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(54) **Electric distributing system**

(57) An electric distributing system includes at least two electrical tracks (2) and an electrical connector (4). Each electrical track (2) includes a track body (21) having two opposite ends (211), at least one of which is provided with a retaining hole (215), and at least two track wires (22) disposed in the track body (21). The electrical connector (4) includes a housing (41) having at least two

connecting end portions (40) that interconnect the electrical tracks (2), and at least two conductive wire units (42) disposed in the housing (41) and connected electrically and respectively to the track wires (22). At least one of the connecting end portions (40) has an engaging member (402) projecting therefrom and engaged to the retaining hole (215).

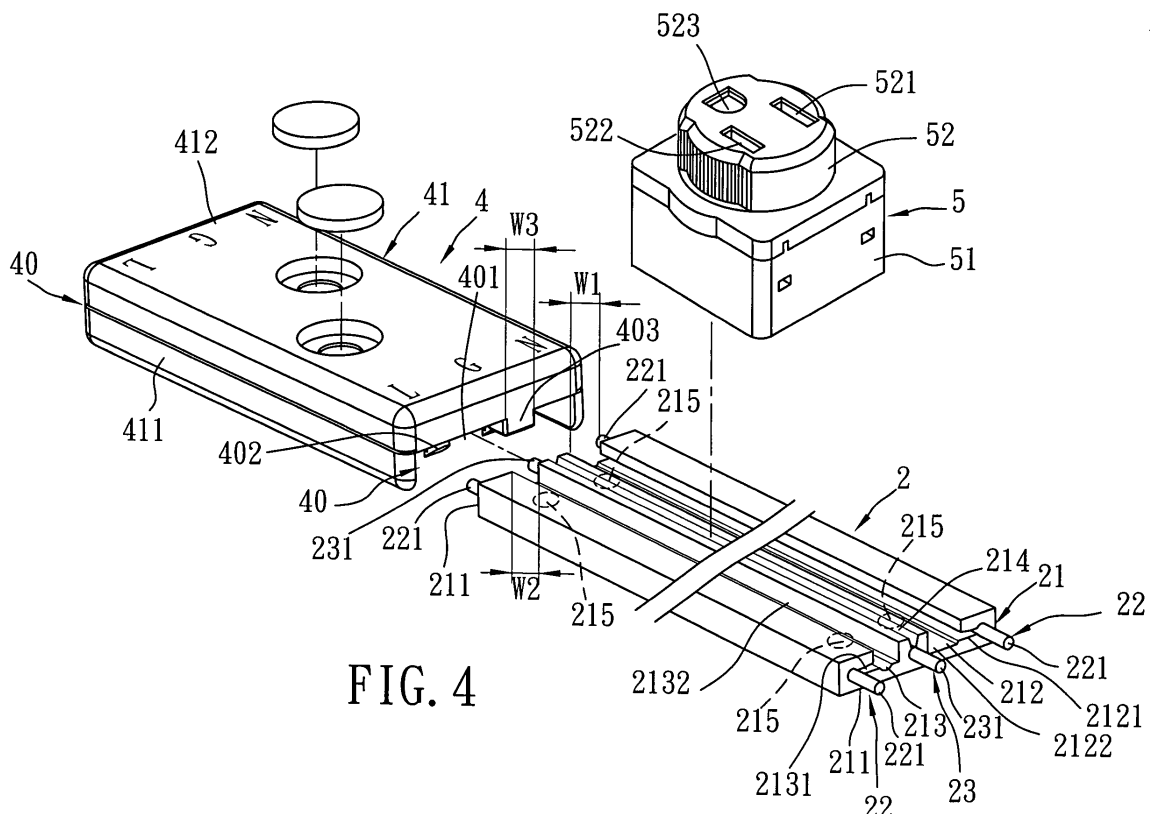


FIG. 4

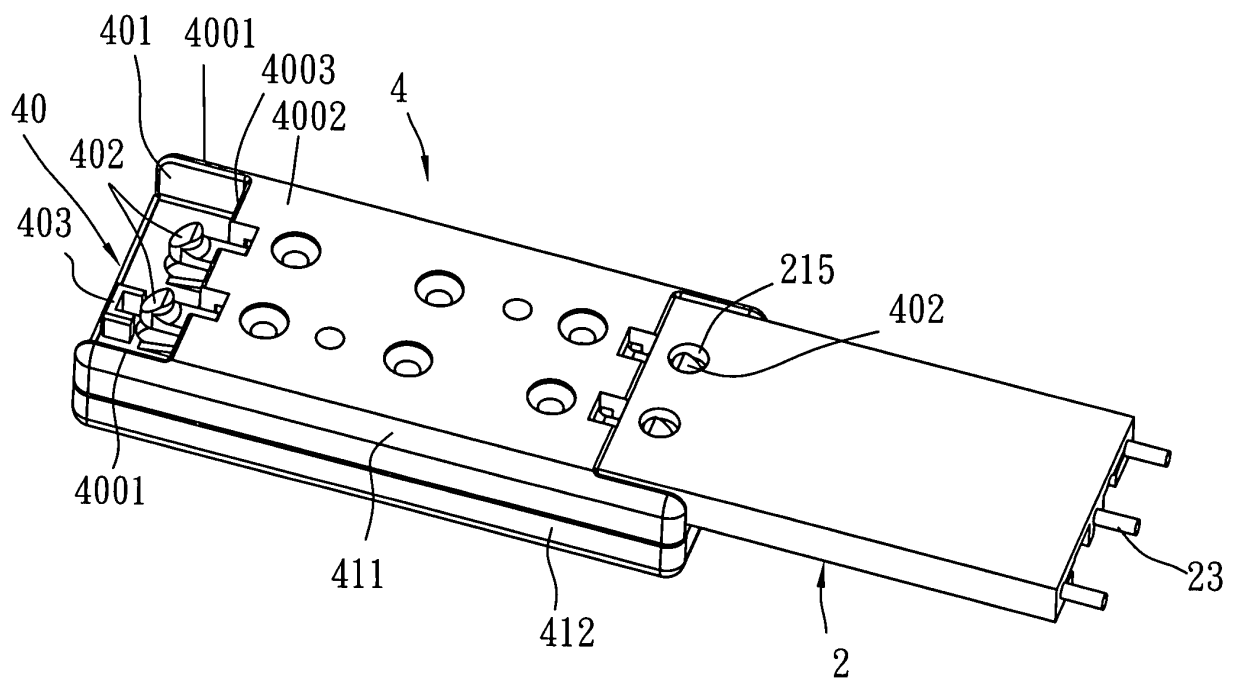


FIG. 6

Description

[0001] The invention relates to an electric distributing system, more particularly to an electric distributing system including a plurality of electrical tracks and at least one electrical connector interconnecting the electrical tracks.

[0002] Referring to Figures 1 and 2, a conventional electric distributing system 1, as disclosed in U.S. Patent No. Re.36,030, includes a plurality of electrical tracks 11, a plurality of electrical connectors 12 to interconnect the electrical tracks 11, a plurality of electrical receptacles 13 connected movably to the electrical tracks 11, and a power supply plug 14 connected electrically to one of the electrical tracks 11 and inserted into a socket of a fixed electrical receptacle 10. Each electrical track 11 has a rectangular track body 111, two parallel track wires 112 extending along the length of the track body 111, and a track ground wire 113 disposed between and parallel to the track wires 112. Each electrical connector 12 includes a housing 121 having at least two connecting ends 125 connected respectively to two electrical tracks 11, two terminals 123 disposed in each of the connecting ends 125 and connected electrically and respectively to the track wires 112 of one of the electrical tracks 11, and a ground terminal 124 disposed in each of the connecting ends 125 and connected electrically to the track ground wire 113 of the corresponding electrical track 11.

[0003] Although the aforementioned conventional electric distributing system 1 can achieve its intended purpose, since each electrical track 11 is only fitted in a slot in the electrical connector 12 without the use of any type of retaining mechanism, an improvement is needed to enhance connection between the electrical connectors 12 and the electrical tracks 11.

[0004] Therefore, the object of the present invention is to provide an electric distributing system that has components which can be stably and securely connected.

[0005] According to this invention, an electric distributing system comprises at least two electrical tracks and an electrical connector. Each of the electrical tracks includes a track body, and at least two track wires disposed therein. The track body has two opposite ends, at least one of which is provided with a retaining hole. The electrical connector includes a housing having at least two connecting end portions that interconnect the electrical tracks, and at least two conductive wire units disposed in the housing and connected electrically and respectively to the track wires. At least one of the connecting end portions has an engaging member projecting therefrom and engaged to the retaining hole.

[0006] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings, of which:

Figure 1 is a perspective view of a conventional electric distributing system disclosed in U.S. Patent No.

Re.36,030;

Figure 2 is an enlarged partly cutaway schematic view of an electrical track and an electrical connector of the conventional electric distributing system;

Figure 3 is a fragmentary schematic view of the first preferred embodiment of an electric distributing system according to the present invention;

Figure 4 is a perspective view of an electrical track, an electrical connector, and an electrical receptacle of the first preferred embodiment;

Figure 5 is an assembled sectional view of the electrical connector and the electrical track of the first preferred embodiment;

Figure 6 is an assembled perspective view of the electrical track and the electrical connector of the first preferred embodiment;

Figure 7 is a partly sectional view illustrating how the electrical receptacle connects with the electrical track;

Figure 8 is a fragmentary perspective view of the second preferred embodiment of an electric distributing system according to the present invention;

Figure 9 is an exploded perspective view of an electrical connector of the second preferred embodiment;

Figure 10 is a fragmentary schematic view of the third preferred embodiment of an electric distributing system according to the present invention;

Figure 11 is an exploded perspective view of an electrical connector of the third preferred embodiment;

Figure 12 is an assembled perspective view of the electrical connector of Figure 11 with first and second covers removed;

Figure 13 is a view similar to Figure 12, but with a movable disc, and first and second bases removed;

Figure 14 is an exploded perspective view of an electrical connector of an electric distributing system according to the fourth preferred embodiment of the present invention;

Figure 15 is an exploded perspective view of an electrical connector of an electric distributing system according to the fifth preferred embodiment of the present invention;

Figure 16 is a perspective view of the sixth preferred embodiment of an electric distributing system according to the present invention; and

Figure 17 is a perspective view of the seventh preferred embodiment of an electric distributing system according to the present invention.

[0007] Before the present invention is described in greater detail, it should be noted that like elements are denoted by the same reference numerals throughout the disclosure.

[0008] Referring to Figures 3 to 7, the first preferred embodiment of an electric distributing system according to the present invention is shown to comprise a plurality of electrical tracks 2, a power supply plug 3, a plurality

of electrical connectors 4, and a plurality of electrical receptacles 5.

[0009] Since the construction of each of the electrical tracks 2 is similar, only one electrical track 2 will be described herein. The electrical track 2 includes a track body 21 having two opposite ends 211, and first, second, and third grooves 212, 213, 214 that are parallel to each other and that extend between the ends 211 of the track body 21. Each end 211 of the track body 21 is provided with two retaining holes 215 respectively communicating with the first and second grooves 212, 213. Each of the first and second grooves 212, 213 has a wire-receiving section 2121, 2131, and a rib-receiving section 2122, 2132 in spatial communication with the wire-receiving section 2121, 2131. The third groove 214 is disposed between the first and second grooves 212, 213. An opening of the first groove 212 has a width (W1) larger than a width (W2) of an opening of the second groove 213. The electrical track 2 further includes two track wires 22 respectively disposed in the first and second grooves 212, 213, and a track ground wire 23 disposed in the third groove 214. Each track wire 22 has two opposite ends 221 projecting outwardly and respectively from the ends 211 of the track body 21. The track ground wire 23 also has two opposite ends 231 projecting outwardly and respectively from the ends 211 of the track body 21.

[0010] The power supply plug 3 is connected electrically to at least one of the electrical tracks 2, and is adapted to be connected electrically to a fixed electrical receptacle 10. Since electrical connection between the power supply plug 3 and the electrical track 2 is conventional, it is not detailed herein for the sake of brevity.

[0011] Since the construction of each of the electrical connectors 4 is similar, only one electrical connector 4 will be described herein. The electrical connector 4, in this embodiment, interconnects two electrical tracks 2, and includes a plastic housing 41, two conductive wire units 42, and a ground wire unit 43. The housing 41 has a base 411 for holding the conductive wire units 22 and the ground wire unit 23, and a cover 412 screwed fixedly to the base 411. The base 411 has two connecting end portions 40 at two ends thereof and connected respectively to the electrical tracks 2, and an aligning rib 403 provided on each of the connecting end portions 40. The aligning rib 403 has a width (W3) larger than the width (W2) of the opening of the second groove 213, but smaller than or equal to the width (W1) of the opening of the first groove 212.

[0012] Each of the connecting end portions 40 has a cutout portion 401 for extension of one end 211 of the track body 21 of one of the electrical tracks 2 thereinto. Each connecting end portion 40 has two parallel sidewall parts 4001, and a bottom wall part 4002 interconnecting the sidewall parts 4001. The sidewall parts 4001 extend beyond a distal edge 4003 of the bottom wall part 4002. The cutout portion 401 is defined by the distal edge 4003 of the bottom wall part 4002 and portions of the sidewall parts 4001. Each connecting end portion 40 further has

two engaging members 402 configured as engaging arms 4021 projecting from the distal edge 4003 of the bottom wall part 4002 into the cutout portion 401. Each of the engaging arms 4021 has a hook end 4022 extending into the cutout portion 401 and engaged to a respective one of the retaining holes 215 at the end 211 of the track body 21. The hook end 4022 has an inclined guide face 404 to guide the electrical track 2 into the electrical connector 4.

[0013] The conductive wire units 42 are disposed in the housing 41. Each conductive wire unit 42 has two terminals 421 respectively disposed in the connecting end portions 40 and connected electrically and respectively to the track wires 221 of the electrical tracks 2, and a conductive wire 422 interconnecting the terminals 421.

[0014] The ground wire unit 43 is disposed in the housing 41, and has two ground terminals 431 respectively disposed in the connecting end portions 40 and connected electrically and respectively to the track ground wires 231 of the electrical tracks 2, and a ground wire 432 interconnecting the ground terminals 431.

[0015] Since the construction of each of the electrical receptacles 5 is similar, only one electrical receptacle 5 will be described herein. The electrical receptacle 5 is connected movably to one of the electrical tracks 2, and includes a rectangular main body 51, a socket 52 disposed on top of the main body 51, and a conductive plate unit 53 installed in the main body 51. The socket 52 has a rectangular neutral slot 521, a rectangular hot (or live) slot 522, and a semi-circular ground slot 523. The conductive plate unit 53 includes two conductive plates 531 respectively aligned with the neutral and hot slots 521, 522 and having bottom end portions projecting out of the main body 51, and a ground plate 532 aligned with the ground slot 523 and having a bottom end portion projecting out of the main body 51.

[0016] During assembly of the electric distributing system of the present invention, the electrical receptacle 5 is slidably connected to one of the electrical tracks 2 with the bottom end portions of the conductive plates 531 extending respectively into the first and second grooves 212, 213 of the electrical track 2 and the bottom end portion of the ground plate 532 extending into the third groove 214 of the electrical track 2. One end 211 of the electrical track 2 is then inserted into the corresponding cutout portion 401 of one of the electrical connectors 4. Through the presence of the aligning rib 403 in each connecting end portion 40 of the electrical connector 4, which is limited to extend solely into the first groove 212 of the corresponding electrical track 2, the conductive wire units 42 can be connected correctly to the track wires 22 of the electrical track 2. Further, through engagement of the engaging arms 4021 in each connecting end portion 40 of the electrical connector 4 with the retaining holes 215 in the corresponding end 211 of the track body 21 of the electrical track 2, the electrical connector 4 and the electrical track 2 can be interconnected stably, thereby further ensuring electrical connections among the components

of the electric distributing system of the present invention.

[0017] Referring to Figures 8 and 9, the second preferred embodiment of an electric distributing system according to the present invention is shown to comprise a power supply plug 3, a plurality of electrical tracks 2, two electrical connectors 6, 4', and a plurality of electrical receptacles 5. Since the construction of each of the power supply plug 3, the electrical track 2, and the electrical receptacle 5 is similar to that described in the first preferred embodiment, a detailed description of the same is dispensed herewith for the sake of brevity.

[0018] In this embodiment, the electrical connector 6 includes a cross-shaped housing 61 having four connecting end portions 60 connected respectively to four electrical tracks 2 and extending in four different track directions. The electrical connector 4' includes a housing 41', two conductive wire units 42' disposed in the housing 41', and a ground wire unit 43' disposed in the housing 41' parallel to and between the conductive wire units 42'. The housing 41' has two connecting end portions 40 connected respectively to two electrical tracks 2 and defined by an L-shaped base 411' and an L-shaped cover 412' screwed fixedly to the base 411'. The engaging arms 4021 on each connecting end portion 40 are provided on a connecting plate 410 which is fixed to the base 41'.

[0019] Referring to Figures 10 to 13, the third preferred embodiment of an electric distributing system according to the present invention is shown to comprise a power supply plug 3, a plurality of electrical tracks 2, two electrical connectors 4", 7, and a plurality of electrical receptacles (not shown) mounted movably on the electrical tracks 2. Since the construction of each of the power supply plug 3, the electrical tracks 2, and the electrical receptacles is similar to that described in the first preferred embodiment, a detailed description of the same is dispensed herewith.

[0020] The electrical connector 4" is similar to that described in the first preferred embodiment. However, in this embodiment, the electrical connector 4" has a U-shaped housing 41" with two connecting end portions 40 connected respectively to two electrical tracks 2. The connecting end portions 40 are spaced apart from each other, and extend substantially parallel to each other along a track direction.

[0021] The electrical connector 7 includes a housing 71, a fixed disc 72, a movable disc 73, two conductive wire units 74, and a ground wire unit 75. The housing 71 has two connecting end portions 70 angled to each other and rotatable relative to each other. The housing 71 includes a first base 713, a first cover 717, a second cover 714, and a second base 718. The first base 713 has a circular first pivot portion 711, and a first radial extension 712 extending radially from the first pivot portion 711. The first cover 717 has a circular second pivot portion 715, and a second radial extension 716 extending radially from the second pivot portion 715. The second cover 714 is screwed fixedly to the top of the first radial extension 712 so as to cover the same. The second base 718 is

screwed fixedly to the bottom of the second radial extension 716 so as to be covered by the same, and has a guide projection 7181 in sliding contact with a bottom surface of the first pivot portion 711. The second pivot portion 715 is pivoted to the first pivot portion 711 in such a manner that the second radial extension 716 is spaced apart angularly from the first radial extension 712. One of the connecting end portions 70 is defined by the first radial extension 712 and the second cover 714. The other one of the connecting end portions 70 is defined by the second base 718 and the second radial extension 716. Each connecting end portion 70 has an aligning rib 701.

[0022] The fixed disc 72 and the movable disc 73 are received in a space 719 between the first and second pivot portions 711, 715. The fixed disc 72 has a pivot shaft 721 projecting from the center thereof and extending through a central hole 731 of the movable disc 73. The pivot shaft 721 also extends through the second pivot portion 715, and is fastened to the second pivot portion 715 by means of a fastener 7151. The fixed disc 72 has three concentric annular grooves 722 around the pivot shaft 721. The fixed disc 72 is screwed fixedly to the first pivot portion 711, whereas the movable disc 73 is screwed fixedly to the second pivot portion 715. Hence, the movable disc 73 is connected pivotally to the fixed disc 72 about the pivot shaft 721.

[0023] Each of the conductive wire units 74 has two terminals 742, 743 respectively disposed in the connecting end portions 70, a fixed wire 744, 747 and a movable wire 744', 747' respectively connected to the terminals 742, 743, a fixed contact member 741 and a movable contact member 745 respectively connected to the fixed and movable wires 744, 747, 744', 747', and an intermediate terminal 746 disposed on top of the movable disc 73. Each of the terminals 742, 743 is connected to one of the track wires 22 of one of the electrical tracks 2. The fixed contact member 741 is a conductive ring supported by the fixed disc 72, and is disposed around the pivot shaft 721. The movable contact member 745 is fixed to a bottom side of the movable disc 73 by means of a conductive stud 7461 which extends through the movable disc 73 and which is connected to the intermediate terminal 746. As such, the intermediate terminal 746 and the movable contact member 745 are connected electrically to each other. The movable contact member 745 has two downwardly extending resilient contact legs 7451 in sliding contact with the fixed contact member 741.

[0024] The ground wire unit 75 is disposed in the housing 71, and has two ground terminals (742G) respectively disposed in the connecting end portions 70, a fixed ground wire 748 and a movable ground wire 748' respectively connected to the ground terminals (742G), a fixed ground contact member 751 and a movable ground contact member (745G) respectively connected to the fixed and movable ground wires 748, 748', and an intermediate ground terminal (746G) disposed on top of the movable disc 73. Each of the ground terminals (742G) is connected to the track ground wire 23 of one of the electrical

tracks 2. The fixed ground contact member 751 is a ground ring disposed around the pivot shaft 721, and is supported by the fixed disc 72. The movable ground contact member (745G) is in sliding contact with the fixed ground contact member 751, and is fixed to the bottom side of the movable disc 73 by means of a conductive stud 7461 which extends through the movable disc 73 and which is connected to the intermediate ground terminal (746G). As such, the intermediate ground terminal (746G) and the movable ground contact member (745G) are connected electrically to each other. The movable ground contact member (745G) has a downwardly extending resilient contact leg (7451G) in sliding contact with the fixed ground contact member 751. The fixed contact members 741 and the fixed ground contact member 751 are respectively received in the annular grooves 722 of the fixed disc 72.

[0025] Therefore, through the presence of the fixed and movable discs 72, 73 in the housing 71, the two connecting end portions 70 of the electrical connector 7 can provide different angular positions of the electrical tracks 2 to satisfy different installation requirements.

[0026] Referring to Figure 14, the fourth preferred embodiment of an electric distributing system according to the present invention is shown to be similar to the third preferred embodiment. In the third preferred embodiment, the connecting end portions 70 of the electrical connector 7 are rotatable relative to each other. In this embodiment, the two connecting end portions 70 of the electrical connector 7' are pivotable relative to each other. Hence, the electrical connector 7' includes a housing 71' having two housing parts 701, a pivot connection 700 interconnecting the housing parts 701, two conductive wire units 74', and a ground conductive wire unit 75'. Each of the housing parts 701 has a base 77, and a cover 76 screwed fixedly to the base 77. The base 77 of each housing part 701 has the respective connecting end portions 70, and has a base pivot part 771. The cover 76 has a cover pivot part 761. The base pivot parts 771 of the bases 77 and the cover pivot parts 761 of the covers 76 of the two housing parts 701 cooperatively form the pivot connection 700.

[0027] The conductive wire units 74' are disposed in the housing 71'. Each of the conductor wire units 74' has two terminals 742' respectively disposed in the connecting end portions 70, two conductive wires 748' respectively connected to the terminals 742', two conductive clamps 749 respectively connected to the conductive wires 748', and a spindle 740 interconnecting pivotally the conductive clamps 749. Each of the terminals 742' is connected electrically to one of the track wires 221 of one of the electrical tracks 2. The spindle 740 is disposed within the pivot connection.

[0028] Since the construction of the ground wire unit 75' is similar to that of each conductive wire unit 74', a detailed description of the same will be dispensed herewith for the sake of brevity.

[0029] Figure 15 illustrates an electrical connector (4a)

of an electric distributing system according to the fifth preferred embodiment of the present invention. The electrical connector (4a) is shown to be similar to the electrical connector 4 of the first preferred embodiment. However, in this embodiment, the electrical connector (4a) includes a housing (41a) having three connecting end portions 40 extending in three different track directions and connected respectively to three electrical tracks 2 (see Figure 3). Two of the connecting end portions 40 are located on the same plane. A third one of the connecting end portions 40 is located on a plane perpendicular to that of the other two connecting end portions 40. The engaging arms 4021 are provided on each connecting end portion 40 of the housing (41a).

[0030] Referring to Figure 16, the sixth preferred embodiment of an electric distributing system according to the present invention is shown to comprise a plurality of electrical tracks 2, and two electrical connectors 6", 7". The electrical connector 6" includes a housing 61" having four connecting end portions 60 extending in four different track directions and connected respectively to four electrical tracks 2. Three of the connecting end portions 60 are located on the same plane. A fourth one of the connecting end portions 60 is located on a plane perpendicular to that of the other three connecting end portions 60.

[0031] The electrical connector 7" is similar to the electrical connector 7' of the fourth preferred embodiment. However, in this embodiment, the electrical connector 7" includes a housing 71" having three housing parts 701", and two pivot connections 700" each interconnecting pivotally two adjacent ones of the housing parts 701". The housing 71" further has two connecting end portions 70 connected respectively to two electrical tracks 2.

[0032] Referring to Figure 17, the seventh preferred embodiment of an electric distributing system according to the present invention is shown to be similar to the first preferred embodiment. However, in this embodiment, the electric distributing system includes a plurality of electrical tracks 2 and two electrical connectors (4b, 6a). The electrical connector (4b) includes a housing (41b) having two connecting end portions 40 connected respectively to two electrical tracks 2. The connecting end portions 40 extend in two different track directions, and are located on two different planes. The electrical connector (6a) has a housing (61a) having three connecting end portions 60 connected respectively to three electrical tracks 2. Two of the connecting end portions 60 are located on the same plane. A third one of the connecting end portions 60 is located on a plane perpendicular to that of the other two connecting end portions 60.

Claims

1. An electric distributing system comprising:

at least two electrical tracks (2), each of which

includes a track body (21), and at least two track wires (22) disposed in said track body (21), said track body (21) having two opposite ends (211); and

an electrical connector (4, 6, 4', 4'', 7, 7', 4a, 6'', 7'', 4b, 6a) including a housing (41, 61, 41', 41'', 71, 71', 41a, 61'', 71'', 41b, 61a) having at least two connecting end portions (40, 60, 70) that interconnect said electrical tracks (2), and at least two conductive wire units (42, 42', 74, 74') disposed in said housing (41, 61, 41', 41'', 71, 71', 41a, 61'', 71'', 41b, 61a) and connected electrically and respectively to said track wires (22);

characterized by:

at least one of said opposite ends (211) of said track body (21) being provided with a retaining hole (215); and

at least one of said connecting end portions (40, 60, 70) having an engaging member (402) projecting therefrom and engaged to said retaining hole (215) .

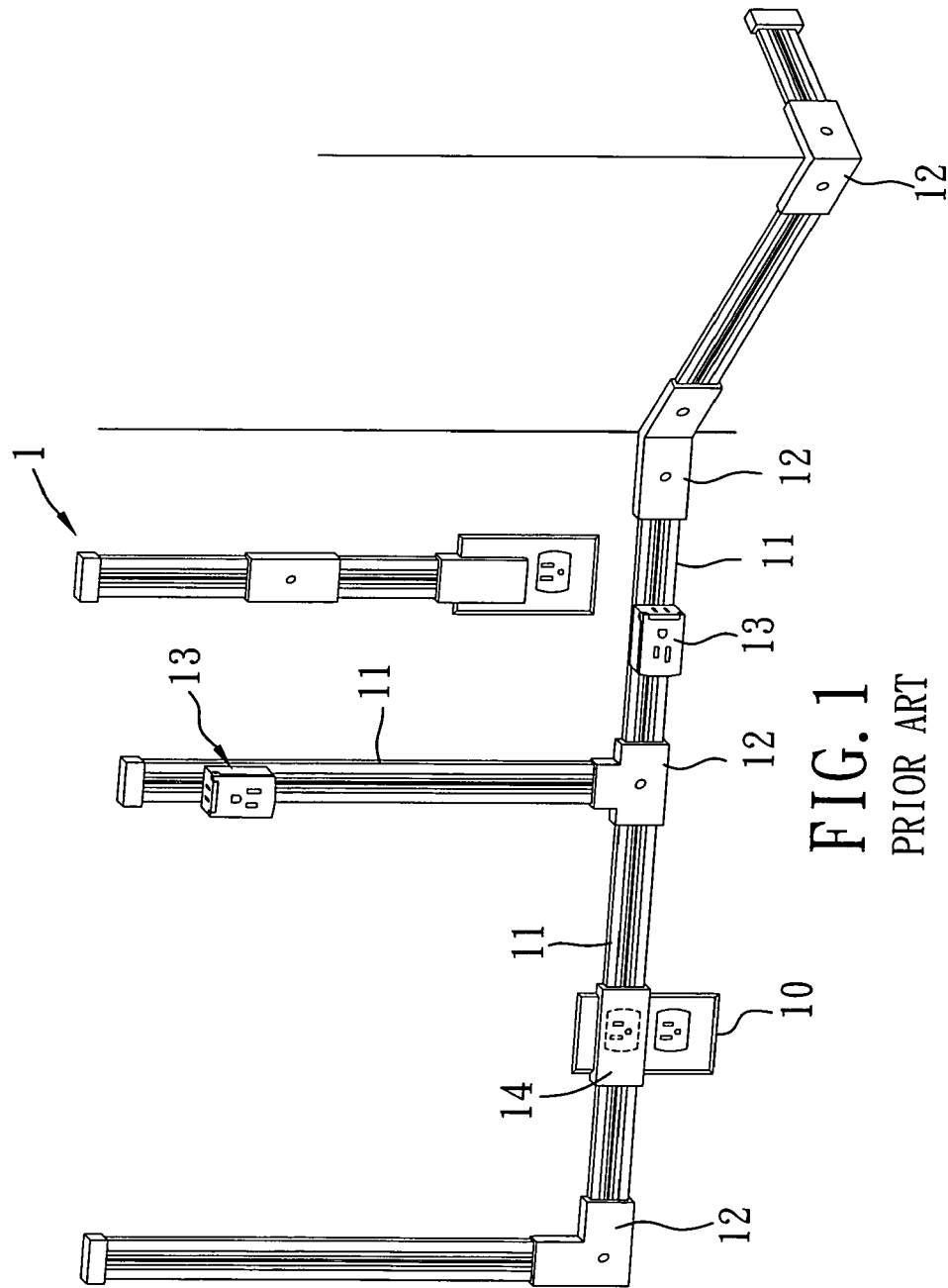
2. The electric distributing system of Claim 1, **characterized in that** each of said connecting end portions (40, 60, 70) further has a cutout portion (401), one of said two opposite ends (211) of said track body (21) of one of said electrical tracks (2) extending into said cutout portion (401), said engaging member (402) being configured as an engaging arm (4021) having a hook end (4022) extending into said cutout portion (401).
3. The electric distributing system of Claim 2, **characterized in that** said hook end (4022) has an inclined guide face (404).
4. The electric distributing system of Claim 2, **characterized in that** said housing (41) has a base (411) holding said conductive wire units (22), and a cover (412) covering said base (411), said base (411) having said connecting end portions (40) at two ends of said base (411), each of said connecting end portions (40) having two parallel sidewall parts (4001), and a bottom wall part (4002) interconnecting said sidewall parts (4001), said sidewall parts (4001) extending beyond a distal edge (4003) of said bottom wall part (4002), said cutout portion (401) being defined by said distal edge (4003) of said bottom wall part (4002) and portions of said sidewall parts (4001), said engaging arm (402) projecting from said distal edge (4003) into said cutout portion (401).
5. The electric distributing system of Claim 1, **characterized in that** said connecting end portions (70) of said housing (71) are angled to each other and are

rotatable relative to each other, each of said conductive wire units (74) having two terminals (742, 743) respectively disposed in said connecting end portions (70), each of said terminals (742, 743) being connected electrically to one of said track wires (22) of one of said electrical tracks (2).

6. The electric distributing system of Claim 5, **characterized in that** each of said conductive wire units (74) further has a fixed wire (744, 747) and a movable wire (744', 747') respectively connected to said two terminals (742, 743), and a fixed contact member (741) and a movable contact member (745) respectively connected to said fixed and movable wires (744, 747, 744', 747'), said movable contact member (745) being in sliding contact with said fixed contact member (741).
7. The electric distributing system of Claim 6, **characterized in that** said electrical connector (70) further includes a fixed disc (72) and a movable disc (73) disposed within said housing (71), said movable disc (73) being connected pivotally to said fixed disc (72) about a pivot shaft (721), said fixed contact member (741) being a conductive ring supported by said fixed disc (72) and disposed around said pivot shaft (721), said movable contact member (745) being fixed to said movable disc (73).
8. The electric distributing system of Claim 7, **characterized in that** said housing (71) includes a first base (713) that has a first pivot portion (711) and a first radial extension (712) extending radially from said first pivot portion (711), a first cover (717) that has a second pivot portion (715) and a second radial extension (716) extending radially from said second pivot portion (715), a second cover (714) covering said first radial extension (712), and a second base (718) connected to and covered by said second radial extension (716), said second pivot portion (715) being pivoted to said first pivot portion (711) in such a manner that said second radial extension (716) is spaced apart angularly from said first radial extension (712), said fixed disc (72) and said movable disc (73) being received in a space (719) between said first and second pivot portions (711, 715).
9. The electric distributing system of Claim 8, **characterized in that** each of said electrical tracks (2) further has a track ground wire (23), said electrical connector (7) further including a ground wire unit (75) disposed in said housing (71) and having two ground terminals (742G) connected electrically and respectively to said track ground wires (23) of said electrical tracks (2), a fixed ground wire (748) and a movable ground wire (748') respectively connected to said ground terminals (742G), and a fixed ground contact member (751) and a movable ground contact mem-

ber (745G) respectively connected to said fixed and movable ground wires (748, 748'), said movable ground contact member (745G) being in sliding contact with said fixed ground contact member (751) and fixed to said movable disc (73), said fixed ground contact member (751) being a ground ring disposed around said pivot shaft (721), said fixed disc (72) having three concentric annular grooves (722) around said pivot shaft (721) and respectively receiving said conductive rings of said two conductive wire units (74) and said ground ring.

10. The electric distributing system of Claim 1, **characterized in that** said housing (71') has two housing parts (701) and a pivot connection (700) interconnecting said housing parts (701), each of said housing parts (701) having a base (77) and a cover (76) covering said base (77), said base (77) of each of said housing parts (701) having one of said connecting end portions (70).
11. The electric distributing system of Claim 10, **characterized in that** each of said conductive wire units (74') has two terminals (742') respectively disposed in said connecting end portions (70), two conductive wires (748') respectively connected to said terminals (742'), two conductive clamps (749) respectively connected to said conductive wires (748'), and a spindle (740) interconnecting pivotally said conductive clamps (749), each of said terminals (742') being connected electrically to one of said track wires (22) of one of said electrical tracks (2), said spindle (740) being disposed within said pivot connection (700).



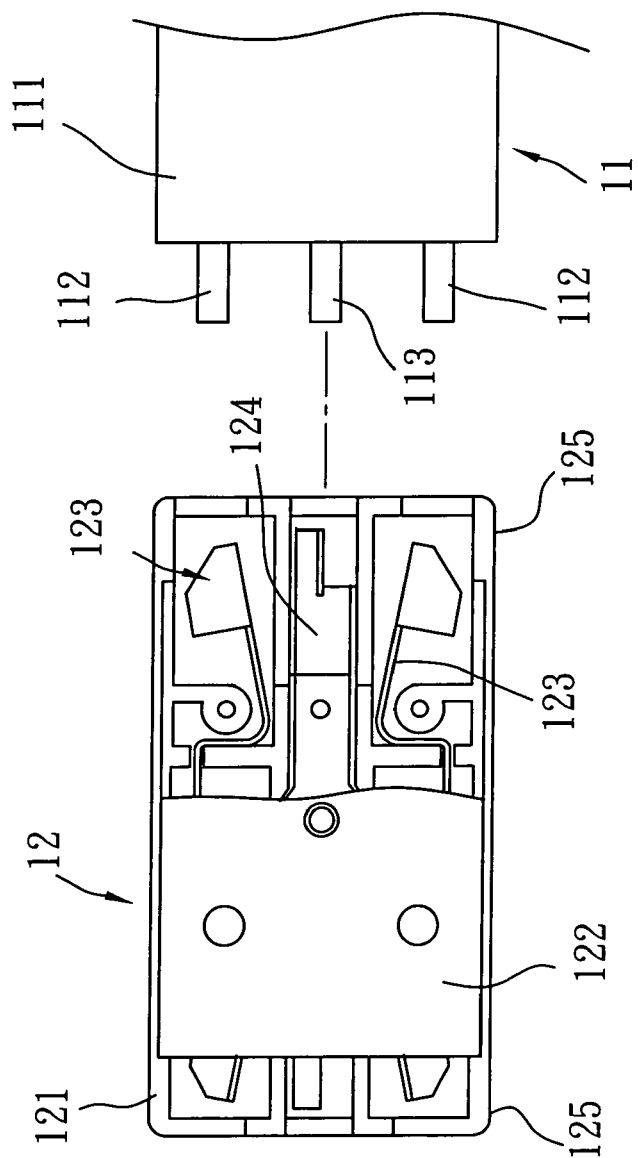


FIG. 2
PRIOR ART

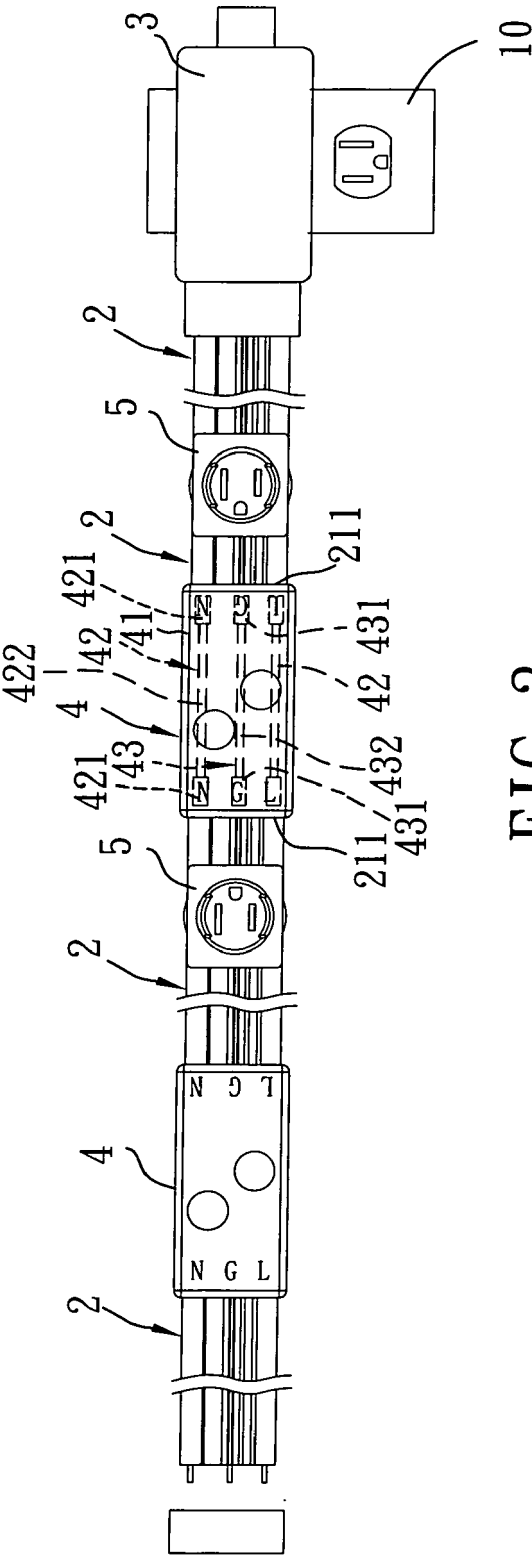


FIG. 3

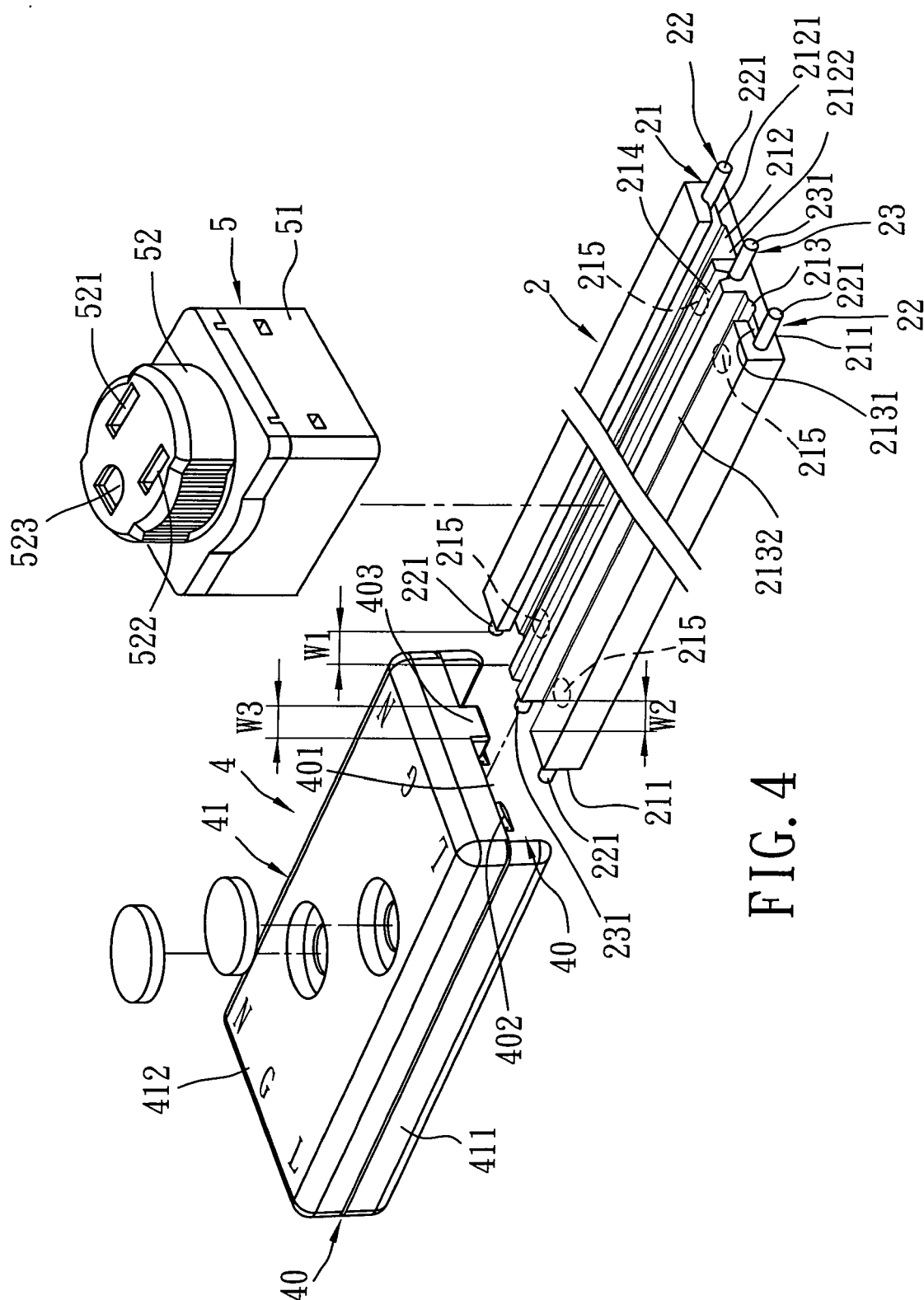


FIG. 4

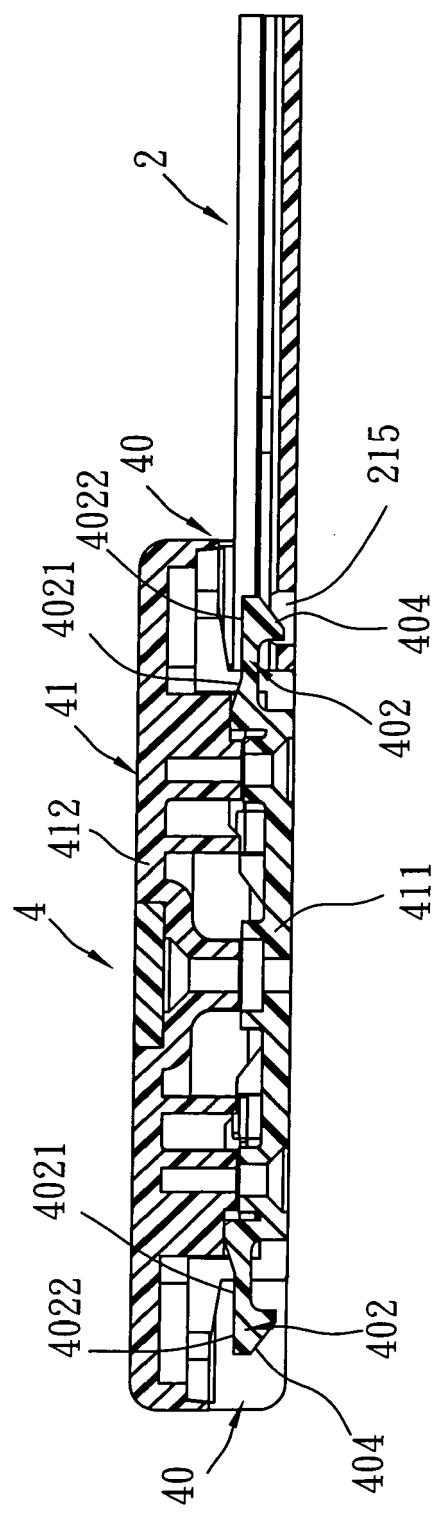


FIG. 5

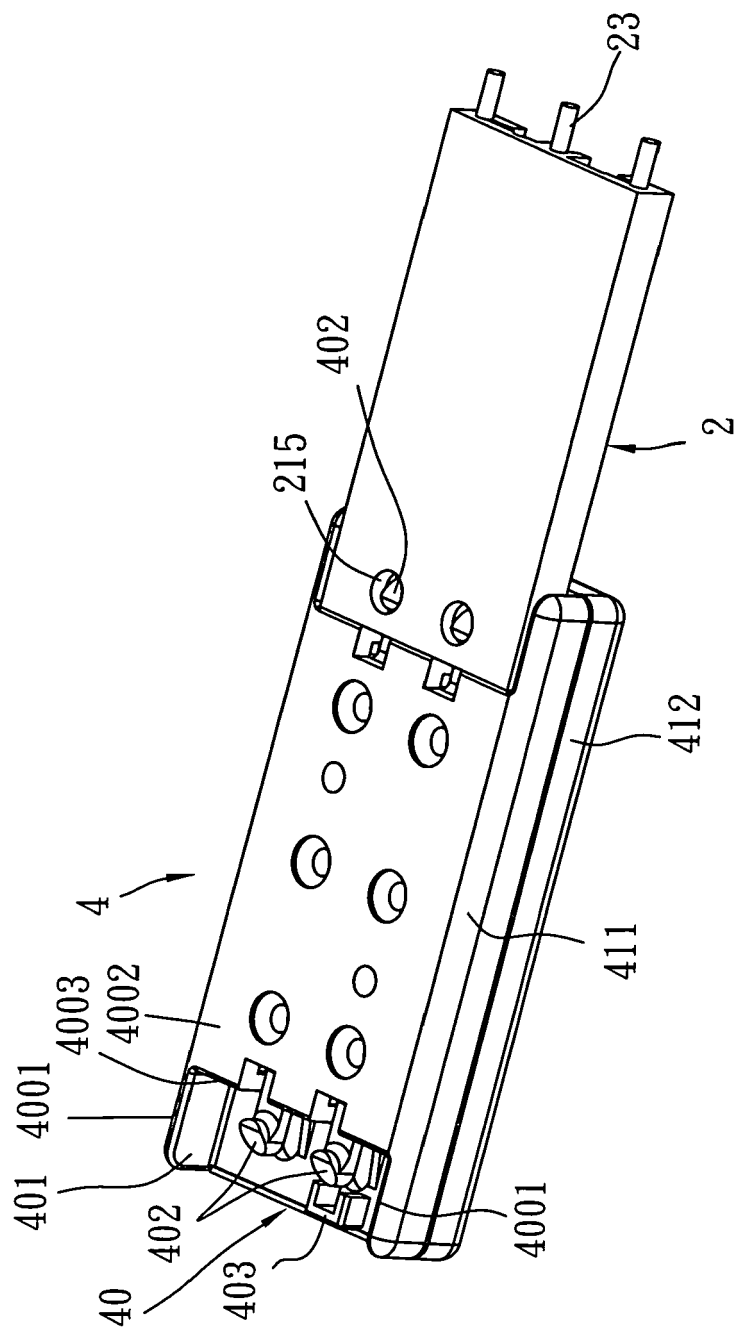


FIG. 6

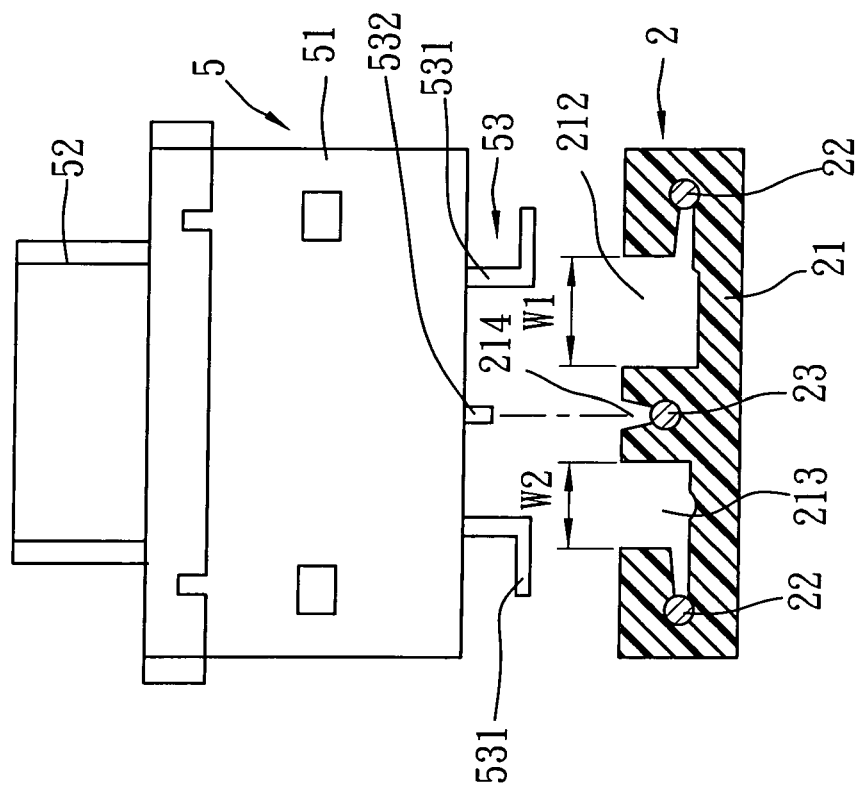


FIG. 7

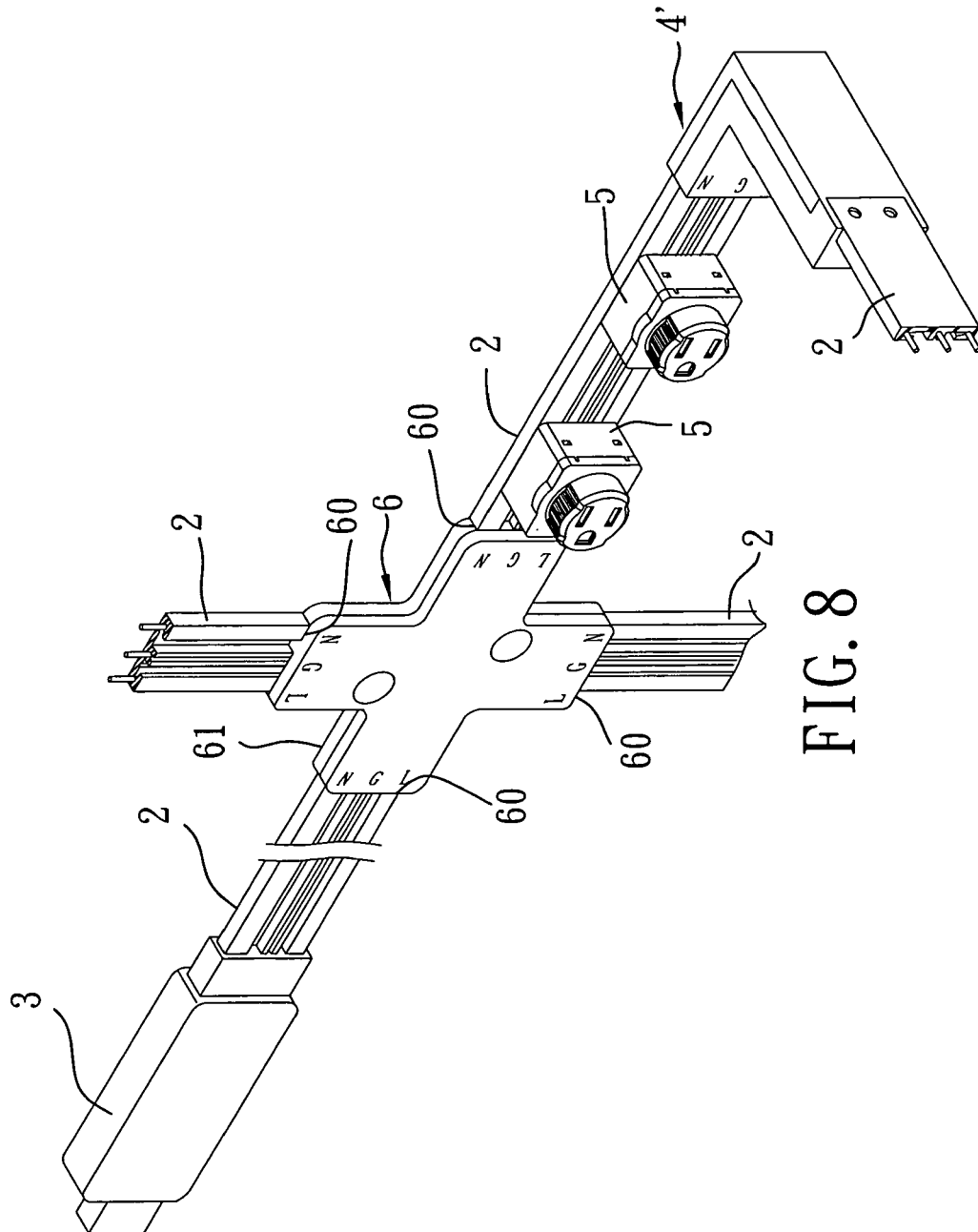
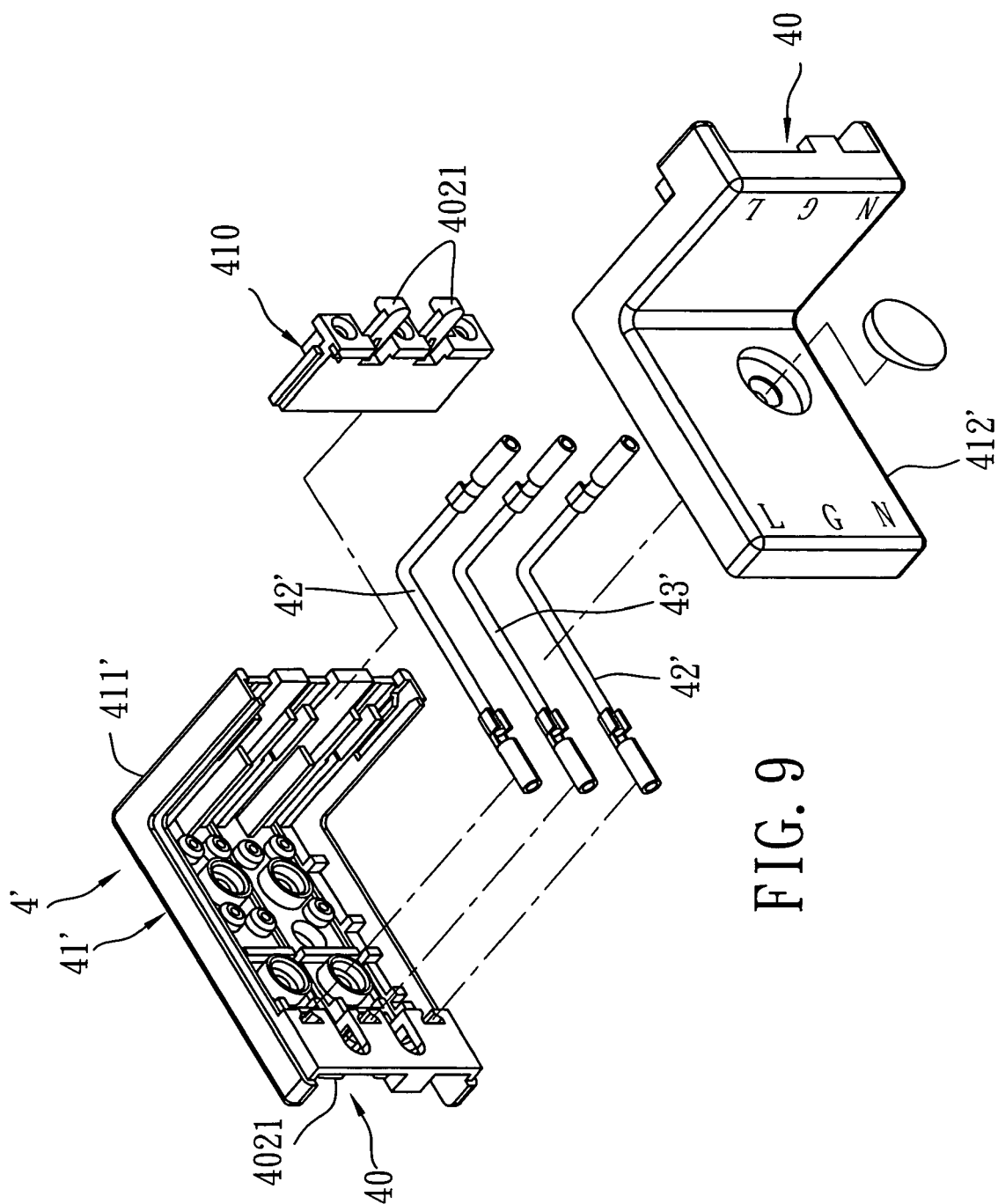
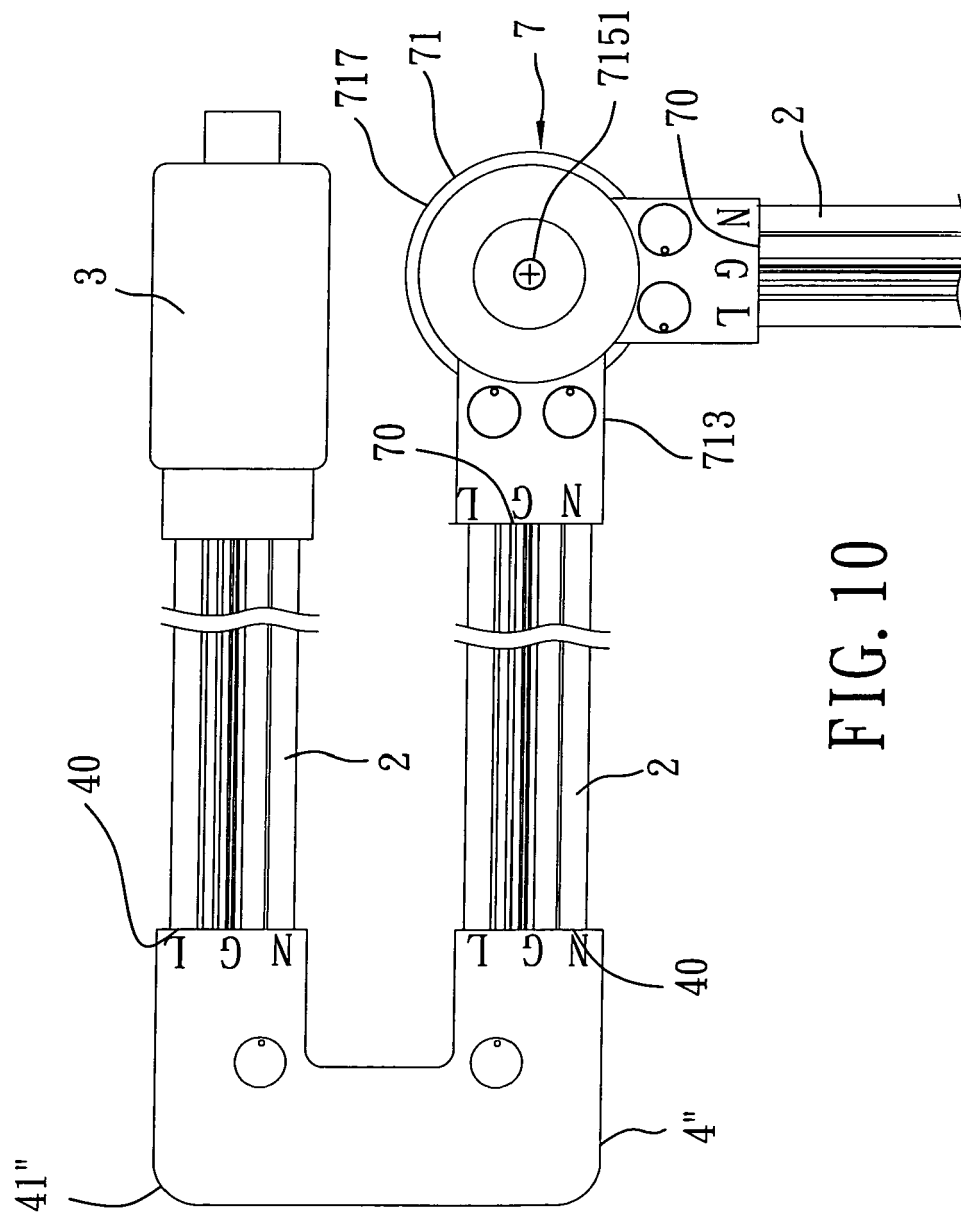


FIG. 8





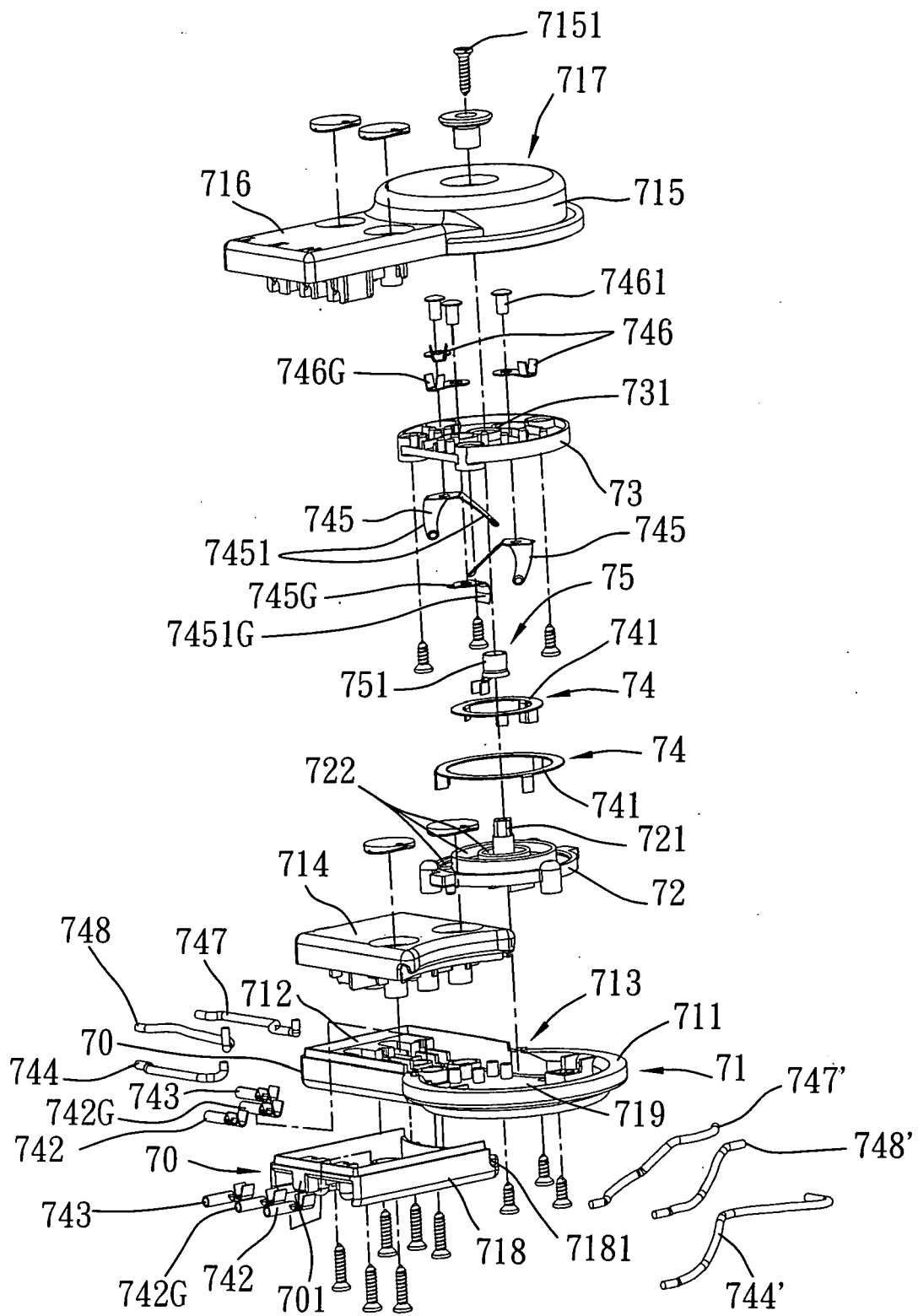
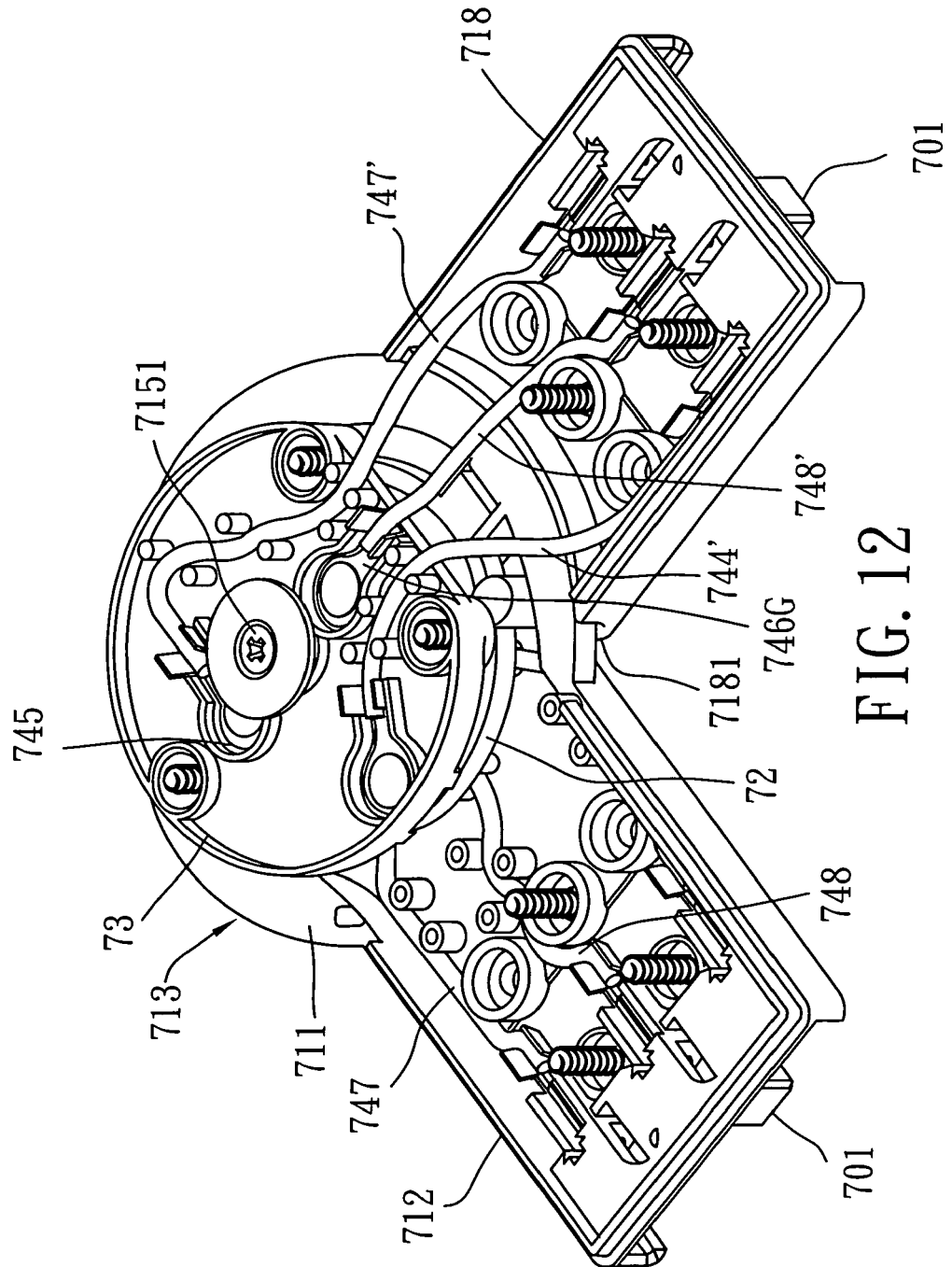


FIG. 11



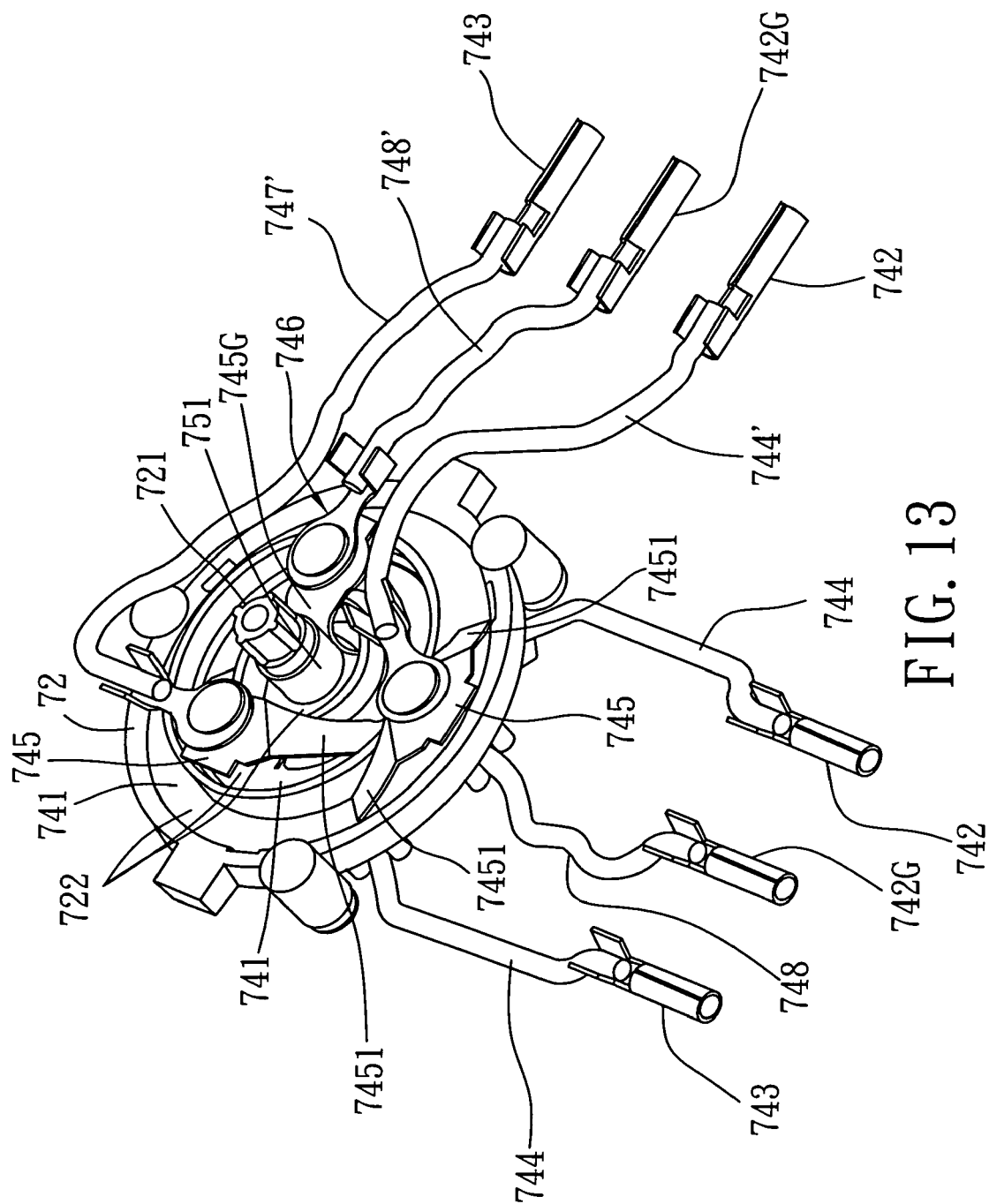


FIG. 13

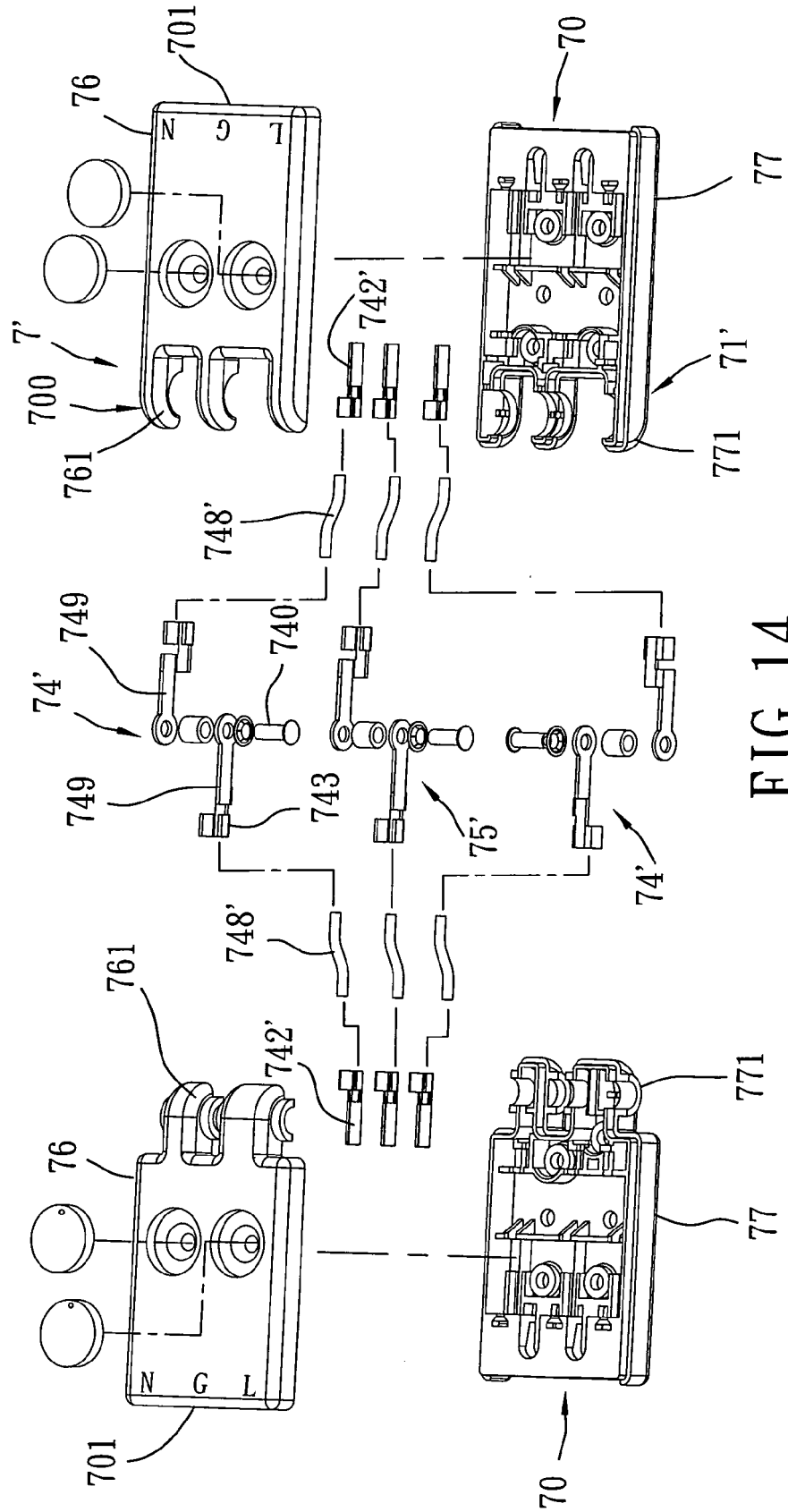


FIG. 14

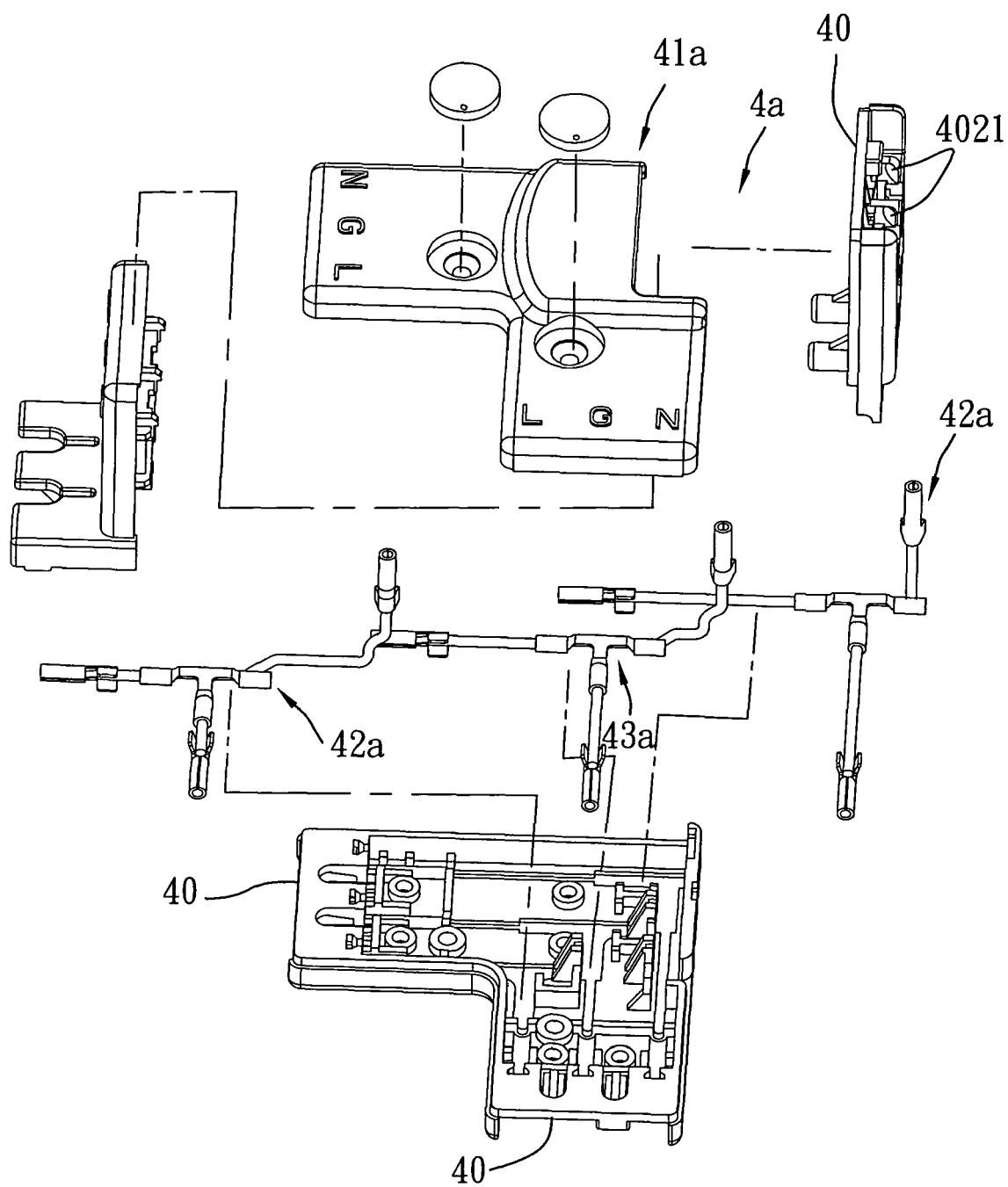


FIG. 15

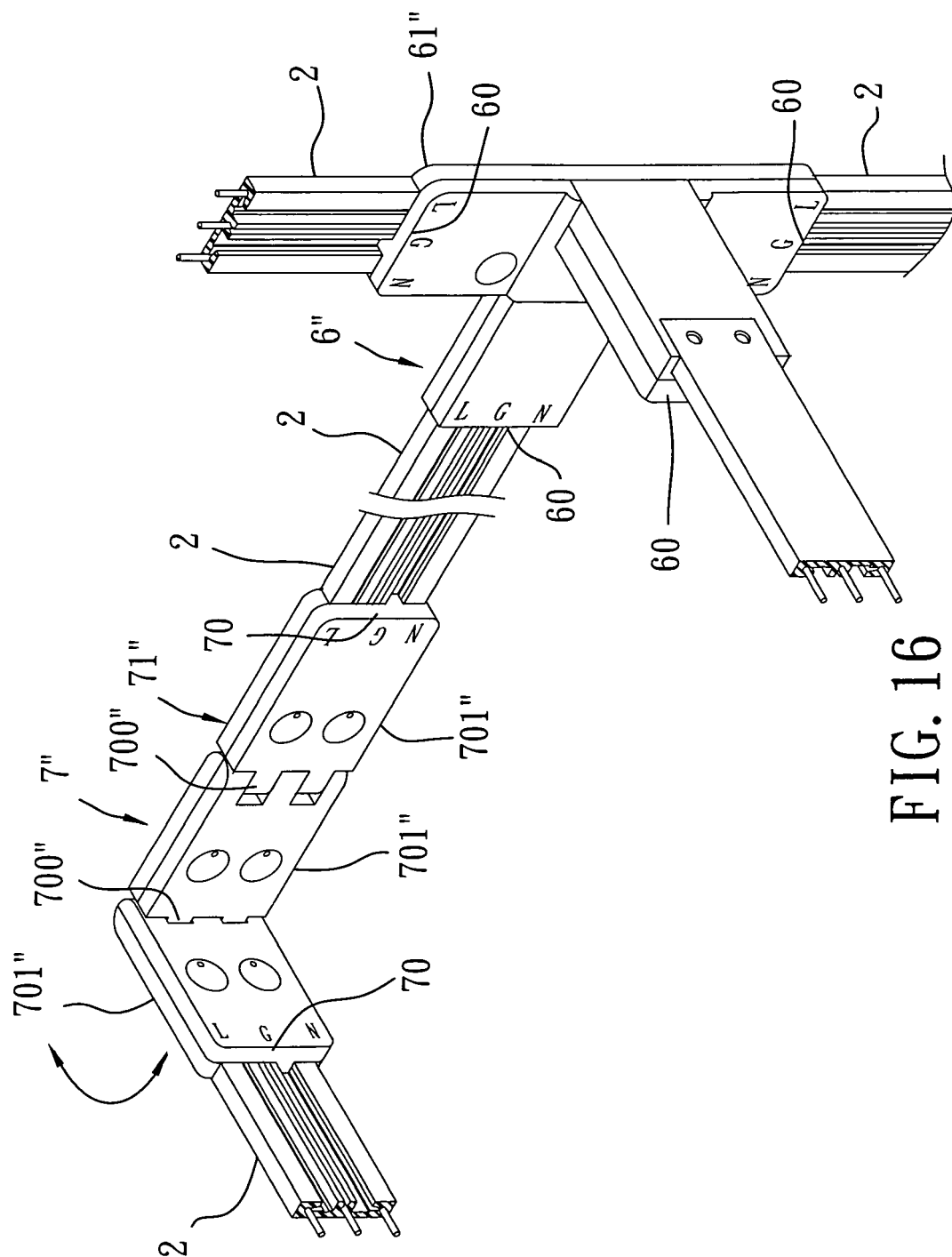


FIG. 16

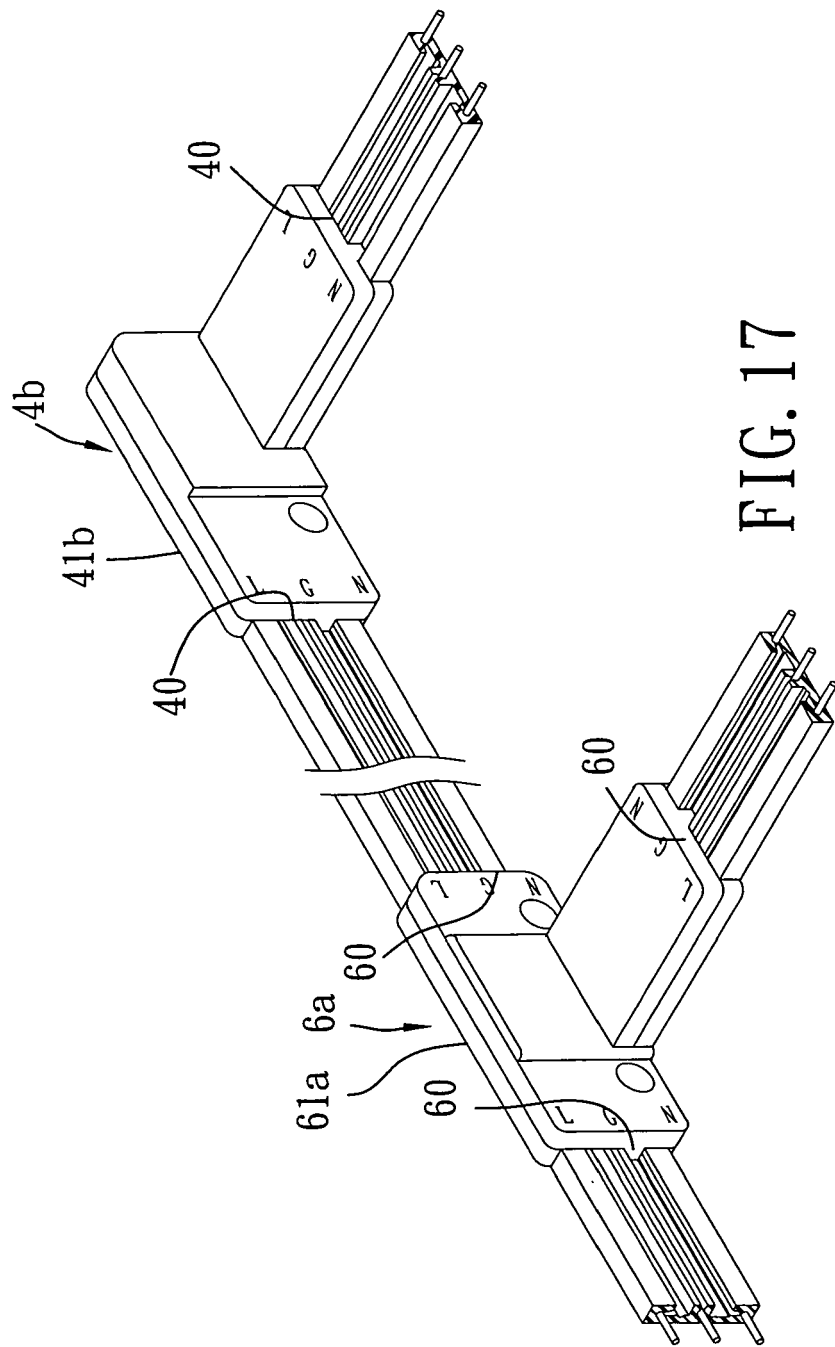


FIG. 17



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EUROPEAN SEARCH REPORT

Application Number
EP 07 25 0284

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 12 February 2008	Examiner Jansen, Helma
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

5
EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- ☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



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**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 07 25 0284

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-4

An electric distribution system with at least two electrical tracks interconnectable by connectors were the connected parts have an engaging member on one side and an retaining hole on the other side

2. claims: 5-11

The connectors of an electric distribution system have connectors with relative to each other rotatable end portions.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 25 0284

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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