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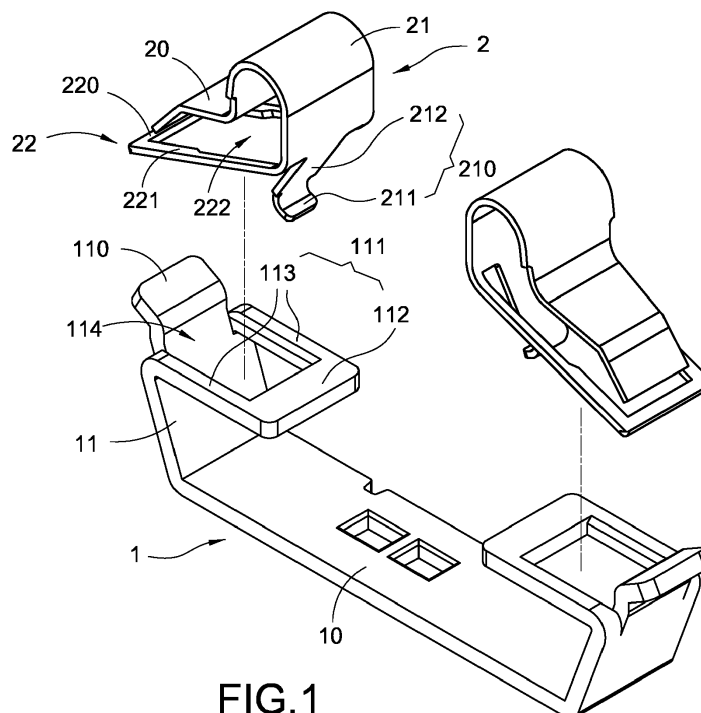
Remarks:

Amended claims in accordance with Rule 137(2) EPC.

(54) STRUCTURE IMPROVEMENT FOR CONNECTION TERMINALS OF TERMINAL BLOCK

(57) A structure improvement for connection terminals of a terminal block includes a frame body (1) and an elastic part (2). The frame body (1) has a bottom plate (10) and a standing plate (11) bending and extending from a side of the bottom plate (10). The standing plate (11) further extends to form a resisting portion (110) and a first frame (111) curved opposite to the resisting portion (110). The elastic part (2) has a contact portion (20), a

hook portion (210) extending from the contact portion (20), and a second frame (22) curved opposite to the hook portion (210). The resisting portion (110) passes through and is against the second frame (22). The hook portion (210) passes through and hooks on the first frame (111). The contact portion (20) is disposed toward the resisting portion (110) from a side of the first frame (111).

**FIG.1****EP 3 306 750 A1**

Description**BACKGROUND OF THE INVENTION**

Field of the Invention

[0001] The present invention relates to an electrical connector and in particular to a structure improvement for connection terminals of a terminal block.

Description of Prior Art

[0002] A terminal block is an electronic component widely applied to various machines and tools which need electrical connection. The terminal block can be used for the connection with a power cable and a control cable, or used for data transmission line.

[0003] However, the terminal in the traditional terminal block is formed by a mutual combination of a body and an elastic plate; the mutual combination is achieved by riveting or snap-in latch. Due to the terminals suffering from the repeated use of connection, the combination effect between the body and the elastic plate is likely to be damaged or the connection could be separated due to insufficient strength of snap-in latch structure. Consequently, the terminals will lose the original functions easily.

[0004] In view of this, the inventor pays special attention to research with the application of related theory and tries to improve and overcome the above disadvantages regarding the above related art, which becomes the improvement target of the inventor.

SUMMARY OF THE INVENTION

[0005] The main objective of the present invention is to provide a structure improvement for connection terminals of a terminal block, which can achieve a good combination effect by mutual hooking or mutual resisting between the components.

[0006] To achieve the above objective, the present invention provides a structure improvement for connection terminals of a terminal block, which comprises a frame body and at least one elastic part. The frame body has a bottom plate and at least one standing plate bending and extending from a side of the bottom plate. The standing plate further extends to form a resisting portion and a first frame curved opposite to the resisting portion. The elastic part has a contact portion, a hook portion further extending from the contact portion, and a second frame curved opposite to the hook portion. The resisting portion passes through the second frame to resist in the second frame. The hook portion passes through the first frame to hook on the first frame. The contact portion is disposed and moved from a side of the first frame to the resisting portion. Thus, a good combination effect can be achieved by means of mutual hooking and mutual resisting between the frame body and the elastic part.

BRIEF DESCRIPTION OF DRAWING**[0007]**

FIG. 1 is a perspective exploded view of the first embodiment of the present invention;

FIG. 2 is a perspective assembled view of the first embodiment of the present invention;

FIG. 3 is a cross-sectional view of the connection terminal disposed in the terminal block in operation according to the first embodiment of the present invention;

FIG. 4 is a perspective exploded view of the second embodiment of the present invention;

FIG. 5 is a perspective view of the elastic part according to the third embodiment of the present invention; and

FIG. 6 is a perspective view of the elastic part according to the fourth embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0008] To understand the technical features and details of the present invention, please refer to the following detailed description and accompanying figures. However, the accompanying figures are only for reference and explanation, but not to limit the scope of the present invention.

[0009] Please refer to FIGS. 1, 2, and 3, which are the perspective exploded view of the first embodiment of the present invention, the perspective assembled view of the first embodiment of the present invention, and the cross-sectional view of the connection terminal disposed in the terminal block in operation according to the first embodiment of the present invention, respectively. The present invention provides a structure improvement for connection terminals of a terminal block, which is disposed in the terminal block 3. The terminal block 3 is provided with a hollow terminal slot 30 therein and a plug hole 31 therein communicating with the terminal slot 30 for the insertion of the connecting wire (not shown) such that after the connection terminals of the terminal block are disposed in the terminal slot 30, an electrical connection of the connection wire can be provided by inserting the connection wire into the plug hole 31. The connection terminals of the terminal block comprise a frame body 1 and at least one elastic part 2.

[0010] The frame body 1 has a bottom plate 10 and at least one standing plate 11 bending and extending from a side of the bottom plate 10. In the current embodiment of the present invention, the frame body 1 has two standing plates 11 which are individually disposed at two sides of the bottom plate 10 to bend and extend; the two sides of the bottom plate 10 are opposite to and separate from each other. Each of the two standing plates 11 further extends to form a resisting portion 110 and a first frame 111 curved opposite to the resisting portion 110. The

resisting portion 110 can bend toward outside of the standing plate 11. The first frame 111 can be shaped like a letter of "U" or "L" and comprises a first primary frame edge 112 and at least one first secondary frame edge 113 which extends from the standing plate 11 and connects to the first primary frame edge 112 such that a first opening 114 is formed in the first frame 111.

[0011] The elastic part 2 is combined between the resisting portion 110 and the first frame 111; the number of the elastic parts 2 can be increased corresponding to that of the standing plates 11. That is, each of standing plates 11 corresponds to an elastic part 2. Each of standing plates 11 has a contact portion 20, a hook portion 210 further extending from the contact portion 20, and a second frame 22 curved opposite to the hook portion 210. The second frame 22 and the contact portion 20 extend in the same direction. In an embodiment of the present invention, the contact portion 20 forms a curved portion 21 which is integrally connected to the hook portion 210 and the second frame 22. The hook portion 210 further can consist of a hook end 211 and an elastic arm 212 and be connected to the contact portion 20 or the curved portion 21 through the elastic arm 212. The second frame 22 can be also shaped like a letter of "U" or "L" and comprises a second primary frame edge 220 and at least one second secondary frame edge 221 which extends from the contact portion 20 or the curved portion 21 to connect to the second primary frame edge 220 such that a second opening 222 is formed in the second frame 22.

[0012] During the assembly, the contact portion 20 of the elastic part 2 has to be disposed toward the resisting portion 110 from a side of the first frame 111. After the resisting portion 110 of the frame body 1 passes through the second opening 222 in the second frame 22 of the elastic part 2 such that the resisting portion 110 resists in the second frame 22, the hook portion 210 of the elastic part 2 passes through the first opening 114 of the first frame 111 such that the hook portion 210 hooks on the first frame 111. In this way, a good combination effect can be achieved by means of the mutual hooking and mutual resisting.

[0013] Thus, by means of the above structure, the structure improvement for connection terminals of a terminal block of the present invention is obtained.

[0014] Moreover, please refer to FIG. 4, which is a perspective exploded view of the second embodiment of the present invention. To make the hook portion 210 of the elastic part 2 hook on the first frame 111 more firmly, a slit 115 can be recessed at the inner edge of the first primary frame edge 112 of the first frame 111 to match with and fix the hook end 211 of the hook portion 210.

[0015] In addition, please refer to FIGS. 5 and 6, which are the perspective views of the elastic part according to the third and the fourth embodiments of the present invention, respectively. The length of the elastic arm 212 of the hook portion 210 can be zeroed, decreased (shown in FIG. 5), or increased (shown in FIG. 6) depending on

the configuration between the elastic part 2 and the frame body 1. Also, as shown in FIG. 6, two slots 213 can be individually disposed at two sides of the hook end 211 of the hook portion 210 to match with and further lock the slit 115.

Claims

1. A structure improvement for connection terminals of a terminal block, comprising:

a frame body (1) having a bottom plate (10) and at least one standing plate (11) bending and extending from a side of the bottom plate (10), wherein the standing plate (11) further extends to form a resisting portion (110) and a first frame (111) curved opposite to the resisting portion (110); and

at least one elastic part (2) having a contact portion (20), a hook portion (210) further extending from the contact portion (20), and a second frame (22) curved opposite to the hook portion (210),

wherein the resisting portion (110) passes through the second frame (22) to be against the second frame (22), wherein the hook portion (210) passes through the first frame (111) to hook on the first frame (111), wherein the contact portion (20) is disposed toward the resisting portion (110) from a side of the first frame (111).

2. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the frame body (1) has two standing plates (11) which are individually disposed at two sides of the bottom plate (10) to bend and extend, wherein the two sides of the bottom plate (10) are opposite to and separate from each other, wherein each of the two standing plates (11) corresponds to the elastic part (2).

3. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the resisting portion (110) bends toward outside of the standing plate (11).

4. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the first frame (111) is shaped like a letter of "U" or "L" and comprises a first primary frame edge (112) and at least one first secondary frame edge (113) which extends from the standing plate (11) and connects to the first primary frame edge (112) such that a first opening (114) is formed in the first frame (111).

5. The structure improvement for connection terminals of a terminal block according to claim 4, wherein a slit (115) is recessed at an inner edge of the first

primary frame edge (112) to match with the hook portion (210).

6. The structure improvement for connection terminals of a terminal block according to claim 5, wherein two slots (213) are individually disposed at two sides of the hook portion (210) to match with the slit (115). 5
7. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the contact portion (20) forms a curved portion (21) which is integrally connected to the hook portion (210) and the second frame (22). 10
8. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the hook portion (210) consists of a hook end (211) and an elastic arm (212) and is connected to the contact portion (20) through the elastic arm (212). 15
9. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the second frame (22) is shaped like a letter of "U" or "L" and comprises a second primary frame edge (220) and at least one second secondary frame edge (221) which extends from the contact portion (20) and connects to the second primary frame edge (220) such that a second opening (222) is formed in the second frame (22). 20 25
10. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the second frame (22) and the contact portion (20) extend in the same direction. 30

Amended claims in accordance with Rule 137(2) EPC.

1. A structure improvement for connection terminals of a terminal block, comprising: 40

a frame body (1) having a bottom plate (10) and at least one standing plate (11) bending and extending from a side of the bottom plate (10), wherein the standing plate (11) further extends to form a resisting portion (110) and a first frame (111) curved opposite to the resisting portion (110), wherein the first frame (111) is shaped like a letter of "U" or "L" and comprises a first primary frame edge (112) and at least one first secondary frame edge (113) which extends from the standing plate (11) and connects to the first primary frame edge (112) such that a first opening (114) is formed between the first primary frame edge (112) and the first secondary frame edge (113); and 45
at least one elastic part (2) having a contact por-

tion (20), a hook portion (210) further extending from the contact portion (20), and a second frame (22) curved opposite to the hook portion (210),

wherein the resisting portion (110) passes through the second frame (22) to be against the second frame (22), wherein the hook portion (210) passes through the first frame (111) to hook on the first frame (111), wherein the contact portion (20) is disposed toward the resisting portion (110) from a side of the first frame (111).

2. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the frame body (1) has two standing plates (11) which are individually disposed at two sides of the bottom plate (10) to bend and extend, wherein the two sides of the bottom plate (10) are opposite to and separate from each other, wherein each of the two standing plates (11) is matched with an elastic part (2). 20
3. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the resisting portion (110) bends toward outside of the standing plate (11). 25
4. The structure improvement for connection terminals of a terminal block according to claim 1, wherein a slit (115) is recessed at an inner edge of the first primary frame edge (112) to match with the hook portion (210). 30
5. The structure improvement for connection terminals of a terminal block according to claim 4, wherein two slots (213) are individually disposed at two sides of the hook portion (210) to match with the slit (115). 35
6. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the contact portion (20) forms a curved portion (21) which is integrally connected to the hook portion (210) and the second frame (22).
7. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the hook portion (210) consists of a hook end (211) and an elastic arm (212) and is connected to the contact portion (20) through the elastic arm (212).
8. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the second frame (22) is shaped like a letter of "U" or "L" and comprises a second primary frame edge (220) and at least one second secondary frame edge (221) which extends from the contact portion (20) and connects to the second primary frame edge (220) such that a second opening (222) is formed in the second frame (22). 50 55

9. The structure improvement for connection terminals of a terminal block according to claim 1, wherein the second frame (22) and the contact portion (20) extend in the same direction.

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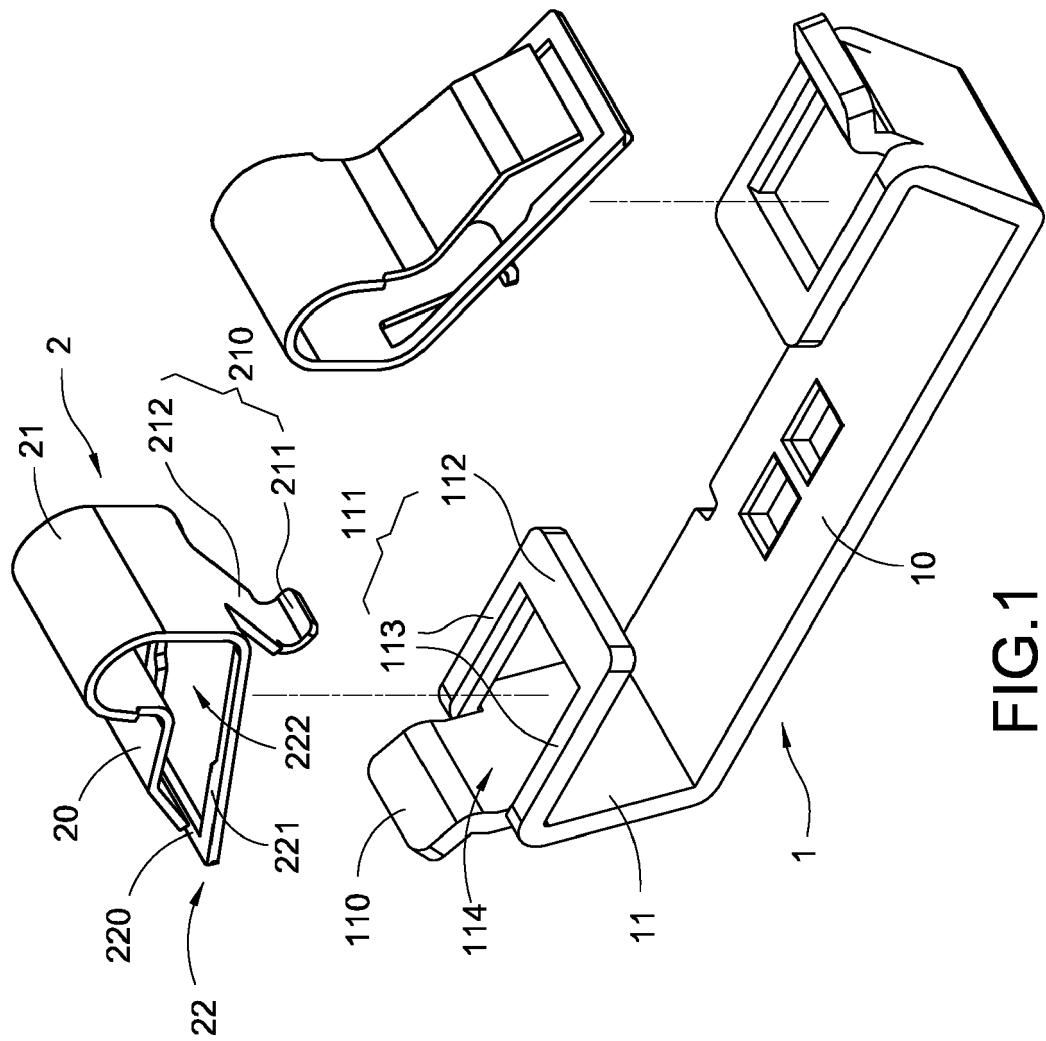


FIG.1

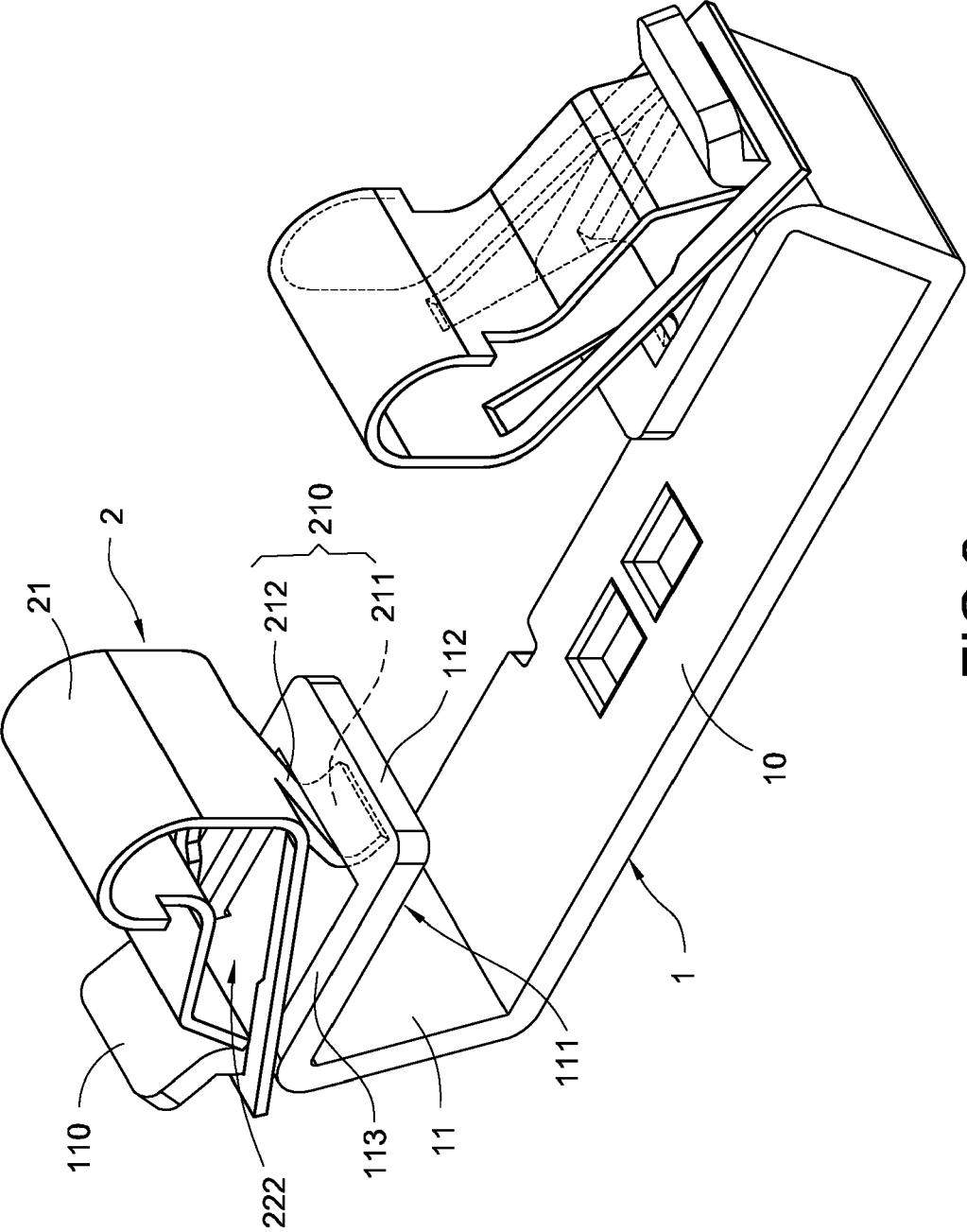


FIG.2

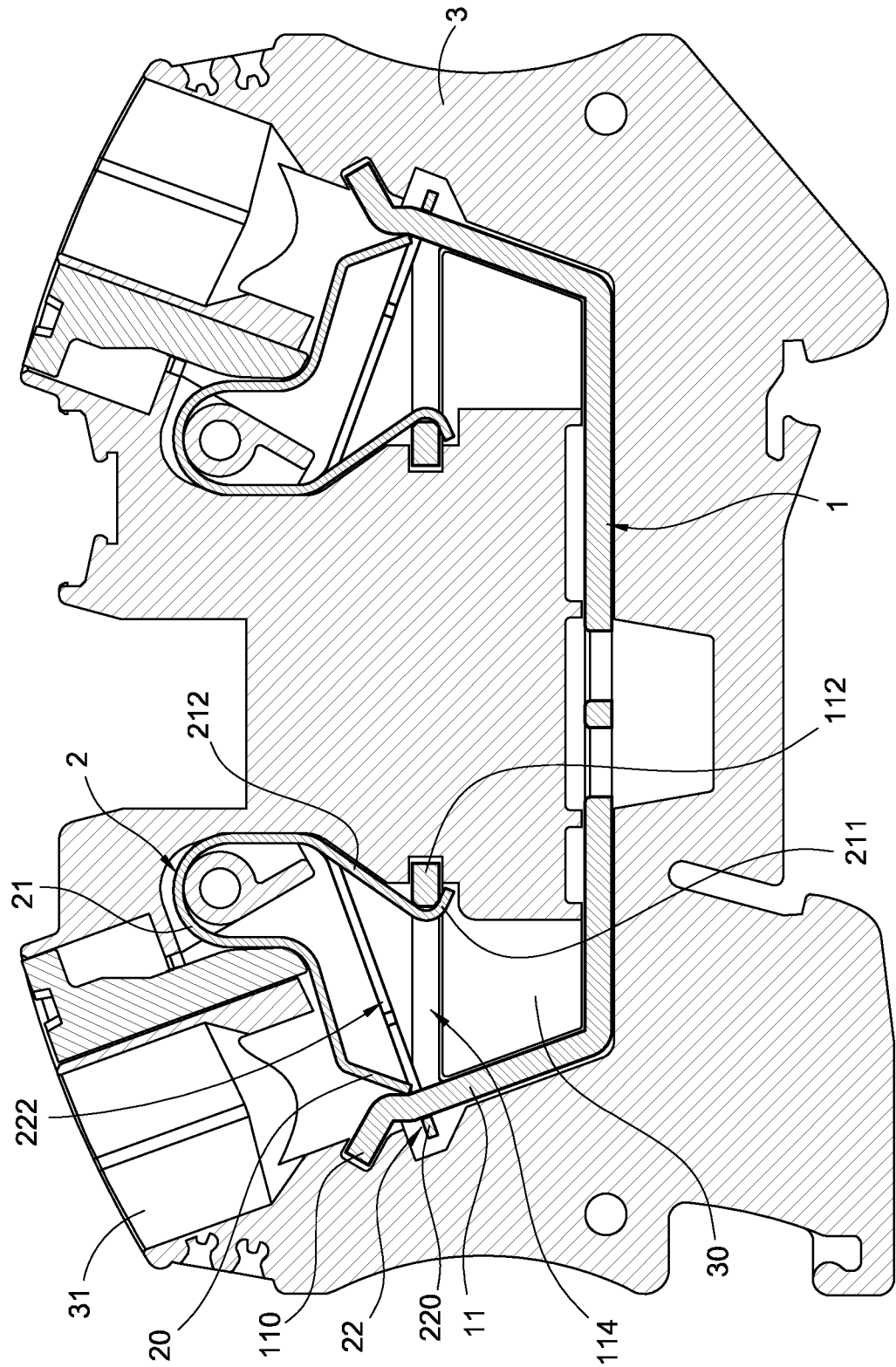


FIG.3

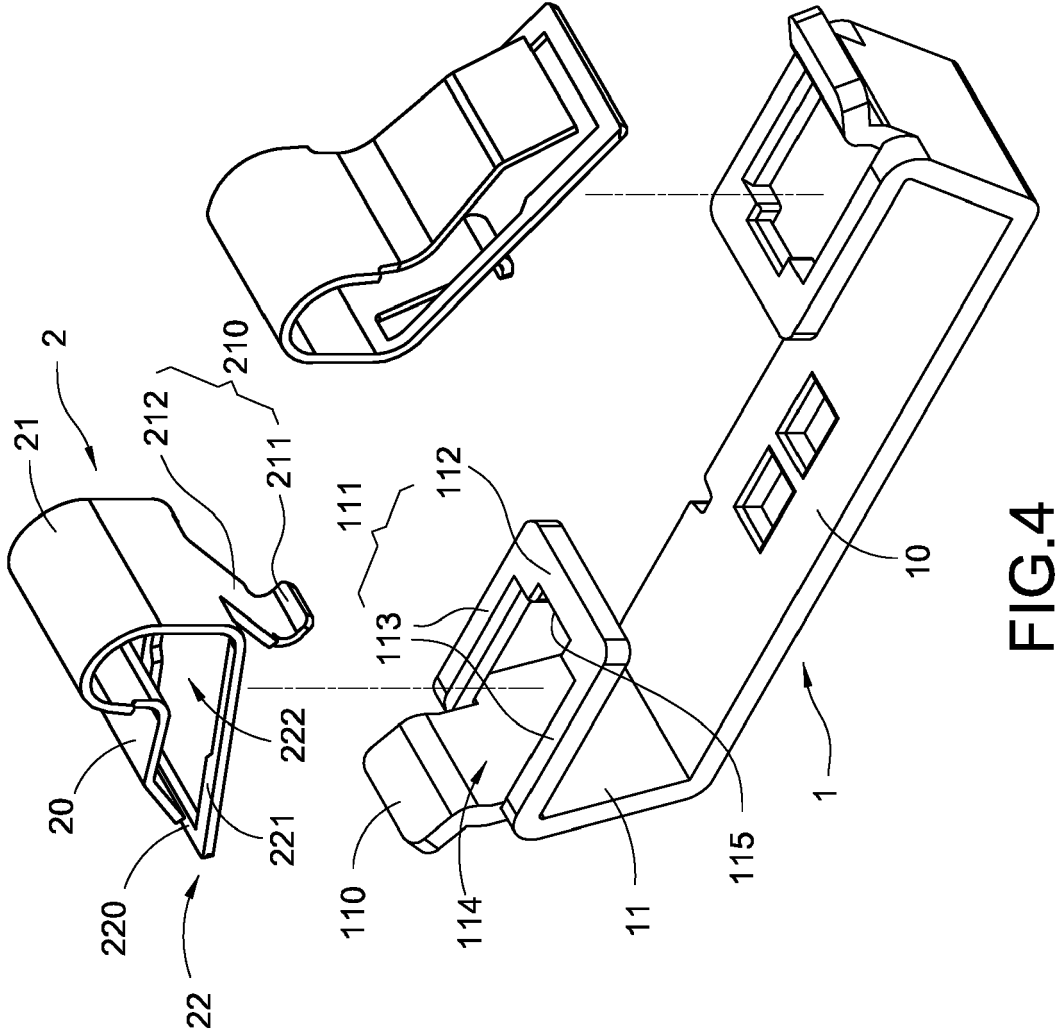


FIG.4

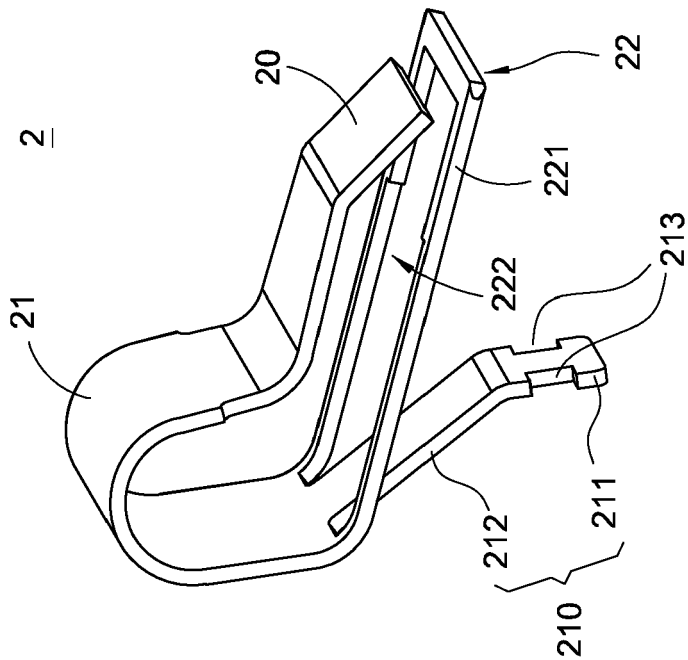


FIG.5

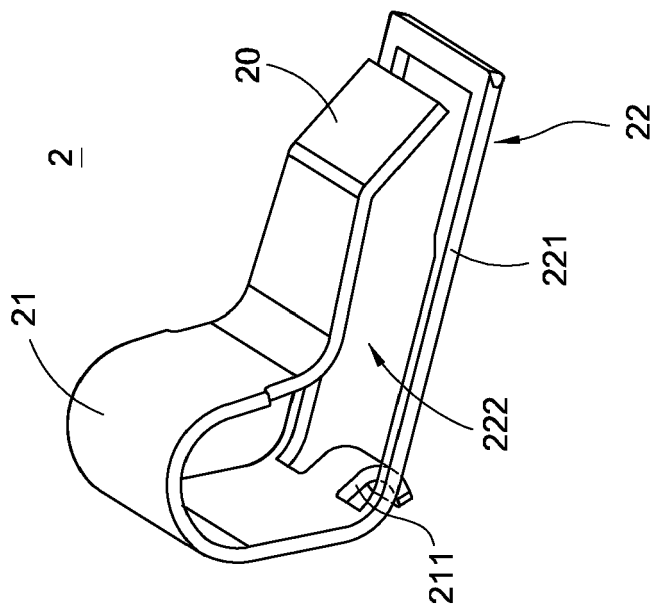


FIG.6



EUROPEAN SEARCH REPORT

Application Number
EP 16 19 2624

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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Y	* figures 1,2 *	2,5,6,8	ADD. H01R9/26
Y	EP 1 515 397 A1 (WEIDMUELLER INTERFACE [DE]) 16 March 2005 (2005-03-16) * figure 9 *	2	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		14 December 2016	Alberti, Michele
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			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 16 19 2624

5 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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