um den zweiten Steckverbinder (200) zu fixieren.

6. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 5, wobei das zweite Verriegelungselement (132) einen elastischen Teil einschließt, der nach innen an einem oberen Abschnitt der Anschlussgehäuses (130) vorspringt.

7. Mehrfach-Anschlusssteckverbinder (100) nach Anspruch 1, wobei Hauptanschlusskontakte (111) und die Unteranschlusskontakte (112a, 112b) im Anschlussisolator (130) auf eine Umspritzweise aufgenommen sind.

8. Mehrfach-Steckverbinder (200), umfassend:

Hauptsteckkontakte (211) und Untersteckkontakte (212a, 212b), die jeweils den Hauptanschlusskontakten (111) und den Unteranschlusskontakten (112a, 112b) eines Mehrfach-Anschlusssteckverbinders (100), umfassend eine Anschlussgehäuse (130), entsprechen, wobei die Unteranschlusskontakte (112a, 112b) auf der gleichen Höhe wie die Hauptanschlusskontakte (111) angeordnet sind und sich an einer relativ inneren Seite in der Einführungsrichtung eines ersten Steckverbinders (300) oder eines zweiten Steckverbinders (200) im Vergleich zu den Hauptanschlusskontakten (111) befinden;
 einen Steckisolator (220), um die Hauptsteckkontakte (211) und die Untersteckkontakte (212a, 212b) aufzunehmen; und

ein Steckgehäuse (230), das mindestens einen Teil des Steckisolators (220) umgibt,

wobei die Untersteckkontakte (212a, 212b) auf der gleichen Höhe wie die Hauptsteckkontakte (211) angeordnet sind und so liegen, dass sie relativ nach vorne im Vergleich zu den Hauptsteckkontakten (211) vorspringen,

dadurch gekennzeichnet, dass das Steckgehäuse (230) einen Austrittsschlitz (235) aufweist, um austreten zu können, ohne an eine vorspringende Struktur der Anschlussgehäuses gehakt zu werden, so dass alle der Hauptsteckkontakte (211) und der Untersteckkontakte (212a, 212b) an die Hauptanschlusskontakte (111) und die Unteranschlusskontakte (112a, 112b) eines Mehrfach-Anschlussteckverbinders (100) verbunden werden können.

9. Mehrfach-Steckverbinder (200) nach Anspruch 8, wobei die Untersteckkontakte (212a, 212b) eine relativ größere Länge im Vergleich zu den Hauptsteckkontakten (211) aufweisen.

10. Mehrfach-Steckverbinder (200) nach Anspruch 8, wobei die Untersteckkontakte (212a, 212b) mindestens einen Kontakt auf jeder von beiden Seiten der Hauptsteckkontakte (211) einschließen und die Kontakte (212a, 212b), die sich an beiden Seiten befinden, in der gleichen Anzahl oder in verschiedenen Anzahlen angeordnet sein können.

11. Mehrfach-Steckverbinder (200) nach Anspruch 8, wobei das Steckgehäuse (230) ein Verriegelungsloch (232) aufweist, um an den Mehrfach-Anschlussteckverbinder (100) gekoppelt und fixiert zu sein.

Revendications

1. Connecteur femelle de plusieurs types (100), comprenant :

un isolant de prise femelle (120) ;

des contacts principaux de prise femelle (111) agencés au niveau de l'isolant de prise femelle (120) pour fournir un point de contact électrique pour un premier connecteur à fiche mâle (300) ;

des contacts auxiliaires de prise femelle (112a, 112b) installés en outre des deux côtés des contacts principaux de prise femelle (111) pour fournir un point de contact supplémentaire pour un second connecteur à fiche mâle (200) ; et

une coque de prise femelle (130) entourant au moins une partie de l'isolant de prise femelle (120),

dans lequel les contacts auxiliaires de prise femelle (112a, 112b) sont agencés à la même hauteur que les contacts principaux de prise femelle (111) et disposés relativement à l'intérieur dans le sens d'insertion du premier connecteur à fiche mâle (300) ou du second connecteur à fiche mâle (200) par rapport aux contacts principaux de prise femelle (111),

caractérisé en ce que la coque de prise femelle (130) comporte :

une première butée (133) pour empêcher que le premier connecteur à fiche mâle (300) ayant seulement des points de contact avec les contacts principaux de prise femelle (111) soit inséré de manière excessive ; et

une seconde butée (134) pour empêcher que le second connecteur à fiche mâle (200) ayant des points de contact avec les contacts principaux de prise femelle (111) et les contacts auxiliaires de prise femelle (112a, 112b) soit inséré de manière excessive,

la première butée (133) et la seconde butée (134) présentant une structure saillante.

2. Connecteur femelle de plusieurs types (100) selon la revendication 1, dans lequel les contacts auxiliaires de prise femelle (112a, 112b) ont une longueur relativement inférieure à celle des contacts principaux de prise femelle (111).

3. Connecteur femelle de plusieurs types (100) selon la revendication 1, dans lequel les contacts auxiliaires de prise femelle (112a, 112b) comportent au moins un contact de chacun des deux côtés des contacts principaux de prise femelle (111), et les contacts (112a, 112b) disposés des deux côtés peuvent être agencés selon le même nombre ou selon des nombres différents.

4. Connecteur femelle de plusieurs types (100) selon la revendication 1, dans lequel la première butée (133) se trouve relativement à l'avant dans le sens d'insertion du premier connecteur à fiche mâle (300) ou du second connecteur à fiche mâle (200) par rapport à la seconde butée (134).

5. Connecteur femelle de plusieurs types (100) selon la revendication 4, dans lequel la coque de prise femelle (130) comporte :

un premier élément de verrouillage (131) pour fixer le premier connecteur à fiche mâle (300) ; et
un second élément de verrouillage (132) pour fixer le second connecteur à fiche mâle (200).

6. Connecteur femelle de plusieurs types (100) selon la revendication 5, dans lequel le second élément de verrouillage (132) comporte une pièce élastique faisant saillie vers l'intérieur dans une partie supérieure de la coque de prise femelle (130).

7. Connecteur femelle de plusieurs types (100) selon la revendication 1, dans lequel les contacts principaux de prise femelle (111) et les contacts auxiliaires de prise femelle (112a, 112b) sont reçus dans l'isolant de prise femelle (120) par moulage par insertion.

8. Connecteur à fiche mâle de plusieurs types (200), comprenant :

des contacts principaux de fiche mâle (211) et des contacts auxiliaires de fiche mâle (212a, 212b) correspondant respectivement aux contacts principaux de prise femelle (111) et aux contacts auxiliaires de prise femelle (112a, 112b) d'un connecteur femelle de plusieurs types (100) comprenant une coque de prise femelle (130), les contacts auxiliaires de prise femelle (112a, 112b) étant agencés à la même hauteur que les contacts principaux de prise femelle (111) et disposés relativement à l'intérieur dans le sens d'insertion d'un premier connecteur à fiche mâle (300) ou d'un second connecteur à fiche mâle (200) par rapport aux contacts principaux de prise femelle (111) ;

un isolant de fiche mâle (220) pour recevoir les contacts principaux de fiche mâle (211) et les contacts auxiliaires de fiche mâle (212a, 212b) ; et

une coque de fiche mâle (230) entourant au moins une partie de l'isolant de fiche mâle (220),

dans lequel les contacts auxiliaires de fiche mâle (212a, 212b) sont agencés à la même hauteur que les contacts principaux de fiche mâle (211) et disposés de manière à faire saillie relativement vers l'avant par rapport aux contacts principaux de fiche mâle (211),

caractérisé en ce que la coque de fiche mâle (230) possède une fente de sortie (235) lui permettant de sortir sans s'accrocher à une structure saillante de la coque de prise femelle de sorte que la totalité des contacts principaux de fiche mâle (211) et des contacts auxiliaires de fiche mâle (212a, 212b) peuvent être connectés aux contacts principaux de prise femelle (111) et aux contacts auxiliaires de prise femelle (112a, 112b) du connecteur femelle de plusieurs types (100).

9. Connecteur à fiche mâle de plusieurs types (200) selon la revendication 8, dans lequel les contacts auxiliaires de fiche mâle (212a, 212b) ont une longueur relativement supérieure à celle des contacts principaux de fiche mâle (211).

10. Connecteur à fiche mâle de plusieurs types (200) selon la revendication 8, dans lequel les contacts auxiliaires de fiche mâle (212a, 212b) comportent au moins un contact de chacun des deux côtés des contacts principaux de fiche mâle (211), et les contacts (212a, 212b) disposés des deux côtés peuvent être agencés selon le même nombre ou selon des nombres différents.

11. Connecteur à fiche mâle de plusieurs types (200) selon la revendication 8, dans lequel la coque de fiche mâle (230) possède un trou de verrouillage (232) destiné à être couplé et fixé au connecteur femelle de plusieurs types (100).

FIG. 1

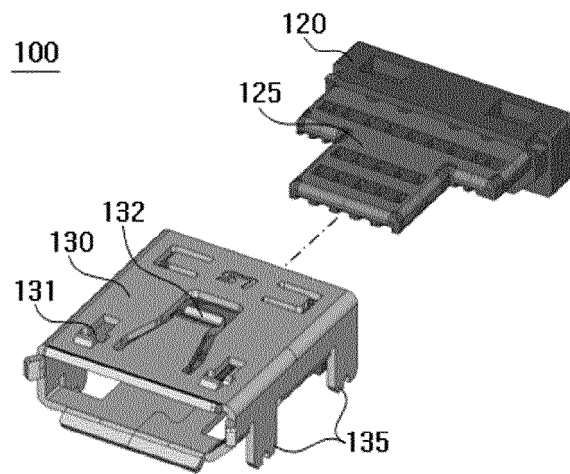


FIG. 2

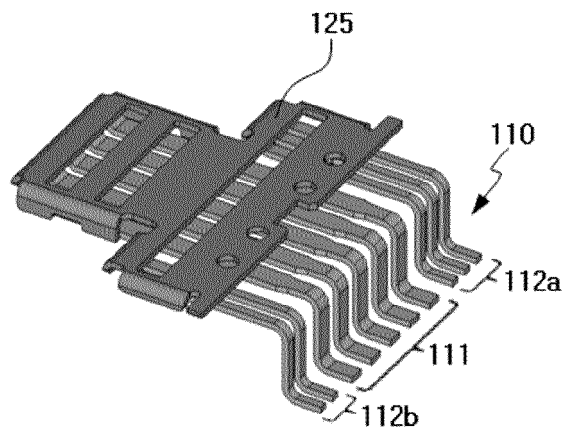


FIG. 3

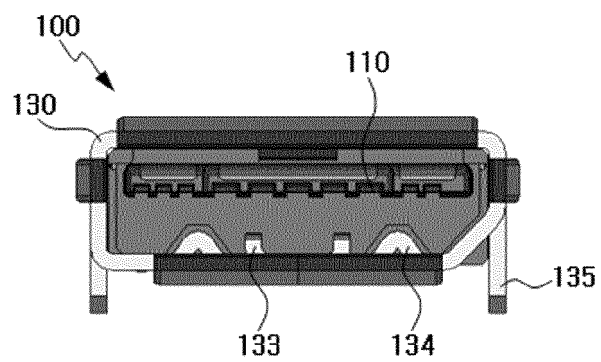


FIG. 4

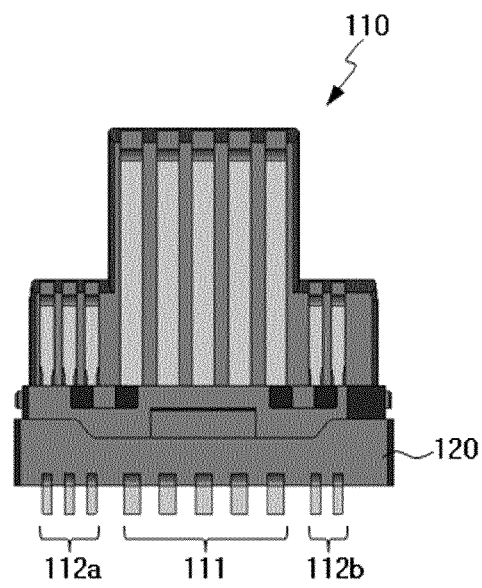


FIG. 5

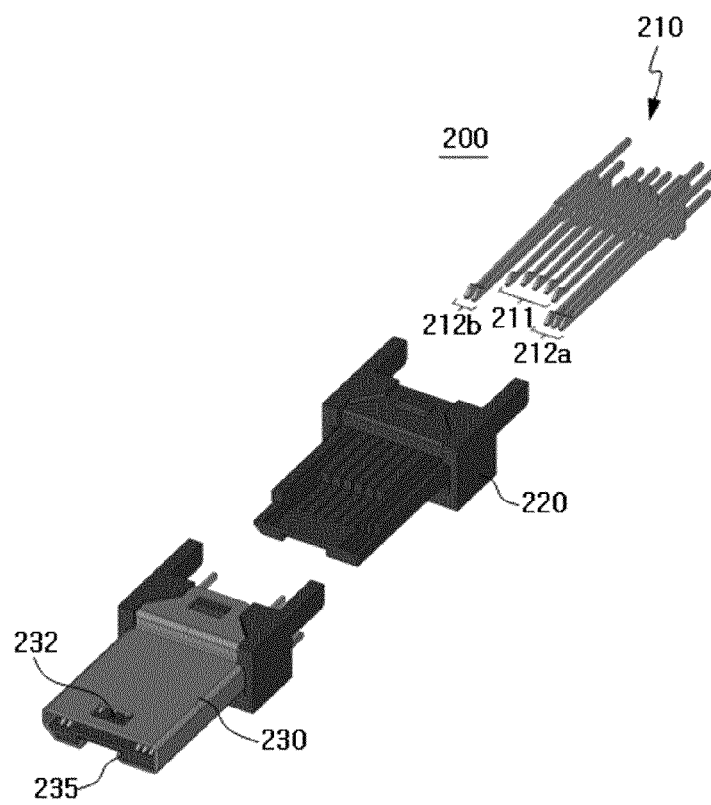


FIG. 6

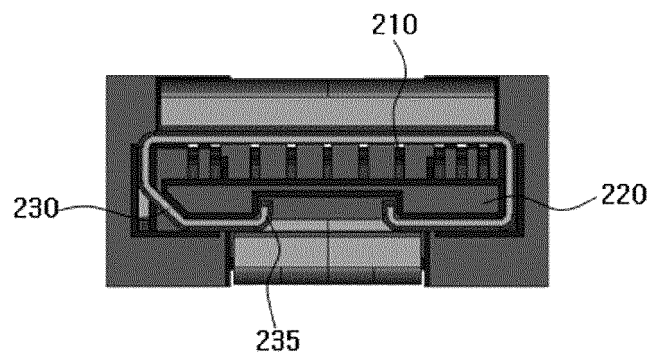


FIG. 7

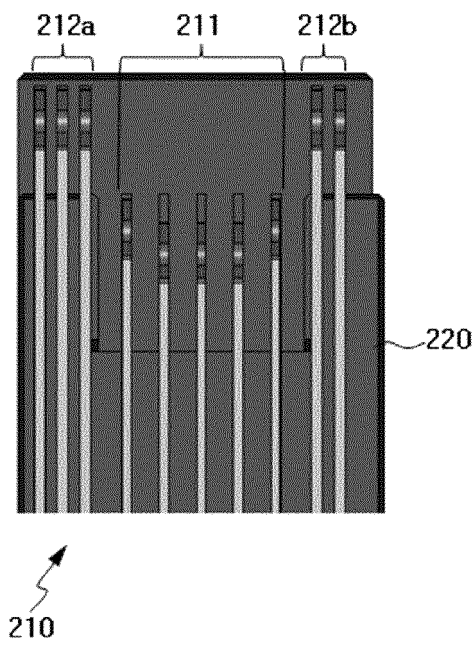


FIG. 8

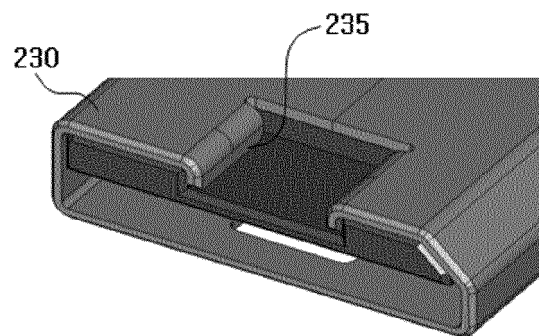


FIG. 9

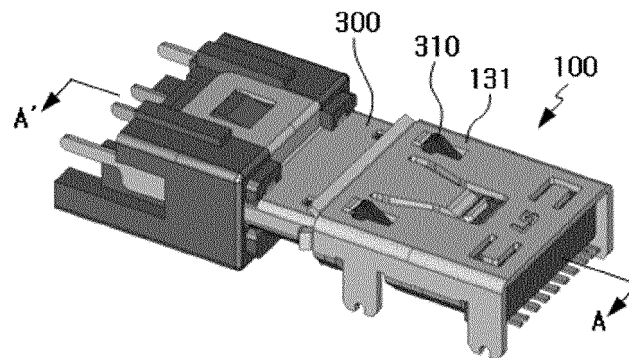


FIG. 10

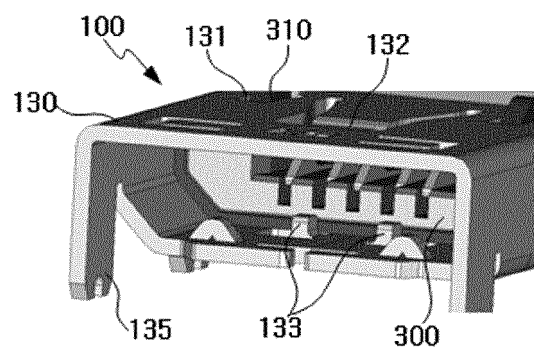


FIG. 11

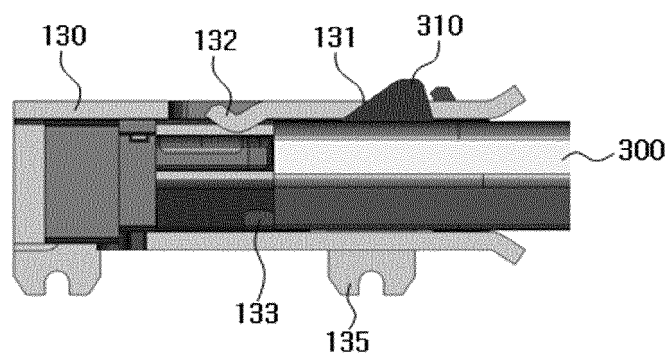


FIG. 12

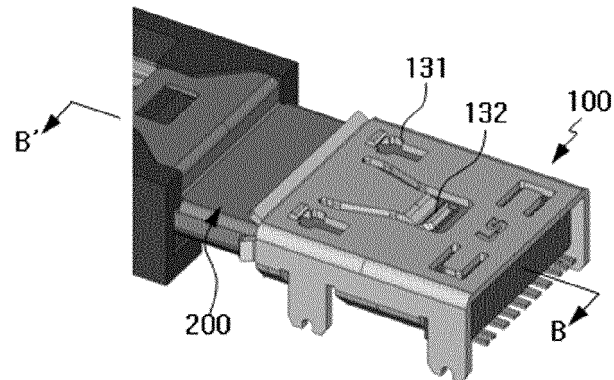


FIG. 13

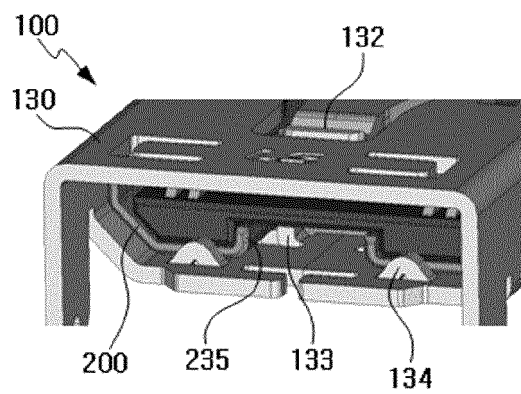
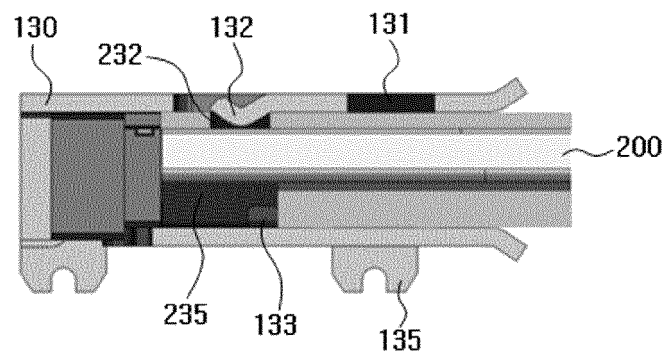


FIG. 14



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20130149915 A1 [0005]
- EP 2453275 A1 [0006]