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(54) **REVERSELY-CONNECTED INK BOX, AND METHODS FOR MOUNTING AND DISMOUNTING SAME**

UMGEKEHRT ANGESCHLOSSENER TINTENBEHÄLTER UND VERFAHREN ZUM MONTIEREN
UND DEMONTIEREN DESSELBEN

CAISSON D'ENCRE À CONNEXION INVERSÉE, ET PROCÉDÉS POUR SON MONTAGE ET SON
DÉMONTAGE

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Description

Technical Field

[0001] The present invention relates to the field of printers, specifically, to a reverse-connected ink cartridge connected to a mounting structure in a printer and a method for mounting a reverse connected ink cartridge to a mounting structure and a method for removing and connecting a reverse connected ink cartridge from a mounting structure.

Related Art

[0002] Ink-jet printers are relatively commonly used printing tools. Currently, laser printers have been relatively popular. However, because laser printers require high maintenance costs, ink-jet printers still occupy a large market share, especially in places such as families, stores, and workplaces.

[0003] Document WO2014/121637 discloses a reverse-connected ink cartridge connected to a mounting structure by engaging a first cartridge positioning structure in a slot located in a lever body which is connected to mounting portion.

[0004] Documents WO2014/063458, US2013/182053 and EP2857206 describe also reverse connected cartridges which are fastened to a mounting portion by embedding a protruding portion of the cartridge in a receiving area of a lever. There are many methods for engaging an ink cartridge used in an ink-jet printer with an ink cartridge holder. As shown in FIG. 5 of Chinese Patent CN201280003040.0, an engaging method described in Patent CN201280003040.0 is that an ink cartridge 20 is fastened by engaging a first device-side engaging structure 810 on a lever 800 of a mounting structure 600 in a printer with a first cartridge-side positioning structure 210 of the ink cartridge 20. When the ink cartridge 20 needs to be taken out, in a process of taking out the ink cartridge 20, an operating member 830 of the lever 800 needs to be pushed to drive the first device-side engaging structure 810 at the other end of the lever 800 to rotate, so that the first device-side engaging structure 810 leaves the first cartridge-side positioning structure 210. In this way, the ink cartridge 20 can be taken out from the mounting structure 600. This structure has the following disadvantages.

First, because a rotating shaft 800c of the lever 800 is located between the operating member 830 and the first device-side engaging structure 810, and the operating member 830 and the first device-side engaging structure 810 are respectively located on two sides of the rotating shaft 800c, the ink cartridge 20 cannot be easily taken out if the space between the ink cartridge 20 and the lever 800 is excessively small, or the ink cartridge 20 and the printer cannot be miniaturized if the space between the ink cartridge 20 and the lever 800 is increased.

[0005] Second, as shown in FIG. 30 of Patent

CN201280003040.0, in the process of taking out the ink cartridge 20, the lever 800 needs to rotate counterclockwise. When rotating counterclockwise, the first device-side engaging structure 810 moves towards a negative Z-axis direction. In this case, the first device-side engaging structure 810 is engaged with the first cartridge-side positioning structure 210. As a result, the first cartridge-side positioning structure 210 leaves the first device-side engaging structure 810 only by moving the ink cartridge 20 downward first. This method causes damage to contact pins 731 to 739 or a chip 700. To successfully take out the ink cartridge 20, particular space in the negative Z-axis direction needs to be reserved for the ink cartridge 20, which is unfavorable to miniaturize the ink cartridge 20 and the printer. In addition, because the space in the negative Z-axis direction is reserved for the ink cartridge 20, an ink supply port 280 of the ink cartridge 20 and an ink supply tube 640 of the mounting structure 600 are incompletely sealed, causing ink leakage.

[0006] Third, in the process of taking out the ink cartridge, the ink cartridge needs to move in the negative Z-axis direction, and applies a greater compression force to an elastic contact member of the ink cartridge holder. When the ink cartridge is taken out, the elastic contact member applies an excessively large elastic force to the ink cartridge, causing the ink cartridge to eject high from the ink cartridge holder. As a result, the ink supply port may leave the bottom of the ink cartridge holder, and ink may splash out of the ink supply port, and stain the ink cartridge holder, the printer, the user, or the table.

[0007] Fourth, a distance between the first cartridge-side positioning structure 210 and a second cartridge-side positioning structure 220 on a Z-axis is short, and a rotating shaft axis that runs through the first cartridge-side positioning structure 210 and the second cartridge-side positioning structure 220 and that is perpendicular to a YZ plane is prone to be formed. In addition, a movement direction of the mounting structure 600 in the printer is a Y-axis direction. During the movement of the mounting structure 600, the ink cartridge 20 receives a force in the Y-axis direction applied by flowing air. Consequently, the ink cartridge 20 may wobble on the YZ plane, and the ink cartridge 20 is unstably fastened, causing poor contact of the chip and incomplete sealing of the ink supply port.

SUMMARY

[0008] For the disadvantages in the prior art, according to an aspect of the present invention, a reverse-connected ink cartridge connected to a mounting structure disposed in a printer is provided. The reverse-connected ink cartridge includes a housing 1, an operating structure 2, and an abutting component 3, where an ink supply port 11 is provided at the bottom of the housing 1, a plane of the ink supply port 11 is a first plane 1a, a long edge direction of the first plane 1a is an X-axis, a short edge direction is a Y-axis, and an axis perpendicular to the X-

axis and the Y-axis is a Z-axis; and the housing 1 is connected to the operating structure 2 and the abutting component 3, one end of the operating structure 2 is disposed on the housing 1, another end of the operating structure 2 extends away from the housing 1 on the X-axis and towards the first plane 1a on the Z-axis, a first cartridge-side positioning structure 4 extends from the another end of the operating structure 2 towards the housing 1 on the X-axis, and the abutting component 3 is located on a same side of the housing 1 as the another end of the operating structure 2 in an X-axis direction. Preferably, the first cartridge-side positioning structure 4 is a protrusion, and the first cartridge-side positioning structure 4 is of any one of the following shapes: a semicircular shape, a trapezoidal shape, a cone, a triangular shape, a sawtooth shape, or another structure having a smooth curve or an inclined surface.

Preferably, the housing 1 is provided with a pivot hole 15 at a corresponding position connected to the operating structure 2, the operating structure 2 is correspondingly provided with a pivot 25, the pivot 25 is mounted in the pivot hole 15, the operating structure 2 is capable of deflecting in an XZ plane around the pivot 25, and a deflection angle of the operating structure 2 is $0^\circ < \alpha \leq 45^\circ$.

Preferably, the ink cartridge further includes a chip 12, a direction pointing from the ink supply port 11 to the chip 12 is a positive X-axis direction, another surface of the ink cartridge that is opposite to the first plane 1a is a second plane 1b, a direction pointing from the first plane 1a to the second plane 1b is a positive Z-axis direction, a negative X-axis side of the ink cartridge is a fourth plane 1d, a plane opposite to the fourth plane is a third plane 1c, and an inclined surface 13 extends from the third plane 1c in a negative Z-axis direction and a negative X-axis direction; and

the operating structure 2 is located on a positive X-axis side of the housing 1, the abutting component 3 is in contact with the inclined surface 13 and disposed in the positive X-axis direction and the positive Z-axis direction, and the first cartridge-side positioning structure 4 is located in a negative X-axis direction of the operating structure 2.

[0009] Preferably, an end of the operating structure 2 in the negative X-axis direction extends in the positive X-axis direction to form a first inclined structure 21, the first inclined structure 21 continues to extend in the negative Z-axis direction to form a second inclined structure 22, and the first cartridge-side positioning structure 4 is disposed in a negative X-axis direction of the second inclined structure 22.

[0010] Preferably, an acute angle α_1 formed between the first inclined structure 21 and the second inclined structure 22 is in a range of 66° to 86° , and an acute angle α_2 formed between the first cartridge-side positioning structure 4 and the second inclined structure 22 is in a range of 52° to 72° .

[0011] Preferably, a spring 5 is disposed in a negative Z-axis direction of the first inclined structure 21, and the

spring 5 elastically supports the first inclined structure 21.

[0012] Preferably, a surface of the first inclined structure 21 in the positive Z-axis direction is provided with a pressing structure 26.

[0013] Preferably, the operating structure 2 further includes a hand-operating member 24, and the hand-operating member 24 protrudes in a positive Z-axis direction of a junction of the first inclined structure 21 and the second inclined structure 22.

[0014] Preferably, the abutting component 3 has at least one guiding surface 31 in a direction perpendicular to the Y-axis, and has at least one pressing surface 32 in the positive X-axis direction.

[0015] According to another aspect of the present invention, an ink cartridge with a replaceable structure is provided. The ink cartridge includes the reverse-connected ink cartridge described above, and further includes a replaceable structure 14, where an abutting component 3, an operating structure 2, and a chip 12 are disposed on the replaceable structure 14.

[0016] Preferably, the replaceable structure 14 is located in a positive X-axis direction of the housing 1, and the chip 12, the abutting component 3, and the operating structure 2 are sequentially arranged on the replaceable structure 14 in a positive X-axis direction and a positive Z-axis direction. The reverse connected cartridge of the present invention is connected to a mounting structure. A mounting structure 8 is disposed in a printer, the mounting structure 8 includes at least a lever body 81, a rotating shaft 82, a first device-side engaging structure 83, and a lever receiving structure 84, the first device-side engaging structure 83 is connected to the lever body 81 by using the rotating shaft 82, an abutting component 3 is in contact with the lever body 81, and drives the lever body 81 to rotate about the rotating shaft 82, when rotating about the rotating shaft 82, the lever body 81 drives the first device-side engaging structure 83 to rotate relative to the lever receiving structure 84, and a first cartridge-side positioning structure 4 is embedded into a gap generated between the first device-side engaging structure 83 and the lever receiving structure 84 by means of rotation.

[0017] The ink cartridge connected to a mounting structure includes a housing 1, an operating structure 2, and the abutting component 3, where the housing 1 is connected to the operating structure 2 and the abutting component 3, one end of the operating structure 2 is disposed on the housing 1, another end of the operating structure 2 extends away from the housing 1 on an X-axis and towards a first plane 1a on a Z-axis, the first cartridge-side positioning structure 4 extends from the another end of the operating structure 2 towards the housing 1 on the X-axis, and the abutting component 3 is located on a same side of the housing 1 as the another end of the operating structure 2 in an X-axis direction. Specifically, the first cartridge-side positioning structure 4 is a protrusion, and the first cartridge-side positioning structure 4 is of any one of the following shapes: a sem-

icircular shape, a trapezoidal shape, a cone, a triangular shape, a sawtooth shape, or another structure having a smooth curve or an inclined surface.

[0018] Preferably, a second plane 1b of the ink cartridge connected to a mounting structure is provided with a pivot hole 15, the operating structure 2 is provided with a pivot 25 at a corresponding position, the pivot 25 is mounted in the pivot hole 15, the operating structure 2 is capable of deflecting in an XZ plane around the pivot 25, and a deflection angle of the operating structure 2 is $0^\circ < \alpha \leq 45^\circ$.

[0019] Preferably, the ink cartridge connected to a mounting structure further includes a chip 12, a direction pointing from an ink supply port 11 to the chip 12 is a positive X-axis direction, another surface of the ink cartridge that is opposite to the first plane 1a is the second plane 1b, a direction pointing from the first plane 1a to the second plane 1b is a positive Z-axis direction, the fourth operating structure 2 is located on a positive X-axis side of the housing 1, the abutting component 3 is in contact with an inclined surface 13 and disposed in a positive X-axis direction and the positive Z-axis direction, and the first cartridge-side positioning structure 4 is located in a negative X-axis direction of the operating structure 2.

[0020] Preferably, an end in the negative X-axis direction of the operating structure 2 of the ink cartridge connected to a mounting structure extends in the positive X-axis direction to form a first inclined structure 21, the first inclined structure 21 continues to extend in a negative Z-axis direction to form a second inclined structure 22, and the first cartridge-side positioning structure 4 is disposed in a negative X-axis direction of the second inclined structure 22.

[0021] Specifically, an acute angle α_1 formed between the first inclined structure 21 and the second inclined structure 22 is in a range of 66° to 86° , and an acute angle α_2 formed between the first cartridge-side positioning structure 4 and the second inclined structure 22 is in a range of 52° to 72° .

[0022] Preferably, the operating structure 2 of the ink cartridge connected to a mounting structure is provided with a spring 5 in a negative Z-axis direction of the first inclined structure 21, and the spring 5 elastically supports the first inclined structure 21.

[0023] Preferably, the operating structure 2 of the ink cartridge connected to a mounting structure is provided with a pressing structure 26 on a surface in a positive Z-axis direction of the first inclined structure 21. Further, the operating structure 2 is further provided with a hand-operating member 24, and the hand-operating member 24 protrudes in a positive Z-axis direction of a junction of the first inclined structure 21 and the second inclined structure 22.

[0024] Preferably, the lever body 81 is provided with a guiding rib 811, a guiding surface 31 is in contact with the guiding rib 811, and a pressing surface 32 is in contact with the lever body 81, and drives the lever body 81 to

rotate about the rotating shaft 82.

[0025] Preferably, the mounting structure 8 includes a second device-side engaging structure 85, and the second device-side engaging structure 85 and a second cartridge-side positioning structure 6 are matched in shape and are mutually engaged.

[0026] According to another aspect of the present invention, a method for mounting an ink cartridge is provided. The method is used to fasten a reverse-connected ink cartridge to a mounting structure, and includes the following steps:

- a. engaging a second cartridge-side positioning structure 6 with a second device-side engaging structure 85;
- b. pressing a second plane 1b, to make an abutting component 3 compress a lever body 81;
- c. pressing, by the abutting component 3, the lever body 81 to rotate, to generate a gap between a first device-side engaging structure 83 and a lever receiving structure 84;
- d. embedding a first cartridge-side positioning structure 4 into the gap to be engaged with the first device-side engaging structure 83; and
- e. releasing a pressing force on the second plane 1b.

[0027] According to another aspect of the present invention, a method for removing an ink cartridge is provided. The method is used to separate a reverse-connected ink cartridge from a mounting structure, and includes the following steps:

- i. pressing a pressing structure 26 of an operating structure 2, to pull out a first cartridge-side positioning structure 4 from a gap, so as to separate the first cartridge-side positioning structure 4 from a first device-side engaging structure 83;
- ii. applying, by a contact member of a mounting structure 8, a rebound force to an ink cartridge, to separate a second cartridge-side positioning structure 6 from a second device-side engaging structure 85, so that a compression force applied by an abutting component 3 to a lever body 81 disappears, and the lever body 81 is reset; and
- iii. taking out the ink cartridge.

[0028] Preferably, the step i is replaced with step i': pushing a hand-operating member 24.

[0029] In the present invention, the ink cartridge is provided with the first cartridge-side positioning structure facing towards the housing. In a mounting process, the first cartridge-side positioning structure is embedded into

the gap formed between the first device-side engaging structure and the lever receiving structure of the mounting structure, to complete engagement between the ink cartridge and the mounting structure. Because the first cartridge-side positioning structure and the first cartridge-side positioning structure are located on a same side of the lever body, in the mounting process, the lever body does not need to rotate by a relatively large angle. In this way, even though space between the ink cartridge and the lever body is relatively small, mounting and removal of the ink cartridge can still be completed. In addition, this is favorable to miniaturize the ink cartridge and the printer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] Other features, objectives, and advantages of the present invention become more apparent by reading detailed descriptions of non-limitative embodiments made with reference to the accompanying drawings.

FIG. 1 is a schematic structural diagram of a reverse-connected ink cartridge according to a first specific implementation of the present invention;

FIG. 2 to FIG. 5 are schematic diagrams of first cartridge-side positioning structures of different shapes according to an embodiment of the present invention;

FIG. 6 is a schematic structural diagram of a handle provided with a spring according to an embodiment of the present invention;

FIG. 7 is a schematic structural diagram of a handle provided with a pressing structure and a hand-operating member according to an embodiment of the present invention;

FIG. 8 is a schematic structural diagram of an abutting component according to an embodiment of the present invention;

FIG. 9 is a schematic structural diagram of a reverse-connected ink cartridge according to an embodiment of the present invention;

FIG. 10 is a schematic structural diagram of a reverse-connected ink cartridge with a replaceable structure according to a second specific implementation of the present invention;

FIG. 11 is a schematic structural diagram of a mounting structure according to a third specific implementation of the present invention;

FIG. 12 is a schematic structural diagram of a lever body and a rotating shaft according to an embodi-

ment of the present invention;

FIG. 13 is a schematic structural diagram of a first device-side engaging structure and a lever receiving structure according to an embodiment of the present invention;

FIG. 14 is a flowchart of mounting a reverse-connected ink cartridge according to a fourth specific implementation of the present invention; and

FIG. 15 is a flowchart of removing a reverse-connected ink cartridge according to a fifth specific implementation of the present invention.

DETAILED DESCRIPTION

[0031] According to an example of the present invention, a reverse-connected ink cartridge is provided. Specifically, FIG. 1 shows some components of the ink cartridge. In an actual application, the ink cartridge further includes an upper cover, an ink injection port rubber plug, an ink injection port film, a valve membrane, a valve cover, a valve film, a passage film, an ink supply port sponge, a spring washer, a prism, and the like. A person skilled in the art understands that the components not shown are conventional components included in an ink cartridge in the prior art. Therefore, the components are not shown in FIG. 1.

[0032] Further, as shown in FIG. 1, the ink cartridge includes at least a housing 1, an operating structure 2, an abutting component 3, and a first cartridge-side positioning structure 4. A person skilled in the art understands that the housing 1, the operating structure 2, the abutting component 3, and the first cartridge-side positioning structure 4 may be independent of each other, and then are fastened by using a conventional mechanical connection method, for example, by using a slot or a bolt; or may be integrally formed. All these can achieve objectives of the present invention, and details are not described herein. To specifically describe position relationships between the components of the ink cartridge, in the present invention, structural relationships between the components of the ink cartridge are specifically described by defining an X-axis, a Y-axis, and a Z-axis. Specifically, an ink supply port 11 is provided at the bottom of the housing 1. A plane of the ink supply port 11 is a first plane 1a, a long edge direction of the first plane 1a is the X-axis, a short edge direction is the Y-axis, and an axis perpendicular to the X-axis and the Y-axis is the Z-axis.

[0033] Further, as shown in FIG. 1, one end of the operating structure 2 is disposed on the housing 1, and another end of the operating structure 2 is away from the housing 1 in an X-axis direction, and faces the first plane 1a in a Z-axis direction. As shown in FIG. 1, the operating structure 2 is of a shape similar to "フ". In some variations,

the operating structure may alternatively be of a "\ " or "¬" shape. Further, the first cartridge-side positioning structure 4 extends from the another end of the operating structure 2 of any one of the different shapes. The first cartridge-side positioning structure 4 faces the housing 1 in the X-axis direction. That is, an extending direction of the first cartridge-side positioning structure 4 is opposite to an extending direction of the operating structure 2. In this way, the operating structure 2 is of a shape similar to a hook, and the first cartridge-side positioning structure 4 is a hook part of the hook shape. Preferably, the first cartridge-side positioning structure 4 is a protrusion, and a shape of the first cartridge-side positioning structure 4 is shown in FIG. 2 to FIG. 5, and may be a semicircular shape, a trapezoidal shape, a cone, or a triangular shape. A person skilled in the art understands that the shape of the first cartridge-side positioning structure 4 is not limited to the shapes shown in FIG. 2 to FIG. 5, and may alternatively be a sawtooth shape, a wave shape, or another structure having a smooth curve or an inclined surface. Further, the abutting component 3 is also disposed on the housing 1, and is located on a same side of the housing 1 as the another end of the operating structure 2 in the X-axis direction. Specifically, the abutting component 3 is a stereoscopic component that protrudes from a surface of the housing 1. In this way, when the ink cartridge needs to be fitted to a mounting structure, the abutting component 3 can come into contact with the mounting structure before the housing 1, to implement an abutting function. More specifically, a shape of the abutting component 3 may be a regular geometric shape, or may be an irregular shape. All these can achieve the objectives of the present invention, and details are not described herein.

[0034] In an example of the present invention, with reference to FIG. 1 and FIG. 6, the housing 1 is provided with a pivot hole 15 at a corresponding position connected to the operating structure 2, the operating structure 2 is correspondingly provided with a pivot 25, the pivot 25 is mounted in the pivot hole 15, and the operating structure 2 is capable of deflecting in an XZ plane around the pivot 25, and a deflection angle of the operating structure 2 is $0^\circ < \alpha \leq 45^\circ$. Specifically, when the operating structure 2 is in a natural undeflected state, the deflection angle of the operating structure 2 is 0° . When the operating structure 2 deflects in an arrow direction shown in FIG. 1, the deflection angle of the operating structure 2 begins to become large, and preferably, the largest deflection angle is 30° . More specifically, the pivot hole 15 and the pivot 25 may be provided with a bearing and rotating shaft structure. In this way, the operating structure 2 may deflect by any angle by using the pivot 25 as a shaft. In a variation, the operating structure 2 and the housing 1 are directly connected to each other by using a simple slot structure, or integrally formed. In this case, the operating structure 2 is made of an elastic material, and deflects by using an elastic force of the operating structure 2. This may similarly achieve the objectives of the

present invention. Compared with the first embodiment, the deflection angle of the operating structure 2 in this variation is limited.

[0035] In an example of the present invention, the ink cartridge further includes a chip 12. The chip 12 is configured to: record an ink volume of the ink cartridge, monitor the usage number of the ink cartridge, and the like. A person skilled in the art understands that the ink cartridge may be provided with the chip 12, or may not be provided with the chip 12. This does not affect the technical solutions of the present invention, and details are not described herein. In this embodiment, the position relationships between the components of the ink cartridge are further described by specifically defining a positive X-axis, a negative X-axis, a positive Y-axis, a negative Y-axis, a positive Z-axis, and a negative Z-axis. Specifically, as shown in FIG. 1, the housing 1 includes a first plane 1a, a second plane 1b, a third plane 1c, and a fourth plane 1d. The first plane 1a is opposite to the second plane 1b, and the third plane 1c is opposite to the fourth plane 1d. A direction pointing from the ink supply port 11 to the chip 12 is a positive X-axis direction, and a direction pointing from the first plane 1a to the second plane 1b is a positive Z-axis direction. A negative X-axis side of the ink cartridge is the fourth plane 1d, and a plane opposite to the fourth plane is the third plane 1c. The operating structure 2 is located on a positive X-axis side of the housing 1, and the first cartridge-side positioning structure 4 is located in a negative X-axis direction of the operating structure 2.

[0036] Further, with reference to FIG. 1 and FIG. 8, it can be learned that an inclined surface 13 extends from the third plane 1c in a negative Z-axis direction and a negative X-axis direction. The abutting component 3 is disposed in contact with the inclined surface 13 in the positive X-axis direction and the positive Z-axis direction. An overall contour of the abutting component 3 shown in

the figures is similar to a "┐" shape, and the inclined surface 13 is disposed for fitting the abutting component 3. A person skilled in the art understands that when the ink cartridge is engaged with the mounting structure, such a structure is more favorable to apply a compression force by the abutting component 3. Specifically, as shown in FIG. 8, the abutting component 3 has a guiding surface 31 in a direction perpendicular to a Y-axis direction, and has a pressing surface 32 in the positive X-axis direction. The guiding surface 31 has a guiding effect when the ink cartridge is mounted, and the pressing surface 32 has an effect of applying a pressing force when the ink cartridge is mounted. In some variations, the abutting component 3 may alternatively be of a grille structure, a sawtooth protrusion structure, or another geometric structure, as long as the guiding surface can be formed in the Y-axis direction and the pressing surface can be formed in the positive X-axis direction. Specifically, according to different structures of the abutting component 3, there may alternatively be a plurality of guiding surfaces and

a plurality of pressing surfaces, and a shape of the pressing surface may alternatively be a surface with an inclined angle, a sawtooth surface, a wave surface, or another irregular special-shaped surface.

[0037] In an example of the present invention, with reference to FIG. 1 and FIG. 6, an end of the operating structure 2 in the negative X-axis direction extends in the positive X-axis direction to form a first inclined structure 21, the first inclined structure 21 continues to extend in the negative Z-axis direction to form a second inclined structure 22, and the first cartridge-side positioning structure 4 is disposed in a negative X-axis direction of the second inclined structure 22. Specifically, as shown in FIG. 6, the first inclined structure 21 is of a curve design. In this way, the first inclined structure 21 has larger movement space in the Z-axis direction, which is more favorable to deflection of the operating structure 2 on an XZ plane. In a variation, the first inclined structure 21 may alternatively be of a straight-line design. Similarly, the second inclined structure 22 may be of a straight-line design, or a curve design. All these variations can achieve the objectives of the present invention, and details are not described herein.

[0038] Further, an acute angle α_1 formed between the first inclined structure 21 and the second inclined structure 22 is in a range of 66° to 86° , and an acute angle α_2 formed between the first cartridge-side positioning structure 4 and the second inclined structure 22 is in a range of 52° to 72° . As shown in FIG. 6, the angle α_1 and the angle α_2 are each an included angle between axes. A person skilled in the art understands that such a structure can be efficient in operation when the operating structure 2 is rotated. In addition, even though space between the ink cartridge and the lever body is relatively small, mounting and removal of the ink cartridge can still be completed. In addition, this is favorable to miniaturize the ink cartridge and the printer.

[0039] In a preferred embodiment, as shown in FIG. 6, a spring 5 is disposed in a negative Z-axis direction of the first inclined structure 21, and the spring 5 elastically supports the first inclined structure 21. Specifically, after the ink cartridge is mounted, the first cartridge-side positioning structure 4 is fastened by means of embedding in the negative X-axis direction. In this case, the spring 5 generates a support force in the positive Z-axis direction to the first inclined structure 21. In addition, because an included angle is formed between the first inclined structure 21 and the second inclined structure 22, the first inclined structure 21 drives the second inclined structure 22 to generate a traction force in the negative X-axis direction. Moreover, the first cartridge-side positioning structure is disposed in the negative X-axis direction of the second inclined structure 22. Therefore, the first cartridge-side positioning structure 4 can be more stably fastened in the negative X-axis direction.

[0040] In another preferred embodiment, as shown in FIG. 7, a surface of the first inclined structure 21 in the positive Z-axis direction is provided with a pressing struc-

ture 26, which is more favorable to a user's operation. Further, to satisfy operation habits of different users and facilitate usage of the different users, the operating structure 2 may further be provided with a hand-operating member 24. The hand-operating member 24 protrudes in a positive Z-axis direction of a junction of the first inclined structure 21 and the second inclined structure 22. In a specific usage process, pushing the hand-operating member 24 by a user can achieve a same effect.

[0041] In an example of the present invention, as shown in FIG. 9, the ink cartridge further includes a protective cover 7, the protective cover 7 is provided with a buckle structure 71 on an X-axis side, and the housing 11 is provided with a buckled structure 72 at a corresponding position. When the protective cover is mounted to the housing, the buckle structure 71 and the buckled structure 72 are buckled with each other, and the buckle structure 71 and the buckled structure 72 are located between the ink supply port 11 and the chip 12. The protective cover 7 is configured to seal the ink supply port 11 to prevent ink leakage when the ink cartridge is not mounted. Specifically, the ink cartridge is further provided with a prism (not shown), the prism and the chip 12 are away from the ink supply port 11, and the buckle structure 71 and the buckled structure 72 have a particular ink storage capability, to prevent the prism and the chip 12 from being stained by ink that accidentally leaks from the ink supply port 11.

[0042] FIG. 2 shows an ink cartridge with a replaceable structure according to a second specific implementation of the present invention. That is, the ink cartridge in the foregoing embodiments further includes a replaceable structure 14, where an abutting component 3, an operating structure 2, and a chip 12 are disposed on the replaceable structure 14. The replaceable structure 14 is removably disposed on a side surface of a housing 11 in a positive X-axis direction. Each specific connection method is covered by the prior art, for example, fastening by using a slot, and for another example, fastening by using a suction cup. Details are not described herein. A shadow part shown in FIG. 10 is the replaceable structure 14, and the replaceable structure 14 is provided with the chip 12, the abutting component 3, and the operating structure 2 sequentially in a positive X-axis direction and a positive Z-axis direction. To repeatedly use a chip, in the market, a replaceable structure with a chip is usually mounted on a housing by using a simple method for easy removal. When ink in an ink bag runs out, a user only needs to remove the replaceable structure, and mount the replaceable structure to a new ink bag. At the same time, the chip automatically resets information to an original state, and a new ink cartridge is obtained. In this solution, the chip 12, the abutting component 3, and the operating structure 2 are disposed on the replaceable structure 2 together, thereby saving costs and ensuring stability of connection of the chip 12. More specifically, a side surface of the replaceable structure 2 in the positive X-axis direction actually forms a part of a third plane

1c. Therefore, for a method for disposing the chip 12, the abutting component 3, and the operating structure 2 on the replaceable structure 2, refer to the disposing method in the foregoing specific implementation and the embodiments. That is, the third plane 1c needs to be considered as the side surface of the replaceable structure 2 in the positive X-axis direction, and then the chip 12, the abutting component 3, and the operating structure 2 are disposed according to corresponding positions.

[0043] According to the present invention, an ink cartridge connected to a mounting structure is provided. A mounting structure 8 is disposed in a printer. As shown in FIG. 11 and FIG. 13, the mounting structure 8 includes at least a lever body 81, a rotating shaft 82, a first device-side engaging structure 83, and a lever receiving structure 84. With reference to FIG. 12, it can be learned that the first device-side engaging structure 83 is connected to the lever body 81 by using the rotating shaft 82. In a specific mounting process, a pressing force is applied to an operating structure of the ink cartridge, to make the ink cartridge move towards a negative Z-axis direction, and an abutting component 3 compresses the lever body 81, to make the first device-side engaging structure 83 move in a positive Z-axis direction (an arrow direction in FIG. 13), so that a gap is generated between the first device-side engaging structure 83 and the lever receiving structure 84. In this case, a first cartridge-side positioning structure 4 is embedded into the gap between the first device-side engaging structure 83 and the lever receiving structure 84, and then the pressing force applied to the operating structure 2 is released. A contact member (not shown) of the mounting structure generates a reaction force on the ink cartridge in the positive Z-axis direction, to make the ink cartridge tend to move in the positive Z-axis direction. Moreover, because the first device-side engaging structure 83 is engaged with the first cartridge-side positioning structure 4, the first cartridge-side positioning structure 4 tends to move in the negative Z-axis direction. Therefore, the first cartridge-side positioning structure 4 has tendencies to move in the positive Z-axis direction and in the negative Z-axis direction. The two tendencies act on each other and are offset by each other, thereby finally implementing stable fastening. More specifically, when the operating structure 2 is provided with a spring 5, the first cartridge-side positioning structure 4 also generates a tendency to move in a negative X-axis direction. In this way, the first cartridge-side positioning structure 4 is more stably embedded into the gap, and a friction force is generated between the first cartridge-side positioning structure 4 and the lever receiving structure 84, to further improve stability of the ink cartridge and the mounting structure.

[0044] In an embodiment of the present invention, the lever body 81 is provided with a guiding rib 811, a guiding surface 31 is in contact with the guiding rib 811, and a pressing surface 32 is in contact with the lever body 81, and drives the lever body 81 to rotate about the rotating shaft 82. Specifically, in a mounting process of the ink

cartridge, the guiding rib 811 is configured to perform guiding. Further, the guiding surface 31 is in contact with the guiding rib 811 and moves. A person skilled in the art understands that in the mounting process, the guiding surface 31 and the guiding rib 811 first come into contact, so that the ink cartridge first implements guiding and then implements positioning. Therefore, the ink cartridge is accurately positioned, and misplacement during mounting is prevented.

[0045] In an embodiment of the present invention, with reference to FIG. 9 and FIG. 11, the mounting structure 8 includes a second device-side engaging structure 85, and a second cartridge-side positioning structure 6 is disposed at a corresponding position of the ink cartridge. Specifically, the second device-side engaging structure 85 shown in FIG. 11 is of a groove structure, and the second cartridge-side positioning structure 6 shown in FIG. 9 is a protrusion of a corresponding shape. The second cartridge-side positioning structure 6 is in contact with a fourth plane 1d and is disposed and extends in a negative X-axis direction. In some variations, the second device-side engaging structure 85 and the second cartridge-side positioning structure 6 may alternatively be of structures of other shapes, as long as the two structures are stably fastened. More specifically, as shown in FIG. 9, the first cartridge-side positioning structure 4 and the second cartridge-side positioning structure 6 are located on a positive X-axis side and a negative X-axis side of the ink cartridge. Such a structure can better fasten an ink supply port 11 and a chip 12. In addition, a drop in a Z-axis direction exists between the second cartridge-side positioning structure 6 and the first cartridge-side positioning structure 4. During movement of the mounting structure, when a force in a Y-axis direction is applied by flowing air to the ink cartridge, the ink cartridge does not tend to rotate, thereby preventing the ink cartridge from wobbling in a YZ plane.

[0046] FIG. 14 shows a method for mounting an ink cartridge according to a fourth specific implementation of the present invention. The method is used to fasten a reverse-connected ink cartridge to a mounting structure, and includes the following steps.

[0047] Perform step S101: Engage a second cartridge-side positioning structure 6 with a second device-side engaging structure 85, to implement pre-fastening of an ink cartridge and a mounting structure. Specifically, in a mounting process, the second cartridge-side positioning structure 6 and the second device-side engaging structure 85 should be located on a horizontal line, and buckling between the two structures should not be excessively loose or excessively tight because excessively loose buckling may cause unstably fastening of the ink cartridge and excessively tight buckling may cause a difficulty in taking out the ink cartridge.

[0048] Further, perform step S102: Press a second plane 1b, to make an abutting component 3 compress a lever body 81. This step is a fundamental step, by means of pressing the second plane 1b, the entire ink cartridge

is forced to move in a direction towards the lever body 81, so that the abutting component 3 comes into contact with the lever body 81, and generates a compression force to the lever body 81.

[0049] Further, based on the step S102, perform step S103: Continuously press the second plane 1b, to make the abutting component 3 compress the lever body 81 to rotate, to drive a first device-side engaging structure 83 to rotate, so as to generate a gap between the first device-side engaging structure 83 and a lever receiving structure 84. The second plane 1b needs to be continuously pressed because a contact member of the mounting structure generates a reaction force to the ink cartridge, to make the abutting component 3 tend to leave the lever body 81, and a continuous compression force on the second plane 1b is used to offset the reaction force applied by the contact member to the ink cartridge.

[0050] Further, perform step S104: A first cartridge-side positioning structure 4 is embedded into the gap to be engaged with the first device-side engaging structure 83. A person skilled in the art understands that this step may be implemented without performing an additional operation on the first cartridge-side positioning structure 4, because the first cartridge-side positioning structure 4 relative to an entire operating structure 2 is similar to a hook part of a hook. When moving to a position of the gap, the first cartridge-side positioning structure 4 is naturally hooked into the gap. For a specific principle, refer to descriptions about how the first cartridge-side positioning structure 4 is engaged with the first device-side

engaging structure 83 in the third specific implementation, so as to better understand this step.

[0051] Perform step S105: Release a pressing force on the second plane 1b. A person skilled in the art understands that a rebound force applied by the contact member to the ink cartridge can have an actual effect only when the pressing force is released. In addition, a force applied by the abutting component 3 to the lever body 81 also disappears when the pressing force is released, and the ink cartridge is fastened in combination with a reset tendency of the lever body 81. For a specific principle, refer to descriptions about how the first cartridge-side positioning structure 4 is engaged with the first device-side engaging structure 83 in the third specific implementation, so as to better understand this step.

[0052] FIG. 15 shows a method for removing an ink cartridge according to a fifth specific implementation of the present invention. The method is used to separate a reverse-connected ink cartridge from a mounting structure, and includes the following steps.

[0053] Perform step S201: Press a pressing structure 26 of an operating structure 2, to pull out a first cartridge-side positioning structure 4 from a gap, so as to separate the first cartridge-side positioning structure 4 from a first device-side engaging structure 83. A person skilled in the art understands that this step is different from a step of taking out an ink cartridge in the prior art. The ink cartridge of this step does not move in a direction towards

a contact member (for example, as shown in FIG. 11, does not move in a negative Z-axis direction). Instead, the first cartridge-side positioning structure 4 is pulled out from the gap by means of rotation of the operating structure 2. In addition, engagement between the first cartridge-side positioning structure 4 and the first device-side engaging structure 83 is a critical to engagement between the ink cartridge and the mounting structure. After this step is completed, the ink cartridge and the mounting structure are in a half-disengaged state. In a variation, if the operating structure 2 is provided with a hand-operating member 24, this step may further be implemented by using the hand-operating member 24. Details are not described herein.

[0054] Further, perform step S202: A contact member of a mounting structure 8 applies a rebound force to an ink cartridge, to separate a second cartridge-side positioning structure 6 from a second device-side engaging structure 85, so that a compression force applied by an abutting component 3 to a lever body 81 disappears, and the lever body 81 is reset. This step actually does not require an additional action. In a specific operating process, after the step S201 is performed, this step is naturally performed, and in an actual process, may be a step that is completed in a moment.

[0055] Further, based on the foregoing steps, perform step S203: Take out the ink cartridge. Specifically, in a process of taking out the ink cartridge according to this specific implementation, the ink cartridge does not need to move in the direction towards the contact member (that is, in the negative Z-axis direction) first. Therefore, a spatial margin of the ink cartridge and the mounting structure in the negative Z-axis space may be smaller. On one hand, damage to the contact member and a chip of the ink cartridge can be avoided. On the other hand, problems such as ink leakage and ink splashing are avoided when the ink cartridge and a printer are miniaturized.

Claims

1. A reverse-connected ink cartridge connected to a mounting structure (8) disposed in a printer, the ink cartridge comprising a housing (1), an operating structure (2), and an abutting component (3), wherein an ink supply port (11) is provided at the bottom of the housing (1), a plane of the ink supply port (11) is a first plane (1a), a long edge direction of the first plane (1a) is an X-axis, a short edge direction is a Y-axis, and an axis perpendicular to the X-axis and the Y-axis is a Z-axis; wherein the housing (1) is connected to the operating structure (2) and the abutting component (3), one end of the operating structure (2) is disposed on the housing (1), another end of the operating structure (2) extends away from the housing (1) on the X-axis and towards the first plane (1a) on the Z-axis, a first cartridge-side positioning structure (4) extends from the

- another end of the operating structure (2) towards the housing (1) on the X-axis, and the abutting component (3) is located on a same side of the housing (1) as the another end of the operating structure (2) in an X-axis direction; **characterized in that** the mounting structure (8) comprises at least a lever body (81), a rotating shaft (82), a first device-side engaging structure (83), and a lever receiving structure (84), the first device-side engaging structure (83) is connected to the lever body (81) via the rotating shaft (82), the abutting component (3) is in contact with the lever body (81), for driving the lever body (81) to rotate about the rotating shaft (82), when rotating about the rotating shaft (82), the lever body (81) is configured to drive the first device-side engaging structure (83) to rotate relative to the lever receiving structure (84), and the first cartridge-side positioning structure (4) is embeddable into a gap generated between the first device-side engaging structure (83) and the lever receiving structure (84) by means of rotation.
2. The ink cartridge according to claim 1, wherein the first cartridge-side positioning structure (4) is a protrusion, and the first cartridge-side positioning structure (4) is of any one of the following shapes:
- a semicircular shape;
 - a trapezoidal shape;
 - a cone;
 - a triangular shape;
 - a sawtooth shape; or
 - another structure having a smooth curve or an inclined surface.
3. The ink cartridge according to claim 2, wherein the housing (1) is provided with a pivot hole (15) at a position connected to the operating structure (2), the operating structure (2) is correspondingly provided with a pivot (25), the pivot (25) is mounted in the pivot hole (15), and the operating structure (2) is capable of deflecting in an XZ plane around the pivot (25); and a deflection angle of the operating structure (2) is $0^\circ < \alpha \leq 45^\circ$.
4. The ink cartridge according to any one of claims 1 to 3, further comprising a chip (12), wherein a direction pointing from the ink supply port (11) to the chip (12) is a positive X-axis direction, another surface of the ink cartridge that is opposite to the first plane (1a) is a second plane (1b), a direction pointing from the first plane (1a) to the second plane (1b) is a positive Z-axis direction, a negative X-axis side of the ink cartridge is a fourth plane (1d), and a plane opposite to the fourth plane is a third plane (1c); and an inclined surface (13) extends from the third plane (1c) in a negative Z-axis direction and a negative X-axis direction, the operating structure (2) is located on a positive X-axis side of the housing (1), the abutting component (3) is in contact with the inclined surface (13) and disposed in the positive X-axis direction and the positive Z-axis direction, and the first cartridge-side positioning structure (4) is located in a negative X-axis direction of the operating structure (2).
5. The ink cartridge according to claim 4, wherein an end of the operating structure (2) extending in the negative X-axis direction continues to extend in the positive X-axis direction forming a first inclined structure (21) extending in the positive Z-axis direction, the first inclined structure (21) continues to extend in the negative Z-axis direction forming a second inclined structure (22), and the first cartridge-side positioning structure (4) is disposed in a negative X-axis direction of the second inclined structure (22).
6. The ink cartridge according to claim 5, wherein an acute angle α_1 formed between the first inclined structure (21) and the second inclined structure (22) is in a range of 66° to 86° , and an acute angle α_2 formed between the first cartridge-side positioning structure (4) and the second inclined structure (22) is in a range of 52° to 72° .
7. The ink cartridge according to claim 6, wherein a spring (5) is disposed at the operating structure (2) in a negative Z-axis direction of the first inclined structure (21), and the spring (5) elastically supports the first inclined structure (21).
8. The ink cartridge according to claim 7, wherein a surface of the first inclined structure (21) in the positive Z-axis direction is provided with a pressing structure (26).
9. The ink cartridge according to any one of claims 1 to 8, wherein the operating structure (2) further comprises a hand-operating member (24), and the hand-operating member (24) protrudes in a positive Z-axis direction of a junction of the first inclined structure (21) and the second inclined structure (22).
10. The ink cartridge according to claim 9, wherein the abutting component (3) has at least one guiding surface (31) in a direction perpendicular to the Y-axis, and has at least one pressing surface (32) in the positive X-axis direction.
11. An ink cartridge, comprising the reverse-connected ink cartridge according to any one of claims 1 to 10, and further comprising a replaceable structure (14) removably disposed on a housing (11), wherein the abutting component (3), an operating structure (2), and a chip (12) are disposed on the replaceable structure (14).

12. The ink cartridge according to claim 11, wherein the replaceable structure (14) is located in a positive X-axis direction of the housing (11), and the chip (12), the abutting component (3), and the operating structure (2) are sequentially arranged on the replaceable structure (14) in a positive X-axis direction and a positive Z-axis direction. 5
13. The ink cartridge according to claim 1, wherein the lever body (81) is provided with a guiding rib (811), the guiding surface (31) is in contact with the guiding rib (811), and the pressing surface (32) is in contact with the lever body (81), for driving the lever body (81) to rotate about the rotating shaft (82). 10
14. The ink cartridge according to claim 13, wherein the mounting structure (8) comprises a second device-side engaging structure (85), and a second cartridge-side positioning structure (6) is disposed at a corresponding position of the ink cartridge, and the second device-side engaging structure (85) and the second cartridge-side positioning structure (6) are matched in shape and are mutually engaged. 15 20
15. A method for mounting an ink cartridge according to claim 1, used to fasten a reverse-connected ink cartridge to a mounting structure (8), wherein the method comprises the following steps: 25
- a. engaging the second cartridge-side positioning structure (6) with the second device-side engaging structure (85); 30
 - b. pressing the second plane (1b), to make the abutting component (3) compress the lever body (81);
 - c. pressing, by the abutting component (3), the lever body (81) to rotate, to generate a gap between the first device-side engaging structure (83) and the lever receiving structure (84); 35
 - d. embedding the first cartridge-side positioning structure (4) into the gap to be engaged with the first device-side engaging structure (83); and 40
 - e. releasing a pressing force on the second plane (1b). 45
16. A method for removing an ink cartridge according to claim 1, used to separate a reverse-connected ink cartridge from a mounting structure (8), wherein the method comprises the following steps: 50
- i. pressing a pressing structure (26) of the operating structure (2), to pull out the first cartridge-side positioning structure (4) from the gap, so as to separate the first cartridge-side positioning structure (4) from the first device-side engaging structure (83); 55
 - ii. applying, by a contact member of the mounting structure (8), a rebound force to an ink car-

tridge, to separate the second cartridge-side positioning structure (6) from a second device-side engaging structure (85), so that a compression force applied by the abutting component (3) to the lever body (81) disappears, and the lever body (81) is reset; and

iii. taking out the ink cartridge.

17. The method according to claim 16, wherein the step i is replaced with step i': pushing a hand-operating member (24).

Patentansprüche

1. Umgekehrt verbundene Tintenkartusche, die mit einer Montagestruktur (8) verbunden ist, die in einem Drucker angeordnet ist, wobei die Tintenkartusche ein Gehäuse (1), eine Betriebsstruktur (2) und eine angrenzende Komponente (3) umfasst, wobei eine Tintenversorgungsöffnung (11) am Boden des Gehäuses (1) bereitgestellt ist, eine Ebene der Tintenversorgungsöffnung (11) eine erste Ebene (1a) ist, eine lange Kantenrichtung der ersten Ebene (1a) eine X-Achse ist, eine kurze Kantenrichtung eine Y-Achse ist und eine Achse rechtwinklig zur X-Achse und der Y-Achse eine Z-Achse ist; wobei das Gehäuse (1) mit der Betriebsstruktur (2) und der angrenzenden Komponente (3) verbunden ist, ein Ende der Betriebsstruktur (2) am Gehäuse (1) angeordnet ist, ein anderes Ende der Betriebsstruktur (2) sich vom Gehäuse (1) auf der X-Achse weg und hin zur ersten Ebene (1a) auf der Z-Achse erstreckt, eine erste Kartuschen-seitige Positionierungsstruktur (4) sich vom anderen Ende der Betriebsstruktur (2) hin zum Gehäuse (1) auf der X-Achse erstreckt und die angrenzende Komponente (3) auf einer selben Seite des Gehäuses (1) wie das andere Ende der Betriebsstruktur (2) in einer X-Achsen-Richtung gelegen ist; **dadurch gekennzeichnet, dass** die Montagestruktur (8) mindestens einen Hebelkörper (81), eine Drehwelle (82), eine erste vorrichtungsseitige Eingriffsstruktur (83) und eine Hebelaufnahmestruktur (4) umfasst, die erste vorrichtungsseitige Eingriffsstruktur (83) mit dem Hebelkörper (81) über die Drehwelle (82) verbunden ist, die angrenzende Komponente (3) in Kontakt mit dem Hebelkörper (81) ist, um den Hebelkörper (81) zur Drehung um die Drehwelle (82) anzutreiben, wenn er um die Drehwelle (82) dreht, der Hebelkörper (81) konfiguriert ist, die erste vorrichtungsseitige Eingriffsstruktur (83) anzutreiben, relativ zur Hebelaufnahmestruktur (84) zu drehen und die erste Kartuschen-seitige Positionierungsstruktur (4) in einen Spalt eingebettet werden kann, der zwischen der ersten vorrichtungsseitigen Eingriffsstruktur (83) und der Hebelaufnahmestruktur (84) mittels Drehung erzeugt ist.

2. Tintenkartusche nach Anspruch 1, wobei die erste Kartuschen-seitige Positionierungsstruktur (4) ein Fortsatz ist und die erste Kartuschen-seitige Positionierungsstruktur (4) eine der folgenden Formen ist:
 - eine Halbkreisform;
 - eine Trapezform;
 - ein Kegel;
 - eine Dreiecksform;
 - eine Sägezahnform; oder
 - eine andere Struktur mit einer glatten Kurve oder einer geneigten Fläche.
3. Tintenkartusche nach Anspruch 2, wobei das Gehäuse (1) mit einem Drehgelenkloch (15) bei einer Position bereitgestellt ist, die mit der Betriebsstruktur (2) verbunden ist, wobei die Betriebsstruktur (2) entsprechend mit einem Drehgelenk (25) bereitgestellt ist, das Drehgelenk (25) im Drehgelenkloch (15) montiert ist und die Betriebsstruktur (2) fähig ist, in einer XZ-Ebene um das Drehgelenk (25) abgelenkt zu werden; und ein Ablenkungswinkel der Betriebsstruktur (2) $0^\circ < \alpha \leq 45^\circ$ ist.
4. Tintenkartusche nach einem der Ansprüche 1 bis 3, weiter umfassend einen Chip (12), wobei eine Richtung, die von der Tintenversorgungsöffnung (11) zum Chip (12) zeigt, eine positive X-Achsen-Richtung ist, eine andere Fläche der Tintenkartusche, die gegenüber der ersten Ebene (1a) liegt, eine zweite Ebene (1b) ist, eine Richtung, die von der ersten Ebene (1a) zur zweiten Ebene (1b) zeigt, eine positive Z-Achsen-Richtung ist, eine negative X-Achsen-Seite der Tintenkartusche eine vierte Ebene (1d) ist und eine Ebene gegenüber der vierten Ebene eine dritte Ebene (1c) ist; und eine geneigte Fläche (13) sich von der dritten Ebene (1c) in einer negativen Z-Achsen-Richtung und einer negativen X-Achsen-Richtung erstreckt, die Betriebsstruktur (2) auf einer positiven X-Achsen-Seite des Gehäuses (1) liegt, die angrenzende Komponente (3) in Kontakt mit der geneigten Fläche (13) ist und in der positiven X-Achsen-Richtung und der positiven Z-Achsen-Richtung angeordnet ist und die erste Kartuschen-seitige Positionierungsstruktur (4) in einer negativen X-Achsen-Richtung der Betriebsstruktur (2) liegt.
5. Tintenkartusche nach Anspruch 4, wobei ein Ende der Betriebsstruktur (2), die sich in der negativen X-Achsen-Richtung erstreckt, sich fortsetzend in der positiven X-Achsen-Richtung erstreckt, wodurch eine erste geneigte Struktur (21) gebildet wird, die sich in der positiven Z-Achsen-Richtung erstreckt, die erste geneigte Struktur (21) sich fortsetzend in der negativen Z-Achsen-Richtung erstreckt, wodurch eine zweite geneigte Struktur (22) gebildet wird, und die erste Kartuschen-seitige Positionierungsstruktur (4) in einer negativen X-Achsen-Richtung der zweiten geneigten Struktur (22) angeordnet ist.
6. Tintenkartusche nach Anspruch 5, wobei ein spitzer Winkel α_1 , der zwischen der ersten geneigten Struktur (21) und der zweiten geneigten Struktur (22) gebildet ist, in einem Bereich von 66° bis 86° ist und ein spitzer Winkel α_2 , der zwischen der ersten Kartuschen-seitigen Positionierungsstruktur (4) und der zweiten geneigten Struktur gebildet ist, in einem Bereich von 52° bis 72° ist.
7. Tintenkartusche nach Anspruch 6, wobei eine Feder (5) bei der Betriebsstruktur (2) in einer negativen Z-Achsen-Richtung der ersten geneigten Struktur (21) angeordnet ist und die Feder (5) die erste geneigte Struktur (21) elastisch stützt.
8. Tintenkartusche nach Anspruch 7, wobei eine Fläche der ersten geneigten Struktur (21) in der positiven Z-Achsen-Richtung mit einer Pressstruktur (26) bereitgestellt ist.
9. Tintenkartusche nach einem der Ansprüche 1 bis 8, wobei die Betriebsstruktur (2) ferner ein Handbetriebsbauteil (24) umfasst und das Handbetriebsbauteil (24) in einer positiven Z-Achsen-Richtung eines Übergangs der ersten geneigten Struktur (21) und der zweiten geneigten Struktur (22) vorragt.
10. Tintenkartusche nach Anspruch 9, wobei die angrenzende Komponente (3) mindestens eine Leitfläche (31) in einer Richtung rechtwinklig zur Y-Achse hat und mindestens eine Druckfläche (32) in der positiven X-Achsen-Richtung hat.
11. Tintenkartusche, umfassend die umgekehrt verbundene Tintenkartusche nach einem der Ansprüche 1 bis 10 und weiter umfassend eine ersetzbare Struktur (14), die entfernbar auf einem Gehäuse (11) angeordnet ist, wobei die angrenzende Komponente (3), eine Betriebsstruktur (2) und ein Chip (12) auf der ersetzbaren Struktur (14) angeordnet sind.
12. Tintenkartusche nach Anspruch 11, wobei die ersetzbare Struktur (14) in einer positiven X-Achsen-Richtung des Gehäuses (11) liegt und der Chip (12), die angrenzende Komponente (3) und die Betriebsstruktur (2) aufeinanderfolgend auf der ersetzbaren Struktur (14) in einer positiven X-Achsen-Richtung und einer positiven Z-Achsen-Richtung angelegt sind.
13. Tintenkartusche nach Anspruch 1, wobei der Hebelkörper (81) mit einer Führungsrippe (811) bereitgestellt ist, die Führungsfläche (31) in Kontakt mit der Führungsrippe (811) ist und die Druckfläche (32) in Kontakt mit dem Hebelkörper (81) ist, um den He-

belkörper (81) um die Drehwelle (82) zu drehen.

14. Tintenkartusche nach Anspruch 13, wobei die Montagestruktur (8) eine zweite vorrichtungsseitige Eingriffsstruktur (85) umfasst und eine zweite Kartuschen-seitige Positionierungsstruktur (6) bei einer entsprechenden Position der Tintenkartusche angeordnet ist und die zweite vorrichtungsseitige Eingriffsstruktur (85) und die zweite Kartuschen-seitige Positionierungsstruktur (6) in Form abgestimmt sind und wechselseitig in Eingriff sind.

15. Verfahren zum Montieren einer Tintenkartusche nach Anspruch 1, verwendet, um eine umgekehrt verbundene Tintenkartusche an einer Montagestruktur (8) zu befestigen, wobei das Verfahren die folgenden Schritte umfasst:

- a. In-Eingriff-Bringen der zweiten Kartuschen-seitigen Positionierungsstruktur (6) mit der zweiten vorrichtungsseitigen Eingriffsstruktur (85);
- b. Pressen der zweiten Ebene (1b), um die angrenzende Komponente (3) zu veranlassen, den Hebelkörper (81) zu komprimieren;
- c. Pressen, durch die angrenzende Komponente (3), des Hebelkörpers (81), um sich zu drehen, um einen Spalt zwischen der ersten vorrichtungsseitigen Eingriffsstruktur (83) und der Hebelaufnahmestruktur (4) zu erzeugen;
- d. Einbetten der ersten Kartuschen-seitigen Positionierungsstruktur (4) in den Spalt, um mit der ersten vorrichtungsseitigen Eingriffsstruktur (83) in Eingriff zu sein; und
- e. Lösen einer Presskraft auf die zweite Ebene (1b).

16. Verfahren zum Entfernen einer Tintenkartusche nach Anspruch 1, verwendet, um eine umgekehrt verbundene Tintenkartusche von einer Montagestruktur (8) zu trennen, wobei das Verfahren die folgenden Schritte umfasst:

- i. Pressen einer Pressstruktur (26) der Betriebsstruktur (2), um die erste Kartuschen-seitige Positionierungsstruktur (4) aus dem Spalt zu ziehen, um die erste Kartuschen-seitige Positionierungsstruktur (4) von der ersten vorrichtungsseitigen Eingriffsstruktur (83) zu trennen;
- ii. Anwenden, durch ein Kontaktbauteil der Montagestruktur (8), einer Rückfederkraft auf eine Tintenkartusche, um die zweite Kartuschen-seitige Positionierungsstruktur (6) von einer zweiten vorrichtungsseitigen Eingriffsstruktur (85) zu trennen, sodass eine Komprimierungskraft, die durch die angrenzende Komponente (3) auf den Hebelkörper (81) angewendet wird, verschwindet und der Hebelkörper (81) zurückgesetzt wird; und

iii. Herausnehmen der Tintenkartusche.

17. Verfahren nach Anspruch 16, wobei der Schritt i mit Schritt i' ersetzt ist: Schieben eines Handbetriebsbauteils (24).

Revendications

1. Cartouche d'encre à connexion inversée, connectée à une structure de montage (8) disposée dans une imprimante, la cartouche d'encre comprenant un logement (1), une structure fonctionnelle (2) et un élément de butée (3), dans laquelle un orifice d'alimentation d'encre (11) est fourni au fond du logement (1), un plan de l'orifice d'alimentation d'encre (11) est un premier plan (1a), une direction de bord long du premier plan (1a) est un axe X, une direction de bord court est un axe Y, et un axe perpendiculaire à l'axe X et l'axe Y est un axe Z ; dans laquelle le logement (1) est connecté à la structure fonctionnelle (2) et l'élément de butée (3), une extrémité de la structure fonctionnelle (2) est disposée sur le logement (1), une autre extrémité de la structure fonctionnelle (2) s'étend loin du logement (1) sur l'axe X et vers le premier plan (1a) sur l'axe Z, une première structure de positionnement côté cartouche (4) s'étend depuis l'autre extrémité de la structure fonctionnelle (2) vers le logement (1) sur l'axe X, et l'élément de butée (3) est situé sur le même côté du logement (1) que l'autre extrémité de la structure fonctionnelle (2) dans une direction d'axe X ; **caractérisée en ce que** la structure de montage (8) comprend au moins un corps de levier (81), un arbre rotatif (82), une première structure de mise en prise côté dispositif (83), et une structure de réception de levier (84), la première structure de mise en prise côté dispositif (83) est reliée au corps de levier (81) via l'arbre rotatif (82), l'élément de butée (3) est en contact avec le corps de levier (81) pour entraîner le corps de levier (81) pour tourner autour de l'arbre rotatif (82) lors de la rotation autour de l'arbre rotatif (82), le corps de levier (81) est configuré pour entraîner la première structure de mise en prise côté dispositif (83) pour tourner par rapport à la structure de réception de levier (84), et la première structure de positionnement côté cartouche (4) peut être encastrée dans un espace généré entre la première structure de mise en prise côté dispositif (83) et la structure de réception de levier (84) au moyen d'une rotation.
2. Cartouche d'encre selon la revendication 1, dans laquelle la première structure de positionnement côté cartouche (4) est une saillie, et la première structure de positionnement côté cartouche (4) est de l'une quelconque des formes suivantes :

- une forme semi-circulaire ;
 une forme trapézoïdale ;
 un cône ;
 une forme triangulaire ;
 une forme en dent de scie ; ou
 une autre structure ayant une courbe uniforme ou une surface inclinée.
3. Cartouche d'encre selon la revendication 2, dans laquelle le logement (1) est doté d'un trou de pivot (15) dans une position reliée à la structure fonctionnelle (2), la structure fonctionnelle (2) est dotée de manière correspondante d'un pivot (25), le pivot (25) est monté dans le trou de pivot (15), et la structure fonctionnelle (2) est capable de déflexion dans un plan XZ autour du pivot (25) ; et un angle de déflexion de la structure fonctionnelle (2) est de $0^\circ < \alpha \leq 45^\circ$.
4. Cartouche d'encre selon l'une quelconque des revendications 1 à 3, comprenant en outre une puce (12), dans laquelle une direction pointant depuis l'orifice d'alimentation d'encre (11) vers la puce (12) est une direction d'axe X positive, une autre surface de la cartouche d'encre qui est opposée au premier plan (1a) est un deuxième plan (1b), une direction pointant du premier plan (1a) vers le deuxième plan (1b) est une direction d'axe Z positive, un côté d'axe X négatif de la cartouche d'encre est un quatrième plan (1d), et un plan opposé au quatrième plan est un troisième plan (1c) ; et une surface inclinée (13) s'étend du troisième plan (1c) dans une direction d'axe Z négative et une direction d'axe X négative, la structure fonctionnelle (2) est située sur un côté d'axe X positif du logement (1), l'élément de butée (3) est en contact avec la surface inclinée (13) et disposé dans la direction d'axe X positive et la direction d'axe Z positive, et la première structure de positionnement côté cartouche (4) est située dans une direction d'axe X négative de la structure fonctionnelle (2).
5. Cartouche d'encre selon la revendication 4, dans laquelle une extrémité de la structure fonctionnelle (2) s'étendant dans la direction d'axe X négative continue de s'étendre dans la direction d'axe X positive en formant une première structure inclinée (21) s'étendant dans la direction d'axe Z positive, la première structure inclinée (21) continue de s'étendre dans la direction d'axe Z négative en formant une deuxième structure inclinée (22), et la première structure de positionnement côté cartouche (4) est disposée dans une direction d'axe X négative de la deuxième structure inclinée (22).
6. Cartouche d'encre selon la revendication 5, dans laquelle un angle aigu α_1 formé entre la première structure inclinée (21) et la deuxième structure inclinée (22) est dans une plage de 66° à 86° , et un angle aigu α_2 formé entre la première structure de positionnement côté cartouche (4) et la deuxième structure inclinée (22) est dans une plage de 52° à 72° .
7. Cartouche d'encre selon la revendication 6, dans laquelle un ressort (5) est disposé au niveau de la structure fonctionnelle (2) dans une direction d'axe Z négative de la première structure inclinée (21), et le ressort (5) supporte élastiquement la première structure inclinée (21).
8. Cartouche d'encre selon la revendication 7, dans laquelle une surface de la première structure inclinée (21) dans la direction d'axe Z positive est dotée d'une structure de pression (26).
9. Cartouche d'encre selon l'une quelconque des revendications 1 à 8, dans laquelle la structure fonctionnelle (2) comprend en outre un élément de fonctionnement manuel (24), et l'élément de fonctionnement manuel (24) fait saillie dans une direction d'axe Z positive d'une jonction entre la première structure inclinée (21) et la deuxième structure inclinée (22).
10. Cartouche d'encre selon la revendication 9, dans laquelle l'élément de butée (3) a au moins une surface de guidage (31) dans une direction perpendiculaire à l'axe Y, et a au moins une surface de pression (32) dans la direction d'axe X positive.
11. Cartouche d'encre comprenant la cartouche d'encre à connexion inversée selon l'une quelconque des revendications 1 à 10, et comprenant en outre une structure remplaçable (14) disposée de manière amovible sur un logement (11), dans laquelle l'élément de butée (3), une structure fonctionnelle (2), et une puce (12) sont disposés sur la structure remplaçable (14).
12. Cartouche d'encre selon la revendication 11, dans laquelle la structure remplaçable (14) est située dans une direction d'axe X positive du logement (11), et la puce (12), l'élément de butée (3), et la structure fonctionnelle (12) sont disposés séquentiellement sur la structure remplaçable (14) dans une direction d'axe X positive et une direction d'axe Z positive.
13. Cartouche d'encre selon la revendication 1, dans laquelle le corps de levier (81) est doté d'une nervure de guidage (811), la surface de guidage (31) est en contact avec la nervure de guidage (811), et la surface de pression (32) est en contact avec le corps de levier (81) pour entraîner le corps de levier (81) pour tourner autour de l'arbre rotatif (82).
14. Cartouche d'encre selon la revendication 13, dans laquelle la structure de montage (8) comprend une deuxième structure de mise en prise côté dispositif

(85), et une deuxième structure de positionnement côté cartouche (6) est disposée dans une position correspondante de la cartouche d'encre, et la deuxième structure de mise en prise côté dispositif (85) et la deuxième structure de positionnement côté cartouche (6) sont adaptées en forme et sont mutuellement en prise.

pe i est remplacée par l'étape i' : pousser un élément de fonctionnement manuel (24).

15. Procédé pour monter une cartouche d'encre selon la revendication 1, utilisé pour fixer une cartouche d'encre à connexion inversée sur une structure de montage (8), dans lequel le procédé comprend les étapes suivantes :
 - a. mettre la deuxième structure de positionnement côté cartouche (6) en prise avec la deuxième structure de mise en prise côté dispositif (85) ;
 - b. presser le deuxième plan (1b) pour faire en sorte que l'élément de butée (3) comprime le corps de levier (81) ;
 - c. presser, grâce à l'élément de butée (3), le corps de levier (81) pour tourner, afin de générer un espace entre la première structure de mise en prise côté dispositif (83) et la structure de réception de levier (84) ;
 - d. encastrer la première structure de positionnement côté cartouche (4) dans l'espace pour être en prise avec la première structure de mise en prise côté dispositif (83) ; et
 - e. relâcher une force de pression sur le deuxième plan (1b).
16. Procédé pour enlever une cartouche d'encre selon la revendication 1, utilisé pour séparer une cartouche d'encre à connexion inversée d'une structure de montage (8), dans lequel le procédé comprend les étapes suivantes :
 - i. presser une structure de pression (26) de la structure fonctionnelle (2) pour retirer la première structure de positionnement côté cartouche (4) de l'espace de manière à séparer la première structure de positionnement côté cartouche (4) de la première structure de mise en prise côté dispositif (83) ;
 - ii. appliquer, grâce à un élément de contact de la structure de montage (8), une force de rebond à une cartouche d'encre pour séparer la deuxième structure de positionnement côté cartouche (6) d'une deuxième structure de mise en prise côté dispositif (85) de sorte qu'une force de compression appliquée par l'élément de butée (3) au corps de levier (81) disparaît, et que le corps de levier (81) est remis à l'état initial ; et
 - iii. extraire la cartouche d'encre.

17. Procédé selon la revendication 16, dans lequel l'éta-

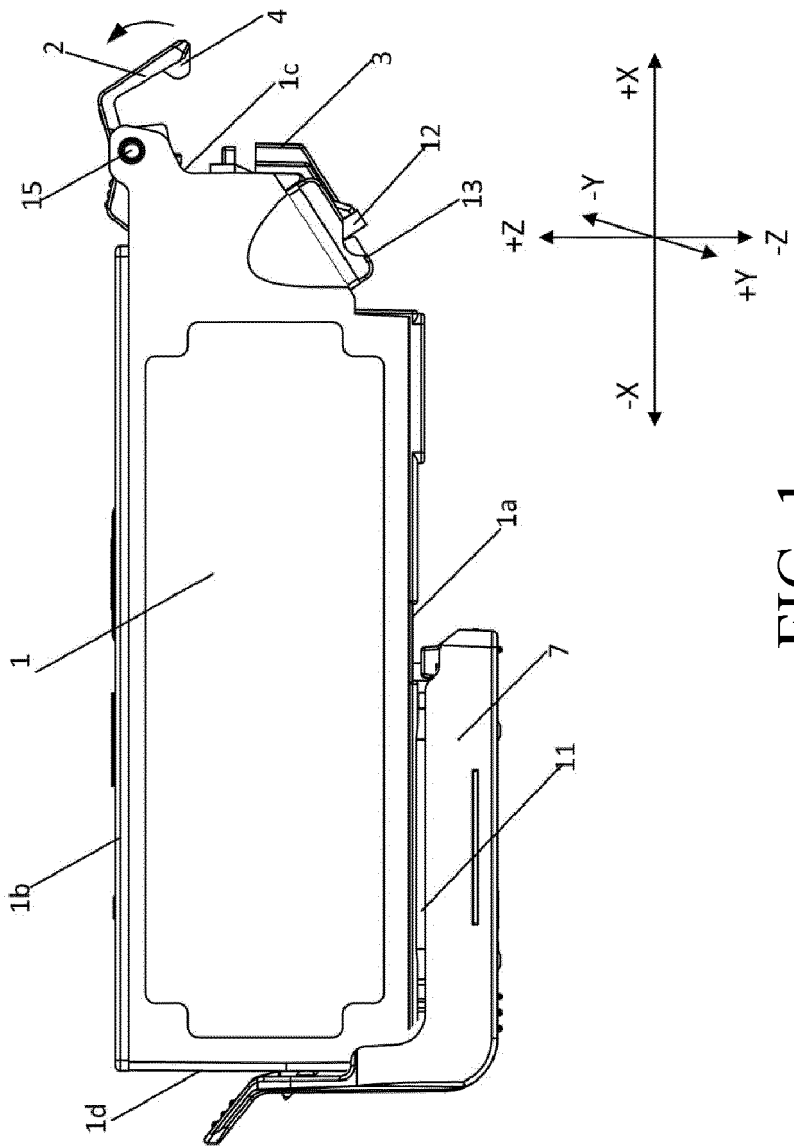


FIG. 1

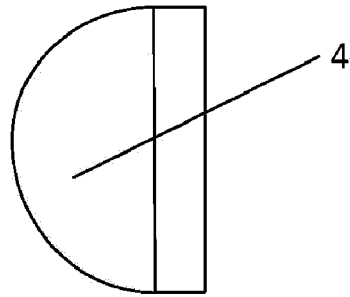


FIG. 2

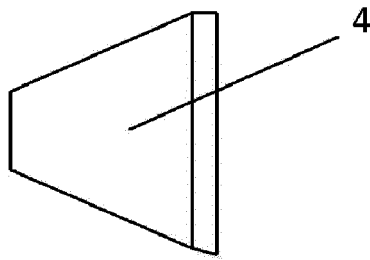


FIG. 3

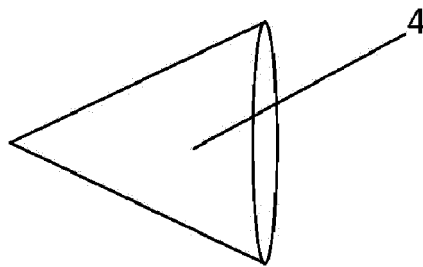


FIG. 4

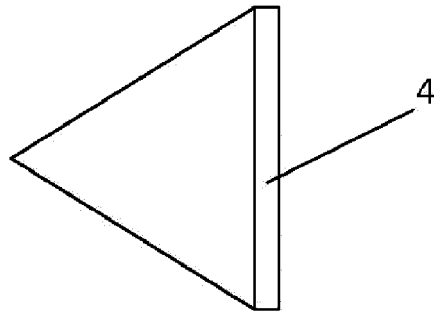


FIG. 5

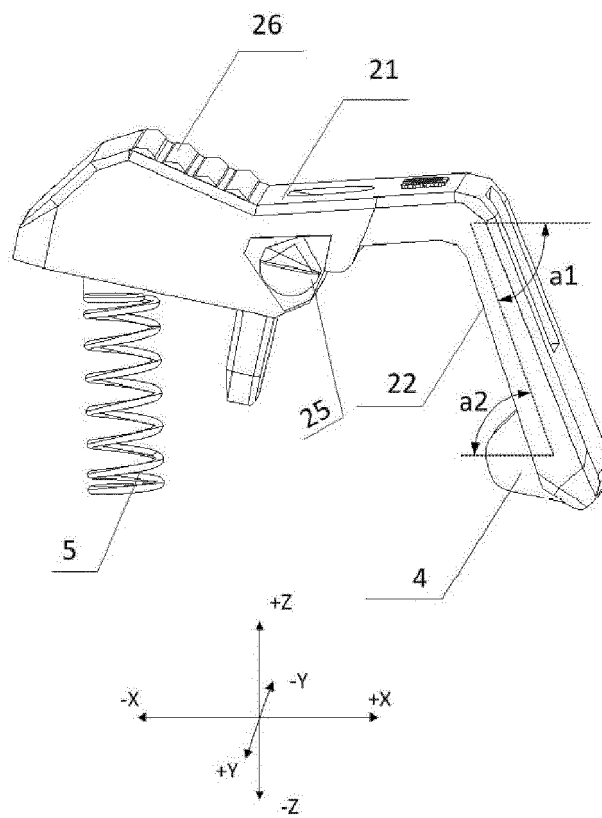


FIG. 6

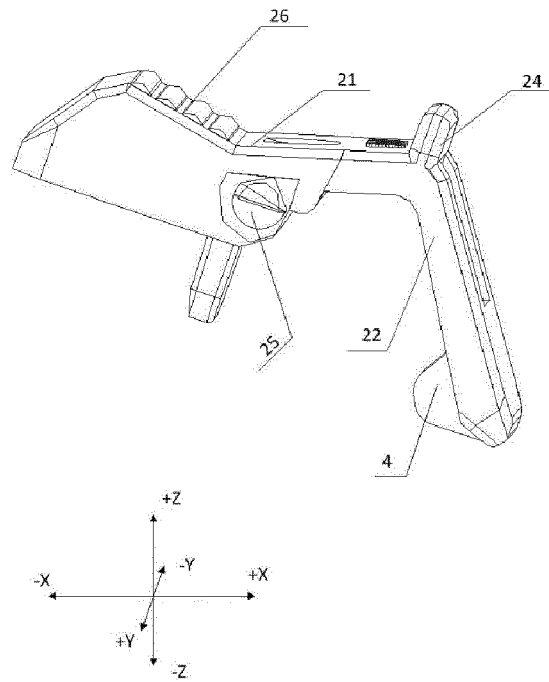


FIG. 7

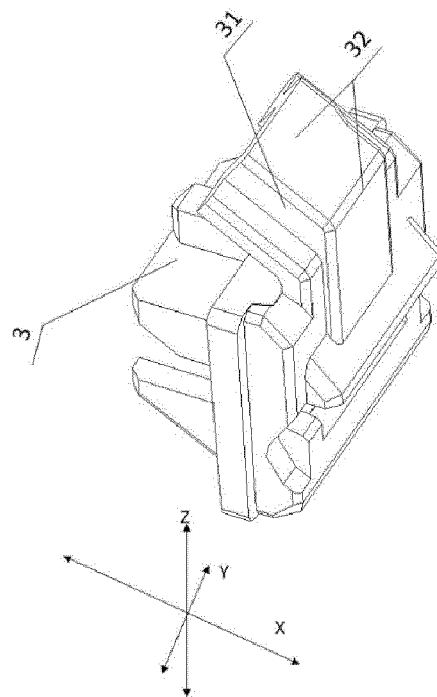


FIG. 8

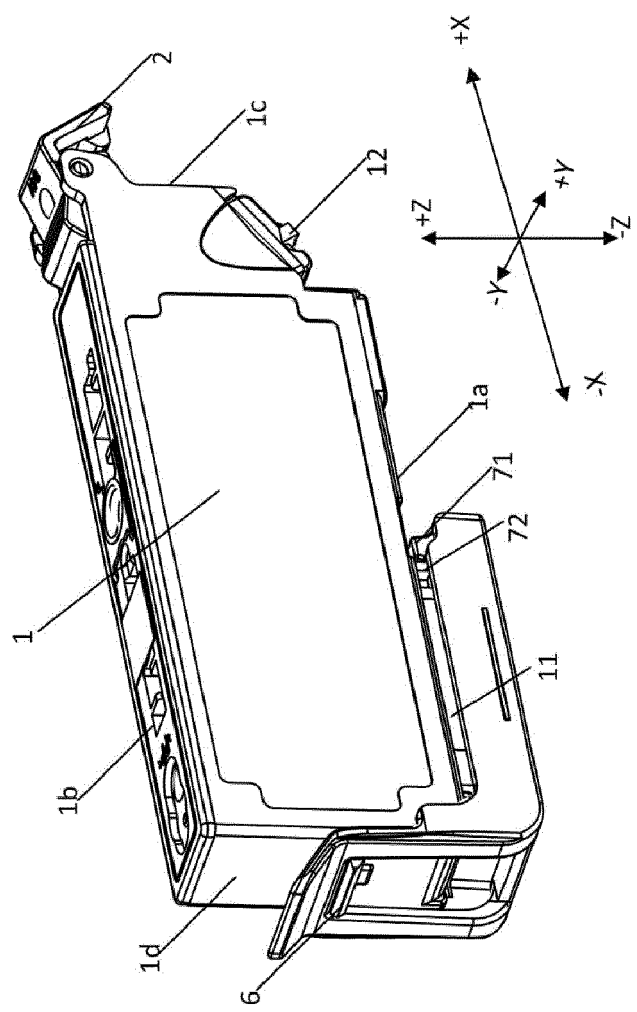


FIG. 9

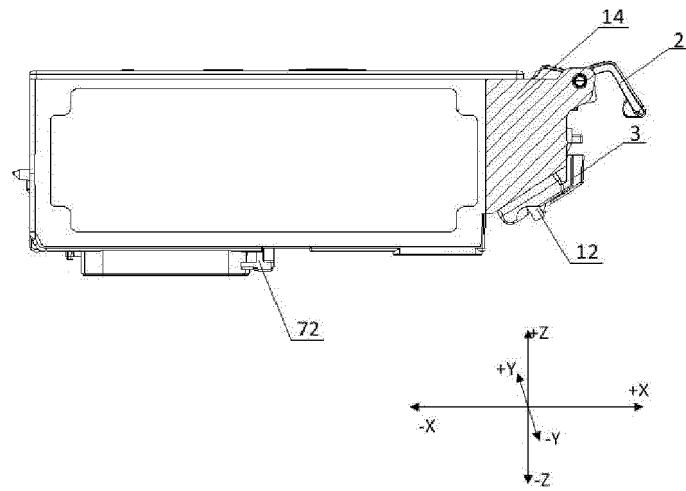


FIG. 10

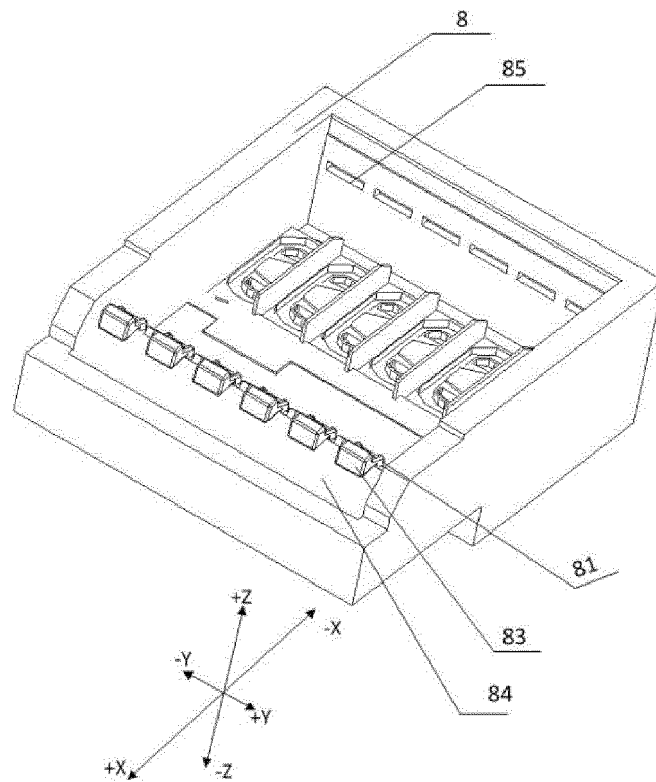


FIG. 11

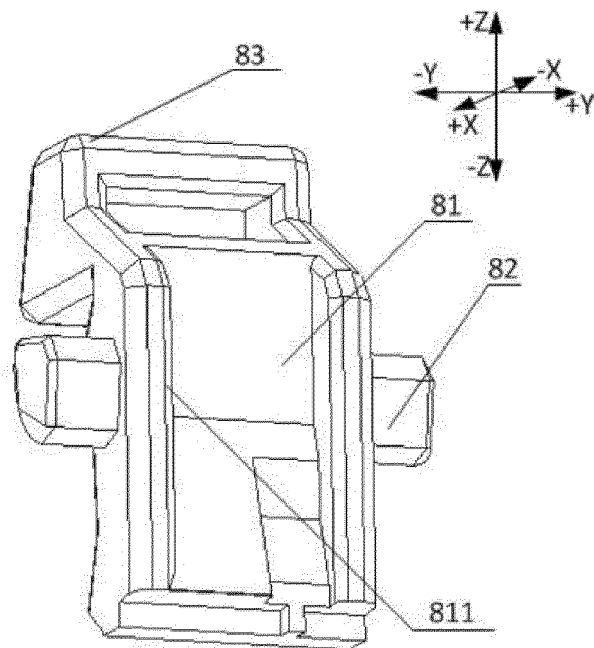


FIG. 12

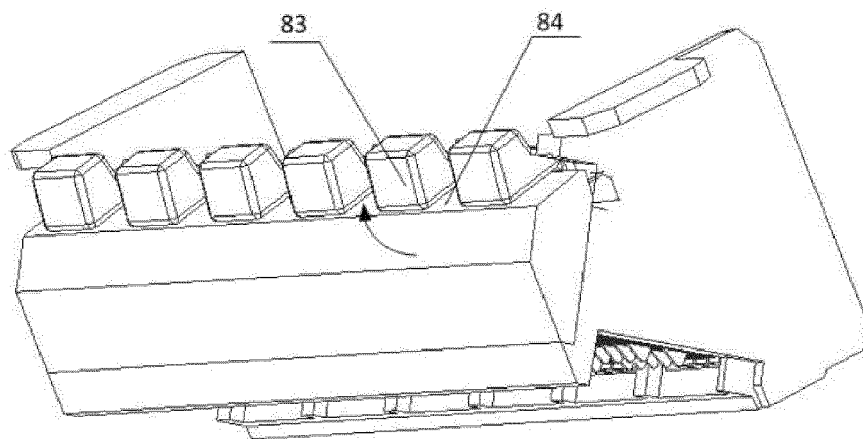


FIG. 13

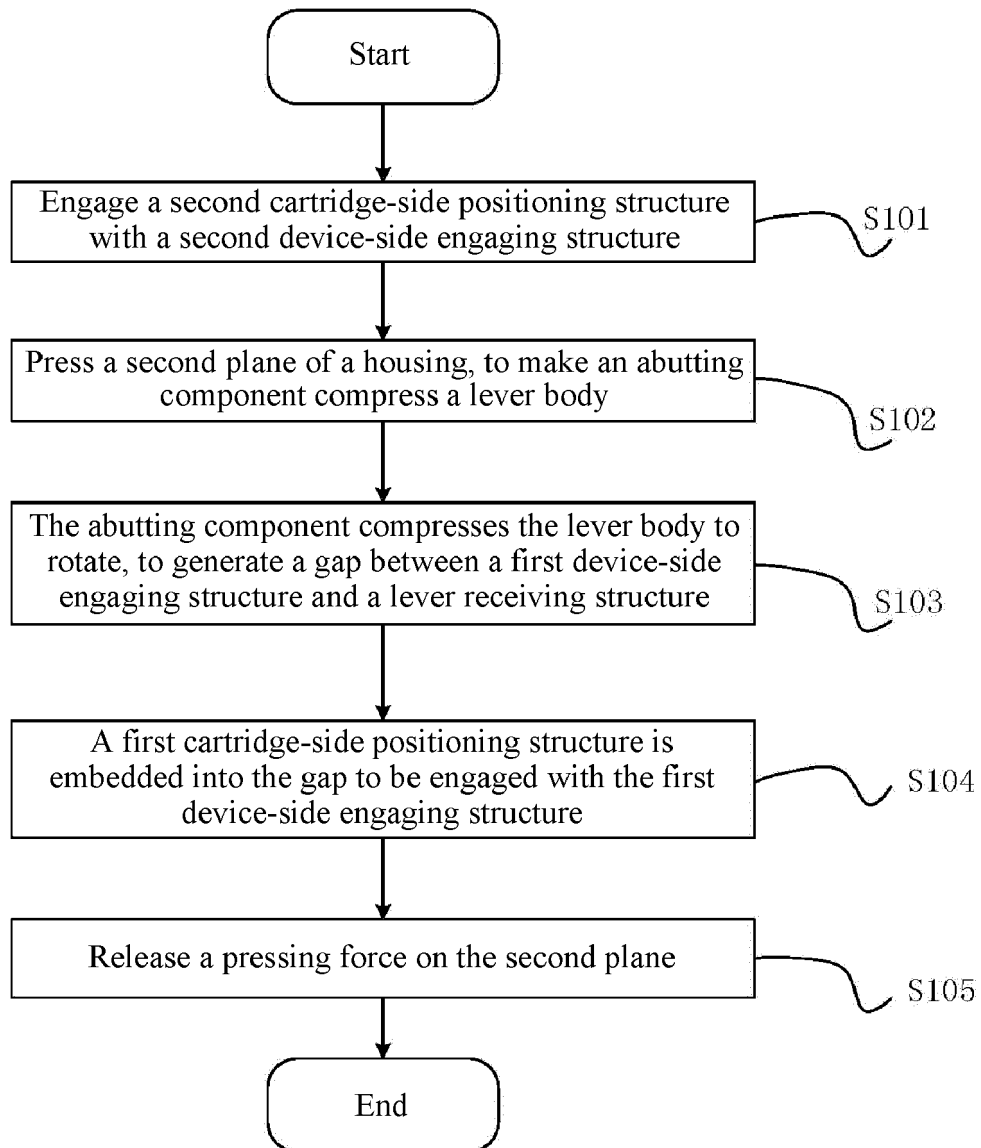


FIG. 14

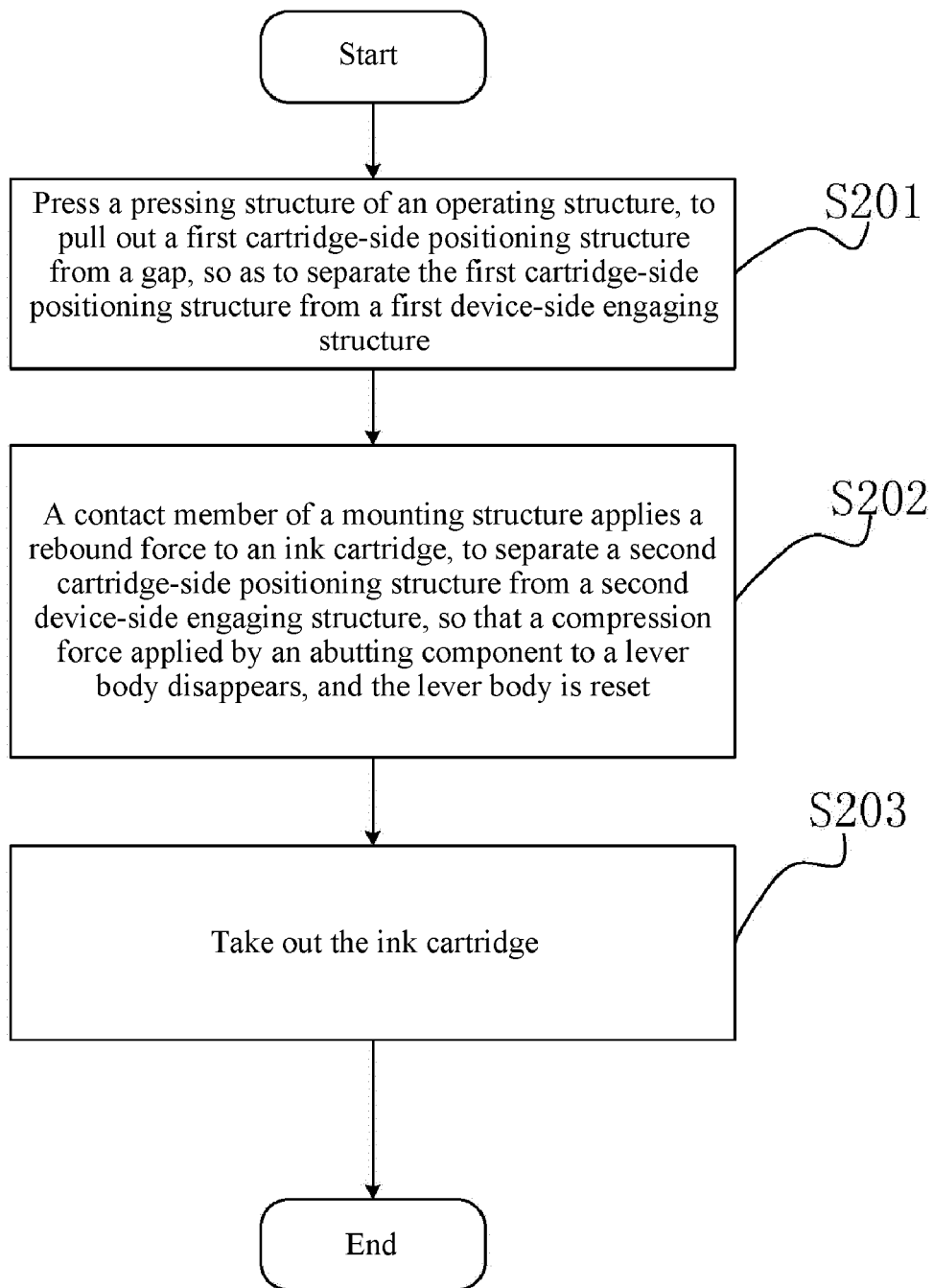


FIG. 15

REFERENCES CITED IN THE DESCRIPTION

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