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(54) **WIRING TERMINAL AND ASSOCIATED ELECTRONIC DEVICE**

(57) Embodiments of the present disclosure provide a wiring terminal and an associated electronic device. The wiring terminal comprises a base attached to a portion of a wall of a housing of an electronic device; a first conductor portion coupled to the base and adapted to be electrically coupled to an electronic module of the electronic device; a second conductor portion coupled to the base and electrically coupled to the first conductor portion, the second conductor portion adapted to be electrically connected to a second conductor portion of a same size terminal via a lead; wherein the first conductor portion and the second conductor portion are arranged in a stepped manner such that the second conductor portion is more adjacent to the portion of the wall than the first conductor portion.

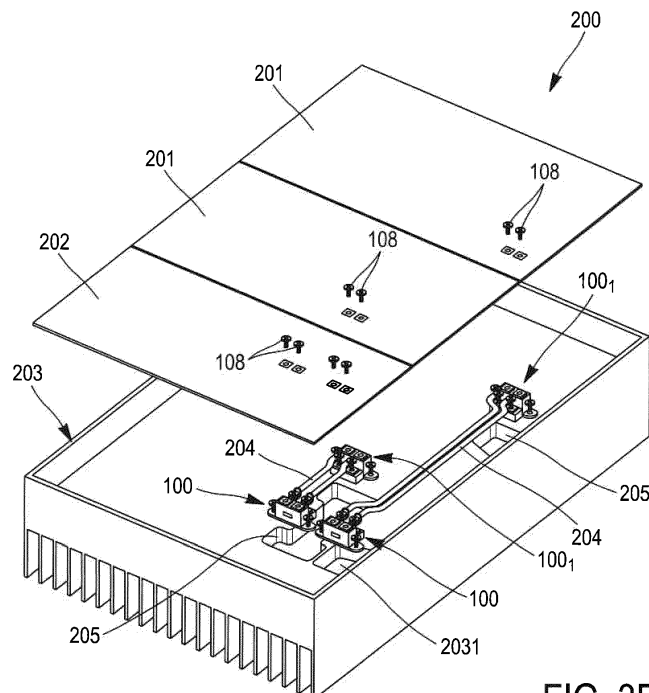


FIG. 3B

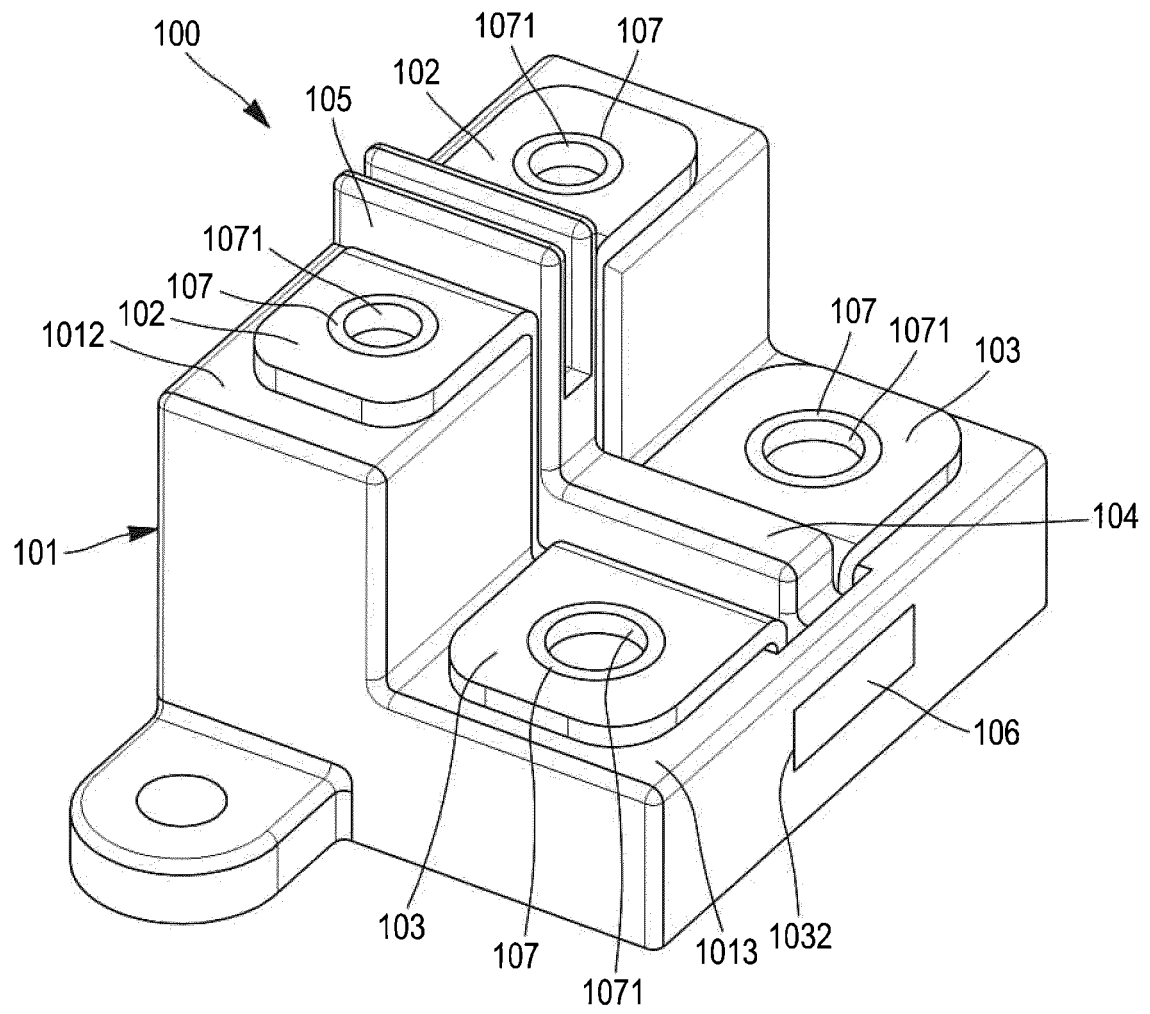


FIG. 5

Description

TECHNICAL FIELD

[0001] Embodiments of the present disclosure generally relate to a wiring terminal and more specifically, to a wiring terminal that can be used in electronic devices.

BACKGROUND

[0002] Majority of currently available electronic devices have separate power modules to power the functional modules. The power module can convert the mains or 48V DC input to 5V or 12V or other DC power to the function modules. Conventionally, power modules and functional modules are electrically connected by wires or by back-insertion. As to the back-insertion, the power module is provided with a socket, and the circuit board of the function module is provided with a matching plug arranged at a corresponding position on back side thereof. The plug is inserted into the socket to form an electrical connection to supply power to the function module. It is also known that power modules and functional modules can be electrically connected to each other via wires. In this case, the wiring terminal is placed on the front side of the power module and the circuit board, and the power module is electrically connected to the circuit board by coupling the wire to the wiring terminal.

SUMMARY

[0003] Embodiments of the present disclosure provide a wiring terminal to address or at least partially address the above and other potential problems of conventional wiring terminals.

[0004] In a first aspect, embodiments of the present disclosure provide a wiring terminal. The wiring terminal comprises a base attached to a portion of a wall of a housing of an electronic device; a first conductor portion coupled to the base and adapted to be electrically coupled to an electronic module of the electronic device; and a second conductor portion coupled to the base and electrically coupled to the first conductor portion, the second conductor portion adapted to be electrically connected to a second conductor portion of another terminal with a same specification via a lead; wherein the first conductor portion and the second conductor portion are arranged in a stepped manner such that the second conductor portion is more adjacent to the portion of the wall of the housing than the first conductor portion, thereby allowing the lead to be positioned between the portion of the wall and the electronic module to provide electromagnetic interference shielding for the electronic module.

[0005] In some embodiments, the base further comprises a first coupling portion arranged adjacent and parallel to the first conductor portion; and a second coupling portion arranged adjacent and parallel to the second conductor portion.

[0006] In some embodiments, the first conductor portion and the second conductor portion are integrally formed on a conductive sheet.

[0007] In some embodiments, each of the first conductor portion and the second conductor portion comprises a pair of parts for connecting two electrodes of the electronic modules.

[0008] In some embodiments, the wiring terminal further comprises a first protrusion protruding from the second coupling portion and arranged between the pair of parts of the second conductor portion to avoid electrical contact between the lead and an adjacent one of the pair of parts.

[0009] In some embodiments, the wiring terminal further comprises a second protrusion protruding from the first coupling portion and arranged between the pair of parts of the first conductor portion for position the electronic module.

[0010] In some embodiments, the wiring terminal further comprises a receiving groove formed between the first protrusion and the second coupling portion and/or between the second protrusion and the first coupling portion to receive the conductive sheet.

[0011] In some embodiments, the wiring terminal further comprises a limiting slot formed on the conductive sheet; an opening formed on at least one side of the base perpendicular to the receiving groove, and the opening aligned with the limiting slot; and a limiting member arranged in the opening and the limiting slot to limit displacement of the conductive sheet in a direction perpendicular to the first coupling portion.

[0012] In some embodiments, the wiring terminal further comprises a first fastener arranged in each of the first coupling portion and a second coupling portion, the first fastener comprising a threaded hole; a through hole formed on each of the first conductor portion and the second conductor portion and axially aligned with the threaded hole; and a second fastener adapted to be engaged with the threaded hole via the through hole to electrically connect the electronic module to the first conductor portion and connect the lead to the second conductor portion.

[0013] In some embodiments, the first fastener comprises a rivet nut or a weld nut.

[0014] In some embodiments, the wiring terminal further comprises a resilient projection arranged on the first conductor portion to facilitate electrical connection of the electronic module to the first conductor portion.

[0015] In a second aspect, embodiments of the present disclosure provide an electronic device. The electronic device comprises a housing; a plurality of electronic modules arranged in the housing; and a wiring terminal of any of claims 1-11, for electrically connecting the plurality of electronic modules via leads.

[0016] In some embodiments, the electronic device further comprises a wiring groove formed in the housing for arranging the wiring terminal to receive the wiring terminal and the lead.

[0017] It is to be understood that the Summary is not intended to identify key or essential features of embodiments of the present disclosure, nor is it intended to be used to limit the scope of the present disclosure. Other features of the present disclosure will become easily comprehensible through the description below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The above and other objectives, features and advantages of the present disclosure will become more apparent through more detailed depiction of example embodiments of the present disclosure in conjunction with the accompanying drawings, wherein in the example embodiments of the present disclosure, same reference numerals usually represent same components.

FIG. 1 shows a conventional electrical connection between electronic modules using open-wire;

FIG. 2 shows a conventional electrical connection between the electronic modules using back-insertion;

FIGs. 3A and 3B show exploded views of electronic devices in accordance with embodiments of the present disclosure;

FIGs. 4A and 4B show cross-sectional views of electronic devices in accordance with embodiments of the present disclosure;

FIG. 5 shows a perspective view of a wiring terminal in accordance with embodiments of the present disclosure;

FIG. 6 shows an exploded perspective view of a wiring terminal in accordance with embodiments of the present disclosure;

FIG. 7 shows a perspective view of another embodiment of a wiring terminal in accordance with embodiments of the present disclosure.

[0019] Throughout the drawings, the same or similar reference symbols are used to indicate the same or similar elements.

DETAILED DESCRIPTION

[0020] Embodiments of the present disclosure will now be discussed with reference to several example embodiments. It is to be understood these embodiments are discussed only for the purpose of enabling those skilled persons in the art to better understand and thus implement the present disclosure, rather than suggesting any limitations on the scope of the subject matter.

[0021] As used herein, the term "comprises" and its variants are to be read as open terms that mean "comprises, but is not limited to." The term "based on" is to be read as "based at least in part on." The term "one embodiment" and "an embodiment" are to be read as "at least one embodiment." The term "another embodiment" is to be read as "at least one other embodiment." The

terms "first," "second," and the like may refer to different or same objects. Other definitions, explicit and implicit, may be comprised below. A definition of a term is consistent throughout the description unless the context clearly indicates otherwise.

[0022] Electronic modules such as power modules and function modules in current electronic devices are electrically connected by means of back-insertion or open-wire. FIG. 1 shows a manner in which a functional module 201' and a power module 202' are connected by open-wire in a conventional electronic device. Apparently, in this manner, the wiring terminal 100' is arranged on the front side of the functional module 201' and the power module 202', and the lead 204' connecting the functional module 201' with the power module 202' is exposed to the outside.

[0023] This type of open-wire electrical connection often requires screwing or soldering, which is cumbersome for assembly and disassembly, resulting in time-consuming and high cost installation and maintenance. In addition, such open-wire arrangement cannot be used to connect too many functional modules 201'. This is because, if too many functional modules 201' are connected, the excessive leads 204' may obscure (or obstruct) some of the functional modules 201'. Even if there are not many functional modules 201' to be connected, the aesthetic appearance of the electrical device would be adversely affected with the open-wires. Further, the inventors have also observed that there is no electromagnetic shielding measure in the vicinity of the wiring terminal 100'. As a result, it is easy to cause electromagnetic interference between the lead 204' and the electronic components on the functional module 201'.

[0024] FIG. 2 shows an implementation of connecting the function module 201" and the power module 202" in a conventional solution using a plug 100". Although wiring is not required in this method, the problem that may arise is that such design may not be suitable for long distance wiring. Furthermore, higher positioning accuracy is required to the function module 201" and the power module 202", which increases the costs in processing and installation. In addition, upgrading of the electronic device is inconvenient with this method. Moreover, just like the open-wire wiring, there is no electromagnetic shielding in the vicinity of the plug 100", which causes the problem of electromagnetic interference. On the other hand, if a plug 100" with electromagnetic shielding is used, the cost will be very high.

[0025] Embodiments of the present disclosure provide a wiring terminal 100 to address or at least partially address the above-noted problems and/or other potential problems of conventional wiring terminal. Some example embodiments will now be described with reference to FIGs. 3A-7.

[0026] FIGs. 3A and 3B show exploded views of electronic devices 200 in accordance with embodiments of the present disclosure, in which positions of the wiring terminals 100 are illustrated. FIGs. 4A and 4B show

cross-sectional views of electronic device 200 in accordance with embodiments of the present disclosure; FIG. 5 illustrates a perspective view of a wiring terminal 100 in accordance with embodiments of the present disclosure. As shown, the wiring terminal 100 according to embodiments of the present disclosure generally comprises a base 101, a first conductor portion 102 and a second conductor portion 103. As can be seen from FIGs. 3A and 3B, the base 101 is attached to a portion of a wall 2031 of a housing 203 of the electronic device 200.

[0027] Specifically, in some embodiments, the wall 2031 may be a bottom wall of the housing 203 without a wiring groove, as shown in FIGs. 3A and 4A. That is, the wiring terminal 100 may be attached to the bottom wall of the housing 203 and electronic modules may be arranged in the housing 203 with edges of the electronic modules abutting a step 2032 formed on side walls of the housing 203.

[0028] Furthermore, in some embodiments, the housing 203 may be made of metal such as aluminum, steel or the like and the electronic modules such as circuit boards comprise copper-cladded plates. In this way, the side walls and wall 2031 of the housing 203 along with the copper-cladded plate can form a shield cavity to shield electromagnetic interference (EMI) at the wiring terminal 100, thereby improving the performance of the electronic device 200.

[0029] In some alternative embodiments, in order to further enhance the EMI shielding effect, a wiring groove 205 may be provided in the bottom wall of the housing 203 for receiving the wiring terminal 100. In these embodiments, the wall 2031 may comprise an upper portion which is the bottom wall of the housing 203 and a lower portion which is a bottom wall of the wiring groove 205, as shown in FIGs. 3B and 4B. That is, the wiring terminal 100 is attached to a lower portion of the wall 2031. In this way, the wiring groove 205 and the copper-cladded plate of the electronic module may form a more closed shield cavity for receiving the wiring terminal 100, thereby improving the effect of the EMI shielding for the electronic module.

[0030] The first conductor portion 102 and the second conductor portion 103 are electrically connected. They may be contacts and are respectively coupled to the base 101. The first conductor portion 102 can be electrically connected to an electronic module such as a function module 201 and a power module 202. Merely as an example, the electronic module here comprises the functional module 201 (such as a circuit board) and the power module 202, but it is to be understood that the electronic module may be any suitable module that can perform certain function by electrical connection through wires.

[0031] Wire terminals 100 are typically used in pairs. The first conductor portion 102 of one of a pair of the wiring terminals 100, 100₁ may be electrically connected to one electronic module (for example, the power module 202) to be connected. At the same time, the first conductor portion 102₁ of another wiring terminal 100₁ may be

electrically connected to another electronic module (for example, the functional module 201) to be connected, as shown in FIGs. 4A and 4B. The second conductor portion 103 of one of a pair of the wiring terminals 100, 100₁ can be electrically connected to the second conductor portion 103₁ of another wiring terminal 100₁ with a same specification via the lead 204, thereby connecting the two electronic modules (for example the function module 201 and the power module 202) as mentioned above.

[0032] It can be seen that this arrangement enables the lead 204 to be hidden behind the electronic module, such as the functional module 201 and the power module 202, i.e., between the electronic module and the wall 2031, as shown in FIGs. 4A and 4B. When observed from outside, the electronic device 200 has no messy leads exposed, which improves the aesthetic appearance of the electronic device. In addition, this wiring method with the wiring terminal 100 is simple and easy to implement. Specifically, prior to the connection, two wiring terminals 100, 100₁ are only needed to be connected by leads 204, and then respectively coupled to two electronic modules by suitable means, so as to conveniently connect the electronic modules.

[0033] It can be seen that the wiring terminal 100 is simple in structure and convenient to install, which significantly reduces cost in manufacturing and installation. In addition, the flexibility of the connection mode is increased, which is beneficial for the structural adjustment of the electronic device 200. In this way, the layout of the electronic module becomes more reasonable. In addition, various wiring forms such as short-distance and long-distance wiring can be implemented with this wiring terminal 100. Furthermore, not only can the wiring terminal 100 be applied to the interior of the electronic device 200, but it is also applicable to occasions having similar connection requirements.

[0034] Furthermore, the lead 204 as mentioned in the present disclosure refers to any suitable wire or conductor that can electrically connect two electronic modules. For example, lead 204 may be a common electrical wire. Furthermore, a connection fork may be provided at the end of the electrical wire to facilitate coupling with the second conductor portion 103. In some alternative embodiments, the lead 204 may also be a conductive sheet or similar structure in a case where the connection distance is relatively short.

[0035] In order to further facilitate manufacture and assembly, in some embodiments, the first conductor portion 102 and the second conductor portion 103 may be integrally formed on the conductive sheet. For example, the first conductor portion 102 and the second conductor portion 103 may be formed on the conductive sheet by means of bending or punching. Of course, this is merely exemplary and is not intended to limit the scope of the disclosure. The first conductor portion 102 and the second conductor portion 103 may be formed in any suitable manner. For example, the first conductor portion 102 and

the second conductor portion 103 may also be separately manufactured and electrically connected with each other in a suitable manner.

[0036] Each of the first conductor portion 102 and the second conductor portion 103 may comprise two parts arranged in pairs, respectively, for connecting two electrodes in the electronic module, as shown in FIGs. 3A, 3B and 5. The pair of parts of the first conductor portion 102 or the second conductor portion 103 may be formed on a separate conductive sheet, respectively. In this way, one of the pair of the parts of the first conductor portion 102 may be used to electrically connect to a positive voltage electrode (for example, 5V or 12V, etc.) of the electronic module and the another one may be used to electrically connect to the ground electrode.

[0037] In some embodiments, in order to facilitate the coupling between the electronic module and the first conductor portion 102 as well as the coupling between the lead 204 and the second conductor portion 103, the base 101 may also comprise two coupling portions, namely, a first coupling portion 1012 and a second coupling portion 1013. The first coupling portion 1012 is adjacent and parallel to the first conductor portion 102 to provide a coupling position for the electronic module that is electrically coupled to the first conductor portion 102. The second coupling portion 1013 is adjacent and parallel to the second conductor portion 103 to provide a coupling position for the coupling of the leads 204.

[0038] In order to prevent the leads 204 electrically connected to the pair of parts of the second conductor portion 103 from touching the adjacent one of the pair of parts of the second conductor portion 103, in some embodiments, the first protrusion 104 may be arranged at the second coupling portion 1013. The first protrusion 104 is arranged between the pair of parts of the second conductor portion 103, thereby preventing the lead 204 from being in electrical contact with the adjacent one of the pair of parts of the second conductor portion 103.

[0039] In some embodiments, a second protrusion 105 may also protrude from the first coupling portion 1012. The second protrusions 105 may also be formed between the first conductor portions 102. A groove corresponding to the second protrusion 105 may be formed at a corresponding position of the electronic module. When the electronic module is electrically coupled to the first conductor portion 102, the groove and the second projection 105 fit with each other to position the electronic module, thereby preventing looseness of the electronic module during use.

[0040] In some embodiments, on both sides of the first protrusion 104 and/or the second protrusion 105, receiving grooves 109 for receiving the conductive sheets may be formed as shown in FIG.6. The conductive sheet integrally formed with the first conductor portion 102 and the second conductor portion 103 may be arranged in the receiving groove 109. This arrangement makes the assembly of the first conductor portion 102 and the second conductor portion 103 easier, thereby further reduc-

ing the cost.

[0041] After the conductive sheet is assembled in the receiving groove 109, in order to provide a limit to the conductive sheet in a direction perpendicular to the first coupling portion 1012 or the second coupling portion 1013, in some embodiments, a limiting slot 1031 may be formed on the conductive sheet. An opening 1032 aligned with the limiting slot 1031 may be accordingly formed on at least one side of the base 101 perpendicular to the receiving groove 109, as shown in FIG. 6.

[0042] Due to the viewing angle, only an opening 1032 formed on one side of the base 101 perpendicular to the receiving groove 109 is visible from FIG. 6. It should be understood that another opening 1032 may also be formed on the other side which is opposite to the side. A corresponding limiting slot 1031 may be accordingly formed on the conductive sheet at a position corresponding to the opening 1032. The aligned opening 1032 and the limiting slot 1031 may be used to receive a limiting member 106. In this way, displacement of the conductive sheet in a direction perpendicular to the first coupling portion 1012 or the second coupling portion 1013 can be provided in a simple and cost effective manner.

[0043] After the wiring terminals 100 to which the lead 204 has been connected are assembled to the wall 2031 of the housing 203, the electronic module can be assembled into the housing 203, such that the first conductor portion 102 of the wiring terminal 100 is electrically connected to the electronic module. However, there is inevitably an assembly error between the electronic module and the housing 203. For example, in different electronic devices 200, there may be a difference in the distance from the electronic module to the wall 2031 of the housing 203.

[0044] In view of this situation, in order to maintain a stable electrical connection between the first conductor portion 102 and the electronic module in the presence of assembly errors, in some embodiments, the conductive sheet may be allowed to be moved a certain distance in the direction perpendicular to the first coupling portion 1012 or the second coupling portion 1013 to compensate for assembly errors. For example, in some embodiments, the size of the limiting member 106 may be designed to be slightly smaller than the size of the limiting slot, such that the conductive sheet can be moved by a certain distance in a direction perpendicular to the first coupling portion 1012 or the second coupling portion 1013 to compensate for assembly errors.

[0045] Of course, it should be understood that the above-described embodiments for error compensation are merely exemplary and are not intended to limit the scope of the disclosure, and any other suitable manner is not possible. For example, in some alternative embodiments, an elastic member may also be arranged between the first conductor portion 102 and the first coupling portion 1012 and between the second conductor portion 103 and the second coupling portion 1013 to compensate for the assembly error between the electronic component

and the housing 203.

[0046] In some embodiments, the electrical connection between the lead 204 and the second conductor portion 103, and the electrical connection between the electronic module and the first conductor portion 102 may be accomplished by means of screw fastening. For example, in some embodiments, threaded holes 1071 may be arranged on the first coupling portion 1012 and the second coupling portion 1013. Accordingly, through holes 1033 aligned with the threaded holes 1071 may be arranged on the first conductor portion 102 and the second conductor portion 103.

[0047] The electronic module such as the function module 201 and the power module 202 may also be provided with through holes thereon, as shown in FIGs. 3A and 3B. Fasteners (referred to as a second fastener 108 for ease of discussion) such as screws pass through the through holes on the electronic module and the through holes 1033 on the first conductor portion 102 and the second conductor portion 103. The second fasteners 108 are then coupled to the threaded holes 1071 on the first coupling portion 1012 and the second coupling portion 1013. In this way, the parts of the first conductor portion 102 are electrically connected to electrodes on back side of the functional module 201 such as a circuit board. Similarly, the leads 204 and the second conductor portion 103 may be electrically connected as well.

[0048] In some embodiments, the threaded holes 1071 on the first coupling portion 1012 and the second coupling portion 1013 may be formed on a fastener (referred to as a first fastener 107 for ease of discussion). Then the first fastener 107 is arranged in the first coupling portion 1012 and the second coupling portion 1013, as shown in FIG. 6. The threaded hole 1071 formed in this manner makes the electrical connection between the functional module 201 and the first conductor portion 102 and between the lead 204 and the second conductor portion 103 more stable.

[0049] In some embodiments, the first fastener 107 may be a rivet nut, a weld nut or the like that is riveted or welded to the first conductor portion 102 and the second conductor portion 103. The use of such a common component can further reduce manufacturing costs. It should be understood, of course, that this is merely exemplary and is not intended to limit the scope of the disclosure. Any other suitable structure or arrangement is also possible. For example, in some alternative embodiments, the threaded holes 1071 may also be integrally formed on the first conductor portion 102 and the second conductor portion 103.

[0050] In order to avoid the effects of screws on the surface of the circuit board, in some embodiments, the perimeter of the through holes on the circuit board may be copper-cladded areas. This arrangement enables the fastening of the second fastener 108, such as a screw, to not affect surface of the circuit board. In this way, the durability of the wiring terminal 100 or even the entire electronic device 200 may be improved.

[0051] Considering that the electronic module is also fixed on the housing 203 in a suitable manner, for example, at its periphery, in order to further improve the convenience of electrical connection between the electronic module and the first conductor portion 102, in some embodiments, the first conductor portion 102 may be provided with a conductive resilient projection 1021, as shown in FIG. 7. By providing the resilient projection 1021, after the electronic module is mounted on the housing 203, the resilient projection 1021 on the first conductor portion 102 of the wiring terminal 100 that have been previously mounted will be electrically contacted with the corresponding electrode on the electronic module, thereby forming electrical connection between the first conductor portion 102 and the electronic module.

[0052] In this way, the components such as the wiring and screw heads become completely invisible on the front side of the electronic device 200, making the electronic device 200 more aesthetical. Moreover, the connection between the electronic modules is more convenient to be accomplished. For example, in order to be coupled with the first conductor portion 102, the electronic modules such as the function module 201 and the power module 202 are only needed to be assembled in the predetermined position. In addition, there is no need to reserve through holes for screws to pass through on the electronic module. As a result, manufacturing and assembly costs can be further reduced.

[0053] An electronic device 200 is also provided in accordance with another aspect of the present disclosure. The electronic device 200 comprises a housing 203 and a plurality of electronic modules to be connected. These electronic modules may be power modules, functional modules or any other suitable module. These electronic modules are connected with the wiring terminal 100 described above. In this way, the connected electronic device 200 has good electromagnetic compatibility, is easy to be upgraded, and has a more aesthetical appearance.

[0054] It should be appreciated that the above detailed embodiments of the present disclosure are only to exemplify or explain principles of the present disclosure and not to limit the present disclosure. Therefore, any modifications, equivalent alternatives and improvement, etc. without departing from the spirit and scope of the present disclosure shall be comprised in the scope of protection of the present disclosure. Meanwhile, appended claims of the present disclosure aim to cover all the variations and modifications falling under the scope and boundary of the claims or equivalents of the scope and boundary.

Claims

1. A wiring terminal (100) comprising:

a base (101) attached to a portion of a wall (2031) of a housing (203) of an electronic device (200);

- a first conductor portion (102) coupled to the base (101) and adapted to be electrically coupled to an electronic module of the electronic device (200); and
 a second conductor portion (103) coupled to the base (101) and electrically coupled to the first conductor portion (102), the second conductor portion (103) adapted to be electrically connected to a second conductor portion (103₁) of another wiring terminal (100₁) with a same specification via a lead (204);
 wherein the first conductor portion (102) and the second conductor portion (103) are arranged in a stepped manner such that the second conductor portion (103) is more adjacent to the portion of the wall (2031) than the first conductor portion (102), thereby allowing the lead (204) to be positioned between the portion of the wall (2031) and the electronic module to provide electromagnetic interference shielding for the electronic module.
2. The wiring terminal (100) of claim 1, wherein the base (101) further comprises:
- a first coupling portion (1012) arranged adjacent and parallel to the first conductor portion (102); and
 a second coupling portion (1013) arranged adjacent and parallel to the second conductor portion (103).
3. The wiring terminal (100) of claim 2, wherein the first conductor portion (102) and the second conductor portion (103) are integrally formed on a conductive sheet.
4. The wiring terminal (100) of claim 3, wherein each of the first conductor portion (102) and the second conductor portion (103) comprises a pair of parts for connecting two electrodes of the electronic module.
5. The wiring terminal (100) of claim 4, further comprising a first protrusion (104) protruding from the second coupling portion (1013) and arranged between the pair of parts of the second conductor portion (103) to avoid electrical contact between the lead (204) and the adjacent one of pair of parts.
6. The wiring terminal (100) of claim 5, further comprising a second protrusion (105) protruding from the first coupling portion (1012) and arranged between the pair of parts of the first conductor portion (102) to position the electronic module.
7. The wiring terminal (100) of claim 6, further comprising:
 a receiving groove (109) formed between the first protrusion (104) and the second coupling portion (1013) and/or between the second protrusion (105) and the first coupling portion (1012) to receive the conductive sheet.
8. The wiring terminal (100) of claim 7, further comprising:
 a limiting slot (1031) formed on the conductive sheet;
 an opening (1032) formed on at least one side of the base (101) perpendicular to the receiving groove (109), and the opening (1032) aligned with the limiting slot (1031); and
 a limiting member (106) arranged in the opening (1032) and the limiting slot (1031) to limit displacement of the conductive sheet in a direction perpendicular to the first coupling portion (1012).
9. The wiring terminal (100) of claim 2, further comprising:
 a first fastener (107) arranged in each of the first coupling portion (1012) and a second coupling portion (1013), the first fastener (107) comprising a threaded hole (1071);
 a through hole (1033) formed on each of the first conductor portion (102) and the second conductor portion (103) and axially aligned with the threaded hole (1071); and
 a second fastener (108) adapted to be engaged with the threaded hole (1071) via the through hole (1033) to electrically connect the electronic module to the first conductor portion (102) and connect the lead (204) to the second conductor portion (103).
10. The wiring terminal (100) of claim 9, wherein the first fastener (107) comprises a rivet nut or a weld nut.
11. The wiring terminal (100) of claim 1 further comprising:
 a resilient projection (1021) arranged on the first conductor portion (102) to facilitate electrical connection of the electronic module to the first conductor portion (102).
12. An electronic device (200) comprising:
 a housing (203);
 a plurality of electronic modules arranged in the housing (203); and
 wiring terminals (100) of any of claims 1-11 for electrically connecting the plurality of electronic modules via leads (204).
13. The electronic device (200) of claim 12, further comprising:

prising a wiring groove (205) formed in the housing (203) for arranging the wiring terminal (100) to receive the wiring terminals (100) and the leads (204).

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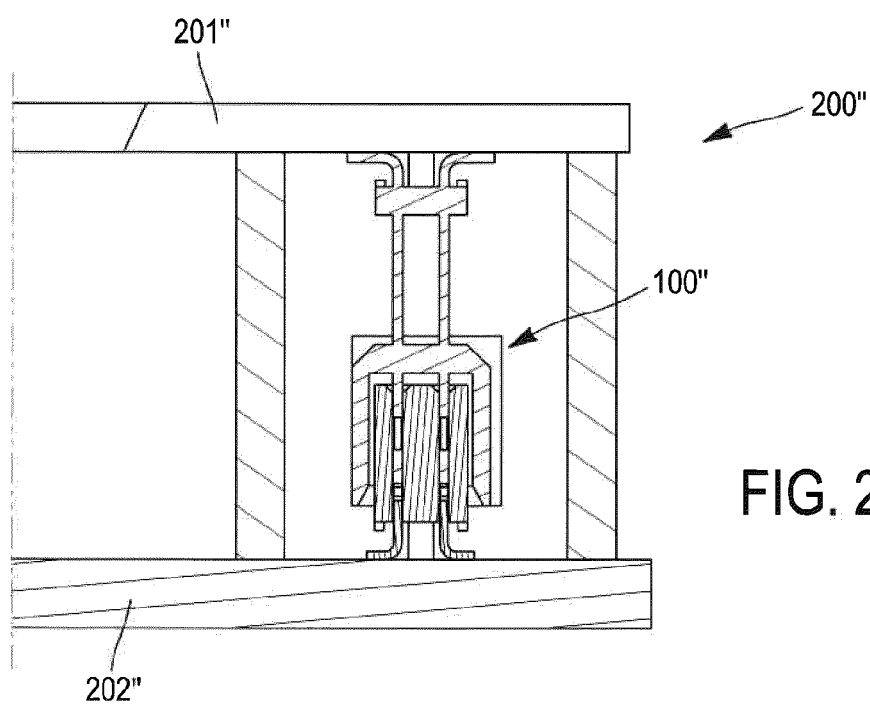
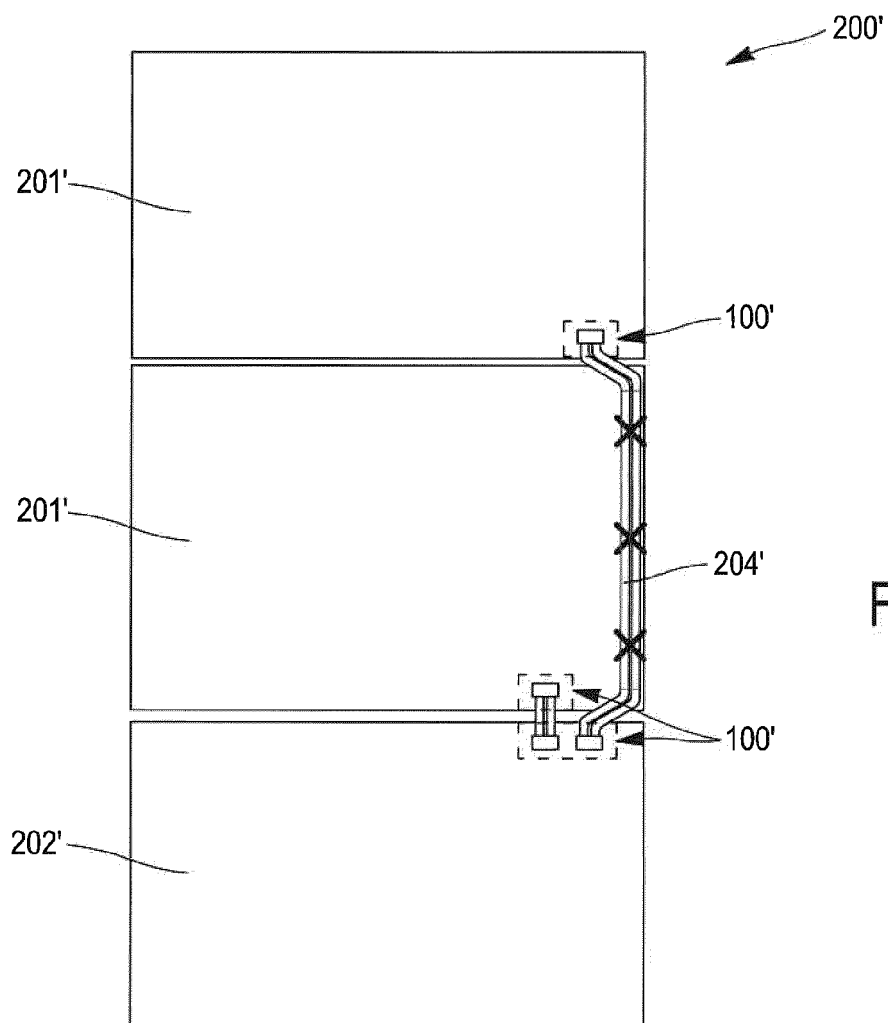
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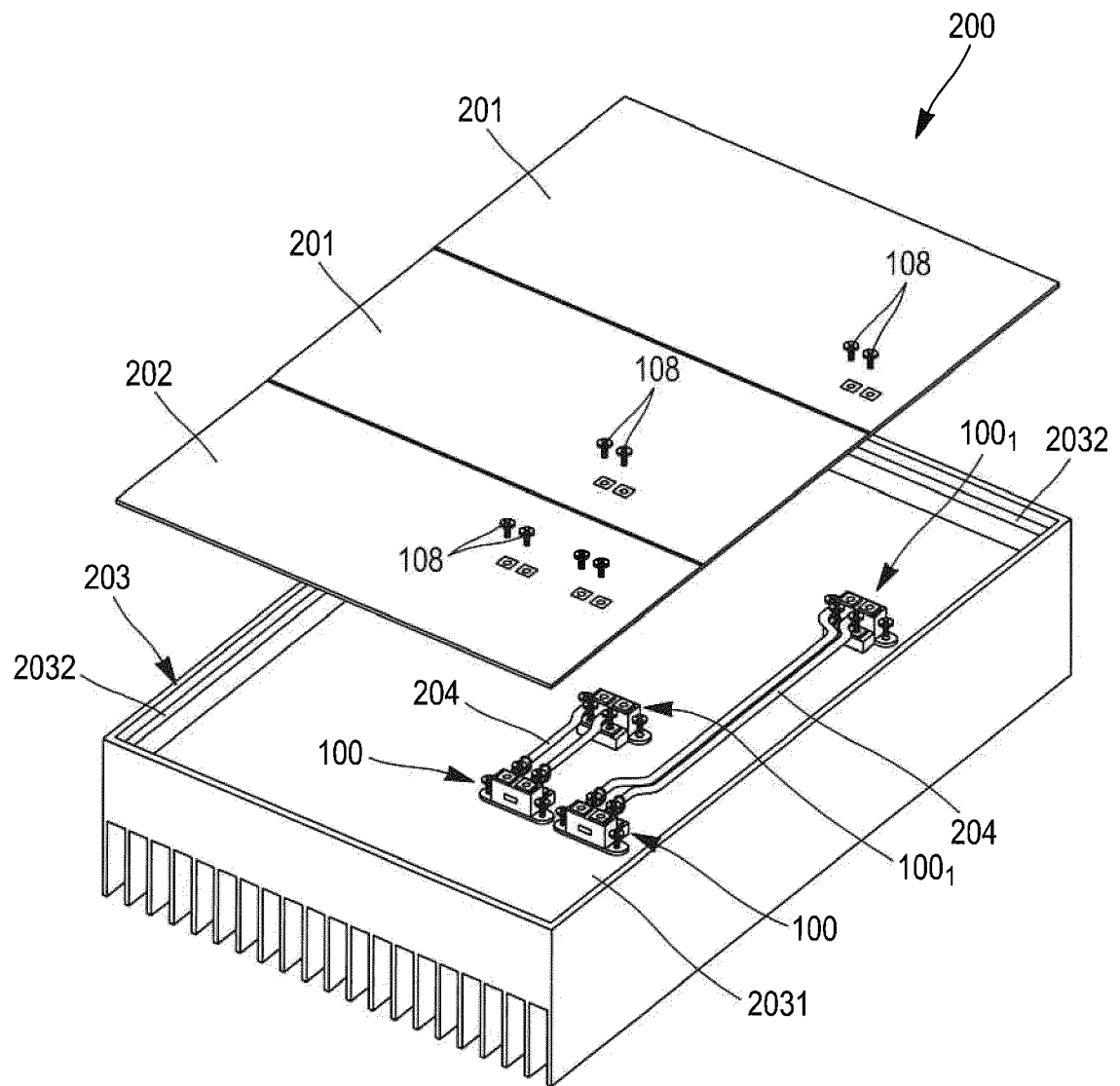


FIG. 3A

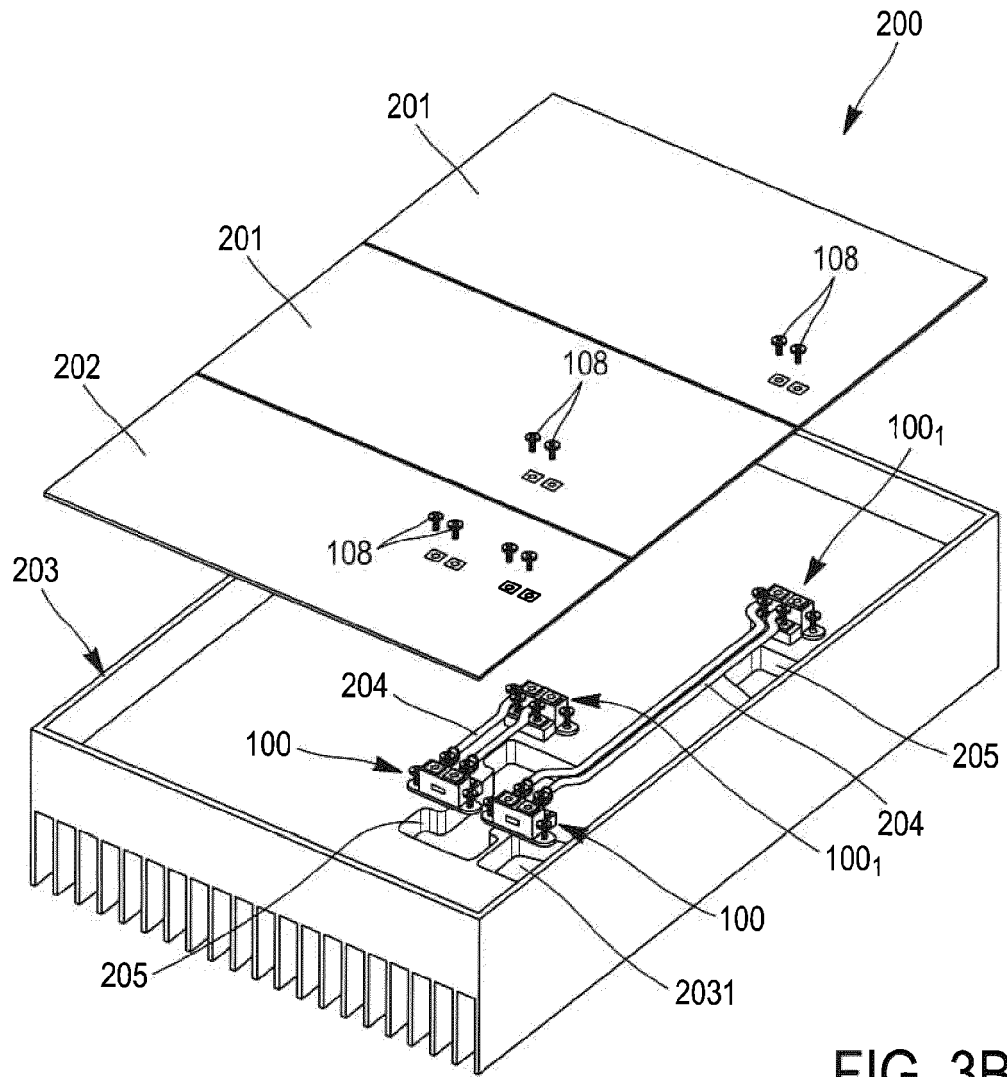


FIG. 3B

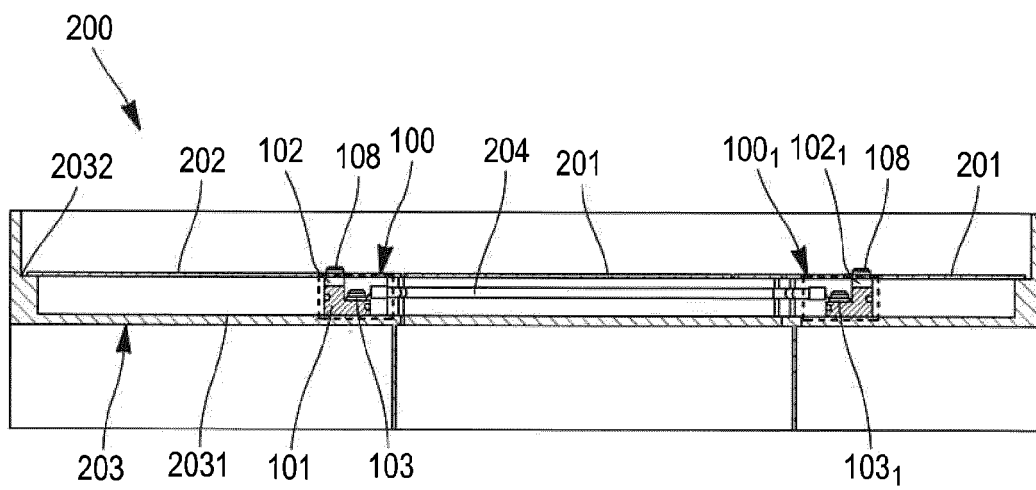


FIG. 4A

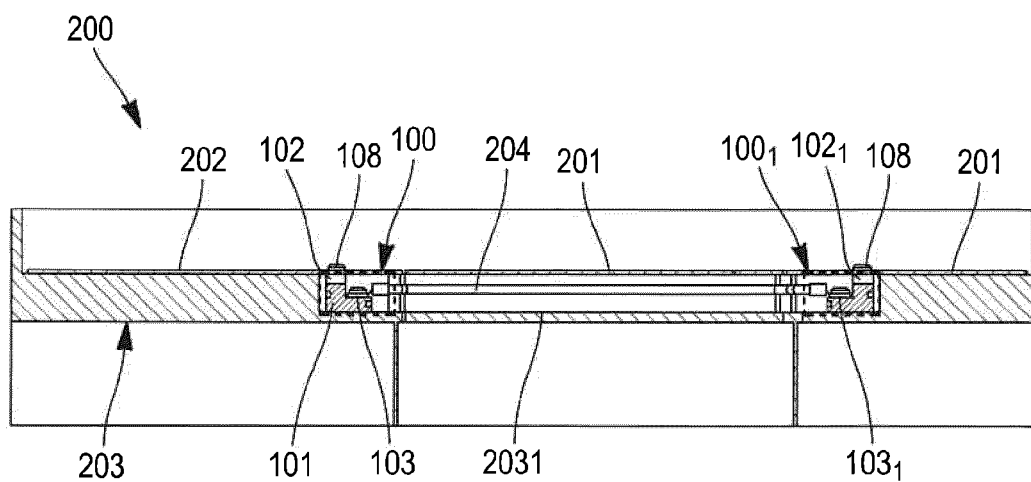


FIG. 4B

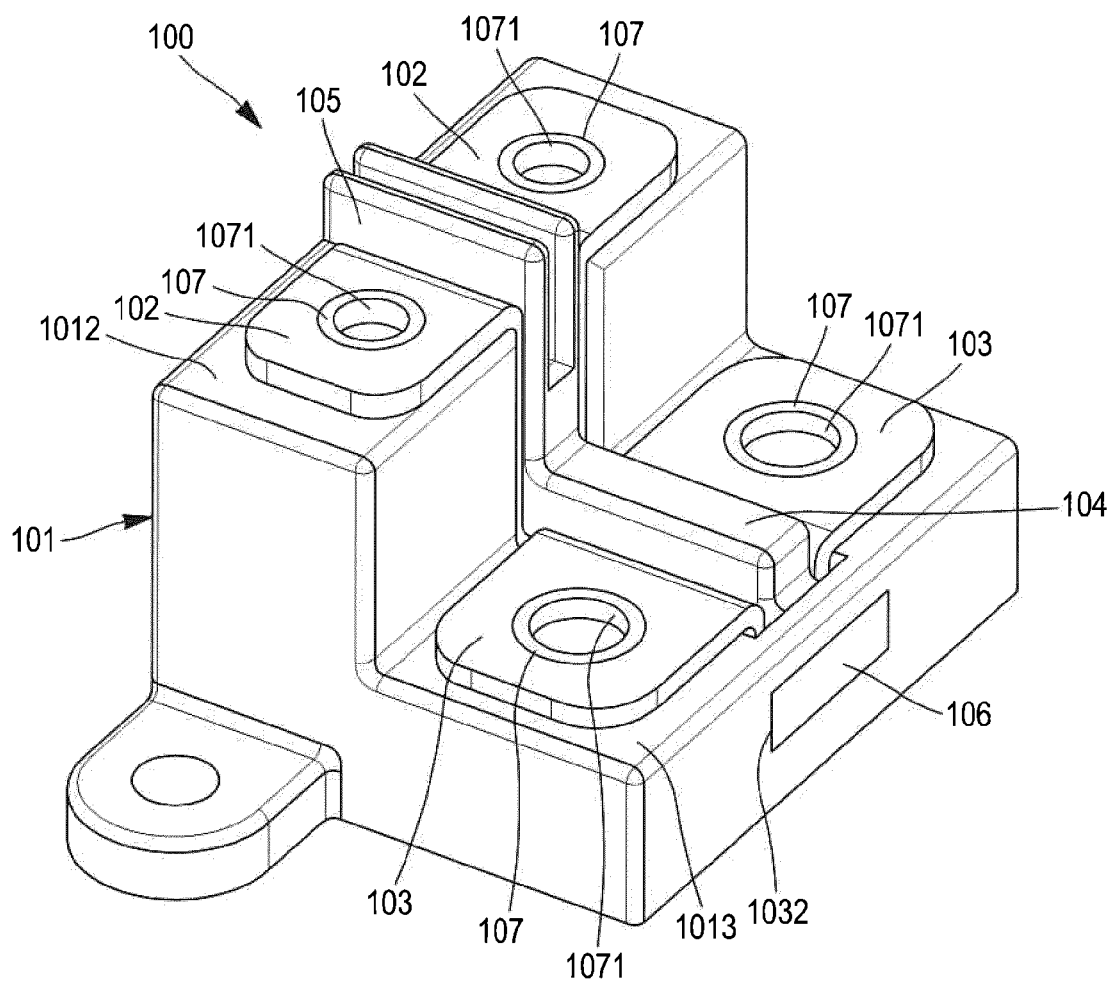


FIG. 5

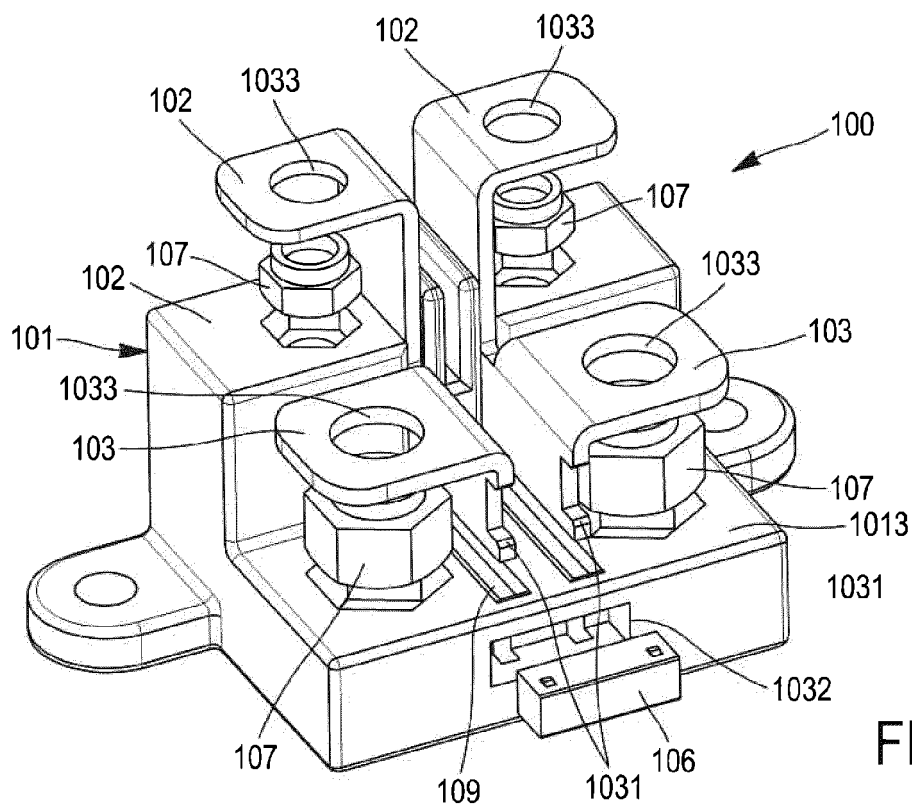


FIG. 6

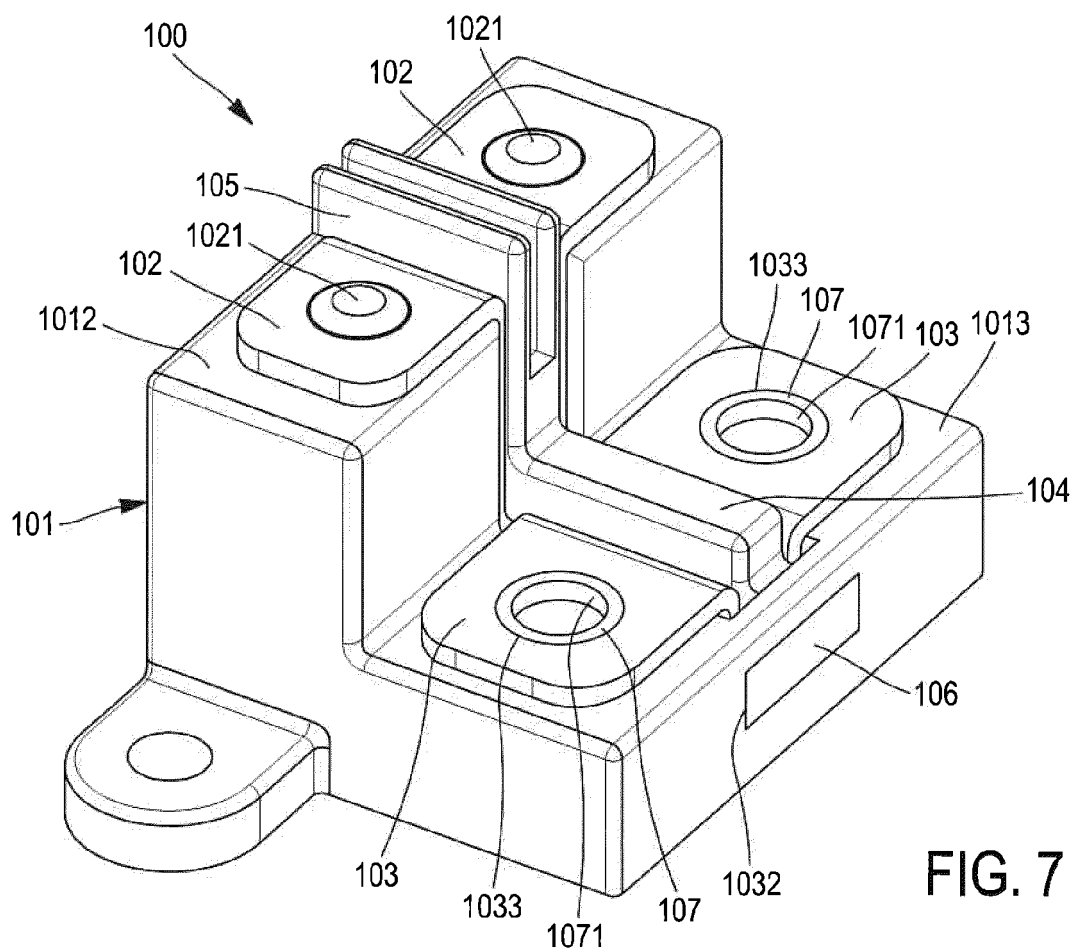


FIG. 7



EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 97/35362 A1 (BEAU INTERCONNECT [US]) 25 September 1997 (1997-09-25) * the whole document *	1-13	INV. H01R12/70 H01R12/71 H01R12/73
X	WO 2018/123414 A1 (MURATA MANUFACTURING CO [JP]) 5 July 2018 (2018-07-05) * the whole document *	1-4, 11-13	H01R13/6581 H01R12/51
A		5-10	H01R9/24
			TECHNICAL FIELDS SEARCHED (IPC)
			H01R
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 31 March 2020	Examiner Gomes Sirenkov E M.
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	

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

EP 19 21 5029

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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31-03-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9735362 A1	25-09-1997	AU 2271397 A	10-10-1997
		CA 2249232 A1	25-09-1997
		DE 69719025 D1	20-03-2003
		EP 0898793 A1	03-03-1999
		JP 2000512063 A	12-09-2000
		TW 342543 B	11-10-1998
		US 5713766 A	03-02-1998
		WO 9735362 A1	25-09-1997

WO 2018123414 A1	05-07-2018	JP WO2018123414 A1	18-07-2019
		US 2019297726 A1	26-09-2019
		WO 2018123414 A1	05-07-2018
