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ELECTRICAL CONNECTOR

Abstract

An electrical connector includes an insulation body, a terminal assembly and a middle grounding plate. The insulation body has a base body and two internal spaces. A front end of the base body extends frontward to form a stepping portion. Two sides of a front end of the stepping portion extend frontward and then extend towards each other to form a docking portion. The docking portion includes a docking end and two connecting arms. The docking end is connected to two front ends of the two connecting arms. The terminal assembly is fastened in the insulation body. The middle grounding plate is mounted in a middle of the terminal assembly. The middle grounding plate has two bending arms. The two bending arms are disposed to two opposite sides of the docking portion through the two internal spaces.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application is based on, and claims priority from, China Patent Application No. 202420325379.2, filed Feb. 21, 2024, the disclosure of which is hereby incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention generally relates to an electrical connector, and more particularly to an electrical connector having a better structure strength.

Description of Related Art

[0003] In various electrical connector types which are frequently used by various electronic products, universal serial bus (USB) connectors are the most widely applied connectors. With the improvement of sciences and technologies, more and more kinds of the universal serial bus connectors are developed, such as USB 2.0 connectors, USB 3.0 connectors, Micro USB connectors, Mini USB connectors or USB Type-C connectors. The USB Type-C connectors have been widely applied in the various electronic products.

[0004] A conventional electrical connector includes an insulation body, a plurality of upper terminals, a plurality of lower terminals, a middle grounding plate and a shielding shell. The conventional electrical connector is a reliable Type-C receptacle connector. The insulation body has an upper insulation body, a lower insulation body and an outer insulation body. The plurality of the upper terminals are fastened to the upper insulation body by an injection molding technology. The plurality of the upper terminals include a plurality of upper power terminals and a plurality of upper grounding terminals. The plurality of the lower terminals are fastened to the lower insulation body by the injection molding technology. The plurality of the lower terminals include a plurality of lower power terminals and a plurality of lower grounding terminals. The middle grounding plate is disposed between the upper insulation body and the lower insulation body. The middle grounding plate, the plurality of the upper terminals, the upper insulation body, the plurality of the lower terminals and the lower insulation body are fastened in the outer insulation body by the injection molding technology.

[0005] However, when the conventional electrical connector is inserted into or withdrawn from a docking connector, because the insulation body and the middle grounding plate of the conventional electrical connector have insufficient structure strengths, so the conventional electrical connector easily sways along a transverse direction, and the insulation body which is made of a plastic material, the plurality of the upper terminals and the plurality of the lower terminals of the conventional electrical connector are easily pulled to be broken and deformed. As a result, a damage phenomenon of the conventional electrical connector is caused to be happened.

[0006] Thus, it is essential to provide an innovative electrical connector having a better structure strength.

BRIEF SUMMARY OF THE INVENTION

[0007] An object of the present invention is to provide an electrical connector having a better structure strength. The electrical connector includes an insulation body, a terminal assembly and a middle grounding plate. The insulation body has a base body and two internal spaces. A front end of the base body extends frontward to form a stepping portion. The stepping portion is a hollow structure. Two sides of a front end of the stepping portion extend frontward and then extend

towards each other to form a docking portion. The docking portion has a docking end and two connecting arms. Two inner surfaces of two opposite sides of the stepping portion extend inward to form two protruding blocks. Two front surfaces of the two protruding blocks extend frontward to form the two connecting arms. The two connecting arms extend out of the front end of the stepping portion. The docking end is connected to two front ends of the two connecting arms. The two connecting arms are connected between the two protruding blocks and two opposite sides of the docking end. The two connecting arms are separated from two side walls of the stepping portion. Each internal space is formed among an outer surface of one connecting arm, an outer surface of one protruding block and an inner surface of one side wall of the stepping portion which are adjacent. The terminal assembly is fastened in the insulation body. The terminal assembly has a base block, and a plurality of terminals fastened in the base block. Two opposite sides of a front end of the base block are recessed inward to form two inserting spaces. The two connecting arms are disposed in the two inserting spaces. The middle grounding plate is mounted in a middle of the terminal assembly. The middle grounding plate has a base plate and two bending arms. Two middles of two opposite sides of the base plate protrude outward, then are bent upward, later extend frontward, next are curved outward and are further bent rearward to form the two bending arms, respectively. The base plate is mounted in the base block. The two bending arms are disposed to two opposite sides of the docking portion through the two internal spaces. The two bending arms are connected to two outer portions of two opposite sides of the two connecting arms.

[0008] Another object of the present invention is to provide an electrical connector. The electrical connector includes an insulation body, a terminal assembly and a middle grounding plate. The insulation body has a base body and two internal spaces. A front end of the base body extends frontward to form a stepping portion. The stepping portion has a top wall, a bottom wall and two side walls. Two sides of a front end of the stepping portion extend frontward and then extend towards each other to form a docking portion. Two inner surfaces of the two side walls of the stepping portion extend inward to form two protruding blocks. The two protruding blocks keep a distance from the top wall of the stepping portion. The two protruding blocks keep a distance from the bottom wall of the stepping portion. The docking portion has a docking end and two connecting arms. Two front surfaces of the two protruding blocks extend frontward to form the two connecting arms. The docking end is connected to two front ends of the two connecting arms. The two connecting arms keep distances from the two side walls of the stepping portion. The two connecting arms extend out of the front end of the stepping portion. The two connecting arms are connected between two opposite sides of the stepping portion and two opposite sides of the docking end of the docking portion. One end of each connecting arm is connected with a front surface of one protruding block. The other end of each connecting arm is connected with a rear surface of one side of the docking end of the docking portion. Each internal space is formed among an outer surface of one connecting arm, an outer surface of the one protruding block and an inner surface of one side wall of the stepping portion which are adjacent. The terminal assembly is fastened in the insulation body. The terminal assembly has a plurality of terminals and two base portions. The plurality of the terminals are fastened in the two base portions. Each base portion has a main body, a connecting portion and a tongue portion. The main body is disposed in the base body. A front end of the main body extends frontward to form the connecting portion. The connecting portion is disposed in the stepping portion. A front end of the connecting portion extends frontward to form the tongue portion. The tongue portion is disposed between the stepping portion and the docking end of the docking portion. Two opposite sides of an inner surface of the tongue portion protrude inward to form two restricting portions. The two connecting arms are disposed to outer surfaces of the restricting portions of the two base portions of the terminal assembly. Two opposite sides of two front ends of the two tongue portions of the two base portions of the terminal assembly are recessed inward to form two inserting spaces. The two connecting arms are disposed in the two inserting spaces. The middle grounding plate is mounted in a middle

of the terminal assembly. The middle grounding plate is disposed among the restricting portions of the two tongue portions of the two base portions of the terminal assembly. The middle grounding plate has a base plate and two bending arms. Two middles of two opposite sides of the base plate protrude outward, then are bent upward, later extend frontward, next are curved outward and are further bent rearward to form the two bending arms, respectively. The base plate is mounted between the two base portions. The two bending arms are disposed in the two internal spaces. The two bending arms are connected to two outer portions of two opposite sides of the two connecting arms.

[0009] Another object of the present invention is to provide an electrical connector. The electrical connector includes an insulation body, a terminal assembly and a middle grounding plate. The insulation body has a base body and two internal spaces. A front end of the base body extends frontward to form a stepping portion. The stepping portion has a top wall, a bottom wall and two side walls. Two sides of a front end of the stepping portion extend frontward and then extend towards each other to form a docking portion. Two inner surfaces of the two side walls of the stepping portion extend inward to form two protruding blocks. The two protruding blocks keep a distance from the top wall of the stepping portion. The two protruding blocks keep a distance from the bottom wall of the stepping portion. The docking portion has a docking end and two connecting arms. Two front surfaces of the two protruding blocks extend frontward to form the two connecting arms. The docking end is connected to two front ends of the two connecting arms. The two connecting arms keep distances from the two side walls of the stepping portion. The two connecting arms extend out of the front end of the stepping portion. The two connecting arms are connected between two opposite sides of the stepping portion and two opposite sides of the docking end of the docking portion. One end of each connecting arm is connected with a front surface of one protruding block. The other end of each connecting arm is connected with a rear surface of one side of the docking end of the docking portion. Each connecting arm has a main portion. One end of the main portion is connected with the one protruding block of the stepping portion, and the other end of the main portion is connected with the docking end of the docking portion. An outer surface of the main portion extends outward to form a protruding portion. Each internal space is formed among an outer surface of one connecting arm, an outer surface of the one protruding block and an inner surface of one side wall of the stepping portion which are adjacent. The terminal assembly is fastened in the insulation body. The terminal assembly has a plurality of terminals and two base portions. The plurality of the terminals are fastened in the two base portions. Each base portion has a main body, a connecting portion and a tongue portion. The main body is disposed in the base body. A front end of the main body extends frontward to form the connecting portion. The connecting portion is disposed in the stepping portion. A front end of the connecting portion extends frontward to form the tongue portion. The tongue portion is disposed between the stepping portion and the docking end of the docking portion. Two opposite sides of an inner surface of the tongue portion protrude inward to form two restricting portions. The two connecting arms are disposed to outer surfaces of the restricting portions of the two base portions of the terminal assembly. Outer side surfaces of two rear ends of the two tongue portions of the two base portions are flush with two outer surfaces of two rear ends of the two protruding portions of the two connecting arms of the insulation body. Two opposite sides of two front ends of the two tongue portions of the two base portions of the terminal assembly are recessed inward to form two inserting spaces. The two connecting arms are disposed in the two inserting spaces. The middle grounding plate is mounted in a middle of the terminal assembly. The middle grounding plate is disposed among the restricting portions of the two tongue portions of the two base portions of the terminal assembly. The middle grounding plate has a base plate and two bending arms. Two middles of two opposite sides of the base plate protrude outward, then are bent upward, later extend frontward, next are curved outward and are further bent rearward to form the two bending arms, respectively. A front of each bending arm is curved outward and then is bent rearward to form a

hook portion. The base plate is mounted between the two base portions. The two bending arms are disposed in the two internal spaces. The two bending arms are connected to two outer portions of two opposite sides of the two connecting arms. Two front ends of the two hook portions of the two bending arms are surrounded by the two opposite sides of the docking end of the docking portion of the insulation body.

[0010] As described above, the two connecting arms are disposed between the two opposite sides of the stepping portion and the two opposite sides of docking portion to reinforce a structure strength of the insulation body by an innovative structure of the electrical connector. The two inserting spaces are formed among the bottom surface of the tongue portion of an upper terminal assembly, the top surface of the tongue portion of a lower terminal assembly and the outer surfaces of the restricting portions of the terminal assembly. The two connecting arms are disposed in the two inserting spaces. Two bending portions and two rear ends of two extending arms of the two bending arms are surrounded by the stepping portion of the insulation body. The two hook portions are partially surrounded by the two opposite sides of the docking portion of the insulation body to reinforce a structure strength of the electrical connector. As a result, the electrical connector has the better structure strength.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will be apparent to those skilled in the art by reading the following description, with reference to the attached drawings, in which:

[0012] FIG. 1 is a perspective view of an electrical connector in accordance with the present invention;

[0013] FIG. 2 is a partially exploded view showing a glue body, an insulating housing, a metal shell assembly, and an insulation body together with a terminal assembly, a middle grounding plate and two shielding plates of the electrical connector of FIG. 1;

[0014] FIG. 3 is another partially exploded view showing the insulation body, the two shielding plates, and the terminal assembly together with the middle grounding plate of the electrical connector of FIG. 2;

[0015] FIG. 4 is a perspective view of the insulation body of the electrical connector of FIG. 2;

[0016] FIG. 5 is an exploded view of an upper terminal assembly of the terminal assembly of the electrical connector of FIG. 2;

[0017] FIG. 6 is another exploded view of the upper terminal assembly of the terminal assembly of the electrical connector of FIG. 5;

[0018] FIG. 7 is a perspective view of a middle grounding plate of the electrical connector of FIG. 2;

[0019] FIG. 8 is a diagrammatic drawing of the electrical connector of FIG. 1; and

[0020] FIG. 9 is a sectional view of the electrical connector along a line IX-IX of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

[0021] With reference to FIG. 1 to FIG. 3, an electrical connector **100** in accordance with the present invention is shown. The electrical connector **100** includes an insulation body **1**, a terminal assembly **2**, a middle grounding plate **3**, two shielding plates **4**, a glue body **5**, an insulating housing **6** and a metal shell assembly **7**. In the present invention, the electrical connector **100** is a USB (Universal Serial Bus) Type-C connector. In a concrete implementation, the electrical connector **100** is able to be another type connector which is different from the USB Type-C connector.

[0022] The terminal assembly **2** is fastened in the insulation body **1**. The middle grounding plate **3** is mounted in a middle of the terminal assembly **2**, and the terminal assembly **2** and the middle

grounding plate 3 are fastened in the insulation body 1. The insulation body 1 surrounds the middle grounding plate 3 and the terminal assembly 2. The two shielding plates 4 are disposed to an upper surface and a lower surface of the insulation body 1. The insulation body 1, the terminal assembly 2, the middle grounding plate 3, the two shielding plates 4 and the glue body 5 are fastened in the insulating housing 6. The metal shell assembly 7 is fastened to a top surface and a bottom surface of the insulating housing 6. The metal shell assembly 7 is used for being connected to ground and shielding an interference.

[0023] The glue body 5 surrounds a rear end of the insulation body 1. The glue body 5 surrounds a part of the terminal assembly 2 and a part of the middle grounding plate 3. The glue body 5 covers to a rear end of the insulating housing 6. The glue body 5 seals up an interval which is formed among the insulation body 1, the terminal assembly 2, the middle grounding plate 3 and the insulating housing 6, so that water is prevented from flowing into a rear end of the electrical connector 100, and the electrical connector 100 is prevented from being damaged due to a water infiltration of the electrical connector 100.

[0024] Referring to FIG. 3 and FIG. 4, the insulation body 1 has a base body 11, a stepping portion 12, a docking portion 13, two protruding blocks 14 and two internal spaces 16. A middle of a front end of the base body 11 extends frontward to form the stepping portion 12. The stepping portion 12 is a hollow structure. Two middles of two sides of a front end of the stepping portion 12 extend frontward and then extend towards each other to form the docking portion 13. The docking portion 13 is a lying U shape. The mouth of the docking portion 13 faces towards a middle of the front end of the stepping portion 12. A front end of the docking portion 13 surrounds a front end of the terminal assembly 2. Two inner surfaces of the two opposite sides of the stepping portion 12 extend inward to form the two protruding blocks 14. The stepping portion 12 has a top wall 121, a bottom wall 122 and two side walls 123. Two inner surfaces of the two side walls 123 of the stepping portion 12 extend inward to form the two protruding blocks 14. The two protruding blocks 14 are separated from the top wall 121 and the bottom wall 122 of the stepping portion 12. The two protruding blocks 14 keep a distance from the top wall 121 of the stepping portion 12. The two protruding blocks 14 keep a distance from the bottom wall 122 of the stepping portion 12. The two protruding blocks 14 are fastened in corresponding mechanisms of the middle grounding plate 3 to realize that the insulation body 1 is located to the middle grounding plate 3, and the insulation body 1 is fixed to the middle grounding plate 3.

[0025] The docking portion 13 includes a docking end 101 and two connecting arms 15. Two front surfaces of the two protruding blocks 14 extend frontward to form the two connecting arms 15. The front end of the docking portion 13 is defined as the docking end 101. The two connecting arms 15 are defined as two sides of the docking portion 13. The two connecting arms 15 extend out of the front end of the stepping portion 12. The docking end 101 is connected to two front ends of the two connecting arms 15. The two connecting arms 15 are connected between the two protruding blocks 14 and two opposite sides of the docking end 101. The two connecting arms 15 are connected between the two opposite sides of the stepping portion 12 and the two opposite sides of the docking end 101 of the docking portion 13. The two connecting arms 15 are disposed between the two opposite sides of the stepping portion 12 and two opposite sides of the front end of the docking portion 13. One end of each connecting arm 15 is connected with a front surface of one protruding block 14 of the stepping portion 12. The other end of each connecting arm 15 is connected with a rear surface of one side of the front end of the docking portion 13. The other end of each connecting arm 15 is connected with a rear surface of one side of the docking end 101 of the docking portion 13. The two connecting arms 15 are separated from the two side walls 123 of the stepping portion 12. The two connecting arms 15 keep distances from the two side walls 123 of the stepping portion 12. Each internal space 16 is formed among an outer surface of one connecting arm 15, an outer surface of one protruding block 14 and the inner surface of one side wall 123 of the stepping portion 12 which are adjacent. Two corresponding sections of the middle grounding

plate **3** are disposed to two outer portions of two opposite sides of the docking portion **13** through the two internal spaces **16** of the insulation body **1**. The two corresponding sections of the middle grounding plate **3** are disposed to two outer portions of two opposite sides of the two connecting arm **15** through the two internal spaces **16** of the insulation body **1**.

[0026] The front end of the docking portion **13** has two enclosing portions **131**, two locating surfaces **132** and two arc portions **133**, so the docking end **101** has the two enclosing portions **131**, the two locating surfaces **132** and the two arc portions **133**. The two opposite sides of the docking end **101** have the two enclosing portions **131**, the two locating surfaces **132** and the two arc portions **133**. Two fronts of the two opposite sides of the docking end **101** protrude outward to form the two enclosing portions **131**. The two enclosing portions **131** surround two corresponding areas of the middle grounding plate **3** to realize that the insulation body **1** is located to the middle grounding plate **3**, and the insulation body **1** is fixed to the middle grounding plate **3**. Two middles of the two opposite sides of the docking end **101** are recessed inward to form the two locating surfaces **132** located to two rear ends of the two enclosing portions **131**. Two corresponding segments of the middle grounding plate **3** are disposed to the two locating surfaces **132** to realize that the insulation body **1** is located to the middle grounding plate **3**, and the insulation body **1** is fixed to the middle grounding plate **3**.

[0027] Two rears of the two opposite sides of the docking end **101** are concaved inward to form the two arc portions **133** located to two rear ends of the two locating surfaces **132**. The two arc portions **133** are disposed to two outer surfaces of the two front ends of the two connecting arms **15**. Two corresponding regions of the middle grounding plate **3** are disposed to the two arc portions **133** to realize that the insulation body **1** is located to the middle grounding plate **3**, and the insulation body **1** is fixed to the middle grounding plate **3**. The docking end **101** which is the front end of the docking portion **13** surrounds the front end of the terminal assembly **2** and a front end of the middle grounding plate **3** to reinforce a structure strength of the electrical connector **100**.

[0028] Each connecting arm **15** has a main portion **151**, a protruding portion **152** and a first lacking groove **153**. One end of the main portion **151** of each connecting arm **15** is connected with the one protruding block **14** of the stepping portion **12** of the insulation body **1**, and the other end of the main portion **151** of each connecting arm **15** is connected with the docking end **101** of the docking portion **13** to reinforce a structure strength of the insulation body **1**. An outer surface of the main portion **151** extends outward to form the protruding portion **152**. A front end of the protruding portion **152** is recessed inward to form the first lacking groove **153**. The first lacking groove **153** is formed between the front end of the protruding portion **152** and a front end of the main portion **151**. The first lacking groove **153** is disposed between a rear end of the protruding portion **152** and one arc portion **133** of the docking portion **13**. The two first lacking grooves **153** of the insulation body **1** are filled by two corresponding positions of the terminal assembly **2**, so that the terminal assembly **2** is located to the insulation body **1**, and the terminal assembly **2** is fixed to the insulation body **1**. Correspondingly, the structure strength of the electrical connector **100** is reinforced.

[0029] Referring to FIG. **3** to FIG. **9**, the terminal assembly **2** is disposed in the insulation body **1**. The terminal assembly **2** includes an upper terminal assembly **21** fastened in an upper portion of the insulation body **1**, and a lower terminal assembly **22** fastened in a lower portion of the insulation body **1**. The upper terminal assembly **21** is disposed on a top surface of the middle grounding plate **3**. The lower terminal assembly **22** is disposed under a bottom surface of the middle grounding plate **3**. The middle grounding plate **3** is disposed between the upper terminal assembly **21** and the lower terminal assembly **22**. The upper terminal assembly **21** includes a plurality of terminals **211** and a base portion **212**. The lower terminal assembly **22** includes the plurality of the terminals **211** and the base portion **212**. The plurality of the terminals **211** are fastened in the base portion **212**.

[0030] The terminal assembly **2** includes a base block **102**, and the plurality of the terminals **211** fastened in the base block **102**. The base block **102** includes two base portions **212** which are the

base portion **212** of the upper terminal assembly **21**, and the base portion **212** of the lower terminal assembly **22** mounted under the base portion **212** of the upper terminal assembly **21**. The terminals **211** of the terminal assembly **2** include the terminals of the upper terminal assembly **21** and the terminals **211** of the lower terminal assembly **22**. The terminal assembly **2** includes the plurality of the terminals **211** and the two base portions **212**. The plurality of the terminals **211** are fastened in the two base portions **212**. The middle grounding plate **3** is mounted in a middle of the base block **102**. Each base portion **212** has a main body **2121**, a connecting portion **2122** and a tongue portion **2123**. Two outer sides of two outermost terminals **211** of the upper terminal assembly **21** are disposed to two top surfaces of two main portions **151** of the two connecting arms **15** of the insulation body **1**. Two outer sides of two outermost terminals **211** of the lower terminal assembly **22** are disposed to two bottom surfaces of the two main portions **151** of the two connecting arms **15** of the insulation body **1**.

[0031] Each terminal **211** has a fastening portion **213**, a contacting portion **214**, a bending piece **215**, an extending portion **216** and a soldering portion **217**. A front end of the fastening portion **213** extends frontward to form the contacting portion **214**. A rear end of the fastening portion **213** is bent downward to form the bending piece **215**. A bottom end of the bending piece **215** extends downward to form the extending portion **216**. A bottom end of the extending portion **216** is bent rearward to form the soldering portion **217**.

[0032] The base portion **212** has the main body **2121**, the connecting portion **2122** and the tongue portion **2123**. The main body **2121** is disposed in the base body **11** of the insulation body **1**. A middle of a front end of the main body **2121** extends frontward to form the connecting portion **2122**. The connecting portion **2122** is disposed in the stepping portion **12** of the insulation body **1**. A front end of the connecting portion **2122** extends frontward to form the tongue portion **2123**. The tongue portion **2123** is disposed between the stepping portion **12** and the docking end **101** of the docking portion **13** of the insulation body **1**. Outer side surfaces of two rear ends of the two tongue portions **2123** of the two base portions **212** of the terminal assembly **2** are flush with two outer surfaces of two rear ends of the two protruding portions **152** of the two connecting arms **15** of the insulation body **1**.

[0033] The two first lacking grooves **153** of the two connecting arms **15** of the insulation body **1** are filled by the tongue portion **2123**, so that the terminal assembly **2** is located to the insulation body **1**, and the terminal assembly **2** is fixed to the insulation body **1**. The docking end **101** of the docking portion **13** of the insulation body **1** surrounds a front end of the tongue portion **2123** of the base portion **212**. The fastening portions **213** of the plurality of the terminals **211** are fastened in the main body **2121** and the connecting portion **2122** of the base portion **212**, and the fastening portions **213** of the plurality of the terminals **211** are surrounded by the main body **2121** and the connecting portion **2122** of the base portion **212**. The contacting portions **214** of the plurality of the terminals **211** are fastened in the tongue portion **2123** of the base portion **212**, and the contacting portions **214** of the plurality of the terminals **211** are partially surrounded by the tongue portion **2123** of the base portion **212**. The soldering portions **217** of the plurality of the terminals **211** project beyond a rear surface and a bottom surface of the main body **2121** of the base portion **212**.

[0034] Two opposite sides of a bottom surface of the tongue portion **2123** of the upper terminal assembly **21** extend downward to form two restricting portions **2124**. Two opposite sides of a top surface of the tongue portion **2123** of the lower terminal assembly **22** extend upward to form the two restricting portions **2124**. The two opposite sides of the top surface of one tongue portion **2123** and the two opposite sides of the bottom surface of the other tongue portion **2123** of the terminal assembly **2** extend inward to form a plurality of the restricting portions **2124**. Two opposite sides of an inner surface of the tongue portion **2123** of each base portion **212** protrude inward to form two restricting portions **2124**. An outer side of each restricting portion **2124** keeps a distance from an outer side of the tongue portion **2123**. An upper portion of the middle grounding plate **3** is disposed between the two restricting portions **2124** of the tongue portion **2123** of the upper terminal

assembly **21**. A lower portion of the middle grounding plate **3** is disposed between the two restricting portions **2124** of the tongue portion **2123** of the lower terminal assembly **22**. The middle grounding plate **3** is disposed among the restricting portions **2124** of the two tongue portions **2123** of the two base portions **212** of the terminal assembly **2**. The two connecting arms **15** of the insulation body **1** are disposed to outer surfaces of the plurality of the restricting portions **2124** of the two base portions **212** of the terminal assembly **2**. The two connecting arms **15** of the insulation body **1** are connected to the outer surfaces of the plurality of the restricting portions **2124** of the terminal assembly **2**.

[0035] When the electrical connector **100** is assembled, the upper terminal assembly **21**, the lower terminal assembly **22** and the middle grounding plate **3** are assembled together. The two restricting portions **2124** of the upper terminal assembly **21** are mounted on the two restricting portions **2124** of the lower terminal assembly **22**. Two inserting spaces **2126** are formed among the outer surfaces of the restricting portions **2124** of the terminal assembly **2**, a bottom surface of the base portion **212** of the upper terminal assembly **21** and a top surface of the base portion **212** of the lower terminal assembly **22**. Two inserting spaces **2126** are formed among the outer surfaces of the restricting portions **2124** of the terminal assembly **2**, the bottom surface of the tongue portion **2123** of the upper terminal assembly **21** and the top surface of the tongue portion **2123** of the lower terminal assembly **22**. The two connecting arms **15** of the insulation body **1** are inserted into the two inserting spaces **2126**. Two opposite sides of two front ends of the two tongue portions **2123** of the two base portions **212** of the terminal assembly **2** are recessed inward to form the two inserting spaces **2126**. Two opposite sides of a front end of the base block **102** are recessed inward to form the two inserting spaces **2126**.

[0036] Two middles of two inner surfaces of the two restricting portions **2124** of each tongue portion **2123** protrude inward to form two fastening blocks **2125**. The two fastening blocks **2125** are fastened in corresponding locations of the middle grounding plate **3** to realize that the terminal assembly **2** is located to the middle grounding plate **3**, and the terminal assembly **2** is fixed to the middle grounding plate **3**.

[0037] Two rear ends of two opposite sides of each tongue portion **2123** are recessed inward to form two second lacking grooves **2127**. The second lacking grooves **2127** of the terminal assembly **2** are disposed behind the restricting portions **2124** of the terminal assembly **2**. The two protruding blocks **14** of the stepping portion **12** of the insulation body **1** are limited in the second lacking grooves **2127** of the terminal assembly **2**. A lot of configurations of the lower terminal assembly **22** and the upper terminal assembly **21** are roughly the same, and the lower terminal assembly **22** and the upper terminal assembly **21** are without being described in detail.

[0038] Referring to FIG. 1 to FIG. 7, the middle grounding plate **3** has a base plate **31**, two bending arms **32**, two first location portions **33** and two second location portions **34**. The base plate **31** is mounted in the middle of the base block **102**. The base plate **31** is mounted between the two base portions **212**. Two middles of two opposite sides of the base plate **31** protrude outward, then are bent upward, later extend frontward, next are curved outward and are further bent rearward to form the two bending arms **32**, respectively. Rear ends of the two bending arms **32** are surrounded by the stepping portion **12** of the insulation body **1**. The two bending arms **32** are disposed in the two internal spaces **16**. The two bending arms **32** are disposed to the two opposite sides of the docking portion **13** of the insulation body **1** through the two internal spaces **16** of the insulation body **1**. The two bending arms **32** are disposed to the two outer portions of the two opposite sides of the two connecting arms **15** through the two internal spaces **16** of the insulation body **1**. The two bending arms **32** are connected to the two outer portions of the two opposite sides of the two connecting arms **15** through the two internal spaces **16** of the insulation body **1**.

[0039] A front and a middle of each bending arm **32** are spaced from a front of one side of the base plate **31** to form a clamping groove **301** between the front and the middle of the bending arm **32** and the one side of the base plate **31**. A junction between each bending arm **32** and the base plate

31 is recessed inward to form the first location portion **33**. The two protruding blocks **14** of the stepping portion **12** of the insulation body **1** are clamped in the two clamping grooves **301** of the middle grounding plate **3**. The two protruding blocks **14** are blocked by the two first location portions **33** of the two bending arms **32** and the base plate **31** to realize that the insulation body **1** is located to the middle grounding plate **3**, and the insulation body **1** is fixed to the middle grounding plate **3**. The two fronts of the two opposite sides of the base plate **31** are recessed inward to form the two second location portions **34**. The two second location portions **34** are disposed in front of the two first location portions **33**. The fastening blocks **2125** of the two base portions **212** of the terminal assembly **2** are fastened in the two second location portions **34** to realize that the terminal assembly **2** is located to the middle grounding plate **3**, and the terminal assembly **2** is fixed to the middle grounding plate **3**.

[0040] Two inner surfaces of the two bending arms **32** are connected with the outer surfaces of the two connecting arms **15** and the two protruding blocks **14** of the insulation body **1**. Each bending arm **32** has a bending portion **321**, an extending arm **322** and a hook portion **323**. The front of each bending arm **32** is curved outward and then is bent rearward to form the hook portion **323**. The bending portion **321** is protruded outward and is perpendicularly bent upward from the middle of the one side of the base plate **31**. A front end of the bending portion **321** slantwise extends frontward and downward, and then extends frontward to form the extending arm **322**. A front end of the extending arm **322** is arched outward, then is bent inward and is further bent rearward to form the hook portion **323**.

[0041] The two bending portions **321** and two rear ends of the two extending arms **322** of the two bending arms **32** are surrounded by the stepping portion **12** of the insulation body **1**. The two bending portions **321** and the two rear ends of the two extending arms **322** of the two bending arms **32** are disposed in the two internal spaces **16** of the insulation body **1**. The bending portion **321** and the rear end of the extending arm **322** of each bending arm **32** are disposed among the outer surface of the one connecting arm **15** and the outer surface of the one protruding block **14**, and the inner surface of the one side wall **123** of the stepping portion **12** which are adjacent. The front ends and two middles of the two extending arms **322** are disposed to two outer surfaces of the two connecting arms **15** of the insulation body **1**. The front ends and two middles of the two extending arms **322** are disposed to two outer surfaces of the two protruding portions **152** of the two connecting arms **15** of the insulation body **1** and outer surfaces of the two tongue portions **2123** of the two base portions **212** of the terminal assembly **2**. The two hook portions **323** of the two bending arms **32** are partially surrounded by the two opposite sides of the docking end **101** of the docking portion **13** of the insulation body **1** to reinforce the structure strength of the electrical connector **100**. Two front ends of the two hook portions **323** of the two bending arms **32** are surrounded by the two opposite sides of the docking end **101** of the docking portion **13** of the insulation body **1**.

[0042] Each hook portion **323** has a first bending section **324**, a second bending section **325** and a third bending section **326**. The first bending section **324** is arched outward from the front end of the extending arm **322**. The first bending sections **324** of the two hook portions **323** of the two bending arms **32** are partially mounted to the two arc portions **133** of the docking portion **13** of the insulation body **1** to realize that the middle grounding plate **3** is located to the insulation body **1**, and the middle grounding plate **3** is fixed to the insulation body **1**. The second bending section **325** is bent inward and towards the base plate **31** of the middle grounding plate **3** from a front end of the first bending section **324**. The third bending section **326** is bent rearward from a free end of the second bending section **325**. The third bending section **326** is bent rearward from an inner end of the second bending section **325**. The first bending section **324**, the second bending section **325** and the third bending section **326** reinforce the structure strength of the middle grounding plate **3** so as to reinforce the structure strength of the electrical connector **100**.

[0043] The first bending sections **324** of the two hook portions **323** of the two bending arms **32** are

disposed at the two locating surfaces **132** and the two arc portions **133** of the docking portion **13** of the insulation body **1** to realize that the middle grounding plate **3** is located to the insulation body **1**, and the middle grounding plate **3** is fixed to the insulation body **1**. The second bending sections **325** and the third bending sections **326** of the two bending arms **32** are surrounded by the two enclosing portions **131** of the docking portion **13** of the insulation body **1** to realize that the middle grounding plate **3** is located to the insulation body **1**, and the middle grounding plate **3** is fixed to the insulation body **1**.

[0044] The two bending portions **321** of the two bending arms **32** are received in the insulation body **1**. The two extending arms **322** of the two bending arms **32** are partially received in the insulation body **1**. The two front ends of the two extending arms **322** and the two first bending sections **324** of the two bending arms **32** are exposed to two sides of the insulation body **1**. The two second bending sections **325** and the two third bending sections **326** of the two bending arms **32** are fastened in the docking portion **13** of the insulation body **1** to reinforce the structure strength of the electrical connector **100**, correspondingly, the middle grounding plate **3** is located to the insulation body **1**, and the middle grounding plate **3** is fixed to the insulation body **1**.

[0045] The first bending section **324**, the second bending section **325** and the third bending section **326** together form the hook portion **323** for reinforcing the structure strength of the middle grounding plate **3** of the electrical connector **100** so as to enhance the structure strength of the electrical connector **100**. The bending portion **321**, the extending arm **322** and the hook portion **323** form the bending arm **32**. Each bending arm **32** is protruded outward and is perpendicularly extended upward.

[0046] The two connecting arms **15** are disposed between the two opposite sides of the stepping portion **12** and the two opposite sides of the docking end **101** of the docking portion **13** to reinforce the structure strength of the insulation body **1**. The outer surfaces of the two tongue portions **2123** of the two base portions **212** of the terminal assembly **2** are flush with the two outer surfaces of the two protruding portions **152** of the two connecting arms **15** of the insulation body **1**. The two bending arms **32** are disposed to two outsides of the two protruding portions **152** of the two connecting arms **15** of the insulation body **1**. The two protruding portions **152** of the two connecting arms **15** of the insulation body **1** are disposed among the two bending arms **32** of the middle grounding plate **3**, the two tongue portions **2123** and the two restricting portions **2124** of the terminal assembly **2**.

[0047] With reference to FIG. 1 to FIG. 9, when the electrical connector **100** is assembled, at first, one base portion **212** is molded with the plurality of the terminals **211** by an injection molding process to form the upper terminal assembly **21**, and the other base portion **212** is molded with the plurality of the terminals **211** by the injection molding process to form the lower terminal assembly **22**. The upper terminal assembly **21**, the lower terminal assembly **22** and the middle grounding plate **3** are manufactured in advance. Then the upper terminal assembly **21**, the lower terminal assembly **22** and the middle grounding plate **3** are assembled together, so that the middle grounding plate **3** is positioned between the upper terminal assembly **21** and the lower terminal assembly **22**. Then the two inserting spaces **2126** are formed among the bottom surface of the tongue portion **2123** of the upper terminal assembly **21**, the top surface of the tongue portion **2123** of the lower terminal assembly **22** and the outer surfaces of the restricting portions **2124** of the terminal assembly **2**. Finally, the insulation body **1** is molded outside the upper terminal assembly **21**, the lower terminal assembly **22** and the middle grounding plate **3** by the injection molding process. The two connecting arms **15** of the insulation body **1** are disposed in the two inserting spaces **2126** of the terminal assembly **2**.

[0048] The base body **11** and the stepping portion **12** of the insulation body **1** are formed at a rear end of the terminal assembly **2** and a rear end of the middle grounding plate **3**. The docking portion **13** of the insulation body **1** is formed at the front end of the terminal assembly **2** and the front end of the middle grounding plate **3**. The stepping portion **12** of the insulation body **1** is integrally

molded with the docking end **101** of the docking portion **13** of the insulation body **1** by the two connecting arms **15** of the insulation body **1**, so that molding times of the injection molding process are reduced.

[0049] As described above, the two connecting arms **15** are disposed between the two opposite sides of the stepping portion **12** and the two opposite sides of docking portion **13** to reinforce the structure strength of the insulation body **1** by an innovative structure of the electrical connector **100**. The two inserting spaces **2126** are formed among the bottom surface of the tongue portion **2123** of the upper terminal assembly **21**, the top surface of the tongue portion **2123** of the lower terminal assembly **22** and the outer surfaces of the restricting portions **2124** of the terminal assembly **2**. The two connecting arms **15** are disposed in the two inserting spaces **2126**. The two bending portions **321** and the two rear ends of the two extending arms **322** of the two bending arms **32** are surrounded by the stepping portion **12** of the insulation body **1**. The two hook portions **323** are partially surrounded by the two opposite sides of the docking portion **13** of the insulation body **1** to reinforce the structure strength of the electrical connector **100**. As a result, the electrical connector **100** has the better structure strength.

Claims

1. An electrical connector, comprising: an insulation body having a base body and two internal spaces, a front end of the base body extending frontward to form a stepping portion, the stepping portion being a hollow structure, two sides of a front end of the stepping portion extending frontward and then extending towards each other to form a docking portion, the docking portion having a docking end and two connecting arms, two inner surfaces of two opposite sides of the stepping portion extending inward to form two protruding blocks, two front surfaces of the two protruding blocks extending frontward to form the two connecting arms, the two connecting arms extending out of the front end of the stepping portion, the docking end being connected to two front ends of the two connecting arms, the two connecting arms being connected between the two protruding blocks and two opposite sides of the docking end, the two connecting arms being separated from two side walls of the stepping portion, each internal space being formed among an outer surface of one connecting arm, an outer surface of one protruding block and an inner surface of one side wall of the stepping portion which are adjacent; a terminal assembly fastened in the insulation body, the terminal assembly having a base block, and a plurality of terminals fastened in the base block, two opposite sides of a front end of the base block being recessed inward to form two inserting spaces, the two connecting arms being disposed in the two inserting spaces; and a middle grounding plate mounted in a middle of the terminal assembly, the middle grounding plate having a base plate and two bending arms, two middles of two opposite sides of the base plate protruding outward, then being bent upward, later extending frontward, next being curved outward and being further bent rearward to form the two bending arms, respectively, the base plate being mounted in the base block, the two bending arms being disposed to two opposite sides of the docking portion through the two internal spaces, the two bending arms being connected to two outer portions of two opposite sides of the two connecting arms.

2. The electrical connector as claimed in claim 1, wherein each bending arm has a bending portion, an extending arm and a hook portion, the bending portion is protruded outward and is perpendicularly bent upward from a middle of one side of the base plate, a front end of the bending portion slantwise extends frontward and downward, and then extends frontward to form the extending arm, a front end of the extending arm is arched outward, then is bent inward and is further bent rearward to form the hook portion, the two bending portions and two rear ends of the two extending arms of the two bending arms are surrounded by the stepping portion of the insulation body, the front ends and two middles of the two extending arms are disposed to two outer surfaces of the two connecting arms of the insulation body, the two hook portions of the two

bending arms are partially surrounded by the two opposite sides of the docking end of the docking portion of the insulation body, the two bending portions and the two rear ends of the two extending arms of the two bending arms are disposed in the two internal spaces of the insulation body.

3. The electrical connector as claimed in claim 2, wherein each connecting arm has a main portion, one end of the main portion is connected with the one protruding block of the stepping portion, and the other end of the main portion is connected with the docking end of the docking portion, an outer surface of the main portion extends outward to form a protruding portion, the front ends and the two middles of the two extending arms are disposed to two outer surfaces of the two protruding portions of the two connecting arms of the insulation body.

4. The electrical connector as claimed in claim 3, wherein two opposite sides of the docking end have two enclosing portions, two locating surfaces and two arc portions, two fronts of the two opposite sides of the docking end protrude outward to form the two enclosing portions, two middles of the two opposite sides of the docking end are recessed inward to form the two locating surfaces located to two rear ends of the two enclosing portions, two rears of the two opposite sides of the docking end are concaved inward to form the two arc portions located to two rear ends of the two locating surfaces, the two arc portions are disposed to two outer surfaces of the two front ends of the two connecting arms, a front end of the protruding portion is recessed inward to form a first lacking groove, the first lacking groove is formed between the front end of the protruding portion and the main portion, the first lacking groove is disposed between a rear end of the protruding portion and one arc portion.

5. The electrical connector as claimed in claim 4, wherein the terminal assembly includes an upper terminal assembly fastened in an upper portion of the insulation body, and a lower terminal assembly fastened in a lower portion of the insulation body, the middle grounding plate is disposed between the upper terminal assembly and the lower terminal assembly, the upper terminal assembly includes the plurality of the terminals and a base portion, the lower terminal assembly includes the plurality of the terminals and the base portion, the base block includes the base portion of the upper terminal assembly, and the base portion of the lower terminal assembly mounted under the base portion of the upper terminal assembly, the terminals of the terminal assembly include the terminals of the upper terminal assembly and the terminals of the lower terminal assembly, two outer sides of two outermost terminals of the upper terminal assembly are disposed to two top surfaces of two main portions of the two connecting arms of the insulation body, two outer sides of two outermost terminals of the lower terminal assembly are disposed to two bottom surfaces of the two main portions of the two connecting arms of the insulation body.

6. The electrical connector as claimed in claim 5, wherein the base portion has a main body, a connecting portion and a tongue portion, the main body is disposed in the base body of the insulation body, a front end of the main body extends frontward to form the connecting portion, the connecting portion is disposed in the stepping portion of the insulation body, a front end of the connecting portion extends frontward to form the tongue portion, the tongue portion is disposed between the stepping portion and the docking end of the docking portion of the insulation body, outer side surfaces of two rear ends of the two tongue portions of the two base portions of the terminal assembly are flush with two outer surfaces of two rear ends of the two protruding portions of the two connecting arms of the insulation body, the two first lacking grooves of the insulation body are filled by the tongue portion, the docking end of the docking portion surrounds a front end of the tongue portion.

7. The electrical connector as claimed in claim 6, wherein two opposite sides of a bottom surface of the tongue portion of the upper terminal assembly extend downward to form two restricting portions, two opposite sides of a top surface of the tongue portion of the lower terminal assembly extend upward to form the two restricting portions, two inserting spaces are formed among outer surfaces of the restricting portions of the terminal assembly, the bottom surface of the tongue portion of the upper terminal assembly and the top surface of the tongue portion of the lower

terminal assembly, the two connecting arms are inserted into the two inserting spaces.

8. The electrical connector as claimed in claim 7, wherein a front and a middle of each bending arm are spaced from a front of the one side of the base plate to form a clamping groove between the front and the middle of the bending arm and the one side of the base plate, two middles of two inner surfaces of the two restricting portions of each tongue portion protrude inward to form two fastening blocks, a junction between each bending arm and the base plate is recessed inward to form a first location portion, the two protruding blocks are clamped in the two clamping grooves of the middle grounding plate, the two protruding blocks are blocked by the two first location portions of the two bending arms and the base plate, two fronts of two opposite sides of the base plate are recessed inward to form two second location portions, the two second location portions are disposed in front of the two first location portions, the fastening blocks of the two base portions of the terminal assembly are fastened in the two second location portions.

9. The electrical connector as claimed in claim 7, wherein two rear ends of two opposite sides of each tongue portion are recessed inward to form two second lacking grooves, the second lacking grooves of the terminal assembly are disposed behind the restricting portions of the terminal assembly, the two protruding blocks of the insulation body are limited in the second lacking grooves of the terminal assembly.

10. The electrical connector as claimed in claim 4, wherein each hook portion has a first bending section, a second bending section and a third bending section, the first bending section is arched outward from the front end of the extending arm, the first bending sections of the two hook portions of the two bending arms are partially mounted to the two arc portions of the docking portion of the insulation body, the second bending section is bent inward and towards the base plate of the middle grounding plate from a front end of the first bending section, the third bending section is bent rearward from a free end of the second bending section, the second bending sections and the third bending sections of the two bending arms are surrounded by the two enclosing portions of the docking portion of the insulation body.

11. The electrical connector as claimed in claim 2, wherein the stepping portion has a top wall, a bottom wall and the two side walls, two inner surfaces of the two side walls of the stepping portion extend inward to form the two protruding blocks, the two protruding blocks keep a distance from the top wall of the stepping portion, the two protruding blocks keep a distance from the bottom wall of the stepping portion, the two connecting arms keep distances from the two side walls of the stepping portion.

12. The electrical connector as claimed in claim 1, wherein the docking portion is a lying U shape, the mouth of the docking portion faces towards a middle of the front end of the stepping portion.

13. An electrical connector, comprising: an insulation body having a base body and two internal spaces, a front end of the base body extending frontward to form a stepping portion, the stepping portion having a top wall, a bottom wall and two side walls, two sides of a front end of the stepping portion extending frontward and then extending towards each other to form a docking portion, two inner surfaces of the two side walls of the stepping portion extending inward to form two protruding blocks, the two protruding blocks keeping a distance from the top wall of the stepping portion, the two protruding blocks keeping a distance from the bottom wall of the stepping portion, the docking portion having a docking end and two connecting arms, two front surfaces of the two protruding blocks extending frontward to form the two connecting arms, the docking end being connected to two front ends of the two connecting arms, the two connecting arms keeping distances from the two side walls of the stepping portion, the two connecting arms extending out of the front end of the stepping portion, the two connecting arms being connected between two opposite sides of the stepping portion and two opposite sides of the docking end of the docking portion, one end of each connecting arm being connected with a front surface of one protruding block, the other end of each connecting arm being connected with a rear surface of one side of the docking end of the docking portion, each internal space being formed among an outer surface of one connecting arm,

an outer surface of the one protruding block and an inner surface of one side wall of the stepping portion which are adjacent; a terminal assembly fastened in the insulation body, the terminal assembly having a plurality of terminals and two base portions, the plurality of the terminals being fastened in the two base portions, each base portion having a main body, a connecting portion and a tongue portion, the main body being disposed in the base body, a front end of the main body extending frontward to form the connecting portion, the connecting portion being disposed in the stepping portion, a front end of the connecting portion extending frontward to form the tongue portion, the tongue portion being disposed between the stepping portion and the docking end of the docking portion, two opposite sides of an inner surface of the tongue portion protruding inward to form two restricting portions, the two connecting arms being disposed to outer surfaces of the restricting portions of the two base portions of the terminal assembly, two opposite sides of two front ends of the two tongue portions of the two base portions of the terminal assembly being recessed inward to form two inserting spaces, the two connecting arms being disposed in the two inserting spaces; and a middle grounding plate mounted in a middle of the terminal assembly, the middle grounding plate being disposed among the restricting portions of the two tongue portions of the two base portions of the terminal assembly, the middle grounding plate having a base plate and two bending arms, two middles of two opposite sides of the base plate protruding outward, then being bent upward, later extending frontward, next being curved outward and being further bent rearward to form the two bending arms, respectively, the base plate being mounted between the two base portions, the two bending arms being disposed in the two internal spaces, the two bending arms being connected to two outer portions of two opposite sides of the two connecting arms.

14. The electrical connector as claimed in claim 13, wherein a front and a middle of each bending arm are spaced from a front of one side of the base plate to form a clamping groove between the front and the middle of the bending arm and the one side of the base plate, two middles of two inner surfaces of the two restricting portions of each tongue portion protrude inward to form two fastening blocks, a junction between each bending arm and the base plate is recessed inward to form a first location portion, the two protruding blocks are clamped in the two clamping grooves of the middle grounding plate, the two protruding blocks are blocked by the two first location portions of the two bending arms and the base plate, two fronts of two opposite sides of the base plate are recessed inward to form two second location portions, the two second location portions are disposed in front of the two first location portions, the fastening blocks of the two base portions of the terminal assembly are fastened in the two second location portions.

15. The electrical connector as claimed in claim 13, wherein each connecting arm has a main portion, one end of the main portion is connected with the one protruding block of the stepping portion, and the other end of the main portion is connected with the docking end of the docking portion, an outer surface of the main portion extends outward to form a protruding portion, a front end of the protruding portion is recessed inward to form a first lacking groove, the first lacking groove is formed between the front end of the protruding portion and the main portion.

16. The electrical connector as claimed in claim 15, wherein two opposite sides of the docking end have two enclosing portions, two locating surfaces and two arc portions, two fronts of the two opposite sides of the docking end protrude outward to form the two enclosing portions, two middles of the two opposite sides of the docking end are recessed inward to form the two locating surfaces located to two rear ends of the two enclosing portions, two rears of the two opposite sides of the docking end are concaved inward to form the two arc portions located to two rear ends of the two locating surfaces, the two arc portions are disposed to two outer surfaces of the two front ends of the two connecting arms, the first lacking groove is disposed between a rear end of the protruding portion and one arc portion.

17. The electrical connector as claimed in claim 16, wherein each bending arm has a bending portion, an extending arm and a hook portion, the bending portion is protruded outward and is perpendicularly bent upward from a middle of one side of the base plate, a front end of the bending

portion slantwise extends frontward and downward, and then extends frontward to form the extending arm, a front end of the extending arm is arched outward, then is bent inward and is further bent rearward to form the hook portion, the two bending portions and two rear ends of the two extending arms of the two bending arms are surrounded by the stepping portion of the insulation body, the front ends and two middles of the two extending arms are disposed to two outer surfaces of the two connecting arms of the insulation body, the two hook portions of the two bending arms are partially surrounded by two opposite sides of the docking end of the docking portion of the insulation body, the two bending portions and the two rear ends of the two extending arms of the two bending arms are disposed in the two internal spaces of the insulation body.

18. The electrical connector as claimed in claim 17, wherein each hook portion has a first bending section, a second bending section and a third bending section, the first bending section is arched outward from the front end of the extending arm, the first bending sections of the two hook portions of the two bending arms are partially mounted to the two arc portions of the docking portion of the insulation body, the second bending section is bent inward and towards the base plate of the middle grounding plate from a front end of the first bending section, the third bending section is bent rearward from a free end of the second bending section, the second bending sections and the third bending sections of the two bending arms are surrounded by the two enclosing portions of the docking portion of the insulation body.

19. An electrical connector, comprising: an insulation body having a base body and two internal spaces, a front end of the base body extending frontward to form a stepping portion, the stepping portion having a top wall, a bottom wall and two side walls, two sides of a front end of the stepping portion extending frontward and then extending towards each other to form a docking portion, two inner surfaces of the two side walls of the stepping portion extending inward to form two protruding blocks, the two protruding blocks keeping a distance from the top wall of the stepping portion, the two protruding blocks keeping a distance from the bottom wall of the stepping portion, the docking portion having a docking end and two connecting arms, two front surfaces of the two protruding blocks extending frontward to form the two connecting arms, the docking end being connected to two front ends of the two connecting arms, the two connecting arms keeping distances from the two side walls of the stepping portion, the two connecting arms extending out of the front end of the stepping portion, the two connecting arms being connected between two opposite sides of the stepping portion and two opposite sides of the docking end of the docking portion, one end of each connecting arm being connected with a front surface of one protruding block, the other end of each connecting arm being connected with a rear surface of one side of the docking end of the docking portion, each connecting arm having a main portion, one end of the main portion being connected with the one protruding block of the stepping portion, and the other end of the main portion being connected with the docking end of the docking portion, an outer surface of the main portion extending outward to form a protruding portion, each internal space being formed among an outer surface of one connecting arm, an outer surface of the one protruding block and an inner surface of one side wall of the stepping portion which are adjacent; a terminal assembly fastened in the insulation body, the terminal assembly having a plurality of terminals and two base portions, the plurality of the terminals being fastened in the two base portions, each base portion having a main body, a connecting portion and a tongue portion, the main body being disposed in the base body, a front end of the main body extending frontward to form the connecting portion, the connecting portion being disposed in the stepping portion, a front end of the connecting portion extending frontward to form the tongue portion, the tongue portion being disposed between the stepping portion and the docking end of the docking portion, two opposite sides of an inner surface of the tongue portion protruding inward to form two restricting portions, the two connecting arms being disposed to outer surfaces of the restricting portions of the two base portions of the terminal assembly, outer side surfaces of two rear ends of the two tongue portions of the two base portions being flush with two outer surfaces of two rear ends of the two protruding portions of the two

connecting arms of the insulation body, two opposite sides of two front ends of the two tongue portions of the two base portions of the terminal assembly being recessed inward to form two inserting spaces, the two connecting arms being disposed in the two inserting spaces; and a middle grounding plate mounted in a middle of the terminal assembly, the middle grounding plate being disposed among the restricting portions of the two tongue portions of the two base portions of the terminal assembly, the middle grounding plate having a base plate and two bending arms, two middles of two opposite sides of the base plate protruding outward, then being bent upward, later extending frontward, next being curved outward and being further bent rearward to form the two bending arms, respectively, a front of each bending arm being curved outward and then being bent rearward to form a hook portion, the base plate being mounted between the two base portions, the two bending arms being disposed in the two internal spaces, the two bending arms being connected to two outer portions of two opposite sides of the two connecting arms, two front ends of the two hook portions of the two bending arms being surrounded by the two opposite sides of the docking end of the docking portion of the insulation body.

20. The electrical connector as claimed in claim 19, wherein the terminal assembly has an upper terminal assembly fastened in an upper portion of the insulation body, and a lower terminal assembly fastened in a lower portion of the insulation body, the middle grounding plate is disposed between the upper terminal assembly and the lower terminal assembly, the upper terminal assembly includes the plurality of the terminals and the base portion, the lower terminal assembly includes the plurality of the terminals and the base portion, two outer sides of two outermost terminals of the upper terminal assembly are disposed to two top surfaces of two main portions of the two connecting arms of the insulation body, two outer sides of two outermost terminals of the lower terminal assembly are disposed to two bottom surfaces of the two main portions of the two connecting arms of the insulation body.
