(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 613 595 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
26.02.2020 Bulletin 2020/09

(21) Application number: **17916060.1**

(22) Date of filing: **14.12.2017**

(51) Int Cl.:
B41J 2/175 *(2006.01)*

(86) International application number:
PCT/CN2017/116264

(87) International publication number:
WO 2019/000853 (03.01.2019 Gazette 2019/01)

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

(30) Priority: **28.06.2017 CN 201710510439**
28.06.2017 CN 201720765829 U

(71) Applicant: **Zhuhai Ninestar Management Co., Ltd.**
Zhuhai, Guangdong (CN)

(72) Inventors:
- **QIU, Yongqun**
  Zhuhai
  Guangdong 519060 (CN)
- **CHEN, Weijian**
  Zhuhai
  Guangdong 519060 (CN)

(74) Representative: **Delorme, Nicolas et al**
Cabinet Germain & Maureau
BP 6153
69466 Lyon Cedex 06 (FR)

(54) CHIP, INK CARTRIDGE AND METHOD FOR REMOVING INK CARTRIDGE

(57) Disclosed are a chip, an ink cartridge and a method for removing the ink cartridge. The chip is used for being electrically connected to styluses in a holding portion of a printer, and includes a first chip portion and a second chip portion. The first chip portion is provided with a plurality of first terminals, and each of the plurality of first terminals includes a first contact portion in contact with the styluses. The second chip portion is provided with a plurality of second terminals, and each of the plurality of second terminals includes a second contact portion in contact with the styluses. The first chip portion includes a first surface and a second surface that are opposite to each other. The second chip portion is connected to the first chip portion. The first chip portion is provided with a plurality of first through grooves for accommodating the styluses, each of the plurality of first through grooves penetrates the first surface and the second surface, and a part of at least one of the plurality of first through grooves is covered by at least part of the second contact portion.

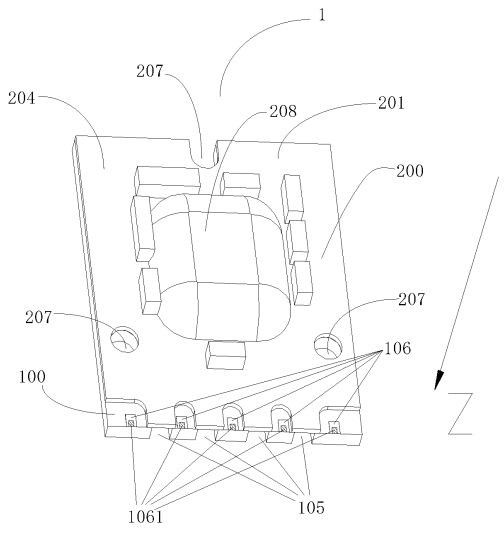

FIG. 3c1

EP 3 613 595 A1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of print imaging technology, and more particularly, to a chip, an ink cartridge and a method for removing the ink cartridge.

BACKGROUND

[0002] There are many kinds of chips for printers, and the chips for printers are used to store information such as manufacturer information, ink amount information, ink cartridge category information, ink color and the like. Chips for inkjet printers play a decisive role in normal operations of inkjet printers.

[0003] Chinese Patent No. 201320875786.2 discloses an ink cartridge chip, an ink cartridge, and an inkjet printer. Referring to FIGs. 1-2, in the related art, a chip 4 includes five chip contacts 41 in a lower row and four chip contacts 42 in an upper row. The chip contacts 41 in the lower row include contact portions 411 at an end thereof, and the chip contacts 42 in the upper row include contact portions 421 at an end thereof. When the ink cartridge chip 4 is in contact with ink cartridge chip styluses of a stylus structure 5, the contact portions 411 is adjacent to a convex portions 511 of ink cartridge chip styluses 51 in the lower row, and the contact portions 421 is adjacent to a convex portions 521 of ink cartridge chip styluses 52 in the upper row.

[0004] However, in a process of implementing the technical solution, the following defects exist in the related art. Since the contact portion for contacting the styluses 51 is a pointed convex structure, it is difficult to manufacture the pointed convex structure and to control the precision, so that the manufacturing is difficult. In addition, during a mounting process, when the chip is in contact with the styluses in the upper row, it will receive a transverse force applied by the styluses, which makes it easy for the chip to shake, thereby causing contact misalignment of the chip and affecting the normal use of the chip.

SUMMARY

[0005] The present disclosure provides a chip, an ink cartridge and a method for removing the ink cartridge, which can effectively solve the problems existing in the related art that the processing and manufacturing are difficult and the chip contacts are easily misaligned, which would affect the normal use of the chips.

[0006] One aspect of the present disclosure is to provide a chip for being electrically connected to styluses in a holding portion of a printer. The chip includes a first chip portion and a second chip portion. The first chip portion is provided with a plurality of first terminals. Each of the plurality of first terminals includes a first contact portion in contact with the styluses. The second chip portion is provided with a plurality of second terminals. Each of the plurality of second terminals includes a second contact portion in contact with the styluses. The first chip portion includes a first surface and a second surface that are opposite to each other. The second chip portion is connected to the first chip portion. The first chip portion is provided with a plurality of first through grooves for accommodating the styluses. Each of the plurality of first through grooves penetrates the first surface and the second surface of the first chip portion. A part of at least one of the plurality of first through grooves is covered by at least part of the second contact portion.

[0007] Another aspect of the present disclosure is to provide a chip for being electrically connected to styluses in a holder portion of a printer. The styluses includes a first group of styluses and a second group of styluses that are arranged at different heights and are alternate with each other. The chip includes a first chip portion and a second chip portion. The first chip portion is provided with a plurality of first terminals. Each of the plurality of first terminals includes a first contact portion in contact with the first group of styluses. The second chip portion is provided with a plurality of second terminals. Each of the plurality of second terminals includes a second contact portion in contact with the second group of styluses. The first chip portion includes a first surface and a second surface that are opposite to each other. The second chip portion is connected to the first chip portion. The first chip portion is provided with a plurality of first through grooves for accommodating the second group of styluses. Each of the plurality of first through grooves penetrates the first surface and the second surface of the first chip portion. A part of at least one of the plurality of first through grooves is covered by at least part of the second contact portion.

[0008] Another aspect of the present disclosure is to provide an ink cartridge for being detachably mounted on a holding portion of a printer, including the above-described chip.

[0009] Still another aspect of the present disclosure provides a method of removing an ink cartridge. The ink cartridge includes the above-described chip, and the ink cartridge includes a housing and a chip holder disposed at a side portion of the housing. The chip holder and the chip are connected. The method includes:

moving the chip holder in a direction intersecting a mounting direction; detaching the chip from the styluses with the movement of the chip holder; and removing the ink cartridge.

[0010] A further aspect of the present disclosure provides a method for removing an ink cartridge. The ink cartridge is mounted with the above-described chip, and the first chip portion and the second chip portion in the chip are movably connected. The method includes:

detaching the second chip portion from the first chip portion when the first chip portion passes the second group of styluses; detaching the second chip portion from the

second group of styluses; and removing the ink cartridge.

[0011] The chip, the ink cartridge and the method for removing the ink cartridge provided by the present disclosure eliminates the terminal structure of the pointed protrusion, thereby reducing the difficulty in manufacturing and processing. By combining and connecting the first chip portion and the second chip portion into an entirety of the chip in such a manner that a part of at least one first through grooves is covered by at least part of the second contact portions, during the mounting process, the first through grooves can guide the styluses during the mounting process, so as to avoid the occurrence of the contact misalignment of the chip, ensure that the chip and the styluses can be in the better contact and also ensure the normal use effect of the chip, thereby improving the practicability of the chip and thus facilitating the promotion and application of the market.

BRIEF DESCRIPTION OF DRAWINGS

[0012]

FIG. 1 is a structural schematic diagram 1 of an ink cartridge provided in the related art;
FIG. 2 is a structural schematic diagram 2 of an ink cartridge provided in the related art;
FIG. 3a1 is a structural schematic diagram 1 of a first chip portion in a chip according to an embodiment of the present disclosure;
FIG. 3a2 is a structural schematic diagram 2 of a first chip portion in a chip according to an embodiment of the present disclosure;
FIG. 3b1 is a structural schematic diagram 1 of a second chip portion in a chip according to an embodiment of the present disclosure;
FIG. 3b2 is a structural schematic diagram 2 of a second chip portion in a chip according to an embodiment of the present disclosure;
FIG. 3c1 is a structural schematic diagram 1 of a chip according to an embodiment of the present disclosure;
FIG. 3c2 is a structural schematic diagram 2 of a chip according to an embodiment of the present disclosure;
FIG. 4a is a structural schematic diagram 1 of another chip according to an embodiment of the present disclosure;
FIG. 4b is a structural schematic diagram 2 of another chip according to an embodiment of the present disclosure;
FIG. 5a is a structural schematic diagram 1 of styluses according to an embodiment of the present disclosure;
FIG. 5b is a structural schematic diagram 2 of styluses according to an embodiment of the present disclosure;
FIG. 6a is a structural schematic diagram 1 of a chip in contact with styluses according to an embodiment of the present disclosure;
FIG. 6b is a structural schematic diagram 2 of a chip in contact with styluses according to an embodiment of the present disclosure;
FIG. 6c is a structural schematic diagram 3 of a chip in contact with styluses according to an embodiment of the present disclosure;
FIG. 7a is a cross-sectional structural schematic diagram 1 of a chip according to an embodiment of the present disclosure;
FIG. 7a1 is a partial enlarged schematic diagram of FIG. 7a;
FIG. 7b is a cross-sectional structural schematic diagram 2 of a chip according to an embodiment of the present disclosure;
FIG. 7b1 is a partial enlarged schematic diagram of FIG. 7b;
FIG. 7c is a cross-sectional structural schematic diagram 3 of a chip according to an embodiment of the present disclosure;
FIG. 7c1 is a partial enlarged schematic diagram of FIG. 7c;
FIG. 8a is a structural schematic diagram 1 of another first chip portion according to an embodiment of the present disclosure;
FIG. 8b is a structural schematic diagram 2 of another first chip portion according to an embodiment of the present disclosure;
FIG. 8c is a structural schematic diagram 1 of still another chip according to an embodiment of the present disclosure;
FIG. 8d is a structural schematic diagram 2 of still another chip according to an embodiment of the present disclosure;
FIG. 9 is a structural schematic diagram 4 of a chip in contact with styluses according to an embodiment of the present disclosure;
FIG. 10a is a structural schematic diagram 1 of yet another chip according to an embodiment of the present disclosure;
FIG. 10b is a structural schematic diagram 2 of yet another chip according to an embodiment of the present disclosure;
FIG. 11 is a structural schematic diagram 5 of a chip being in contact with styluses according to an embodiment of the present disclosure;
FIG. 12 is a structural schematic diagram 3 of a chip according to an embodiment of the present disclosure;
FIG. 13a is a structural schematic diagram 1 of a first chip portion being connected to a second chip portion through a connecting portion according to an embodiment of the present disclosure;
FIG. 13b is a structural schematic diagram 2 of a first chip portion being connected to a second chip portion through a connecting portion according to an embodiment of the present disclosure;
FIG. 13c is an exploded structural schematic dia-

gram of a first chip portion being connected to a second chip portion through a connection portion according to an embodiment of the present disclosure;
FIG. 14a is a structural schematic diagram 5 of a chip being in contact with styluses according to an embodiment of the present disclosure;
FIG. 14b is a structural schematic diagram 6 of a chip being in contact with styluses according to an embodiment of the present disclosure;
FIG. 15 is a structural schematic diagram of a chip holder according to an embodiment of the present disclosure;
FIG. 16a is a separate structural schematic diagram 1 of an ink cartridge and a chip according to an embodiment of the present disclosure;
FIG. 16b is an assembled structural schematic diagram 1 of an ink cartridge and a chip according to an embodiment of the present disclosure;
FIG. 17 is a structural schematic diagram 1 of a holding portion according to an embodiment of the present disclosure;
FIG. 18 is an assembled structural schematic diagram 2 of an ink cartridge and a chip according to an embodiment of the present disclosure;
FIG. 19a is a structural schematic diagram of an ink cartridge according to an embodiment of the present disclosure;
FIG. 19b is a separate structural schematic diagram 2 of an ink cartridge and a chip according to an embodiment of the present disclosure;
FIG. 20 is a structural schematic diagram 2 of a holding portion according to an embodiment of the present disclosure;
FIG. 21 is a structural schematic diagram 3 of a holding portion according to an embodiment of the present disclosure;
FIG. 22 is a structural schematic diagram of an ink cartridge according to an embodiment of the present disclosure;
FIG. 23 is a separate structural schematic diagram 3 of an ink cartridge and a chip according to an embodiment of the present disclosure;
FIG. 24 is a diagram showing a positional relationship between a chip and styluses when the chip is detached from an ink cartridge according to an embodiment of the present disclosure;
FIG. 25 is a structural schematic diagram of a chip being mounted on a chip holder according to an embodiment of the present disclosure;
FIG. 26a is a structural schematic diagram 1 of a chip holder being in contact with styluses according to an embodiment of the present disclosure;
FIG. 26b is a structural schematic diagram 2 of a chip holder being in contact with styluses according to an embodiment of the present disclosure;
FIG. 27 is a schematic flow chart of a method for removing an ink cartridge according to an embodiment of the present disclosure; and
FIG. 28 is a schematic flow chart of another method for removing an ink cartridge according to an embodiment of the present disclosure.

DESCRIPTION OF EMBODIMENTS

[0013] The specific embodiments of the present disclosure are further described in detail below with reference to the drawings and embodiments. The following examples are intended to illustrate the present disclosure but are not intended to limit the scope of the present disclosure.

[0014] In the present technical solution, the terms "first" and "second" are used for the purpose of description only, and are not to be construed as indicating or implying relative importance; unless otherwise expressly stated and limited; and the terms "mount" , "connect" , "fix" and the like are to be understood broadly. For example, "connect" can be a fixed connection, a detachable connection, or an integral connection. For those skilled in the art, the specific meanings of the above terms in the present disclosure can be understood on a case-by-case basis.

[0015] Referring to FIGs. 3a1-3c2, the present embodiment provides a chip 1. The chip 1 is used for being electrically connected to styluses 4 in a holding portion of a printer, and includes a first chip portion 100 and a second chip portion 200. The first chip portion 100 is provided with multiple first terminals 106, and the first terminal 106 includes a first contact portion 1061 in contact with the styluses 4. The second chip portion 200 is provided with multiple second terminals 206, and the second terminal 206 includes a second contact portion 2061 in contact with the styluses 4. The first chip portion 100 includes a first surface 101 and a second surface 102 that are opposite to each other. The second chip portion 200 is connected to the first chip portion 100. The first chip portion 100 is provided with multiple first through grooves 105 for accommodating the styluses 4, and the first through grooves 105 penetrate the first surface 101 and the second surface 102. Part of at least one first through groove 105 is covered by at least part of the second contact portion 2061.

[0016] The structure of the first chip portion 100 is as shown in FIGs. 3a1-3a2. The first chip portion 100 can have a rectangular parallelepiped shape. Without doubt, in a specific application, the first chip portion 100 can also be provided in a cube structure. It has the first surface 101 - a sixth surface (not shown in the drawing). The first surface 101 is opposite to the second surface 102. A third surface 103 is opposite to a fourth surface 110. A fifth surface is opposite to a sixth surface. A first substrate 104 can be included. The first substrate 104 can be used to carry electrical components such as the first through groove 105, the first terminal 106, the first contact portion 1061, and a positioning portion 107. The first contact portion 1061 is at least part of the first terminal 106. The first through groove 105, the first terminal 106, and the positioning portion 107 can be provided on the first substrate

104. The positioning portion 107 is used to position the first chip portion 100/the chip 1. For example, the positioning portion 107 can be a hole (as shown in FIG. 3a1), and at this time, the positioning portion 107 can be engaged with a positioning post located on the ink cartridge/chip holder to fix the first chip portion 100 on the ink cartridge/chip holder The positioning portion 107 can also be part of any several surfaces of the first surface 101 to the sixth surface, and the first chip portion 100 can be fixed on the chip holder /ink cartridge with the surface being the positioning portion 107. The positioning portion 107 can also be used to implement a positioning connection between the first chip portion 100 and the second chip portion 200. It can be understood that the number of the positioning portions 107 can be one or more.

[0017] In addition, in the present embodiment, the number of the first through grooves 105 is plural, and as shown in FIG. 3a1, the number of the first through grooves 105 is four. It can be understood that the number of the first through grooves 105 can also be 2, 3, 5, and the like. The shape of the first through groove 105 can be circular, elliptical, a U-shaped hole (as shown in FIG. 3a1), an irregular hole, or the like. The first through groove 105 is used for accommodating the styluses 4 and has space for accommodating the styluses 4. However, it should be noted that there is no contact portion in the first through groove 105, so that the first through groove 105 is not electrically connected to the styluses 4. In addition, the number of the first terminals 106 in the present embodiment is plural, and can be 2, 3, 4, or 5 (as shown in FIG. 3a1). In general, the first terminal 106 is formed by plating copper on the first substrate 104. The first terminal 106 has the first contact portion 1061 in contact with the styluses 4 on the holding portion. The number of the first contact portions 1061 can in one-to-one correspondence with the number of the first terminals 106 or cannot correspond to the number of the first terminals 106. Two first terminals 106 can be in contact with the styluses 4 in one holding portion, and at this time, the two first terminals 106 have one first contact portion 1061 thereon; or, one first terminal 106 is in contact with the styluses 4 in two holding portions, and at this time, one first terminal 106 has two first contact portions 1061 thereon.

[0018] As shown in FIGs. 3b1-3b2, the second chip portion 200 in the present embodiment can have a rectangular parallelepiped structure having a first surface 201 to a sixth surface (not shown in the drawing) and can also include a second substrate 204. The second substrate 204 can be used to carry the electrical components such as a positioning portion 207, a memory 208, a second through groove 205, the second terminal 206, and the second contact portion 2061. The specific shape structure, function, and the number of the second chip portion 200, and the positioning portion 207, the second terminal 206 and the second contact portion 2061 that are on the second chip portion 200 in the present embodiment can be similar to the specific shape structure, function, and the number of the first chip portion 100, and the positioning portion 107, the first terminal 106, and the first contact portion 1061 that are on the first chip portion 100. Reference can be made to the above description for details, which will not be described herein again.

[0019] In addition, when the first chip portion 100 is connected to the second chip portion 200, an entirety of the chip 1 can be formed. Specifically, the second chip portion 200 abuts against the first chip portion 100. Further, the first surface 101 of the first chip portion 100 can abut the second surface 202 of the second chip portion 200. The possible connection manner can include any one of the following: the first chip portion 100 and the second chip portion 200 are welded together; the first chip portion 100 and the second chip portion 200 are combined together by a positioning hole and a connecting member such as a positioning buckle and a positioning post; the first chip portion 100 and the second chip portion 200 are pasted together by an adhesive. Without doubt, other connection manners can be used by those skilled in the art, as long as the first chip portion 100 and the second chip portion 200 can be stably and effectively connected, and details will not be described herein again.

[0020] When the first chip portion 100 and the second chip portion 200 constitute an entirety of the chip 1, the first contact portion 1061 and the second contact portion 2061 can be spaced apart from each other. Specifically, the first contact portion 1061 and the second contact portion 2061 can be alternately arranged at intervals. In addition, referring to FIGs. 3c1-3c2, part of at least one first through groove 105 in the first chip portion 100 can be covered by at least part of the second contact portion 2061. Specifically, if a direction perpendicular to the first surface 101 and the second surface 102 of the first chip portion 100 is defined as a Z direction and a direction in which the second chip portion 200 is guided to the first chip portion 100 is taken as a +Z axis direction, then the second contact portion 2061 is on the -Z axis side of the first through groove 105 and the positions of the second contact portions 2061 in the +Z direction correspond to the positions of all of the first through grooves 105, thereby achieving that the second contact portion 2061 can cover part of the first through groove 105. Without doubt, in a specific configuration, the positions of the second contact portions 2061 in the +Z direction can be configured to correspond to the positions of not all the first through grooves 105, and can correspond to the positions of part of the first through grooves 105, which further achieves that the second contact portion 2061 on the second terminal 206 can cover part of at least one first through groove 105, thereby further achieving the better contact between the chip 1 and the styluses 4.

[0021] The chip 1 provided in the present embodiment eliminates the pointed convex structure in Background and reduces the difficulty in manufacturing and processing; by connecting and combining the first chip portion 100 with the second chip portion 200 to form the entirety

of the chip 1, part of at least one first through groove 105 is covered by at least part of the second contact portion 2061 when constituting the entirety of the chip 1, such that during the mounting process, the first through groove 105 can guide the styluses 4 during the mounting process, so as to avoid the occurrence of contact misalignment of the chip 1, achieve the better contact between the chip 1 and the styluses 4 and also achieve the normal use effect of the chip 1, thereby improving the practicability of the chip 1 and thus facilitating the promotion and application of the market.

[0022] Based on the above embodiments, with continued reference to FIGs. 3a1-3c2, the first chip portion 100 is provided with the first contact portions 1061 and the first through grooves 105. The specific positional relationship between the first contact portions 1061 and the first through grooves 105 is not limited in the present embodiment, and those skilled in the art can make configures according to specific design requirements. Preferably, the first chip portion 100 can further include a third surface 103 intersecting the first surface 101 and the second surface 102. When viewing the first chip portion 100 in a direction perpendicular to the third surface 103, the first contact portions 1061 are spaced apart from the first through grooves 105. Specifically, the first contact portion 1061 and the first through groove 105 can be alternately arranged at intervals.

[0023] Similarly, the specific positional relationship between the first terminals 106 and the first through grooves 105 is not limited in the present embodiment, and those skilled in the art can make configures according to specific design requirements. Preferably, when the first chip portion 100 is viewed in a direction perpendicular to the third surface 103, the first terminals 106 are spaced apart from the first through grooves 105. Specifically, referring to FIGs. 3a1-3a2, the first terminals 106 and the first through grooves 105 can be alternately arranged at intervals, and at this time the number of the first terminals 106 is greater than the number of the first through grooves 105 by one. Without doubt, those skilled in the art can also configure the positional relationship between the first terminal 106 and the first through groove 105, and between the first contact portion 1061 and the first through groove 105 by using other configurations. For example, uniform interval configuration can be adopted, and at this time, the number of the first terminals 106 and the number of the first through grooves 105 can be the same or different, and the number of the first contact portions 1061 and the number of the first through grooves 105 can be the same or different.

[0024] By spacing the first terminals 106 from the first through grooves 105 in the first chip portion 100, the first contact portions 1061 are spaced apart from the first through grooves 105, such that the interval between the first terminals 106 on the first chip portion 100 can be made larger, which not only results in the larger designable space in the first contact portion 1061, but also reduces the manufacturing difficulty and the process difficulty. Moreover, during the mounting process of the chip 1 and the styluses 4, the first through groove 105 can guide the styluses 4 during the mounting process, so as to avoid the occurrence of contact misalignment of the chip 1, further achieve the better contact between the chip 1 and the styluses 4 and improve the practicability of the chip 1.

[0025] Based on the above embodiments, with continued reference to FIGs. 3a1-3c2 and 4b, when specifically configuring the first contact portion 1061, the first chip portion 100 further has a fourth surface 110 opposite to the third surface 103. The first contact portion 1061 is closer to the third surface 103 than to the fourth surface 110. In this case, for the first contact portion 1061, it is preferable that the first contact portion 1061 is provided on an end of the first chip portion 100 close to the third surface 103. Specifically, the first contact portion 1061 is on an end closer to the third surface 103 than to the fourth surface 110. At this time, the first contact portion 1061 can be provided on any one of the first surface 101, the second surface 102, and the third surface 103; or, the first contact portion 1061 can be provided on the first surface 101 and the second surface 102; or, the first contact portion 1061 can be provided on the first surface 101 and the third surface 103; or, the first contact portion 1061 can be provided on the first surface 101, the second surface 102, and the third surface 103. More preferably, the first contact portion 1061 can be located only on the first surface 101.

[0026] Since the first contact portion 1061 is at least part of the first terminal 106, for the first terminal 106, the first terminal 106 can be located only on any one of the first surface 101, the second surface 102, and the third surface 103 (as shown in FIG. 3a1, the first terminal 106 is provided on the first surface 101), can also be located on the first surface 101 and the second surface 102, can also be located on the first surface 101 or the third surface 103, and can also be located on the first surface 101, the second surface 102 and the third surface 103 (as shown in FIG. 4b). Preferably, the first terminal 106 can be located only on the first surface 101.

[0027] In the present embodiment, when configuring the first contact portion 1061, the first contact portion 1061 is configured to be closer to the third surface 103 than to the fourth surface 110 of the first chip portion 100. Specifically, the first contact portion 1061 can be provided on an end of the ink cartridge close to the third surface 103, and the first contact portion 1061 is closer to the styluses 4. Such a structure can further ensure that the chip 1 can be in better contact with the styluses 4, thereby improving the stability and reliability of the use of the chip 1.

[0028] Based on the above embodiments, with continued reference to FIGs. 3a1-3c2, for the second chip portion 200, the second chip portion 200 can include the first surface 201 to the sixth surface (not shown in the drawing). The first surface 201 is opposite to the second surface 202. The third surface 203 is opposite to the fourth

surface 210. The fifth surface is opposite to the sixth surface. Moreover, the third surface 203 can intersect the first surface 201 and the second surface 202. In this case, the second chip portion 200 can be provided with multiple second through grooves 205 for accommodating the styluses 4, and the second through grooves 205 penetrate the first surface 201 and the second surface 202. Part of at least one second through groove 205 is covered by at least part of the first contact portion 1061.

[0029] Further, when viewing the second chip portion 200 along a direction perpendicular to the third surface 203, the second contact portions 2061 are spaced apart from the second through grooves 205. Specifically, the second contact portions 2061 and the second through grooves 205 can be alternately arranged at intervals. Similarly, when viewing the second chip portion 200 along a direction perpendicular to the third surface 203, the second terminals 206 are spaced apart from the second through grooves 205. Specifically, the second terminals 206 and the second through grooves 205 can be alternately arranged at intervals.

[0030] In addition, the specific arrangement position of the second contact portion 2061 is not limited in the present embodiment, and can be arranged by those skilled in the art according to specific design requirements. The second chip portion 200 further has a fourth surface 210 opposite to the third surface 203, and the second contact portion 2061 is closer to the third surface 203 than to the fourth surface 210. Preferably, the second contact portion 2061 can be provided on an end of the second chip portion 200 close to the third surface 203. Specifically, the second contact portion 2061 is provided on any one of the first surface 201, the second surface 202 and the third surface 203; or, the second contact portion 2061 is provided on the first surface 201 and the second surface 202; or, the second contact portion 2061 is provided on the first surface 201 and the third surface 203; or, the second contact portion 2061 is provided on the first surface 201, the second surface 202 and the third surface 203. Preferably, the second contact portion 2061 can be provided only on the second surface 202.

[0031] Since the second contact portion 2061 is at least part of the second terminal 206, for the second terminal 206, the second terminal 206 can be located only on any one of the first surface 201, the second surface 202 and the third surface 203 (as shown in FIG. 3b2, the second terminal 206 is provided on the first surface 201), can be located on the first surface 201 and the second surface 202, can also be located on the first surface 201 or the third surface 203, and can also be located on the first surface 201, the second surface 202 and the third surface 203. Preferably, the second terminal 206 can be located only on the second surface 202.

[0032] It should be noted that, in the present embodiment, the specific shape structure, arrangement manner, and functional effects of the second through groove 205, the second contact portion 2061, and the second terminal 206 are similar to the specific shape structure, arrangement manner and functional effects of the first through groove 105, the first contact portion 1061 and the first terminal 106. Reference can be made to the above description for details, which will not be described herein again.

[0033] After the first chip portion 100 and the second chip portion 200 are combined and connected, the first chip portion 100 and the second chip portion 200 can abut against each other. Specifically, as shown in FIGs. 3c1-3c2, the second surface 202 of the second chip portion 200 and the first surface 101 of the first chip portion 100 can abut against each other. Moreover, the number of the first through grooves 105 is 4, and the number of the first contact portions 1061 is 5; the number of the second contact portions 2061 is 4, and the number of the second through grooves 205 is 5. In this case, for the entirety of the chip 1, at least part of the second contact portion 2061 can cover part of at least one first through groove 105, and at least part of the first contact portion 1061 can cover part of at least one second through groove 205, thereby effectively guiding the mounting of the styluses 4 and ensuring the contact effect of the styluses 4 with the chip 1.

[0034] By providing the second contact portion 2061, the second contact portion 2061 is configured to be closer to the third surface 203 than to the fourth surface 210 of the second chip portion 200. Specifically, the second contact portion 2061 can be provided on an end of the ink cartridge close to the third surface 203, and the second contact portion 2061 is closer to the styluses 4. Such a structure can further ensure that the chip 1 can be in the better contact with the styluses 4, thereby improving the stability and reliability of the use of the chip 1.

[0035] Further, in conjunction with FIGs. 5a-5b, the present embodiment provides another chip 1 for electrically connecting with styluses 4 in a holding portion of a printer. The styluses 4 includes a first group of styluses 401 and a second group of styluses 402 that are arranged at different heights and alternate with each other. The chip 1 includes a first chip portion 100 and a second chip portion 200. The first chip portion 100 is provided with multiple first terminals 106. The first terminal 106 includes a first contact portion 1061 in contact with the first group of styluses 401. The second chip portion 200 is provided with multiple second terminals 206. The second terminal 206 includes a second contact portion 2061 in contact with the second group of styluses 402. The first chip portion 100 includes a first surface 101 and a second surface 102 that are opposite to each other. The second chip portion 200 is connected to the first chip portion 100. The first chip portion 100 is provided with multiple first through grooves 105 for accommodating the second group of styluses 402. The first through grooves 105 penetrate the first surface 101 and the second surface 102, and part of at least one first through groove 105 is covered by at least part of the second contact portion 2061.

[0036] Further, the second chip portion 200 includes a first surface 201 and a second surface 202 opposite to

each other. The second chip portion 200 is provided with multiple second through grooves 205 for accommodating the first group of styluses 401. The second through grooves 205 penetrate the first surface 201 and the second surface 202, and part of at least one second through groove 205 is covered by at least part of the first contact portion 1061.

[0037] The chip structure in the present embodiment is the same as the chip structure corresponding to the above-described FIGs. 3a1-3c2, 4a-4b. Reference can be made to the above description for details, which will not be described herein again.

[0038] In addition, for the structure of the styluses 4, referring to FIGs. 5a-5b, the styluses 4 can include a first group of styluses 401 and a second group of styluses 402 alternately arranged in a direction perpendicular to the Z-axis. In the Z-axis direction, the first group of styluses 401 and the second group of styluses 402 are located at positions of different heights. Moreover, the first group of styluses 401 and the second group of styluses 402 can each include a rod portion 404, a transverse portion 403 located at an upper end of the rod portion 404, and a head portion 405 located at a lower end of the rod portion 404. The head portion 405 and the transverse portion 403 are connected by the rod portion 404, and the head portion 405 and the rod portion 404 are rotatable about the transverse portion 403. In this case, the stylus 4 has a certain elasticity, and when pressure is applied to the head portion 405 or the rod portion 404 of the stylus 4, the stylus 4 will rotate accordingly.

[0039] With continued reference to FIGs. 6a-6c, when the chip 1 is in contact with the styluses 4, the first contact portions 1061 are in contact with the first group of styluses 401, and the second contact portions 2061 are in contact with the second group of styluses 402. The first through grooves 105 are used for accommodating the second group of styluses 402, and the second through grooves 205 are used for accommodating the first group of styluses 401.

[0040] When providing the first chip portion 100 and the second chip portion 200, the first substrate 104 and the second substrate 204 can be made of same materials or different materials. Specifically, a possible manner is as follows. The first chip portion 100 can be a hard board. The hard board portion can be made of an FR-4 material, will not generate deformation when being applied with a force, and thus has a feature that the shape and size are fixed without deformation. The second chip portion 200 can be a soft board chip. The soft board portion can be made of a flexible printed circuit board FPC material, has a flexible feature and is easily bent and deformed. In this case, when the second contact portions 2061 are in contact with the second group of styluses 402, the second contact portions 2061 can be deformed by the contact force imparted to the second chip portion 200 by the styluses 4. Specifically, referring to FIGs. 7a-7a1, the second chip portion 200 can be a soft board chip, and when viewing the chip 1 in a direction perpendicular to the third surface 203 of the second chip portion 200, the deformed second contact portions 2061 are arranged in one row with the first contact portions 1061; or, after the second contact portions 2061 are deformed, the second terminals 206 and the first terminals 106 are arranged in one row.

[0041] Specifically, after the chip 1 is engaged with the styluses 4, the second group of styluses 402 is engaged with the second chip portion 200. Because the styluses 4 generate a force against the second contact portion 2061 on the second chip portion 200, the second contact portion 2061 partially generates a certain degree of deformation downwards (T direction), which in turn causes the second terminal 206 to generate a certain degree of deformation downwards (T direction). As shown in FIGs. 7a-7a1, in the mounting direction T, after the chip 1 is in contact with the styluses 4, positions of the deformed second terminals 206 are arranged in one row with the first terminals 106, i.e., both the second terminals 206 and the first terminals 106 are arranged on the L1. The positions of the deformed second contact portions 2061 are arranged in one row with the first contact portions 1061, i.e., both the second contact portions 2061 and the first contact portions 1061 are arranged on the horizontal straight line L1. In this case, the second contact portion 2061 can be provided right below the first through groove 105 (in the direction of the -Z axis).

[0042] Based on the above embodiment, with continued reference to FIGs. 7b-7b1, unlike the embodiment corresponding to FIGs. 7a-7a1, the second chip portion 200 in the present embodiment is a hard board chip, and the material can be an FR-4 material. Generally, the hard board chip will not deform by default. In this case, when the first chip portion 100 is connected with the second chip portion 200, and when the chip 1 is observed in a direction perpendicular to the third surface 203 of the second chip portion 200, the deformed second contact portions 2061 and the first contact portions 1061 are arranged in two rows, i.e., the first contact portions 1061 are arranged on the horizontal straight line L2 and the second contact portions 2061 are arranged on the horizontal straight line L3; or, the second terminals 206 and the first terminals 106 are arranged in two rows, i.e., the first terminals 106 are arranged on the horizontal straight line L2 and the second terminals 206 are arranged on the horizontal straight line L3.

[0043] Specifically, when the second surface 102 of the first chip portion 100 abuts against the second surface 202 of the second chip portion 200, since the first terminals 106 and the second terminals 206 that are respectively provided on the first substrate 104 and the second substrate 204 can be formed by plating copper on the substrate, in the mounting direction T, after the chip 1 is in contact with the styluses 4, the positions of the second terminals 206 and the first terminals 106 are arranged in two rows, and the positions of the second contact portions 2061 and the first contact portions 1061 are arranged in two rows. Further, the second contact portion 2061 can

be provided inside the first through groove 105.

[0044] Based on the above embodiments, with continued reference to FIGs. 7c-7c1, unlike the embodiments corresponding to FIGs. 7a-7a1 and 7b-7b1, in the present embodiment, the first chip portion 100 and the second chip portion 200 are connected by an intermediate portion 5. The intermediate portion 5 can be a separately provided connection structure and can be provided on the first chip portion 100 or the second chip portion 200. After the first chip portion 100 and the second chip portion 200 are connected through the intermediate portion 5, a gap is formed between the first chip portion 100 and the second chip portion 200, and the first terminal 106 and the second terminal 206 are provided in the gap. In this case, for the intermediate portion 5, the intermediate portion 5 is provided between the first chip portion 100 and the second chip portion 200. The first chip portion 100 further includes a third surface 103 intersecting the first surface 101 and the second surface 102. When the chip 1 is viewed in a direction perpendicular to the third surface 103 of the first chip portion 100, a height of the intermediate portion 5 is the sum of a copper plating thickness of the first terminal 106 and a copper plating thickness of the second terminal 206. Further, when the chip 1 is viewed in a direction perpendicular to the third surface 103 of the first chip portion 100, the intermediate portions 5, the first terminals 106 and the second terminals 206 are arranged in one row, i.e., the intermediate portions 5, the first terminals 106 and the second terminals 206 are arranged in one row on the horizontal straight line L4; or, the first contact portions 1061 and the second contact portions 2061 are arranged in one row, i.e., the first contact portions 1061 and the second contact portions 2061 are arranged in one row on the horizontal straight line L4.

[0045] Specifically, the first surface 101 of the first chip portion 100 is opposite to the second surface 202 of the second chip portion 200. Moreover, there is the intermediate portion 5 between the first chip portion 100 and the second chip portion 200, and the length of the intermediate portion 5 in the direction T is the sum of the copper plating thicknesses of the first terminal 106 and the second terminal 206. Therefore, the intermediate portions 5, the first terminals 106 and the second terminals 206 can be arranged in one row due to the presence of the intermediate portions 5. Since the first contact portion 1061 is at least part of the first terminal 106 and the second contact portion 2061 is at least part of the second terminal 206, the first contact portions 1061 and the second contact portions 2061 can also be arranged in one row in the direction T. Further, the second contact portion 2061 is provided right below the first through groove 105 (in the direction of the -Z axis). With such a structure, the intermediate portion 5 is provided between the first chip portion 100 and the second chip portion 200 such that the first chip portion 100 and the second chip portion 200 are not in direct contact with each other. This structure can avoid damage to the chip caused by the unevenness of the first surface 201 of the first chip portion 100 and the second surface 202 of the second chip portion 200 and the rigid contact therebetween.

[0046] The first chip portion 100 and the second chip portion 200 in the present embodiment can abut against each other or be connected by the intermediate portion 5. Moreover, the first chip portion 100 and the second chip portion 200 can be made of the same materials or different materials, which effectively expands the achievable manner of the structure of the chip 1, makes the structure of the chip 1 flexible and diverse, and is convenient for a user to configure the structure of the respective chip 1 according to specific design requirements, thereby expanding the application range of the chip 1.

[0047] Based on the above embodiments, with continued reference to FIGs. 10a-10b, the first chip portion 100 and the second chip portion 200 can be combined and connected in other manners. Specifically, the second chip portion 200 can include an engagement portion 6. The second terminal 206 is connected to one side end of the engagement portion 6, and the second chip portion 200 is connected to the first chip portion 100 through the engagement portion 6.

[0048] The engagement portion 6 described above can be an engagement mechanism provided between the first chip portion 100 and the second chip portion 200, or an engagement mechanism provided between the respective second terminals 206. The second terminal 206 can be a copper piece, and the second terminal 206 can communicate with the first chip portion 100 through the engagement portion 6. As shown in FIGs. 10a-10b, the second terminal 206 is arranged on the engagement portion 6 in a suspending manner, so that the second terminal 206 has a certain moving space with respect to the engagement portion 6. Since the second contact portion 2061 is at least part of the second terminal 206, the second contact portion 2061 also has a certain moving space with respect to the engagement portion 6. Therefore, when the chip 1 is in contact with the styluses 4, the second group of styluses 402 will impart a certain contact force to the second chip portion 201, and the second chip portion 200 moves under the action of the contact force. Specifically, the second chip portion 200 is movable relative to the first chip portion 100. Moreover, when the chip 1 is viewed in a direction perpendicular to the third surface 203 of the second chip portion 200, the moved second contact portions 2061 and the first contact portions 1061 can be arranged in one row; or, after the second contact portions 2061 has moved, the second terminals 206 and the first terminals 106 can be arranged in one row.

[0049] Specifically, as shown in FIG. 11, a schematic diagram of the chip 1 in contact with the styluses 4 is shown. When the second group of styluses 402 is engaged with the second terminals 206, the second terminals 206 will move in the -T direction / -Z axis direction under the force of the second group of styluses 402, and the second contact portions 2061 will also move in the

-T direction / -Z axis direction under the force of the second group of styluses 402 so as to achieve the effect of being arranged in one row with the first contact portions 1061 in the direction T.

[0050] In the present embodiment, the second chip portion 200 is connected to the first chip portion 100 via the engagement portion 6, which not only ensures the stable reliability of the connection between and the second chip portion 200 and the first chip portion 100, but also expands the connection manners between the first chip portion 100 and the second chip portion 200 so as to facilitate processing and manufacturing of the chip 1.

[0051] Based on the above embodiments, with continued reference to FIG. 12, unlike the above-described embodiment corresponding to the FIGs. 10a-10b, the first chip portion 100 and the second chip portion 200 in the present embodiment are movably connected by the engagement portion 6. As an example, the first chip portion 100 and the second chip portion 200 are hinged by the engagement portion 6. After the first chip portion 100 is connected to the second chip portion 200, the second chip portion 200 can move relative to the first chip portion 100 (including rotating, revolving, moving, etc.). In this case, for the first chip portion 100 and the second chip portion 200, the first chip portion 100 cannot move or rotate with respect to the second chip portion 200, but the second chip portion 200 can rotate or move relative to the first chip portion 100. For example, an angle formed between the second chip portion 200 and the first chip portion 100 is adjusted, such that the first chip portion 100 and the second chip portion 200 are perpendicular, intersecting or parallel. When the first chip portion 100 is parallel to the second chip portion 200, multiple abutting portions 109 provided on the first chip portion 100 are in contact with multiple abutting portions 209 provided on the second chip portion 200.

[0052] Another implementation will be described as follows. Reference to FIGs. 13a-13c, the first chip portion 100 and the second chip portion 200 are movably connected through a connecting portion 7. As an example, the first chip portion 100 and the second chip portion 200 are hinged by the connecting portion 7. Further, one end of the connecting portion 7 is connected to an end of the first chip portion 100 and the other end thereof is connected to an end of the second chip portion 200, such that it is achieved that the first chip portion 100 and the second chip portion 200 can relatively move (including rotating, revolving, moving, etc.) after the first chip portion 100 and the second chip portion 200 are connected. In this case, for the first chip portion 100 and the second chip portion 200, the first chip portion 100 can move or rotate relative to the second chip portion 200, and the second chip portion 200 can also rotate or move relative to the first chip portion 100. The chip 1 is composed of the first chip portion 100, the second chip portion 200, and the connection portion 7. It can be understood that the connecting portion 7 has a flexible feature and is easily to be bent and deformed. For example, the connecting portion 7 is made of a flexible printed circuit board FPC material. Further, a folding line can be provided on the connecting portion 7, and the first chip portion 100 and the second chip portion 200 are folded into the chip 1 through the connection portion 7. In this case, for the chip 1, the chip 1 can be produced in a folded manner. Namely, the first chip portion 100 and the second chip portion 200 are folded by a folding line provided on the connecting portion 7, to form the above-described chip 1. However, the production process is complicated in this manner. In addition, providing the folding line at a position of the connecting portion 7 where the folding occurs can cause an offset between the folding marks and the preset folding line when the chip 1 is folded, thereby resulting in a misalignment between the terminals. Moreover, the folding manner can lead to disconnection of the chip circuit. Therefore, it is preferable to produce the chip 1 in a non-folding manner. For the chip 1 produced in the non-folding manner by using a welding method, or a positioning buckle and a positioning hole, or a positioning post and a positioning hole, or an adhesive bonding method, it is unlikely to result in displacement between terminals and the disconnection of the chip circuit.

[0053] In a specific application, referring to FIGs. 14a-14b, the chip 1 in the present embodiment can be in contact with the styluses 4. Specifically, the chip 1 can be mounted on a chip holder, and the structure of the chip holder can be as shown in FIG. 15. The chip holder is mounted on an ink cartridge, such that the chip 1 is electrically connected with the styluses 4. Compared with the connection structure in which the first chip portion 100 and the second chip portion 200 cannot move relative to each other so that the chip holder also rotates with the chip 1 after the chip 1 is mounted on the chip holder, which results in the more occupied space and the complicated structure for the ink cartridge that needs to be mounted with the chip holder, in the present embodiment, since the second chip portion 200 can move relative to the first chip portion 100, it is easy to implement mounting and removing between the chip 1 and the chip holder by configuring the second chip portion 200 and the first chip portion 100 to be in a relatively movable structure. Moreover, since the rotation of the entire chip 1 is not required, the structure is simple and the space is small, such that it is easy to achieve the miniaturization of the ink cartridge and the printer.

[0054] Based on the above embodiments, with continued reference to FIG. 4a, the chip 1 in the present embodiment is further provided with third terminals 3 that are not in contact with the styluses 4. The third terminals 3 are provided on the first chip portion 100; or, the third terminals 3 are provided on the second chip portion 200; or, the third terminals 3 are provided on the first chip portion 100 and the second chip portion 200.

[0055] Specifically, the third terminal 3 can be used to detect whether there is a short circuit between the first terminals 106 or between the second terminals 206 or between the first terminal 106 and the second terminal

206. The third terminal 3 can also be used to detect whether there is water stain or ink stain or water droplet on the surface of the chip 1. The third terminal 3 can also be used for detecting other. As shown in FIG. 4a, when the third terminal 3 is located on the first chip portion 100, the arrangement position of the third terminal 3 is the same as that of the first terminal 106. Reference can be made to the above description for details, which will not be described herein again. If the arrangement position of the third terminal 3 is the same as that of the second terminal 206 when the third terminal 3 is located on the second chip portion 200, then reference can be referred to the above description for details, which will not be described herein again. With the provided third terminal 3, the connection state of the first terminal 106 and the second terminal 206 on the first chip portion 100 and the second chip portion 200 can be effectively detected, thereby further improving the safety and reliability of the use of the chip 1.

[0056] Based on the above-described embodiments, with reference to FIGs. 8a-8d, the first chip portion 100 in the present embodiment can further be provided with third through grooves 108. The third through grooves 108 penetrate the first surface and the second surface. In this case, for the first contact portion 1061, the first contact portion 1061 can be provided in the third through groove 108; or, the first contact portion 1061 can be provided on a first surface or a second surface on an edge of the third through groove 108; or, the first contact portion 1061 can be provided on the first surface and the second surface on the edge of the third through groove 108; or, the first contact portion 1061 can be provided on the first surface, the second surface, and in the third through groove 108.

[0057] In this case, when the chip 1 is in contact with the styluses 4, as shown in FIG. 9, the first group of styluses 401 is in contact with the first contact portion 1061 provided in the third through groove 108, and the second group of styluses 402 is in contact with the second contact portion 2061. Thus, by providing the third through groove 108, the first contact portion 1061 can be effectively protected, such that the first contact portion 1061 is prevented from being easily damaged. In addition, it can guide the styluses 4 when the chip 1 is in contact with the styluses 4, thereby ensuring the contact effect of the chip 1 being in contact with the contact portion, and further improving the stability and reliability of the use of the chip 1.

[0058] Referring to FIGs. 16a-16b, 18 and 19a-19b, the present embodiment provides an ink cartridge 8. The ink cartridge 8 is detachably mounted on the holding portion 10 of the printer. The ink cartridge 8 is provided with the chip 1 of any one of the above embodiments.

[0059] By providing the chip according to the above embodiments in the ink cartridge 8 provided in the present embodiment, the pointed convex structure in Background can be abandoned from the terminal in the chip 1, which reduces the difficulty in manufacturing and processing. Specifically, the first chip portion and the second chip portion are connected and combined to form an entirety of the chip 1 such that part of at least one first through groove is covered by at least part of the second contact portion. In this way, during the mounting process, the first through groove can guide the stylus, so as to avoid the occurrence of contact misalignment of the chip 1, achieve the better contact between the chip 1 and the styluses and also ensure the normal use effect of the ink cartridge 8, thereby improving the practicability of ink cartridge 8 and thus facilitating the promotion and application in the market.

[0060] Based on the above embodiment, with continued reference to FIGs. 16a-16b, the ink cartridge 8 in the present embodiment is mounted on the holding portion 10. The holding portion 10 is the holding portion 10 shown in FIG. 17. Specifically, with respect to the specific structure of the holding portion 10, the direction T is a direction in which the chip 1/the ink cartridge 8 is mounted on the holding portion 10. Multiple ink cartridges 8 can be simultaneously mounted on the holding portion 10, and the multiple ink cartridges 8 can be ink cartridges 8 of different colors or different widths. As shown in FIG. 17, the holding portion 10 has four mounting positions 1002, and the ink cartridge 8 can be mounted on the above four mounting positions 1002. In addition, the holding portion 10 further includes: a restricted portion 1004, a stylus holder 1003, a stylus, and an ink needle 1001. The restricted portion 1004 is used for restricting the ink cartridge 8 so as to prevent the ink cartridge 8 from moving away from the holding portion 10 towards the -T direction. Styluses are provided on the stylus holder 1003, and the stylus holder 1003 can fix the stylus. The styluses can be in contact with terminals (including the first terminal 106 and the second terminal 206) on the chip 1 to establish electrical transmission between the ink cartridge 8 and the holding portion 10.

[0061] In addition, the specific implementation for mounting the chip 1 on the ink cartridge 8 in the present embodiment is not limited. Those skilled in the art can make a configuration according to specific design requirements. One achievable manner is as shown in FIGs. 16a-16b. The ink cartridge 8 can include an ink outlet 803, a first housing 8011 and a second housing 8012 connected to the first housing 8011. The ink outlet 803 can be provided at a lower end of the first housing 8011, and a mounting portion 804 is provided at a side portion of the second housing 8012. The chip 1 is mounted on a chip holder 9, and the chip holder 9 is mounted at a mounting portion 804 by an elastic member 806. Specifically, a trajectory hole 805 is provided at a side end of the mounting portion 804. The chip holder 9 is provided with a rotating shaft 902 and a supporting portion 903, and the rotating shaft 902 is movable along the trajectory hole 805. When the chip holder 9 is mounted in the mounting portion 804, the supporting portion 903 abuts against the elastic member 806. It can be understood that the ink cartridge 8 in the present embodiment can further include multiple housings 801 and is not limited to including the first housing 8011 and the second housing 8012

described above.

[0062] In addition, for the chip holder 9, referring to FIGs. 15 and 25, the chip holder 9 can include an upper bracket 904 and a lower bracket 905 movably connected to the upper bracket 904. The first chip portion is fixed on the upper bracket 904, and the second chip portion is fixed on the lower bracket 905. The upper bracket 904 can move with the movement of the first chip portion. The lower bracket 905 can move with the movement of the second chip portion. Specifically, the chip holder 9 can be provided with a positioning post 901, a rotating shaft 902, and a supporting portion 903. The positioning post 901 cooperates with the positioning portion on the chip 1 and can fix the chip 1 to the chip holder 9, such that the chip 1 can move with the chip holder 9. The rotating shaft 209 can move or rotate along the trajectory hole 805 on the housing 801. The supporting portion 903 is a portion that abuts against the elastic body. The chip holder 9 can move and rotate along the trajectory hole 805 while pressing the elastic member 806 under an external force. As shown in FIG. 16b, when the ink cartridge 8 is mounted to the mounting portion 804 along the mounting direction T, the ink outlet 803 is engaged with an ink tube 1005, and the chip 1 is engaged with the stylus, thereby mounting the chip 1 to the ink cartridge 8.

[0063] For the specific structure of the ink cartridge 8, reference is made to FIG. 18. The ink cartridge 8 is mounted on the holding portion 10 as shown in FIG. 17. Specifically, the ink cartridge 8 can include the housing 801. A chip holder 807 is provided at the side portion of the housing 801. The chip holder 807 is connected to the chip 1. The chip 1 is mounted on the housing 801 through the chip holder 807. An elastic member is provided between the chip holder 807 and the housing 801. A trajectory hole 805 is provided at the side end of the housing 801. The chip holder 807 is provided with an operation portion 8071, and the chip holder 807 is mounted on the housing 801 through a rotating shaft 808. The rotating shaft 808 can move (moving or rotating) along the trajectory hole 805. When pressure is applied to the operating portion 8071, the rotating shaft 808 moves (moves or rotates) along the trajectory hole 805, and the chip 1 is mounted on the housing 801 following the movement (moving or rotating) of the chip holder 807.

[0064] Specifically, the ink cartridge 8 can further include a housing 801 and an ink outlet 803 provided at a lower end of the housing 801. Unlike the above-described embodiment corresponding to FIGs. 16a-16b, the chip 1 is connected to the chip holder 807 (either being directly connected or connected through the chip holder 9 or an intermediate component). The movement/rotation of the chip holder 807 can drive the chip 1 to move/rotate. When mounting the ink cartridge 8 to the holding portion 10 in the mounting direction T, the operator's finger presses the operation portion 8071 of the chip holder 807, and the rotating shaft 808 of the chip holder 807 moves or rotates in the trajectory hole 805 to drive the chip 1 to move or rotate, such that the position of the chip 1 changes relative to the previous position, and the chip 1 moves towards the inside of the ink cartridge 8 with the chip holder 807, and then the ink cartridge 8 is mounted in the holding portion 10. When removing the ink cartridge 8 from the mounting portion 804 in a direction -T opposite to the mounting direction T, the operator's finger presses the operating portion 8071 of the chip holder 807, and the rotating shaft 808 of the chip holder 807 moves or rotates in the trajectory hole 805 to drive the chip 1 to move or rotate in the reverse direction, such that the position of the chip 1 changes relative to the previous position, and the chip 1 moves with the movable member and is separated from the stylus. Then, the ink cartridge 8 is removed from the holding portion 10. It can be seen from the above process that the process of mounting and removing of the ink cartridge 8 and the chip 1 is simple and it is easy to implement, thereby improving the practicability of the ink cartridge 8.

[0065] Further, for the structure of the holding portion 10, there is another structure, which can be made specific reference to FIGs. 20-21. The structure of the ink cartridge 8 as shown in FIGs. 22-23 can be mounted in the holding portion. Specifically, the holding portion 10 can include a restricted portion 1004, an engagement hole 1007, an ink tube 1005, a stylus, and a lever 1006. Two restricted portions 1004 can be provided, one is a concave structure, and the other one is provided on the lever 1006. The structure of the ink cartridge 8 suitable for being mounted in the holding portion 10 is as shown in FIGs. 22-23. Specifically, a first engagement position 809 and a second engagement position 810 are provided on two sides of the ink cartridge 8. When the ink cartridge 8 is mounted on the holding portion 10, the restricted portion 1004 is engaged with the first engagement position 809, the engagement hole 1007 and the second engagement position 810, respectively, and the ink tube 1005 is engaged with the ink outlet 803.

[0066] The ink cartridge 8 in the above-described FIGs. 16a-16b, 18, 19a-19b is used to be mounted in the holding portion 10 corresponding to FIG. 17, When the above-described ink cartridge 8 needs to be detached from the holding portion 10, referring to FIG. 27, the present embodiment provides a method for removing the ink cartridge as follows. The ink cartridge has the chip in any one of the above embodiments mounted thereon, the ink cartridge includes a housing and a chip holder provided at a side portion of the housing, and the chip holder is connected to the chip. The method includes steps as follows.

[0067] At step S101, the chip holder is moved in a direction intersecting the mounting direction. The direction intersecting the mounting direction can be a direction inclined or perpendicular to the mounting direction. Specifically, the chip holder is moved by applying pressure to the operation portion.

[0068] At step S102, the chip is detached from the styluses with the movement of the chip holder. Since the chip is connected to the chip holder, the movement of

the chip holder drives the chip to move, thereby causing the chip to be detached from the stylus, and at this time, positions of the chip and the styluses are as shown in FIG. 24.

[0069] At step S103, the ink cartridge is removed.

[0070] The implementation process of removing the ink cartridge in the present embodiment is the same as the specific implementation process of the above-described embodiment corresponding to FIG. 18. Reference can be made to the above description for details, which will not be described herein again.

[0071] The method for removing the ink cartridge provided by the present embodiment is an easy-to-operate method, and it is easy to implement, and convenient for a user to perform timely replacement and maintenance operations on the ink cartridge, thereby improving the practicability of the method for removing the ink cartridge.

[0072] The above-described ink cartridge 8 in FIGs. 22-23 is used to be mounted in the holding portion 10 corresponding to FIGs. 20-21. When the above-described ink cartridge 8 does not need to be detached from the holding portion 10, referring to FIG. 28, the present embodiment provides another method for removing an ink cartridge, this ink cartridge has the chip in any one of the above embodiments mounted thereon, and the first chip portion and the second chip portion of the chip are movably connected. The method includes steps as follows.

[0073] At step S201, the second chip portion is detached from the first chip portion when the first chip portion passes the second group of styluses.

[0074] At step S202, the second chip portion is detached from the second group of styluses.

[0075] At step S203, the ink cartridge is removed.

[0076] Specifically, when the ink cartridge is being removed in the -T direction, a positional relationship between the chip 1 and the styluses 4 is as shown in FIG. 22. When the chip 1 rotates and moves, the second terminal will cross the second group of styluses 402. When the second terminal is crossing the second group of styluses 402, the ink cartridge can be removed from the holding portion. When the ink cartridge is being removed from the holding portion, as shown in FIG. 26a, since the first chip portion and the second chip portion are movably connected, the second group of styluses 402 is located on an upstream side of the direction -T, such that the second group of styluses 402 will block the second chip portion from continuing to move in the direction -T. As the cartridge continues to move in the direction -T, the first chip portion is separated from the second chip portion, i.e., the upper bracket 904 and the lower bracket 905 in the drawing are separated from each other. At the same time, the chip and the chip holder 9 move and rotate along the trajectory of the trajectory hole under double forces of a take-out force and a force applied by the styluses to the second chip portion, as shown in FIG. 26b. When the second terminal is crossing the second group of styluses 402, the styluses do not exert a force on the chip 1 anymore, and at this time, the ink cartridge can be removed from the holding portion.

[0077] The method for removing the ink cartridge provided by the present embodiment is an easy-to-operate method, and it is easy to implement, and convenient for a user to perform timely replacement and maintenance operations on the ink cartridge, thereby improving the practicability of the method for removing the ink cartridge.

[0078] Finally, it should be noted that the above embodiments are merely illustrative of the technical solutions of the present disclosure, and are not intended to be limiting; although the present disclosure has been described in detail with reference to the foregoing embodiments, those skilled in the art will understand that the technical solutions described in the foregoing embodiments can be modified, or some or all of the technical features can be equivalently substituted; and the essence of the modifications or substitutions do not deviate from the scope of the technical solutions of the various embodiments of the present disclosure.

Claims

1. A chip for being electrically connected to styluses in a holding portion of a printer, **characterized in that** the chip comprises a first chip portion and a second chip portion, the first chip portion is provided with a plurality of first terminals, each of the plurality of first terminals comprises a first contact portion in contact with the styluses, the second chip portion is provided with a plurality of second terminals, each of the plurality of second terminals comprises a second contact portion in contact with the styluses, the first chip portion comprises a first surface and a second surface that are opposite to each other, the second chip portion is connected to the first chip portion, the first chip portion is provided with a plurality of first through grooves for accommodating the styluses, each of the plurality of first through grooves penetrates the first surface and the second surface of the first chip portion, and a part of at least one of the plurality of first through grooves is covered by at least part of the second contact portions.

2. The chip according to claim 1, **characterized in that** the first chip portion further comprises a third surface intersecting the first surface and the second surface of the first chip portion, and the first contact portions and the plurality of first through grooves are spaced apart from each other, when the first chip portion is viewed in a direction perpendicular to the third surface of the first chip portion.

3. The chip according to claim 2, **characterized in that** the first chip portion further comprises a fourth surface opposite to the third surface of the first chip portion, and the first contact portions is closer to the

third surface of the first chip portion than to the fourth surface of the first chip portion; and the first contact portions is provided on an end close to the third surface of the first chip portion.

4. The chip according to claim 1, **characterized in that** the second chip portion comprises a first surface and a second surface that are opposite to each other, and the second chip portion is provided with a plurality of second through grooves for accommodating the styluses, each of the plurality of second through grooves penetrates the first surface and the second surface of the second chip portion, and a part of at least one of the plurality of second through grooves is covered by at least part of the first contact portions.

5. The chip according to claim 4, **characterized in that** the second chip portion further comprises a third surface intersecting the first surface and the second surface of the second chip portion, and the second contact portion and the plurality of second through grooves are spaced apart from each other when the second chip portion is viewed in a direction perpendicular to the third surface of the second chip portion.

6. The chip according to claim 1, **characterized in that** the first chip portion and the second chip portion abut against each other.

7. A chip for being electrically connected to styluses in a holder portion of a printer, **characterized in that** the styluses comprise a first group of styluses and a second group of styluses that are arranged at different heights and are alternate with each other, wherein the chip comprises a first chip portion and a second chip portion, the first chip portion is provided with a plurality of first terminals, each of the plurality of first terminals comprises a first contact portion in contact with the first group of styluses, the second chip portions is provided with a plurality of second terminals, each of the plurality of second terminals comprises a second contact portion in contact with the second group of styluses, the first chip portion comprises a first surface and a second surface that are opposite to each other, the second chip portion is connected to the first chip portion, the first chip portion is provided with a plurality of first through grooves for accommodating the second group of styluses, each of the plurality of first through grooves penetrates the first surface and the second surface of the first chip portion, and a part of at least one of the plurality of first through grooves is covered by at least part of the second contact portion.

8. The chip according to claim 7, **characterized in that** the second chip portion comprises a first surface and a second surface that are opposite to each other, the second chip portion is provided with a plurality of second through grooves for accommodating the first group of styluses, each of the plurality of second through grooves penetrates the first surface and the second surface of the second chip portion, and a part of at least one of the plurality of second through grooves is covered by at least part of the first contact portion.

9. The chip according to claim 8, **characterized in that** the plurality of first through grooves is used for accommodating the second group of styluses, and the plurality of second through grooves is used for accommodating the first group of styluses.

10. The chip according to claim 9, **characterized in that** when the second contact portion is in contact with the second group of styluses, the second contact portion is deformed under a contact force imparted to the second chip portion by the styluses.

11. The chip according to claim 9, **characterized in that** the second chip portion is a hard board chip, and when the chip is viewed in a direction perpendicular to a third surface of the second chip portion:
after the chip is in contact with the styluses, the second contact portion and the first contact portion are arranged in two rows, and the second contact portion is provided in corresponding one of the plurality of first through grooves.

12. The chip according to any one of claims 7-11, **characterized in that** after the first chip portion is connected to the second chip portion, the first contact portion the second contact portion are spaced apart from each other when the chip is viewed in a direction perpendicular to a third surface of the first chip portion.

13. An ink cartridge for being detachably mounted on a holding portion of a printer, **characterized in that** the ink cartridge comprises the chip according to any one of claims 1-12.

14. The ink cartridge according to claim 13, **characterized in that** the ink cartridge comprises a housing, wherein a mounting portion is provided at a side portion of the housing, the chip is mounted on a chip holder, and at least part of the chip and the chip holder are to be mounted at the mounting portion.

15. The ink cartridge according to claim 14, **characterized in that** an elastic member is provided between the chip holder and the housing, a trajectory hole is provided at a side end of the mounting portion, the chip holder is provided with a rotating shaft and a supporting portion, and the rotating shaft is movable along the trajectory hole; and the supporting portion and the elastic member abut against each other

when the chip holder is mounted in the ink cartridge.

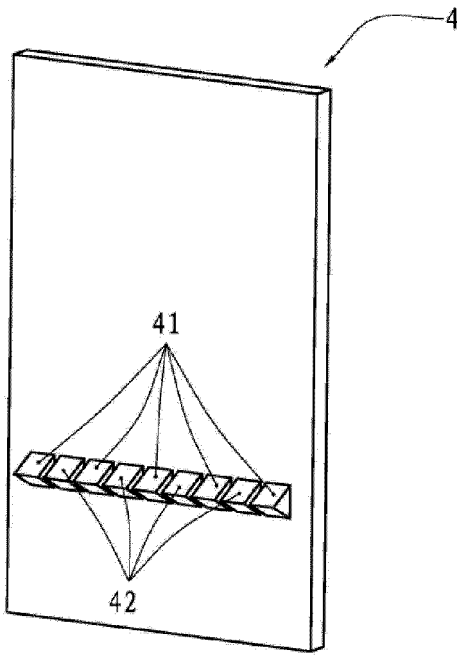

FIG. 1

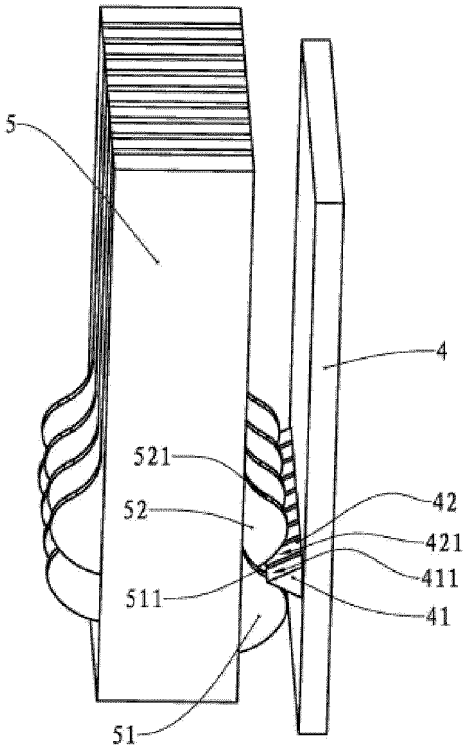

FIG. 2

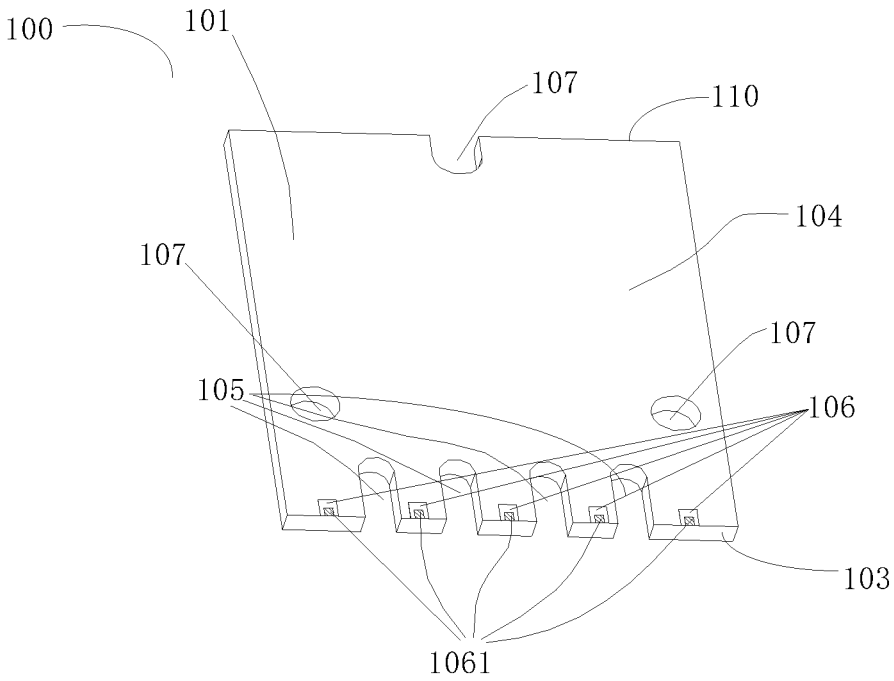

FIG. 3a1

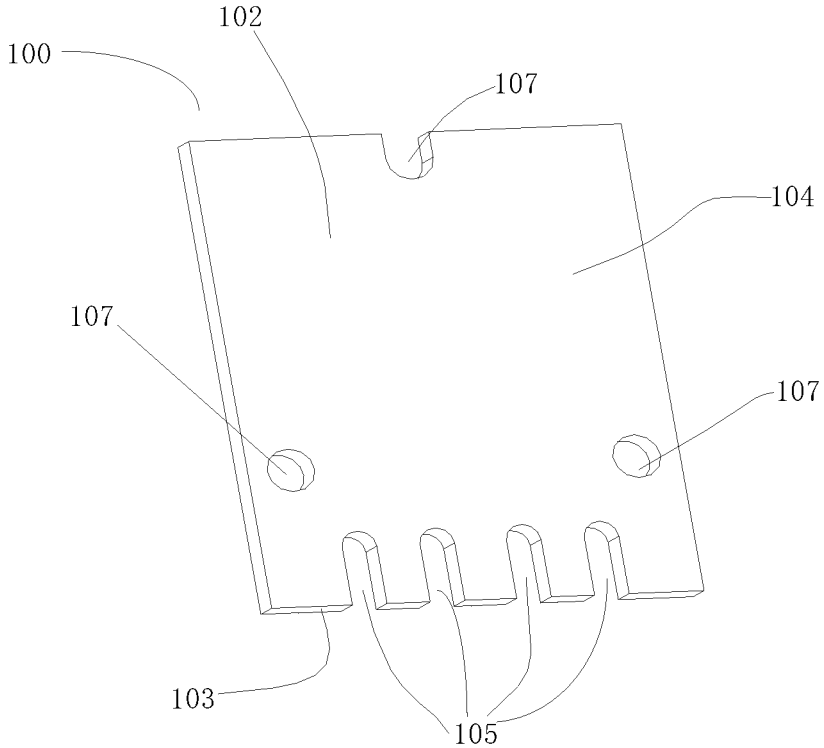

FIG. 3a2

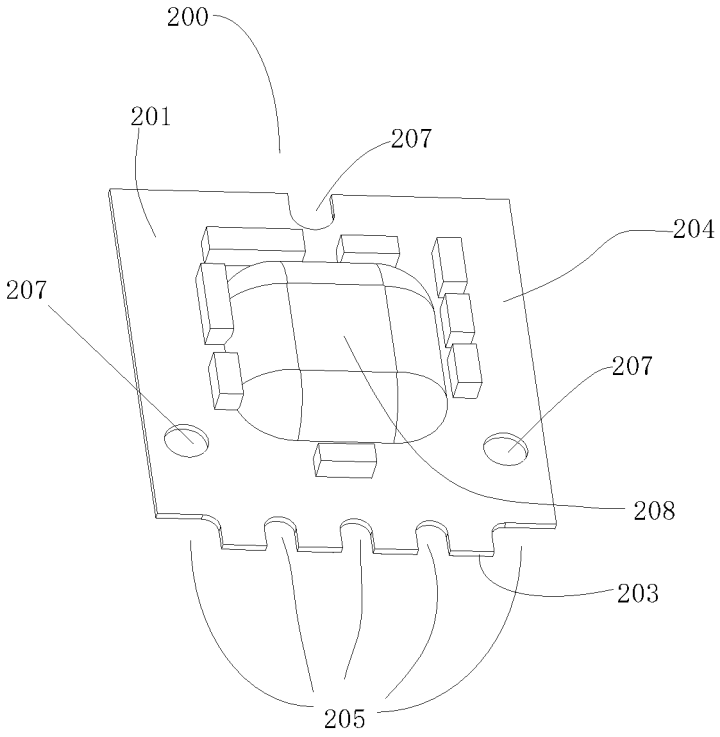

FIG. 3b1

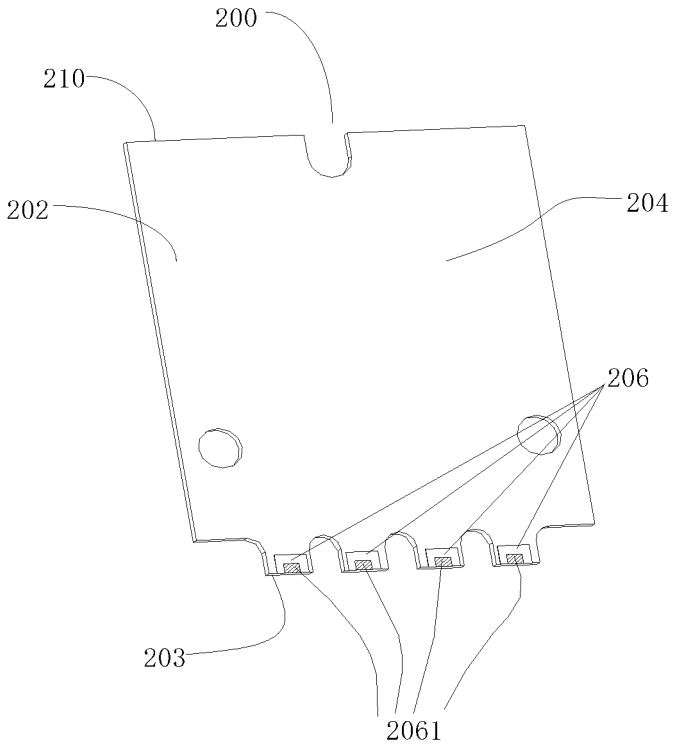

FIG. 3b2

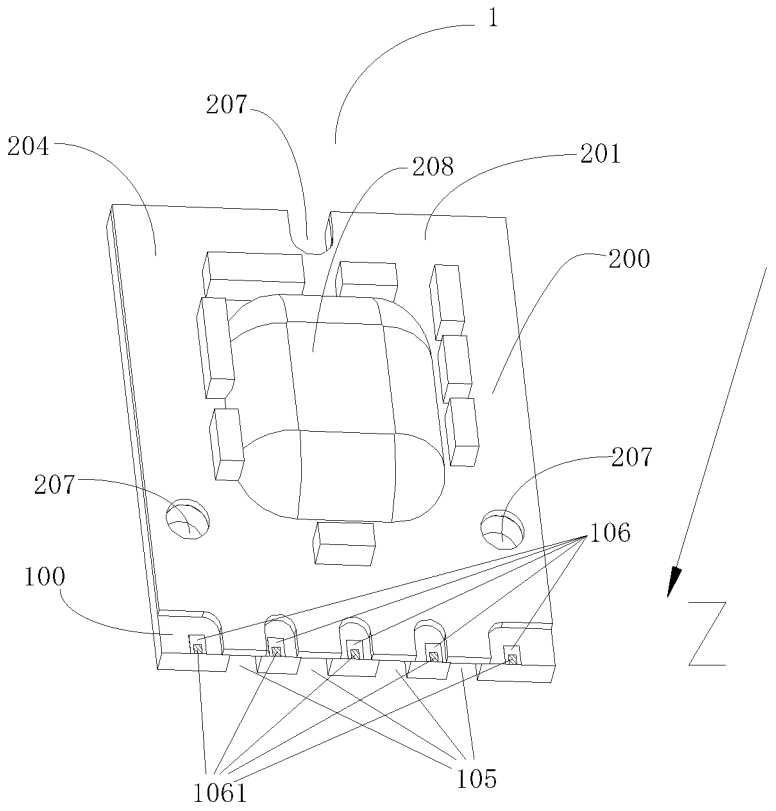

FIG. 3c1

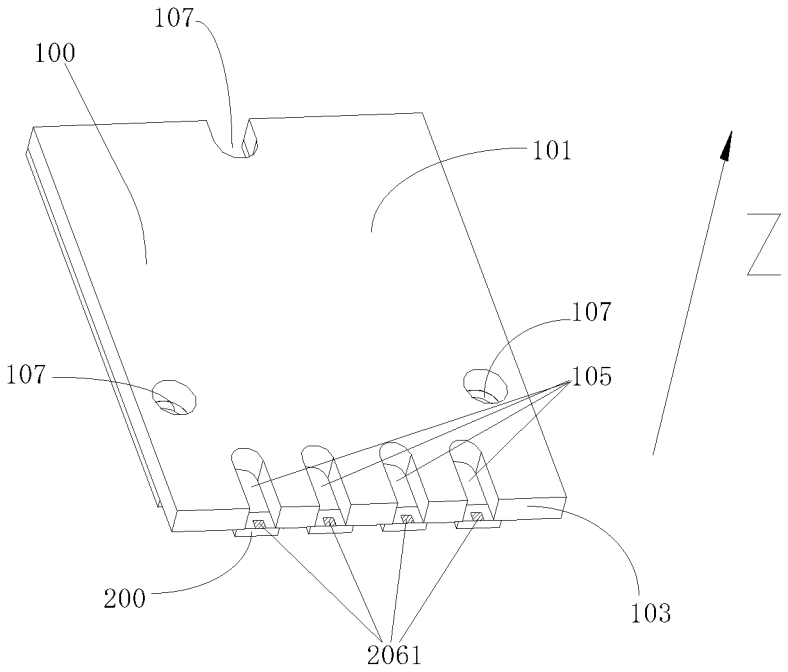

FIG. 3c2

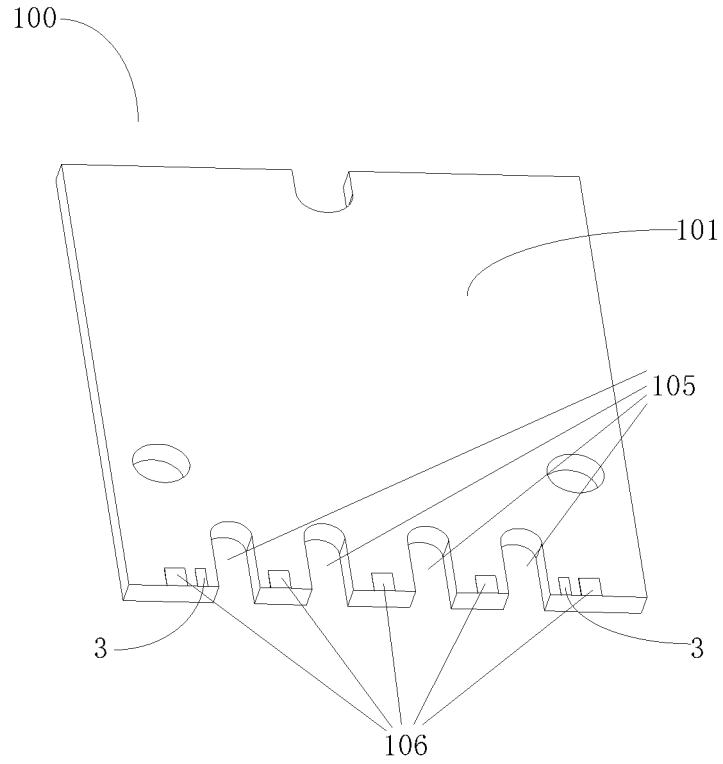

FIG. 4a

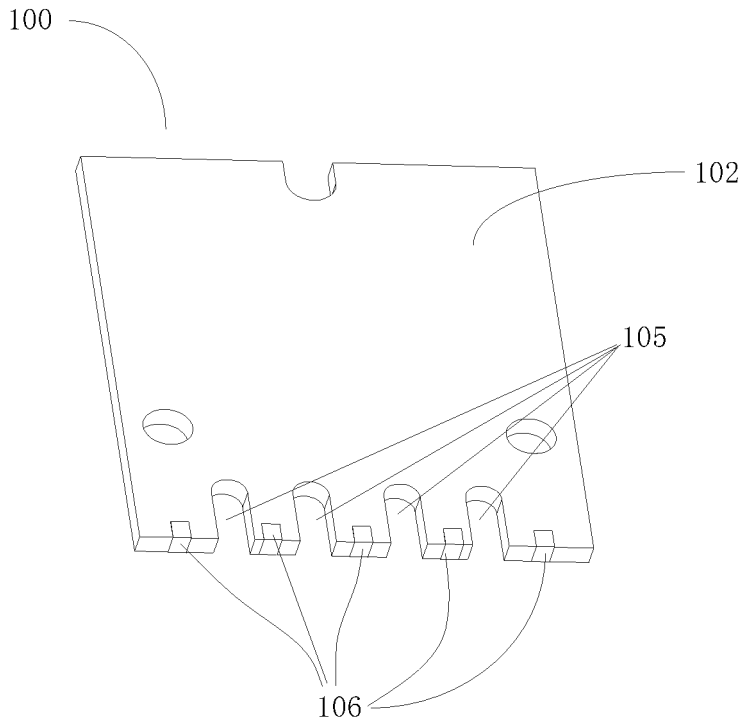

FIG. 4b

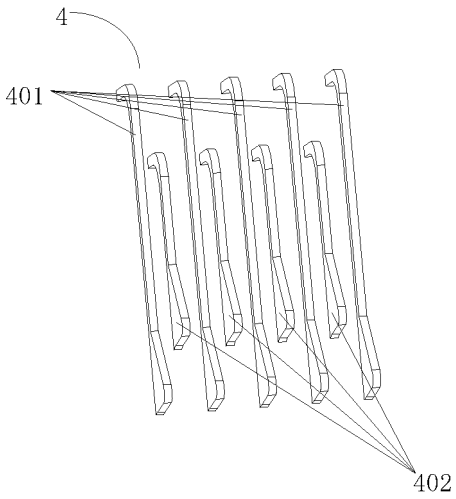

FIG. 5a

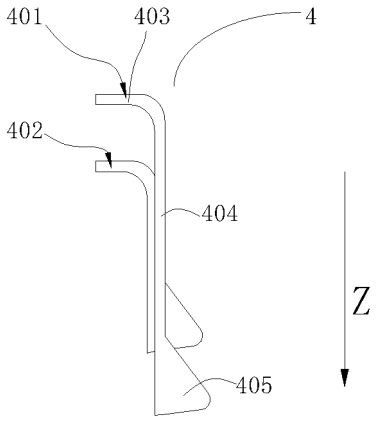

FIG. 5b

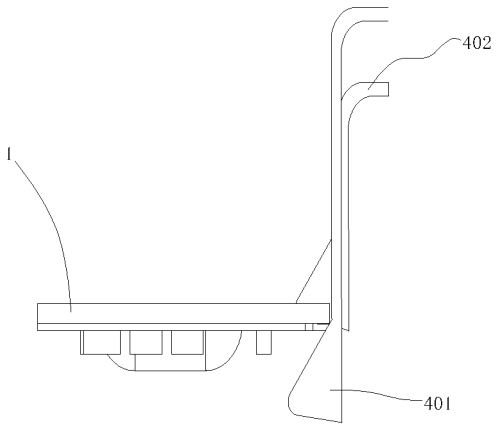

FIG. 6a

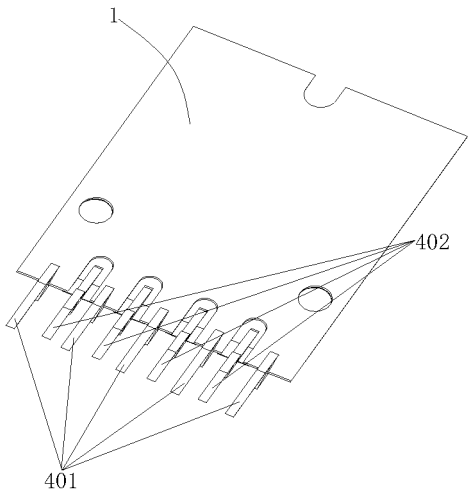

FIG. 6b

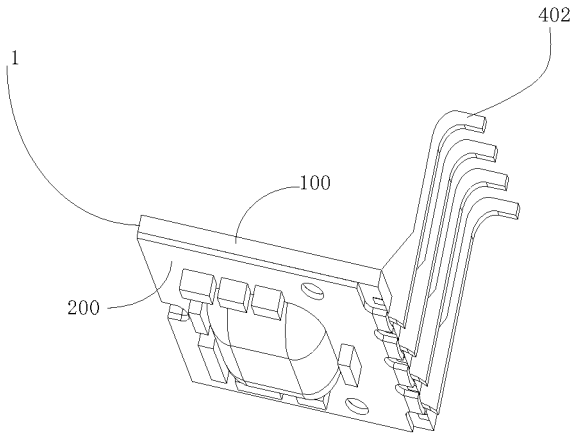

FIG. 6c

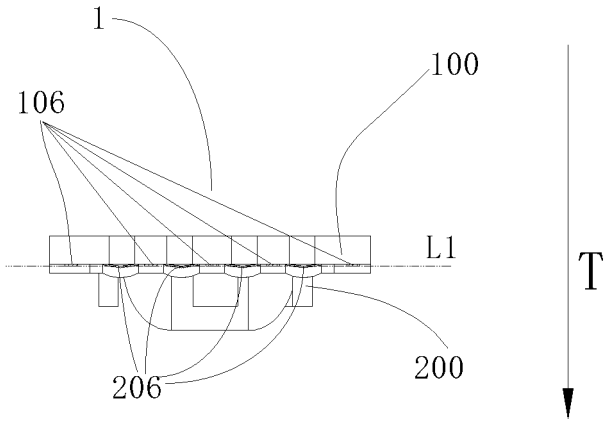

FIG. 7a

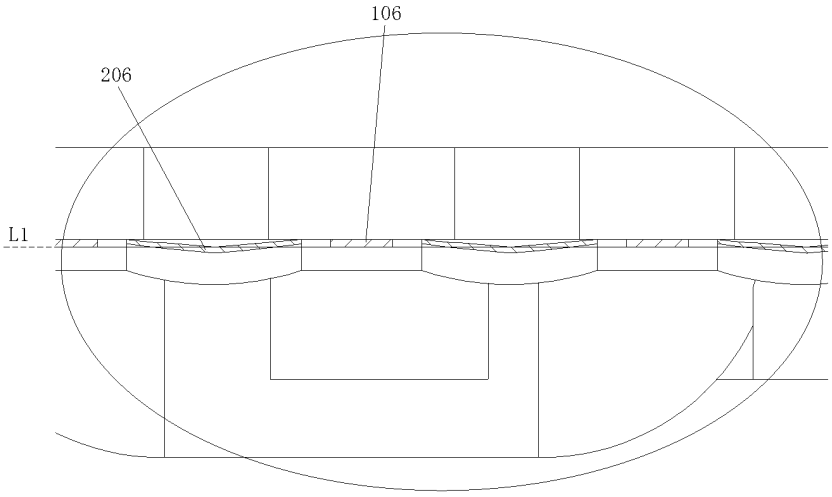

FIG. 7a1

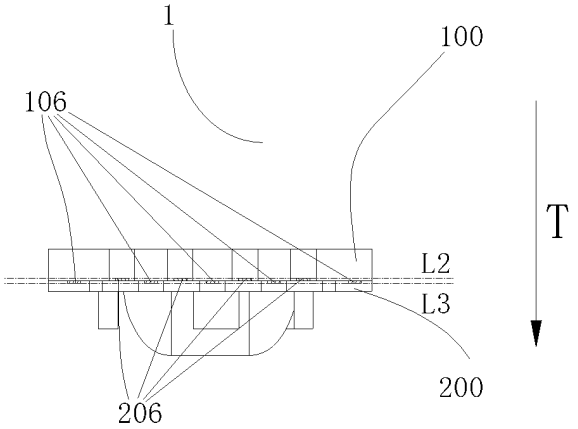

FIG. 7b

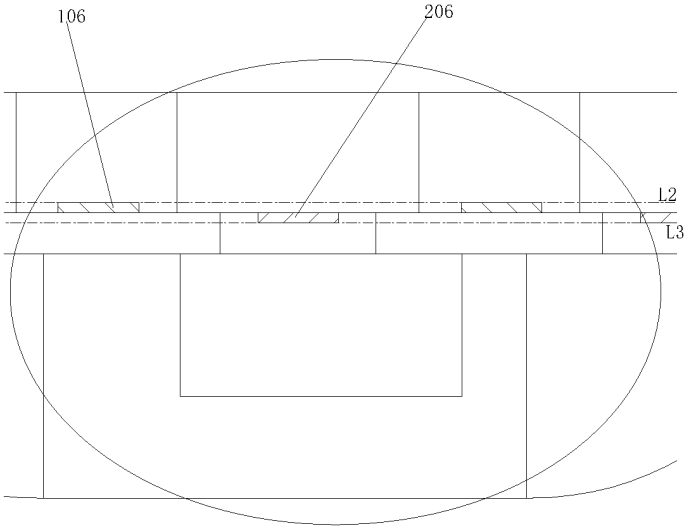

FIG. 7b1

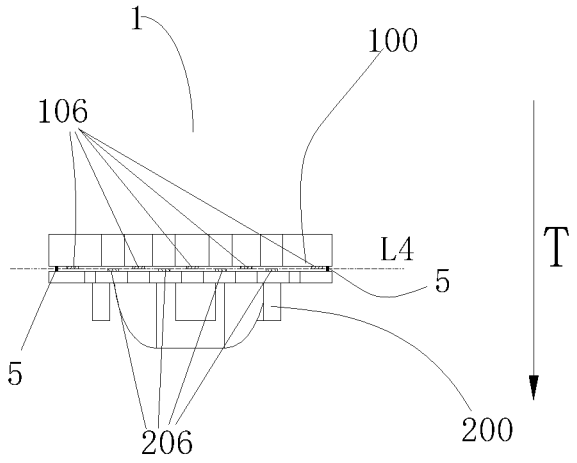

FIG. 7c

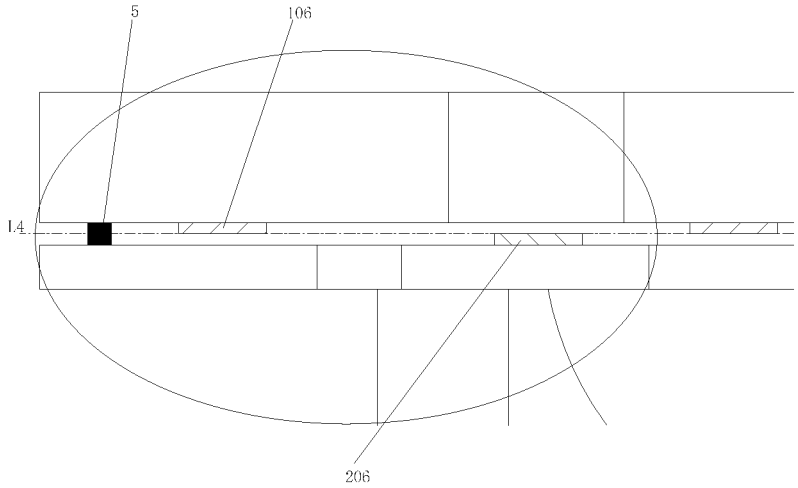

FIG. 7c1

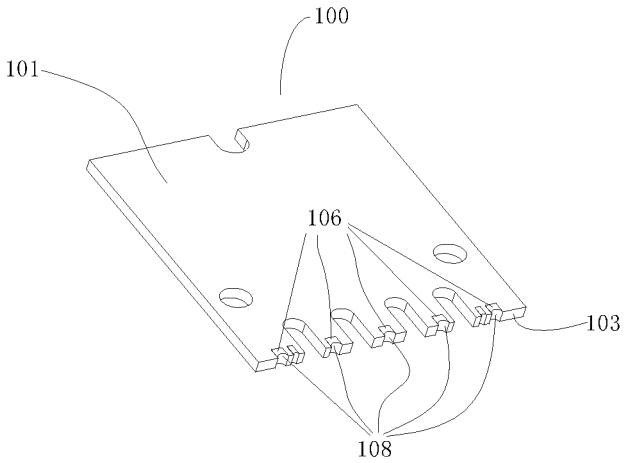

FIG. 8a

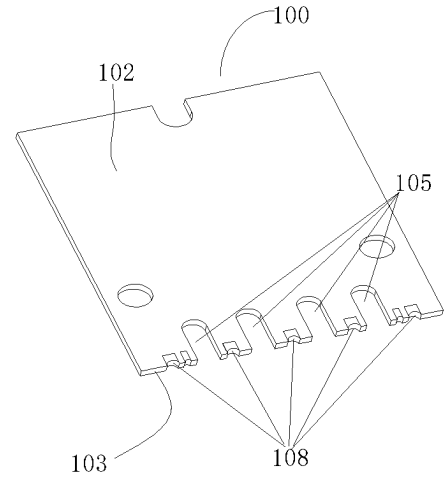

FIG. 8b

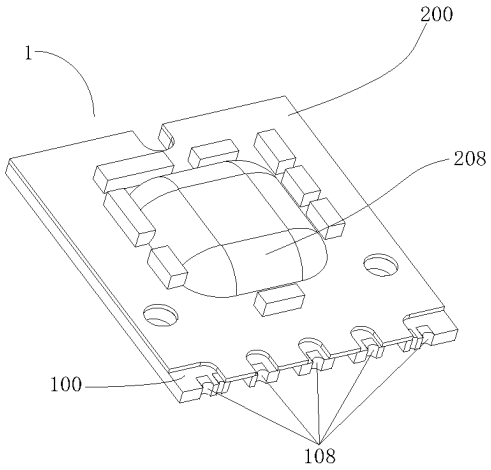

FIG. 8c

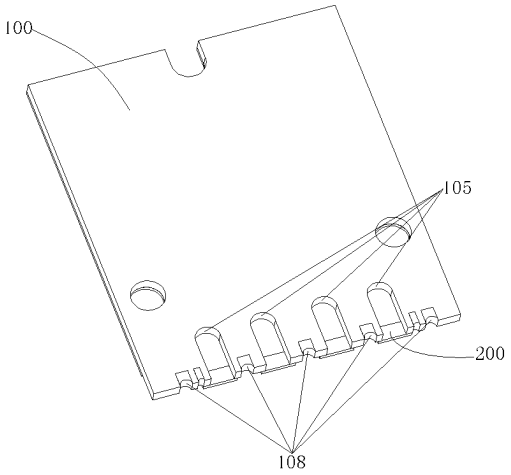

FIG. 8d

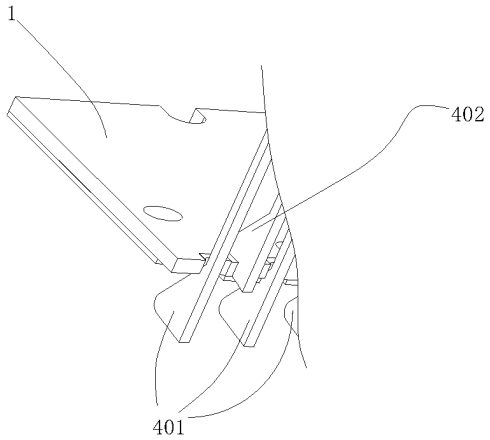

FIG. 9

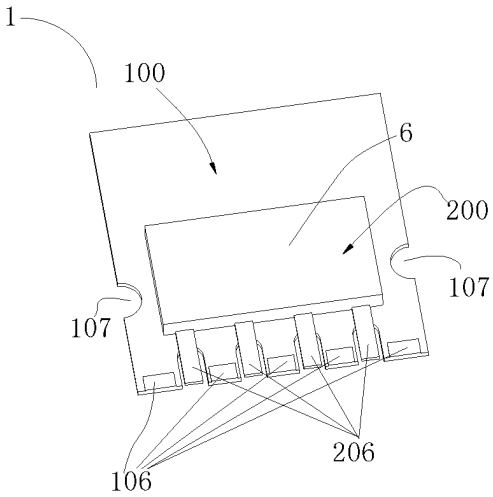

FIG. 10a

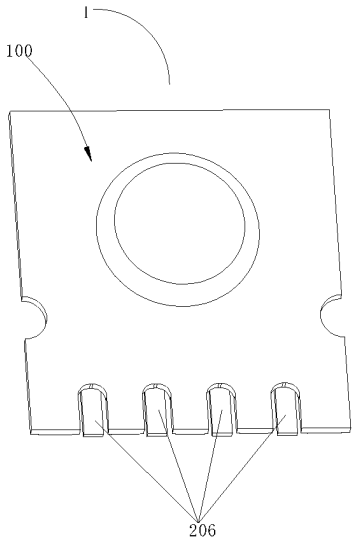

FIG. 10b

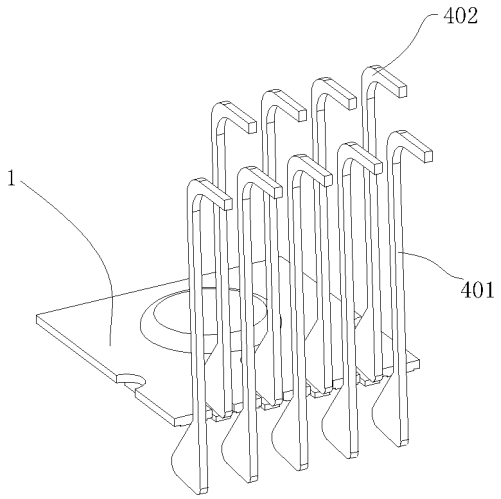

FIG. 11

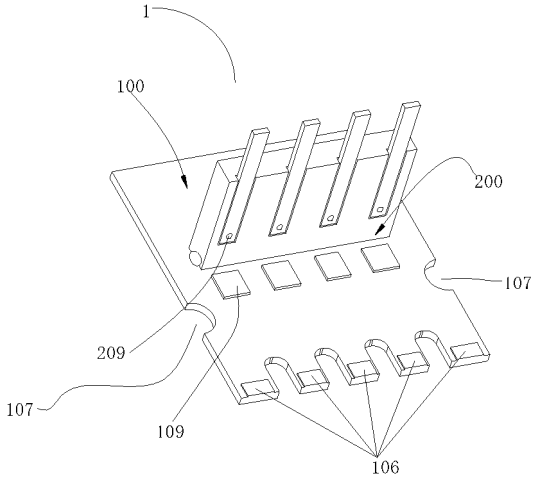

FIG. 12

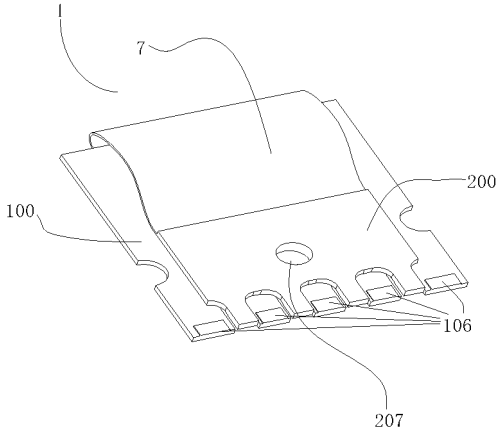

FIG. 13a

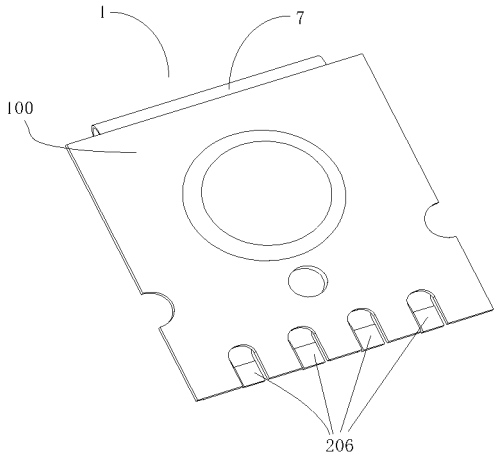

FIG. 13b

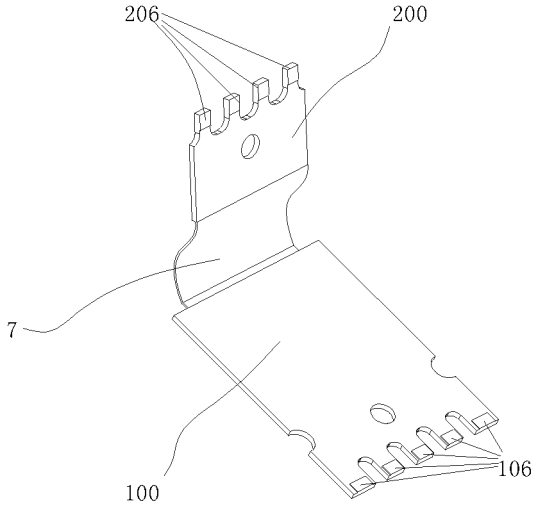

FIG. 13c

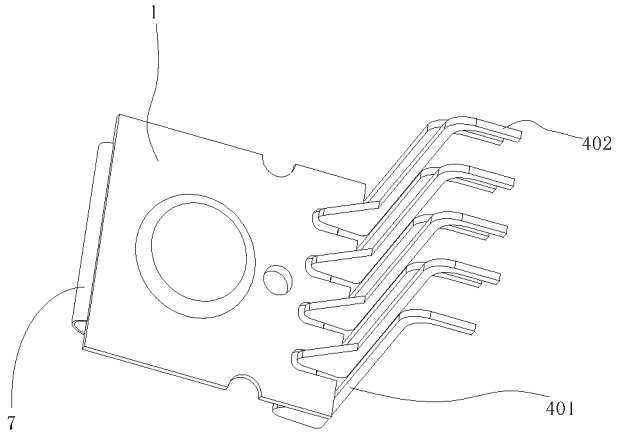

FIG. 14a

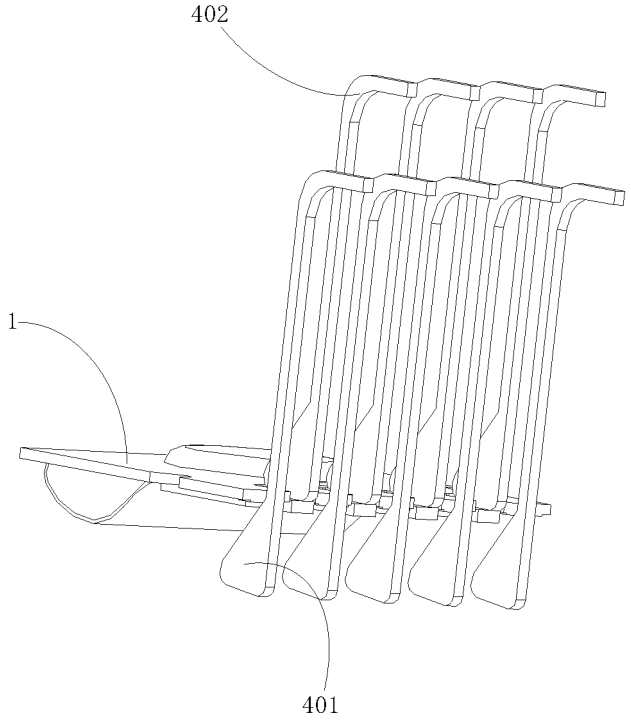

FIG. 14b

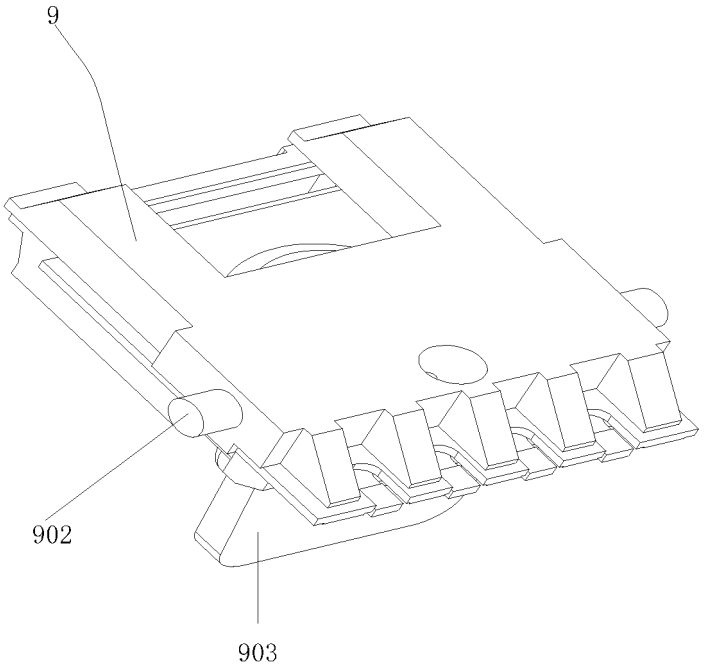

FIG. 15

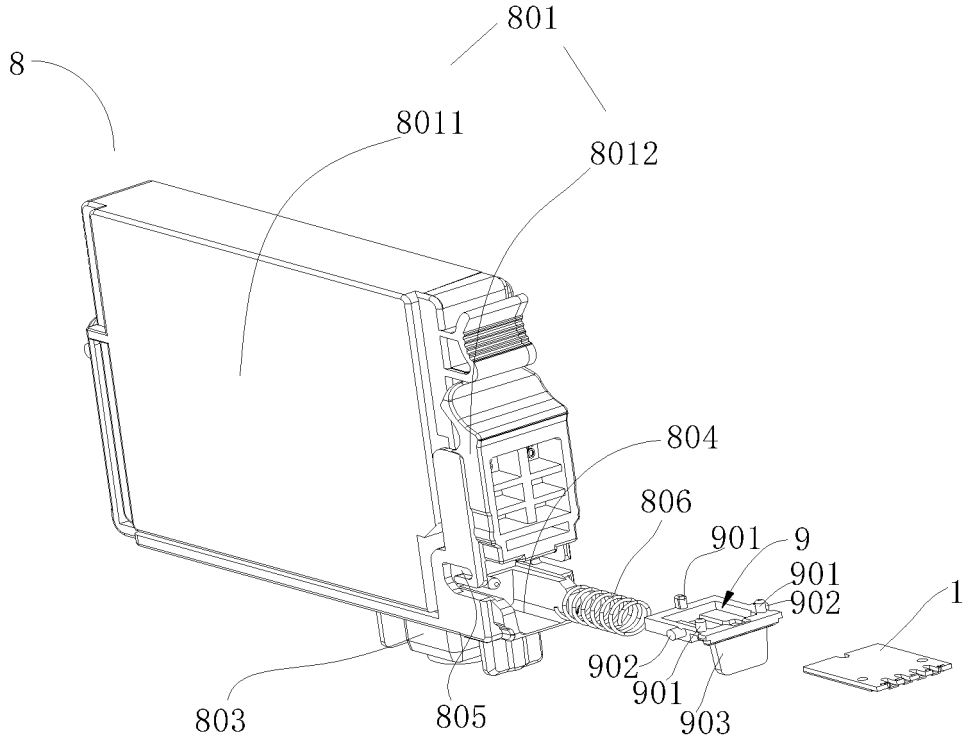

FIG. 16a

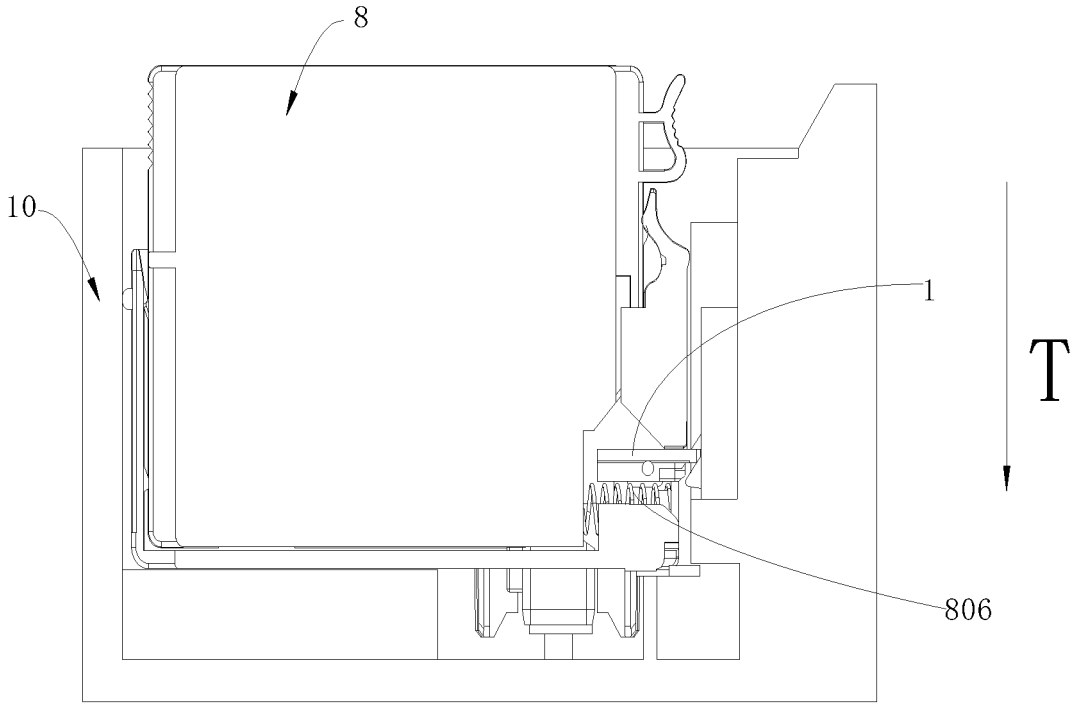

FIG. 16b

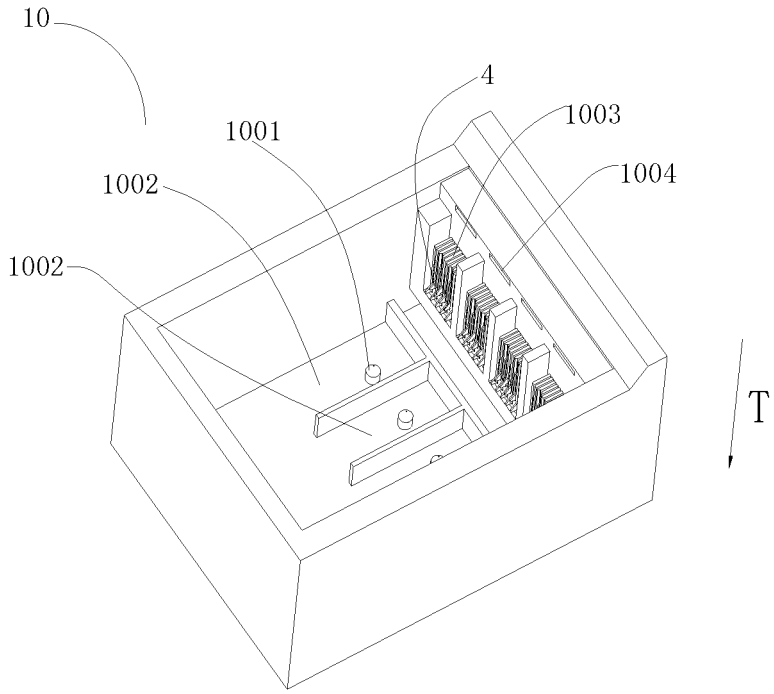

FIG. 17

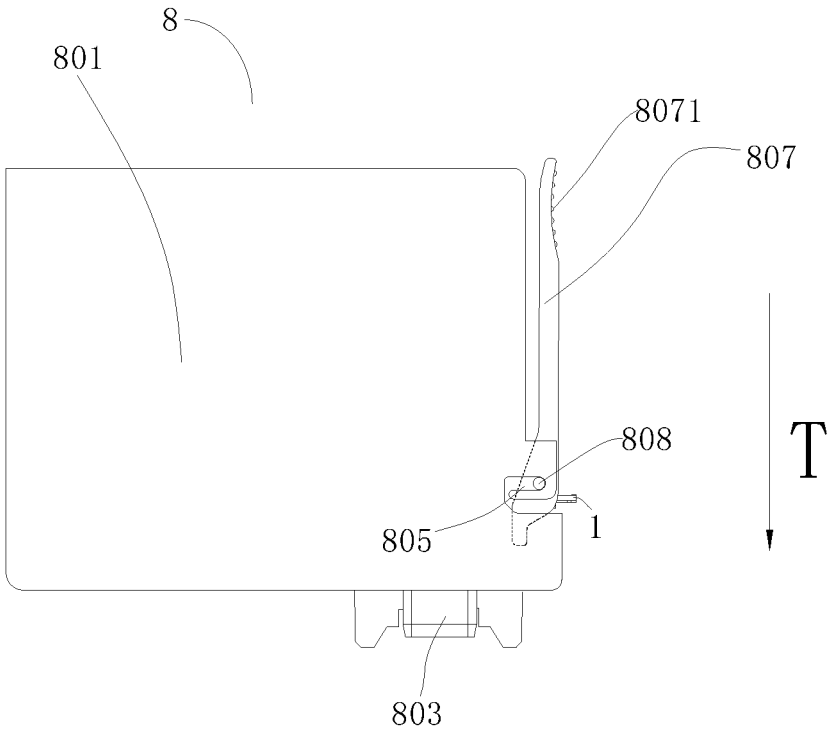

FIG. 18

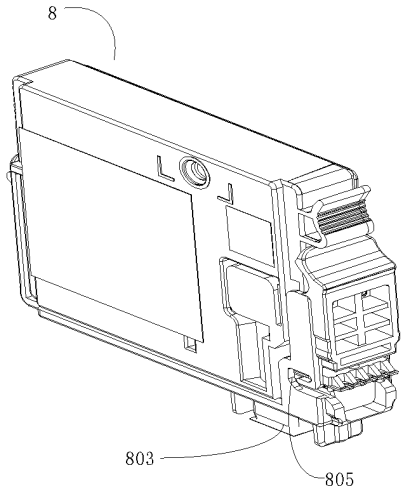

FIG. 19a

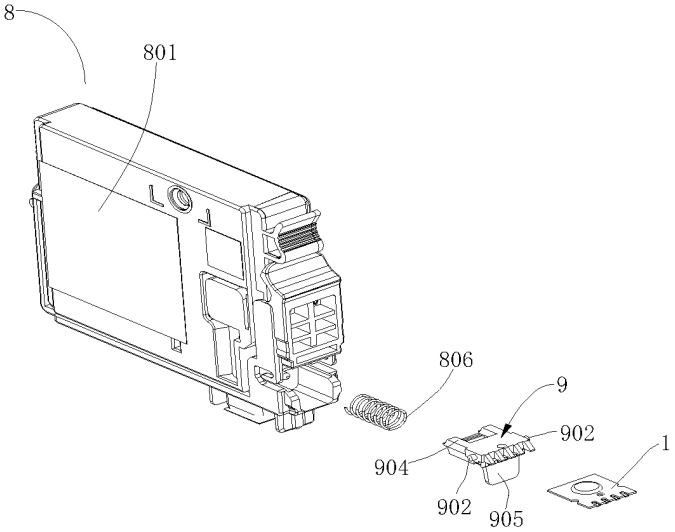

FIG. 19b

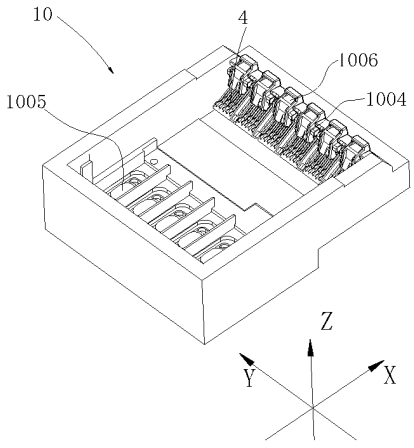

FIG. 20

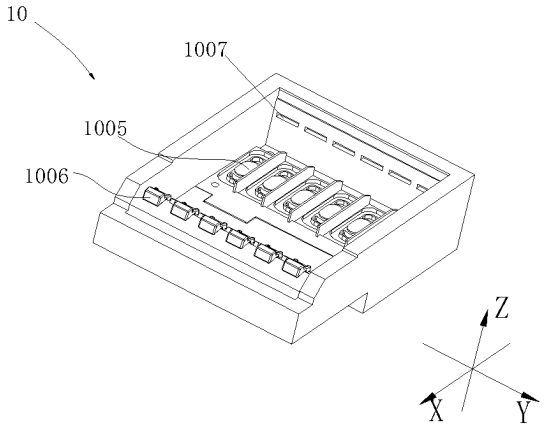

FIG. 21

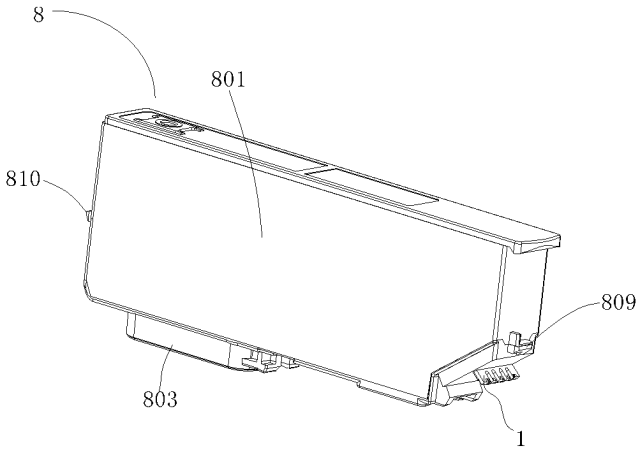

FIG. 22

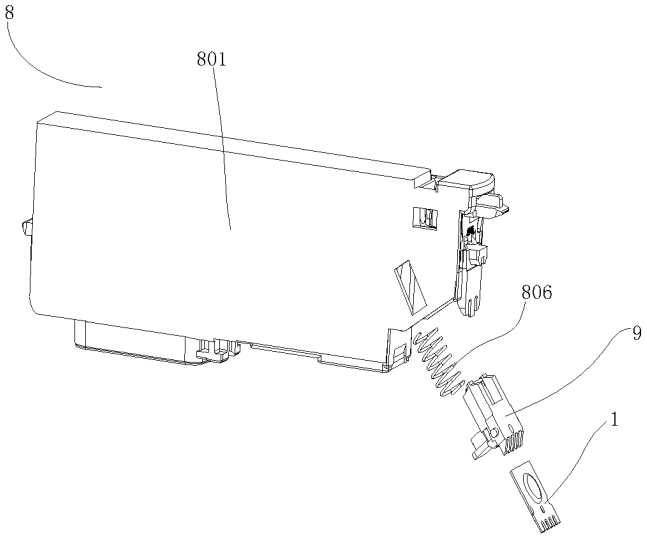

FIG. 23

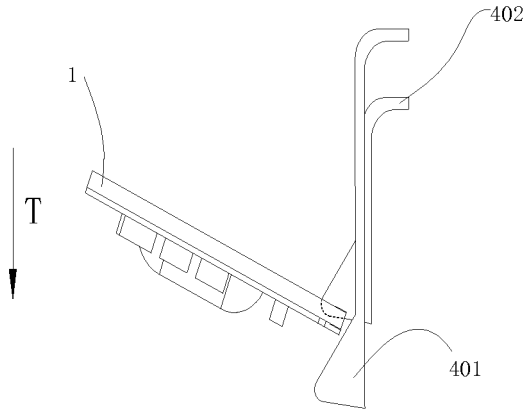

FIG. 24

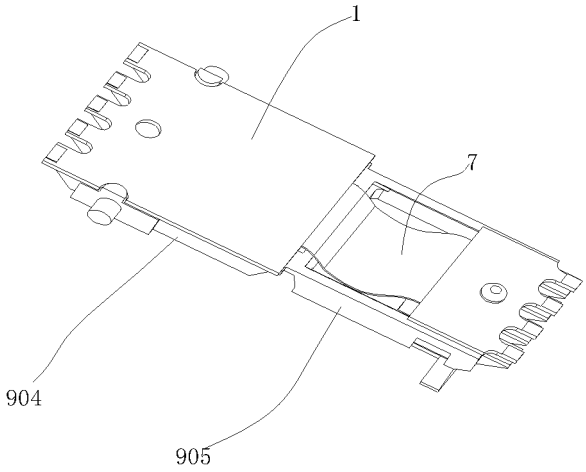

FIG. 25

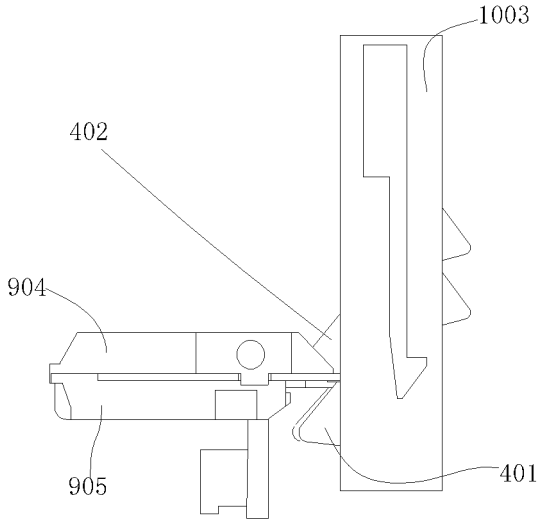

FIG. 26a

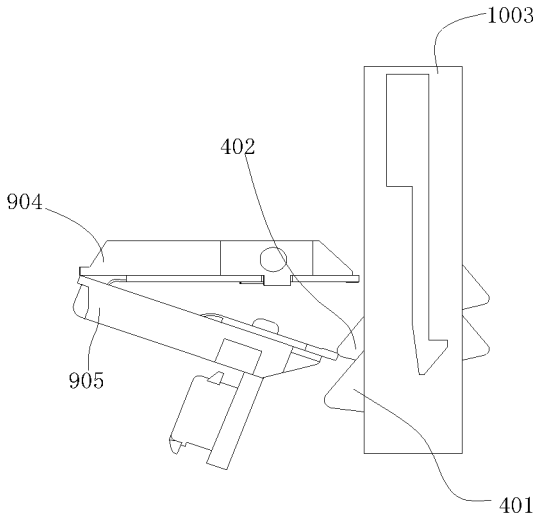

FIG. 26b

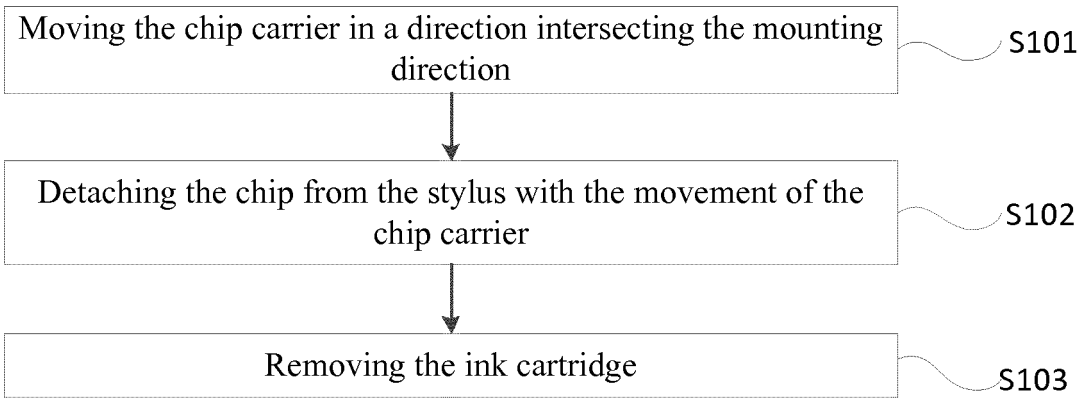

FIG. 27

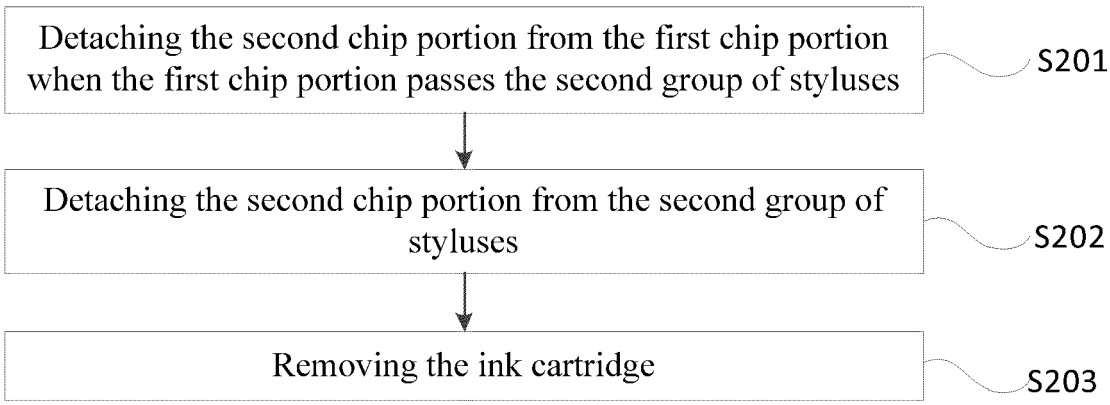

FIG. 28

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/116264

A. CLASSIFICATION OF SUBJECT MATTER

B41J 2/175 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B41J; H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, CNPAT, CNKI: 打印机, 墨盒, 芯片, 电路板, 槽, 触点, 触针, 端子, 第二, printer, ink, box, chip, core, circuit, sheet, plate, groove?, slot?, contact+, terminal?, channel, needle?, pin, second

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 206012027 U (ZHUHAI NASIDA ENTERPRISE MANAGEMENT CO., LTD.), 15 March 2017 (15.03.2017), description, paragraphs 72-93, and figures 3-26	1-15
A	CN 203157377 U (ZHUHAI NASIDA ENTERPRISE MANAGEMENT CO., LTD.), 28 August 2013 (28.08.2013), entire document	1-15
A	CN 203004522 U (APEX MICROELECTRONICS CO., LTD.), 19 June 2013 (19.06.2013), entire document	1-15
A	CN 104378913 A (APEX MICROELECTRONICS CO., LTD.), 25 February 2015 (25.02.2015), entire document	1-15
A	CN 206154912 U (ZHUHAI NASIDA ENTERPRISE MANAGEMENT CO., LTD.), 10 May 2017 (10.05.2017), entire document	1-15
A	JP 2015136815 A (S. T. SANGYO CO., LTD.), 30 July 2015 (30.07.2015), entire document	1-15

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 March 2018	02 April 2018
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer GAO, Bo Telephone No. (86-10) 010-53961070

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/116264

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 206012027 U	15 March 2017	None	
CN 203157377 U	28 August 2013	None	
CN 203004522 U	19 June 2013	None	
CN 104378913 A	25 February 2015	CN 104378913 B	13 October 2017
CN 206154912 U	10 May 2017	None	
JP 2015136815 A	30 July 2015	None	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- CN 201320875786 **[0003]**