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(54) PRINTER CLEAN DEVICE

(57) The printer clean device (1) includes an inner case (2), a scraper assembly (4) and a first movable member (5). The scraper assembly (4) is disposed in the inner case (2) and includes a scraper (41), a base (42) and a protrusion (43). The scraper (41) and the protrusion (43) are disposed on the base (42). The first movable member (5) includes an elastic element (51), a sheet body (52), an end portion (53) and an extending portion (54). The elastic element (51) is disposed in the inner case (2). The sheet body (52) is connected to the elastic element (51) and is adjacent to the scraper (41). The end portion (53) is an end of the sheet body (52). The extending portion (54) is extended from the sheet body (52). When the scraper assembly (4) is lifted, the protrusion (43) pushes against the first movable member (5) and makes the end portion (53) away from the scraper (41). When the scraper assembly (4) is dropped, the protrusion (43) pushes against the first movable member (5) and makes the end portion (53) contact with the scraper (41).

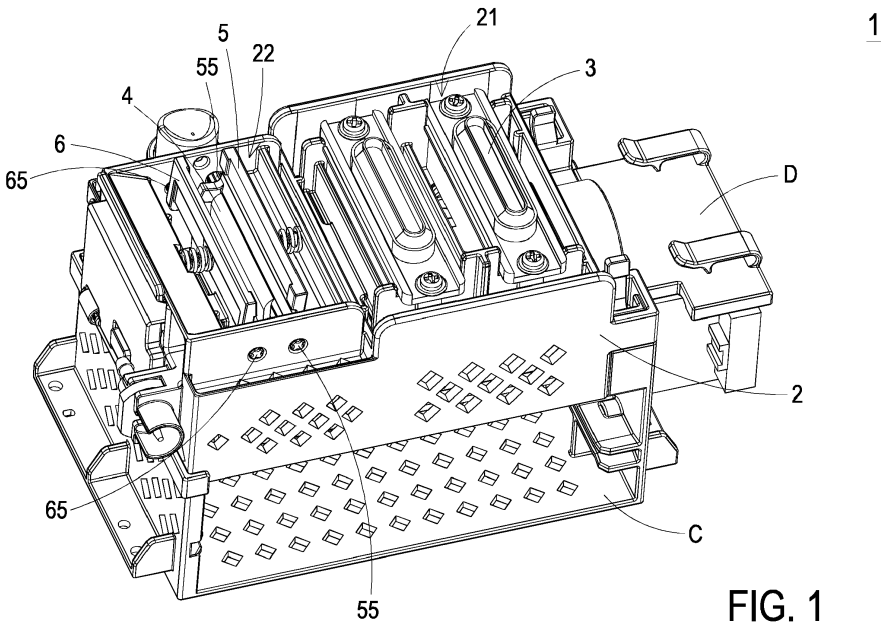

FIG. 1

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Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to a printer clean device, and more particularly to a printer clean device capable of cleaning a scraper disposed therein.

BACKGROUND OF THE INVENTION

[0002] Recently, inkjet printers are widely used as printing equipment due to their excellent printing quality. Generally, to prevent the nozzles of the ink cartridge from being clogged by the drying ink, moisturizing functions are utilized. For example, the nozzles of the ink cartridge are connected with the ink absorption pumps when the printer is not operated, and flash spraying is regularly performed to maintain moisture of the nozzles. These moisturizing functions will unavoidably cause the ink to attach on the surface of the nozzles and then affects the printing quality. Therefore, the cleanliness of the nozzles of the ink cartridge is a key factor with respect to the printing quality of the inkjet printers.

[0003] Current inkjet printers utilize scraper to clean the nozzles of the ink cartridge. With the increase of cleaning times, a lot of ink scraped from the nozzles will also be accumulated on the scraper. For removing the ink accumulated on the scraper, a scraper cleaning structure is employed. However, scraper cleaning structures in the art are fixed hard sheets, which cannot contact with the scraper according to the moving direction of the scraper. As a result, the ink removed from the scraper by the scraper cleaning structures will be attached on the scraper again. Consequently, the nozzles are polluted by the scraper instead of being cleaned when the scraper contacts with the nozzles of the ink cartridge.

[0004] Therefore, there is a need of providing a printer clean device which can effectively remove the ink attached on the scraper to solve the problems of pollution, color mixing or clogging of the nozzles of the ink cartridge in order to address the drawbacks of the conventional technologies.

SUMMARY OF THE INVENTION

[0005] It is an object of the present invention to provide a printer clean device in order to solve the drawbacks of prior art.

[0006] It is another object of the present invention to provide a printer clean device with a moveable member. An end portion of the moveable member is moved away from the scraper when the scraper assembly is lifted and extended from the second accommodation groove, and is moved close to and contacts with the scraper when the scraper assembly is dropped and accommodated in the second accommodation groove, so that the scraper is prevented from being polluted by the ink attached on the movable member, and the cleanliness of the scraper is maintained to ensure the effect of cleaning the nozzles of the ink cartridge.

[0007] It is another object of the present invention to provide a printer clean device. By the collaborative structural design of the ink stack assembly, the scraper assembly and the transmission assembly, it facilitates the printer clean device to be integrally formed in one piece, the production process of the printer clean device is simplified, and the overall size of the printer clean device is reduced. In addition, by the improvement of the structure of the transmission assembly, the method of detecting the positions of the ink stack assembly and the scraper assembly is simplified.

[0008] In accordance with an aspect of the present disclosure, a printer clean device is provided. The printer clean device includes an inner case, an ink stack assembly, a scraper assembly, a first movable member, a transmission assembly and a driving device. The inner case includes a first accommodation groove and a second accommodation groove. The first accommodation groove is adjacent to the second accommodation groove. The ink stack assembly is disposed in the first accommodation groove. The scraper assembly is disposed in the second accommodation groove and includes a scraper, a base and at least one protrusion. The scraper is disposed on the base, and the protrusion is disposed on a side of the base. The first movable member is disposed in the second accommodation groove and includes an elastic element, a sheet body, an end portion and at least one extending portion. The elastic element is connected to a wall of the second accommodation groove. The sheet body is connected to the elastic element and is adjacent to the scraper. The end portion is disposed at an end of the sheet body facing the scraper. The extending portion is extended from the sheet body toward the scraper and includes a first surface and a second surface. The transmission assembly is penetrated through the first accommodation groove and the second accommodation groove and is connected to the ink stack assembly and the scraper assembly. By the rotation of the transmission assembly, the ink stack assembly is lifted or dropped between a first ink stack position and a second ink stack position, and the scraper assembly is lifted or dropped between a first scraper position and a second scraper position. The driving device is connected to the transmission assembly for driving the transmission assembly to rotate. When the scraper assembly is lifted from the first scraper position to the second scraper position, the protrusion pushes against the first movable member from the first surface of the extending portion, so as to make the end portion away from the scraper. When the scraper assembly is dropped from the second scraper position to the first scraper position, the protrusion pushes against the first movable member from the second surface of the extending portion, so as to make the end portion close to and contact with the scraper.

[0009] The above contents of the present disclosure will become more readily apparent to those ordinarily

skilled in the art after reviewing the following detailed description and accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a schematic view illustrating the printer clean device according to a first embodiment of the present disclosure;
FIG. 2A is an exploded view schematically illustrates the printer clean device of FIG. 1 and taken from a first aspect;
FIG. 2B is an exploded view schematically illustrating the printer clean device of FIG. 1 and taken from a second aspect;
FIG. 3A is a schematic view illustrating the actions of the sheet bodies of the first movable member and the second movable member when the scraper assembly is lifted;
FIG. 3B is a schematic view illustrating the actions of the sheet bodies of the first movable member and the second movable member when the scraper assembly is dropped;
FIG. 4A is a schematic view illustrating the transmission assembly when the transmission assembly is in the initial angle;
FIG. 4B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the initial angle;
FIG. 4C is a front view schematically illustrating the printer clean device when the transmission assembly is in the initial angle;
FIG. 5A is a schematic view illustrating the transmission assembly when the transmission assembly is in the first angle;
FIG. 5B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the first angle;
FIG. 5C is a front view schematically illustrating the printer clean device when the transmission assembly is in the first angle;
FIG. 6A is a schematic view illustrating the transmission assembly when the transmission assembly is in the second angle;
FIG. 6B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the second angle;
FIG. 6C is a front view schematically illustrating the printer clean device when the transmission assembly is in the second angle; and
FIG. 7 is a schematic view illustrating the printer clean device according to a second embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] The present disclosure will now be described more specifically with reference to the following embodiments. It is to be noted that the following descriptions of preferred embodiments of this disclosure are presented herein for purpose of illustration and description only. It is not intended to be exhaustive or to be limited to the precise form disclosed.

[0012] Please refer to FIGS. 1 to 3B. FIG. 1 is a schematic view illustrating the printer clean device according to a first embodiment of the present disclosure. FIG. 2A is an exploded view schematically illustrates the printer clean device of FIG. 1 and taken from a first aspect. FIG. 2B is an exploded view schematically illustrating the printer clean device of FIG. 1 and taken from a second aspect. FIG. 3A is a schematic view illustrating the actions of the sheet bodies of the first movable member and the second movable member when the scraper assembly is lifted. FIG. 3B is a schematic view illustrating the actions of the sheet bodies of the first movable member and the second movable member when the scraper assembly is dropped. As shown in the drawings, the printer clean device 1 includes an inner case 2, an ink stack assembly 3, a scraper assembly 4, a first movable member 5, a transmission assembly 7 and a driving device D. The inner case 2 includes a first accommodation groove 21 and a second accommodation groove 22. The first accommodation groove 21 is adjacent to the second accommodation groove 22. The ink stack assembly 3 is disposed in the first accommodation groove 21. The scraper assembly 4 is disposed in the second accommodation groove 22 and includes a scraper 41, a base 42 and at least one protrusion 43. The scraper 41 is disposed on the base 42 and is preferably but not exclusively made of flexible materials, and the protrusion 43 is disposed on a side of the base 42. The first movable member 5 is disposed in the second accommodation groove 22 and includes an elastic element 51, a sheet body 52, an end portion 53 and at least one extending portion 54. The elastic element 51 is connected to a wall within the second accommodation groove 22 and is for example but not limited to a spring or an elastic arm. The sheet body 52 is connected to the elastic element 51 and is adjacent to the scraper 41. In this embodiment, the elastic element 51 is disposed between the wall and the sheet body 52, but not limited thereto. The end portion 53 is disposed at an end of the sheet body 52 facing the scraper 41. The extending portion 54 is extended from the sheet body 52 toward the scraper 41 and includes a first surface 54a and a second surface 54b. The transmission assembly 7 is penetrated through the first accommodation groove 21 and the second accommodation groove 22 and is connected to the ink stack assembly 3 and the scraper assembly 4. By the rotation of the transmission assembly 7, the ink stack assembly 3 is lifted or dropped between a first ink stack position and a second ink stack position, and the scraper

assembly 4 is lifted or dropped between a first scraper position and a second scraper position. The driving device D is connected to the transmission assembly 7 for driving the transmission assembly 7 to rotate. When the scraper assembly 4 is lifted from the first scraper position to the second scraper position, the protrusion 43 pushes against the first movable member 5 from the first surface 54a of the extending portion 54, so as to make the end portion 53 away from the scraper 41. When the scraper assembly 4 is dropped from the second scraper position to the first scraper position, the protrusion 43 pushes against the first movable member 5 from the second surface 54b of the extending portion 54, so as to make the end portion 53 close to and contact with the scraper 41.

[0013] In this embodiment, the printer clean device 1 further includes a second movable member 6. The second movable member 6 and the first movable member 5 are disposed on the two opposite sides of the scraper 41 and have familiar structures with each other. That is, the second movable member 6 also includes an elastic element 61, a sheet body 62, an end portion 63 and at least one extending portion 64. In this embodiment, the first movable member 5 and the second movable member 6 are both for example but not limited to include two shafts 55, 65. The shafts 55, 65 are extended from the two sides of the sheet bodies 52, 62 and are penetrated through two walls within the second accommodation groove 22, so that the first movable member 5 and the second movable member 6 are rotated with an axis defined by an extending direction of the shafts 55, 65. In this embodiment, the first surface 54a, 64a and the second surface 54b, 64b of the extending portion 54, 64 are two slopes adjacent to each other, so that the protrusion 43 can push against the extending portions 54, 64 along the slopes. Consequently, when the scraper assembly 4 is lifted from the first scraper position to the second scraper position, the protrusion 43 pushes against the first movable member 5 and the second movable member 6 from the first surfaces 54a, 64a of the extending portions 54, 64 thereof simultaneously, so as to make the end portions 53, 63 moved away from each other and prevent the scraper 41 from contacting with the end portions 53, 63 as being lifted. After a cleaning action of cleaning the nozzles (not shown) by the scraper 41 is completed, the scraper assembly 4 is dropped from the second scraper position to the first scraper position, and the protrusion 43 pushes against the first movable member 5 and the second movable member 6 from the second surfaces 54b, 64b of the extending portions 54, 64 thereof, so as to make the end portions 53, 63 close to each other and contact with the scraper 41. Therefore, when ink is accumulated on the surfaces of the first movable member 5 and the second movable member 6 owing to several times of the cleaning actions, by the opened-closed action of the first movable member 5 and the second movable member 6, the printer clean device 1 of the present disclosure can prevent the scraper 41 from being polluted before contacting with the nozzles. In conclusion, the cleanliness of the scraper 41 is maintained, and the effect of cleaning the nozzles is ensured.

[0014] In this embodiment, ink absorption pads (not shown) are disposed on the surfaces of the end portions 53, 63 of the first movable member 5 and the second movable member 6, respectively, so that the effect of cleaning can be improved further. In this embodiment, the end of the scraper 41 is slightly bent toward the ink stack assembly 3, the first movable member 5 is disposed on the side closer to the ink stack assembly 3, and the second movable member 6 is disposed on the side farther from the ink stack assembly 3. Accordingly, the length of the extending portion 54 of the first movable member 5 is longer than the length of the extending portion 64 of the second movable member 6, so that the end portion 53 of the first movable member 5 has a larger moving amplitude than the end portion 63 of the second movable member 6 in consideration of the profile of the scraper 41, but not limited thereto.

[0015] Please refer to FIGS. 2B and 4A. FIG. 4A is a schematic view illustrating the transmission assembly when the transmission assembly is in the initial angle. As shown in the drawings, the ink stack assembly 3 includes a first connection portion 31, the scraper assembly 4 further includes a second connection portion 44, and the transmission assembly 7 includes a transmission shaft 71, two first supporting bases 72, two second supporting bases 73, a first connection rod 74, a second connection rod 75, a first connection element 76, a second connection element 77 and a rod portion 78. The transmission shaft 71 includes a separating segment 711, and an end of the transmission shaft 71 is for example but not limited to a gear and is connected to the driving device D. The first supporting bases 72 are parallel to each other and are both extended out from the transmission shaft 71 along a radial direction of the transmission shaft 71. The second supporting bases 73 are respectively disposed on two ends of the separating segment 711, are parallel to each other and are both extended out from the transmission shaft 71 along a radial direction of the transmission shaft 71. An angle difference between an extending direction of the second supporting bases 73 and an extending direction of the first supporting bases 72 is in a range between 30 degrees and 90 degrees, preferably be 60 degrees. The first connection rod 74 is connected between the two first supporting bases 72. The second connection rod 75 is connected between the two second supporting bases 73, so as to connect the two ends of the separating segment 711. In this embodiment, the two ends of the separating segment 711 are connected through another rod. Such rod and the second connection rod 75 are substantially on the opposite sides with respect to the transmission shaft 71, but not limited thereto. The first connection element 76 includes a first end and a second end. The first end of the first connection element 76 is pivotally disposed on the first connection rod 74, and the second end of the first connection element 76 is pivotally disposed on the first

connection portion 31 of the ink stack assembly 3. The second connection element 77 includes a first end and a second end. The first end of the second connection element 77 is pivotally disposed on the second connection rod 75, and the second end of the second connection element 77 is pivotally disposed on the second connection portion 44 of the scraper assembly 4. In this embodiment, the first ends and the second ends of the first connection element 76 and the second connection element 77 can be bushings or clasps for being pivotally disposed on the first connection rod 74, the second connection rod 75, the first connection portion 31 and the second connection portion 44, but not limited thereto. The rod portion 78 is connected to an end of the transmission shaft 71 opposite to the end connected to the driving device D, and is extended out from the transmission shaft 71 along a radial direction of the transmission shaft 71. An angle difference between an extending direction of the rod portion 78 and the extending direction of the first supporting bases 72 is in a range between 15 degrees and 45 degrees, preferably be 30 degrees. An angle difference between an extending direction of the rod portion 78 and the extending direction of the second supporting bases 73 is in a range between 15 degrees and 45 degrees, preferably be 30 degrees.

[0016] Please refer to FIGS. 4A to 6C. FIG. 4B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the initial angle. FIG. 4C is a front view schematically illustrating the printer clean device when the transmission assembly is in the initial angle. FIG. 5A is a schematic view illustrating the transmission assembly when the transmission assembly is in the first angle. FIG. 5B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the first angle. FIG. 5C is a front view schematically illustrating the printer clean device when the transmission assembly is in the first angle. FIG. 6A is a schematic view illustrating the transmission assembly when the transmission assembly is in the second angle. FIG. 6B is a front view schematically illustrating the transmission assembly when the transmission assembly is in the second angle. FIG. 6C is a front view schematically illustrating the printer clean device when the transmission assembly is in the second angle. In this embodiment, the transmission assembly 7 includes an initial angle, a first angle and a second angle. For example, the initial angle is the angle when the extending direction of the rod portion 78 is in horizon, but not limited thereto. An angle difference between the initial angle and the first angle is equal to a required rotating angle for making the first supporting bases 72 be in perpendicular to horizon and toward the ink stack assembly 3, and is in a range between 45 degrees and 75 degrees, preferably be 60 degrees, but not limited thereto. An angle difference between the first angle and the second angle is equal to the angle difference between the first supporting bases 72 and the second supporting bases 73, i.e., is in a range between 30 degrees and 90 degrees, preferably be 60 degrees, but not limited thereto.

[0017] As shown in FIGS. 4A to 6C, in this embodiment, when the transmission assembly 7, the ink stack assembly 3 and the scraper assembly 4 are assembled, and the transmission assembly 7 is in the initial angle, the ink stack assembly 3 is at the first ink stack position, and the scraper assembly 4 is at the first scraper position. That is, the ink stack assembly 3 and the scraper assembly 4 are both at the lowest positions of them, respectively, but not limited thereto. When the driving device D drives the transmission assembly 7 to be in the first angle, the ink stack assembly 3 is at the second ink stack position, which is the highest position of the ink stack assembly 3. Meanwhile, the scraper assembly 4 is between the first scraper position and the second scraper position. When the driving device D drives the transmission assembly 7 to be in the second angle, the scraper assembly 4 is at the second scraper position, which is the highest position of the scraper assembly 4. Meanwhile, the ink stack assembly 3 is at the first ink stack position, but not limited thereto. In this embodiment, the transmission assembly 7 is controlled to rotate forward and backward by the driving device D according to a sequence of initial angle, the first angle, the second angle, the first angle and initial angle, but not limited thereto. When the transmission assembly 7 is in the first angle, the protrusion 43 of the scraper assembly 4 is in contact with the first surfaces 54a, 64a or the second surfaces 54b, 64b of the extending portions 64, 54 of the first movable member 5 and the second movable member 6 (as shown in FIGS. 3A and 3B). When the transmission assembly 7 is in the initial angle or the second angle, the protrusion 43 of the scraper assembly 4 is separated from the first movable member 5 and the second movable member 6. By the elastic force of the elastic elements 51, 61, the sheet bodies 52, 62 of the first movable member 5 and the second movable member 6 are returned to the original position and substantially parallel to each other, but not limited thereto. By the forward and backward rotation of the transmission assembly 7, the ink stack assembly 3 and the scraper assembly 4 can be lifted and dropped by turns, so as to combine the ink stack assembly 3 with the ink cartridge and clean the nozzles of the ink cartridge by the scraper assembly 4, sequentially.

[0018] It is noted that the collaborative structural design of the ink stack assembly 3, the scraper assembly 4 and the transmission assembly 7 mentioned above facilitates the printer clean device 1 to be integrally formed in one piece. Consequently, the efficacy of simplifying the production process and reducing the overall size of the printer clean device 1 is achieved. In this embodiment, the inner case 2, the ink stack assembly 3, the scraper assembly 4, the first movable member 5 and the transmission assembly 7 are integrally formed in one piece, but not limited thereto.

[0019] Please refer to FIGS. 2A and 4A to 6C. In this embodiment, the printer clean device 1 further includes an outer case C and a sensor (not shown). The outer

case C covers a side of the inner case 2, and a sensing area S is defined by the outer case C and the inner case 2 collaboratively. The sensing area S is corresponding in position to the rod portion 78 of the transmission assembly 7, so that the rod portion 78 is accommodated and rotating therein. An allowed rotating angle for the rod portion 78 in the sensing area S is in a range between 75 degrees and 180 degrees, preferably be 120, but not limited thereto. The sensor is disposed in the sensing area S and is configured to detect the extending direction of the rod portion 78, so as to detect the angle of the transmission assembly 7, thereby knowing the positions of the ink stack assembly 3 and the scraper assembly 4, and then controlling the transmission assembly 7.

[0020] Please refer to FIG. 7. FIG. 7 is a schematic view illustrating the printer clean device according to a second embodiment of the present disclosure. In this embodiment, the printer clean device 1' includes the first movable member 5 and a sheet M, and the cleaning action is performed by the first movable member 5 and the sheet M. That is, the opened-closed action is only performed on one side. More specifically, the first movable member 5 and the sheet M are disposed on two opposite sides within the second accommodation groove 22. When the scraper assembly 4 is lifted from the first scraper position to the second scraper position, the protrusion 43 pushes against the first movable member 5 from the first surface 54a of the extending portion 54, so as to make the end portion 53 away from the scraper 41. On the other hand, the sheet M contacts with the scraper 41. When the scraper assembly 4 is dropped from the second scraper position to the first scraper position, the protrusion 43 pushes against the first movable member 5 from the second surface 54b of the extending portion 54, so as to make the end portion 53 close to and contact with the scraper 41. On the other hand, the sheet M contacts with the scraper 41 again. The structure of the movable member is identical to the movable member of the first embodiment, and are not redundantly described hereinafter. In this embodiment, the sheet M is made of a rigid plastic material, and is disposed on the side closer to the ink stack assembly 3, but not limited thereto. In some embodiments, the sheet M is disposed on the side farther from the ink stack assembly 3, and the first movable member 5 is disposed on the side closer to the ink stack assembly 3.

[0021] From the above descriptions, the present disclosure provides the printer clean device. By the collaboration between the movable member and the scraper assembly, when the scraper assembly is lifted, the end portion of the movable member is moved away from the scraper to prevent the ink attached on the movable member polluting the scraper. After the cleaning action being completed, the scraper assembly is dropped, and the end portion of the movable member is moved close to and contacts with the scraper to remove the ink attached on the scraper, thereby maintaining the cleanliness of the scraper and ensuring the effect of cleaning the nozzles of the ink cartridge. In addition, by the collaborative structural design of the ink stack assembly, the scraper assembly and the transmission assembly, the printer clean device is integrally formed in one piece. Furthermore, the efficacy of simplifying the production process of the printer clean device, reducing the overall size of the printer clean device and simplifying the method of detecting the positions of the ink stack assembly and the scraper assembly is achieved.

Claims

1. A printer clean device (1), **characterized in that** the printer clean device (1) comprises:

    an inner case (2) comprising a first accommodation groove (21) and a second accommodation groove (22), wherein the first accommodation groove (21) is adjacent to the second accommodation groove (22);
    an ink stack assembly (3) disposed in the first accommodation groove (21);
    a scraper assembly (4) disposed in the second accommodation groove (22) and comprising a scraper (41), a base (42) and at least one protrusion (43), wherein the scraper (41) is disposed on the base (42), and the protrusion (43) is disposed on a side of the base (42);
    a first movable member (5) disposed in the second accommodation groove (22) and comprising:

        an elastic element (51) connected to a wall of the second accommodation groove (22);
        a sheet body (52) connected to the elastic element (51) and adjacent to the scraper (41);
        an end portion (53) disposed at an end of the sheet body (52) facing the scraper (41); and
        at least one extending portion (54) extended from the sheet body (52) toward the scraper (41) and comprising a first surface (54a) and a second surface 54b;

    a transmission assembly (7) penetrated through the first accommodation groove (21) and the second accommodation groove (22) and connected to the ink stack assembly (3) and the scraper assembly (4), wherein by the rotation of the transmission assembly (7), the ink stack assembly (3) is lifted or dropped between a first ink stack position and a second ink stack position, and the scraper assembly (4) is lifted or dropped between a first scraper position and a second scraper position; and
    a driving device (D) connected to the transmis-

sion assembly (7) for driving the transmission assembly (7) to rotate,
wherein when the scraper assembly (4) is lifted from the first scraper position to the second scraper position, the protrusion (43) pushes against the first movable member (5) from the first surface (54a) of the extending portion (54), so as to make the end portion (53) away from the scraper (41), wherein when the scraper assembly (4) is dropped the second scraper position to the first scraper position, the protrusion (43) pushes against the first movable member (5) from the second surface (54b) of the extending portion (54), so as to make the end portion (53) close to and contact with the scraper (41).

2. The printer clean device (1) according to claim 1, wherein the first movable member (5) comprises a shaft (55), the shaft (55) is extended from the two sides of the sheet body (52) and penetrated two walls within the second accommodation groove (22), so that the first movable member (5) is rotated with an axis defined by an extending direction of the shaft (55).

3. The printer clean device (1) according to claim 1, wherein the first surface (54a) and the second surface (54b) of the extending portion (54) of the first movable member (5) are adjacent to each other.

4. The printer clean device (1) according to claim 1, further comprising a second movable member (6), wherein the second movable member (6) is disposed in the second accommodation groove (22), is opposite to the first movable member (5), and comprises:

an elastic element (61) connected to a wall of the second accommodation groove (22);
a sheet body (62) connected to the elastic element (61) and adjacent to the scraper (41);
an end portion (63) disposed at an end of the sheet body (62) facing the scraper (41); and
at least one extending portion (64) extended from the sheet body (62) toward the scraper (41) and comprising a first surface (64a) and a second surface 64b;
wherein when the scraper assembly (4) is lifted from the first scraper position to the second scraper position, the protrusion (43) pushes against the first movable member (5) and the second movable member (6) simultaneously from the first surfaces (54a, 64a) of the extending portions (54, 64) of the first movable member (5) and the second movable member (6), so as to make the end portions (53, 63) of the first movable member (5) and the second movable member (6) away from each other, wherein when the scraper assembly (4) is dropped from the second scraper position to the first scraper position, the protrusion (43) pushes against the first movable member (5) and the second movable member (6) from the second surfaces (54b, 64b) of the extending portions (54, 64) of them, so as to make the end portions (53, 63) close to each other and contact with the scraper (41).

5. The printer clean device (1) according to claim 4, wherein an end of the scraper (41) is bent toward the ink stack assembly (3), the first movable member (5) is disposed on the side closer to the ink stack assembly (3), the second movable member (6) is disposed on the side farther from the ink stack assembly (3), and the length of the extending portion (54) of the first movable member (5) is longer than the length of the extending portion (64) of the second movable member (6).

6. The printer clean device (1') according to claim 1, further comprising a sheet (M), wherein the sheet (M) is disposed in the second accommodation groove (22) and is opposite to the first movable member (5), and when the scraper assembly (4) is lifted from the first scraper position to the second scraper position and dropped from the second scraper position to the first scraper position, the sheet (M) is in contact with the scraper (41).

7. The printer clean device (1) according to claim 1, wherein the inner case (2), the ink stack assembly (3), the scraper assembly (4), the first movable member (5) and the transmission assembly (7) are integrally formed in one piece.

8. The printer clean device (1) according to claim 1, wherein the transmission assembly (7) comprises an initial angle, a first angle and a second angle, an angle difference between the initial angle and the first angle is in a range between 45 degrees and 75 degrees, and an angle difference between the first angle and the second angle is in a range between 30 degrees and 90 degrees, wherein the transmission assembly (7) is controlled to rotate forward and backward according to a sequence of initial angle, the first angle, the second angle, the first angle and initial angle, wherein when the transmission assembly (7) is in the initial angle, the ink stack assembly (3) is at the first ink stack position, and the scraper assembly (4) is at the first scraper position, when the transmission assembly (7) is in the first angle, the ink stack assembly (3) is at the second ink stack position, and when the transmission assembly (7) is in the second angle, the scraper assembly (4) is at the second scraper position.

9. The printer clean device (1) according to claim 1, further comprising an outer case (C) and a sensor,

wherein the outer case (C) covers a side of the inner case (2), and a sensing area (S) is defined by the outer case (C) and the inner case (2) collaboratively, wherein the transmission assembly (7) further comprises a rod portion (78), the rod portion (78) is disposed on an end opposite to the end where the transmission assembly (7) connected with the driving device (D), located in the sensing area (S) defined by the outer case (C) and the inner case (2), and has an extending direction, wherein the sensor is disposed in the sensing area (S) and detects the extending direction of the rod portion (78), so as to detect the angle of the transmission assembly (7).

10. The printer clean device (1) according to claim 1, wherein the ink stack assembly (3) comprises a first connection portion (31), and the scraper assembly (4) comprises a second connection portion (44), wherein the transmission assembly (7) comprises:

a transmission shaft (71) comprising a separating segment (711), wherein an end of the transmission shaft (71) is connected to the driving device (D);
two first supporting bases (72) parallel to each other and both extended out from the transmission shaft (71) along a radial direction of the transmission shaft (71);
two second supporting bases (73) disposed on two ends of the separating segment (711), parallel to each other and both extended out from the transmission shaft (71) along a radial direction of the transmission shaft (71), wherein an angle difference between an extending direction of the second supporting bases (73) and an extending direction of the first supporting bases (72) is in a range between 30 degrees and 90 degrees;
a first connection rod (74) connected between the two first supporting bases (72);
a second connection rod (75) connected between the two second supporting bases (73);
a first connection element (76) comprising a first end and a second end, wherein the first end is pivotally disposed on the first connection rod (74), and the second end is pivotally disposed on the first connection portion (31) of the ink stack assembly (3);
a second connection element (77) comprising a first end and a second end, wherein the first end is pivotally disposed on the second connection rod (75), and the second end is pivotally disposed on the second connection portion (44) of the scraper assembly (4); and
a rod portion (78) connected to an end of the transmission shaft (71) opposite to the end connected to the driving device (D) and extended out from the transmission shaft (71) along a radial direction of the transmission shaft (71), wherein an angle difference between an extending direction of the rod portion (78) and the extending direction of the first supporting bases (72) is in a range between 15 degrees and 45 degrees, and an angle difference between an extending direction of the rod portion (78) and the extending direction of the second supporting bases (73) is in a range between 15 degrees and 45 degrees.

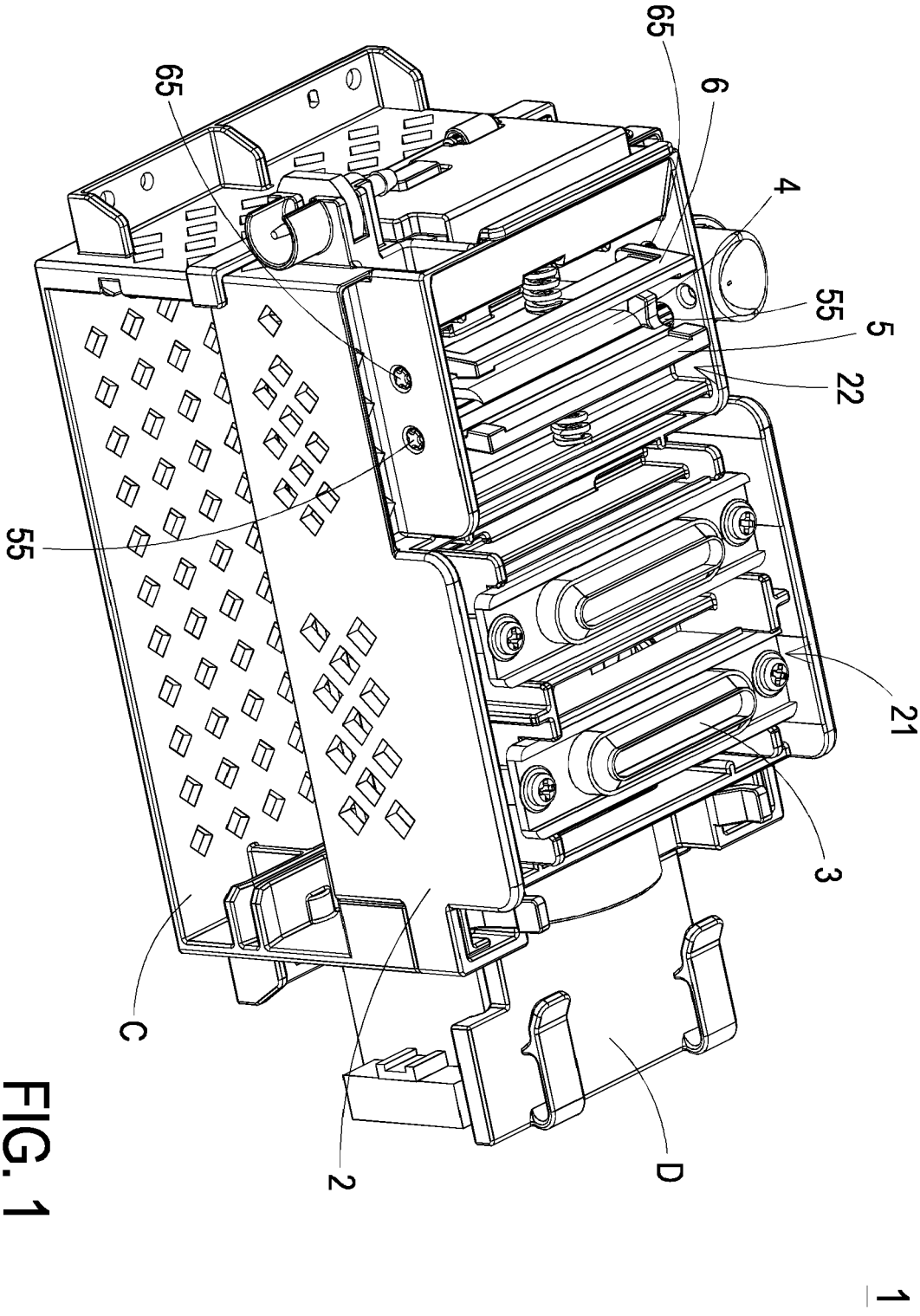


FIG. 1

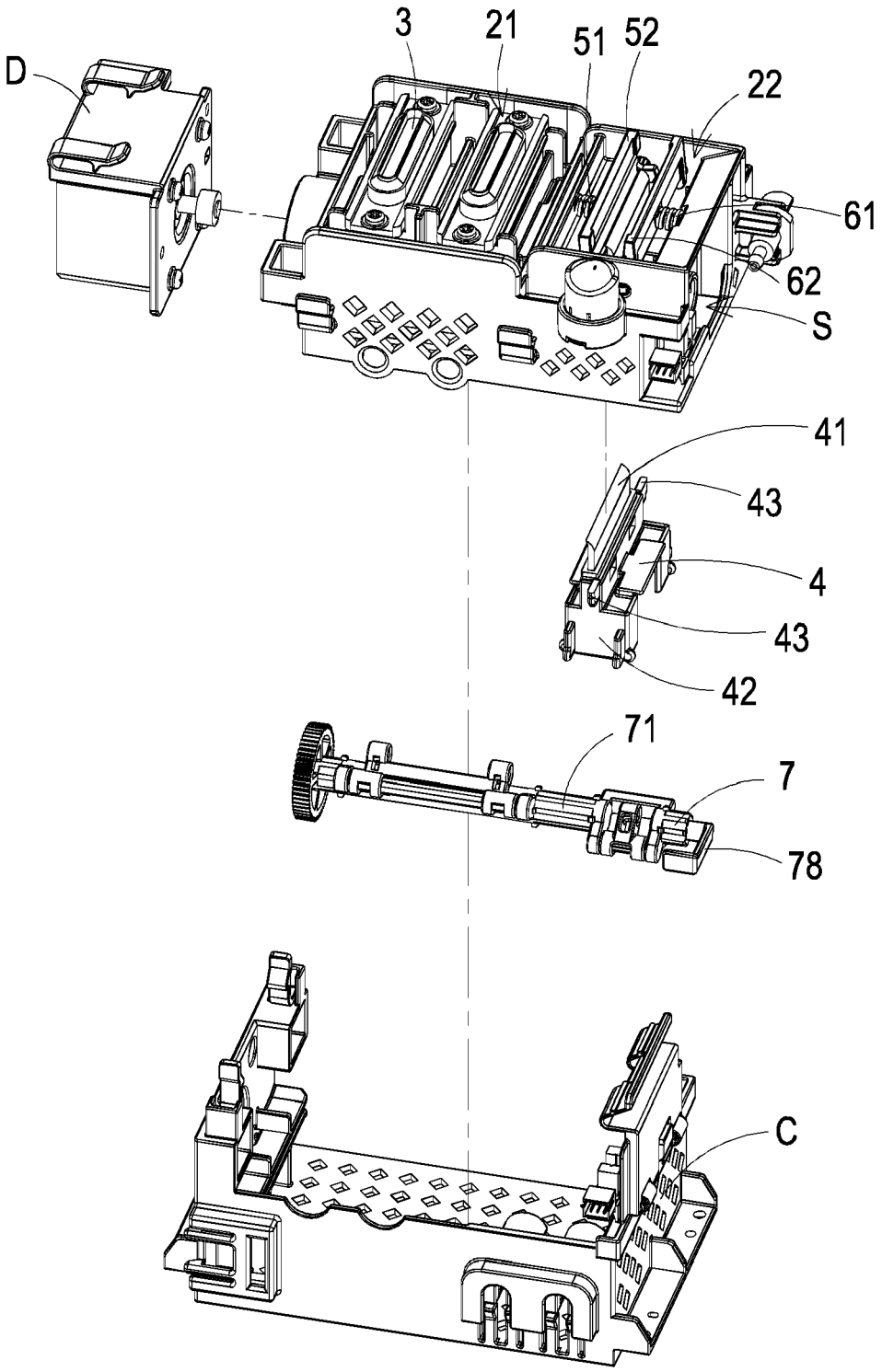


FIG. 2A

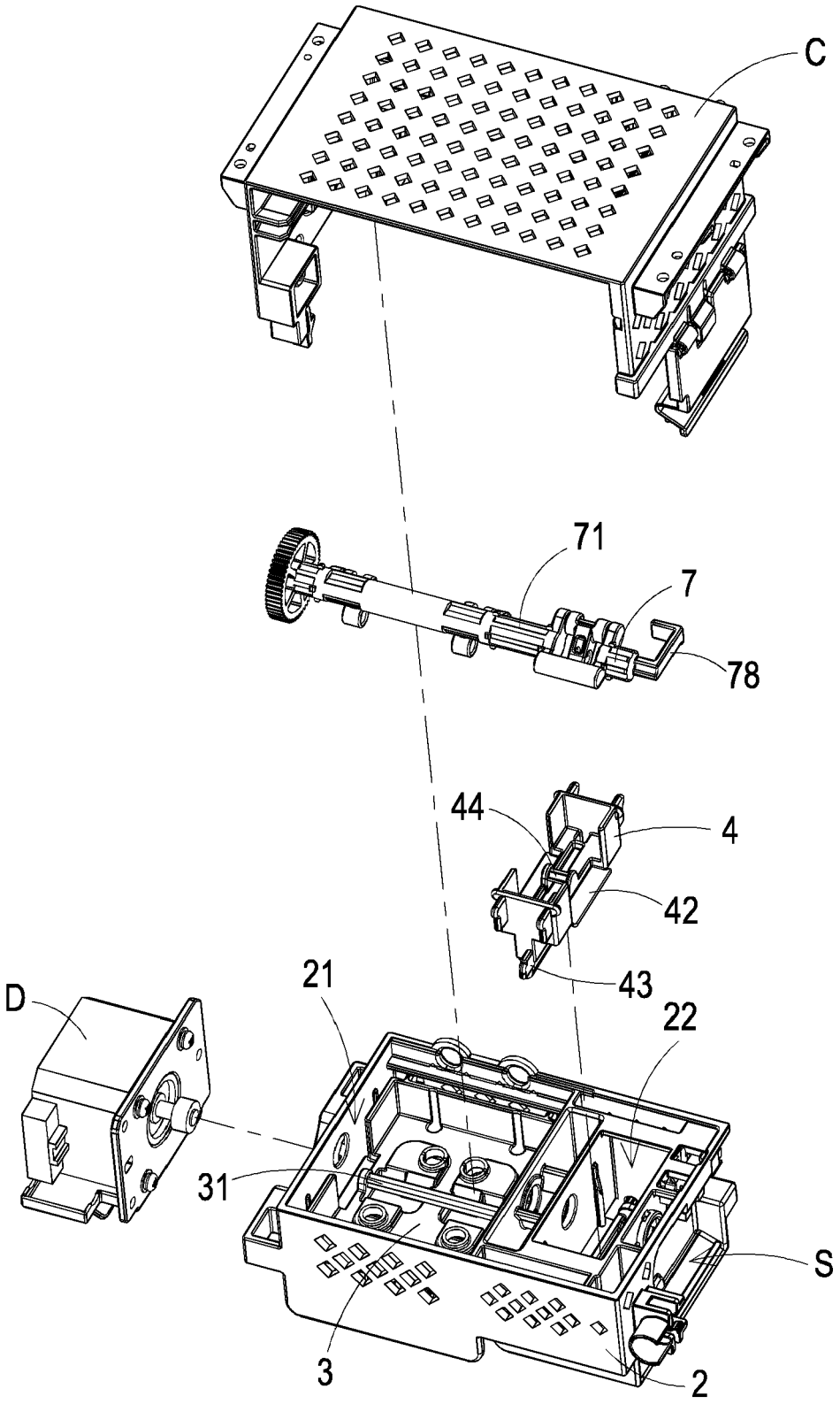
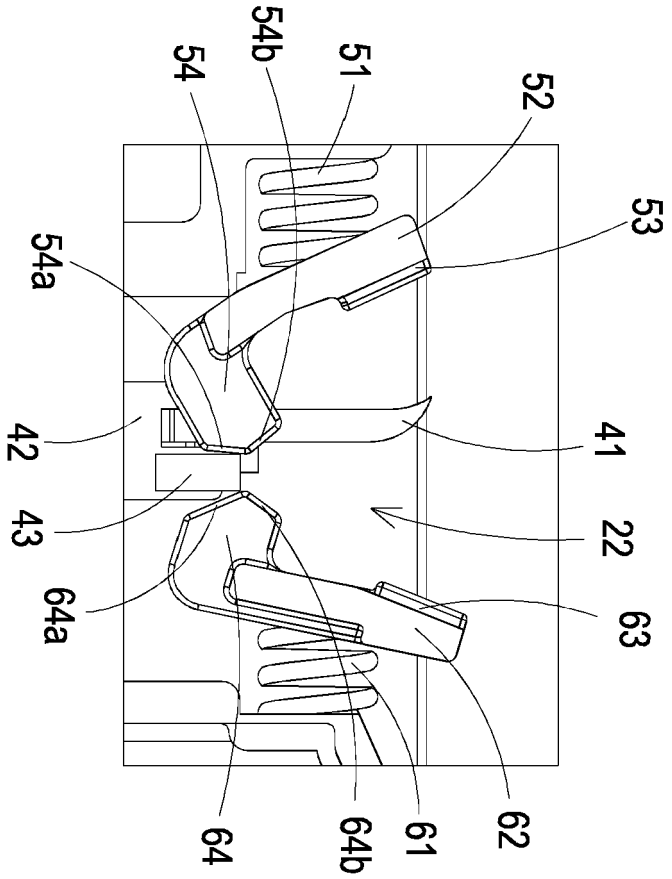


FIG. 2B


54b
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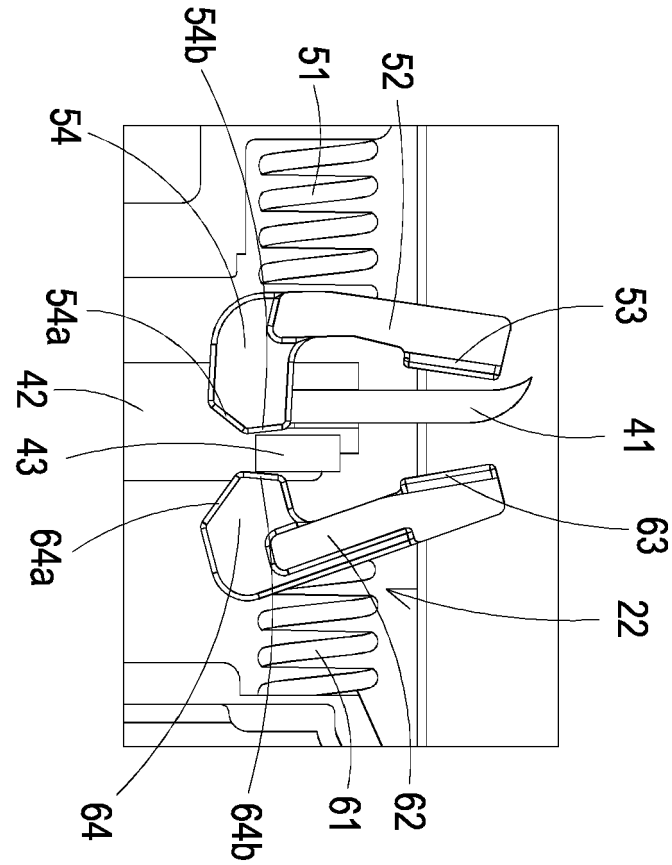
54
52
53
54a
42
41
43
22
64a
63
64
64b
61
62

FIG. 3A


54b
51
52
54
53
54a
42
41
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63
64a
22
64
64b
61
62

FIG. 3B

FIG. 4A

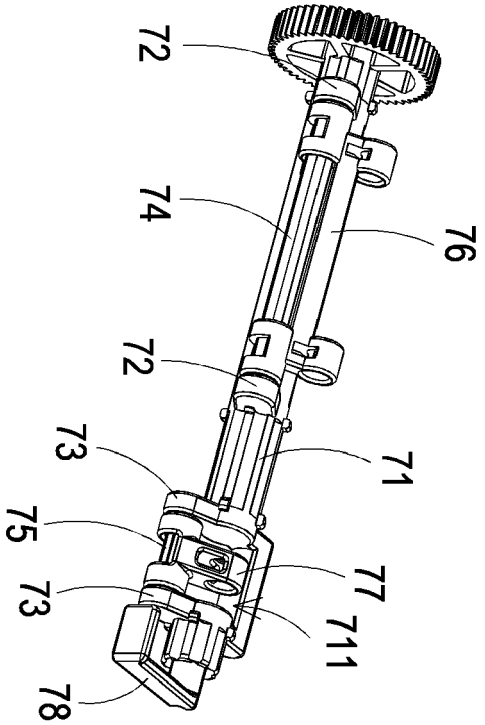
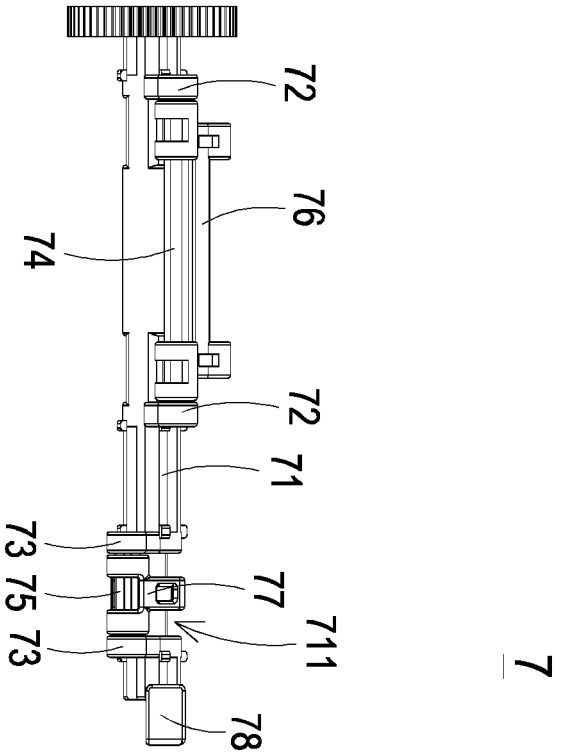


FIG. 4B



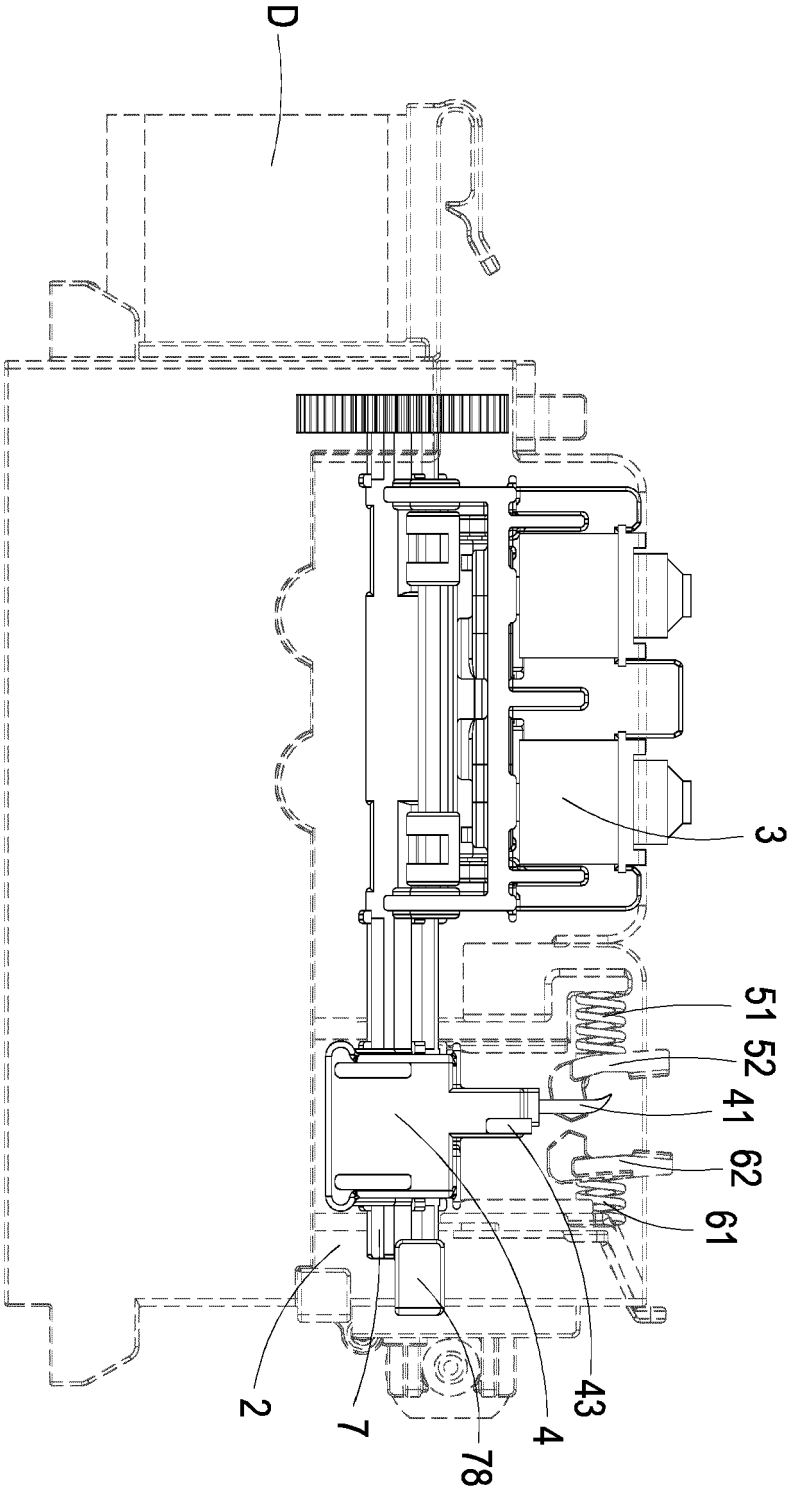


FIG. 4C

FIG. 5A

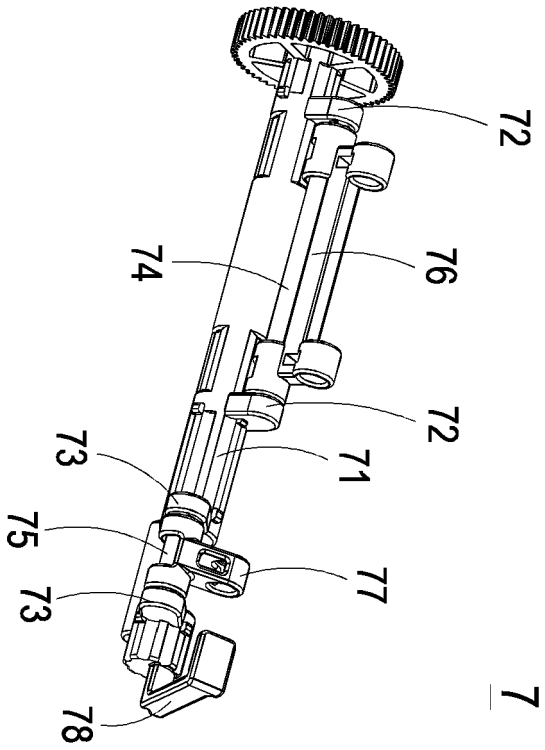
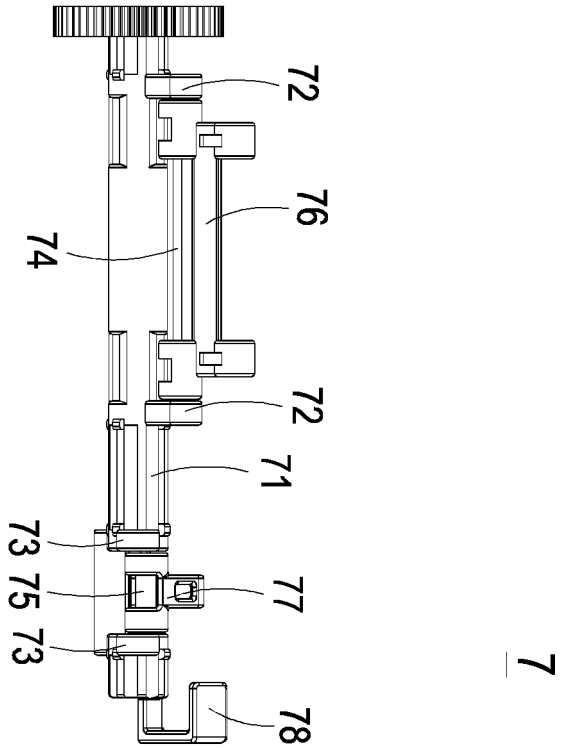


FIG. 5B



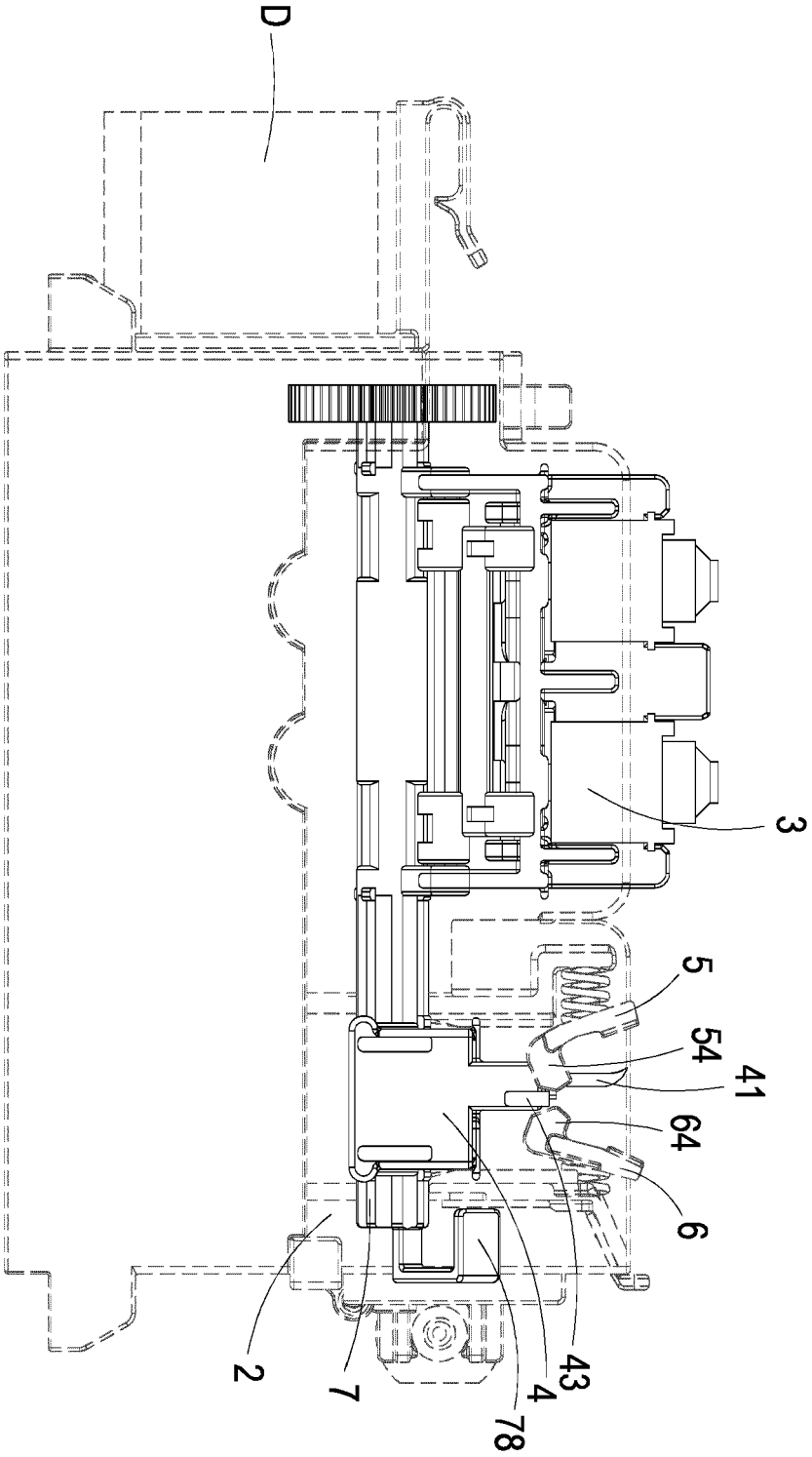


FIG. 5C

FIG. 6A

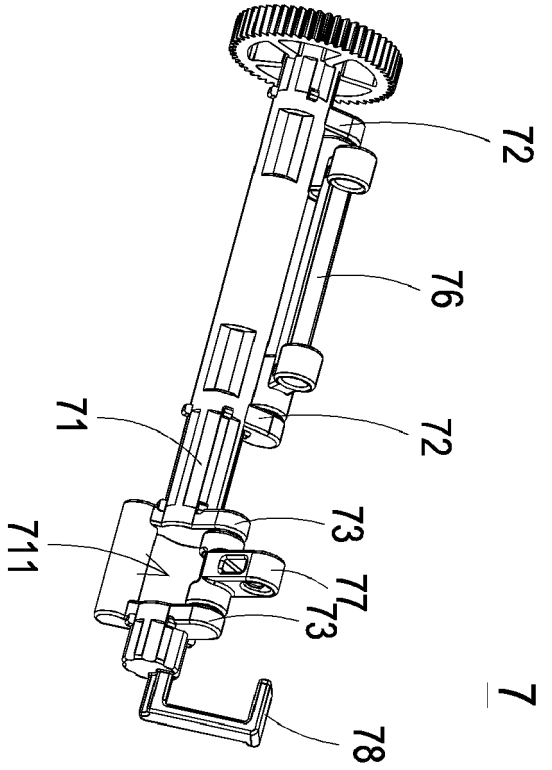
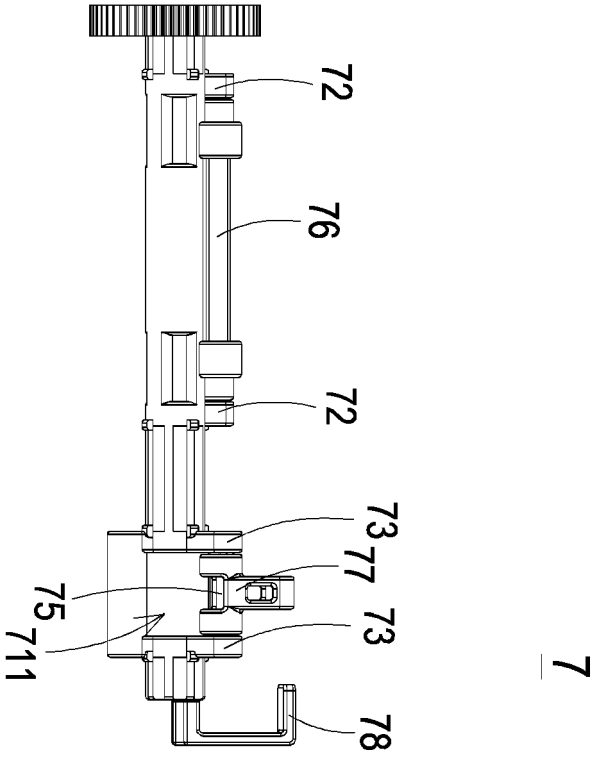


FIG. 6B



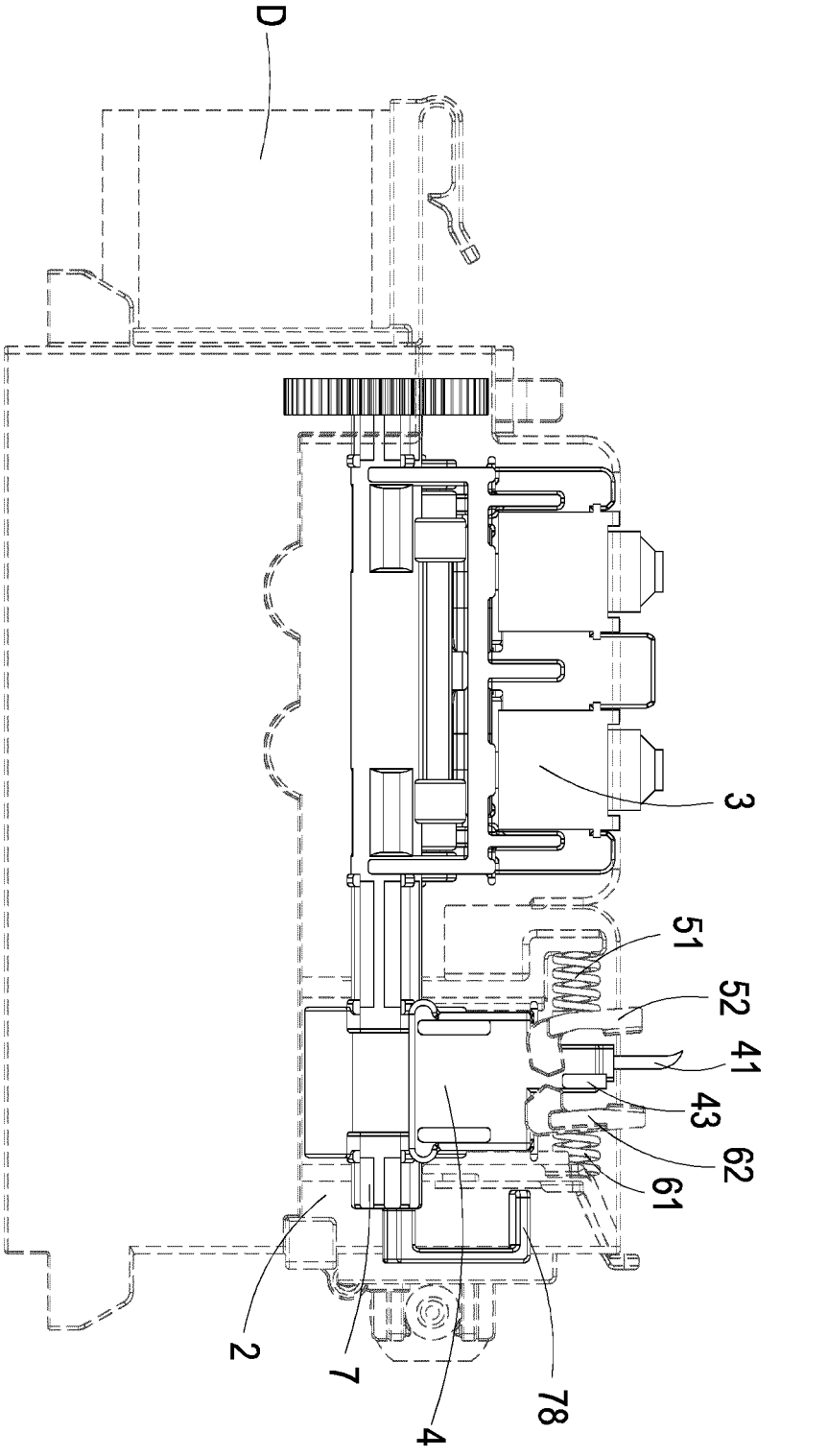


FIG. 6C

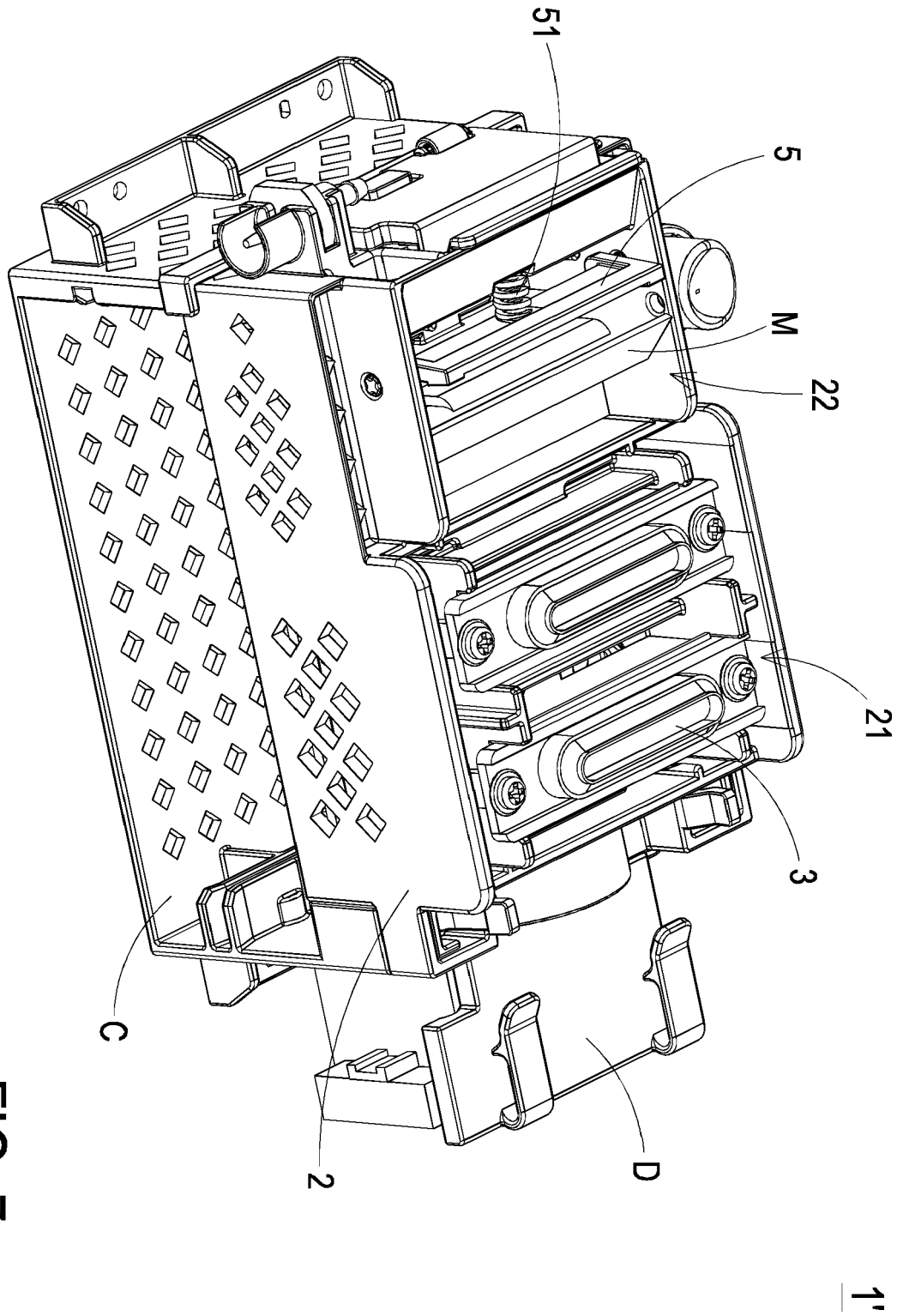


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 19 21 8375

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 963 229 A (FUKUOKA MUTSUO [JP]) 5 October 1999 (1999-10-05) * abstract; figures 1-3 * -----	1-10	INV. B41J2/165
A	US 2009/289992 A1 (KAWABATA YOICHI [JP]) 26 November 2009 (2009-11-26) * figures 4-10 * * paragraph [0057] - paragraph [0061] * * paragraph [0065] - paragraph [0069] * * paragraph [0073] - paragraph [0081] * -----	1-10	
A	US 2015/251433 A1 (MIYAZAWA HISASHI [JP]) 10 September 2015 (2015-09-10) * figures 4, 7, 9-11 * * paragraph [0071] - paragraph [0072] * * paragraph [0121] - paragraph [0128] * * paragraph [0083] * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC) B41J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 June 2020	João, César

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09-06-2020

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