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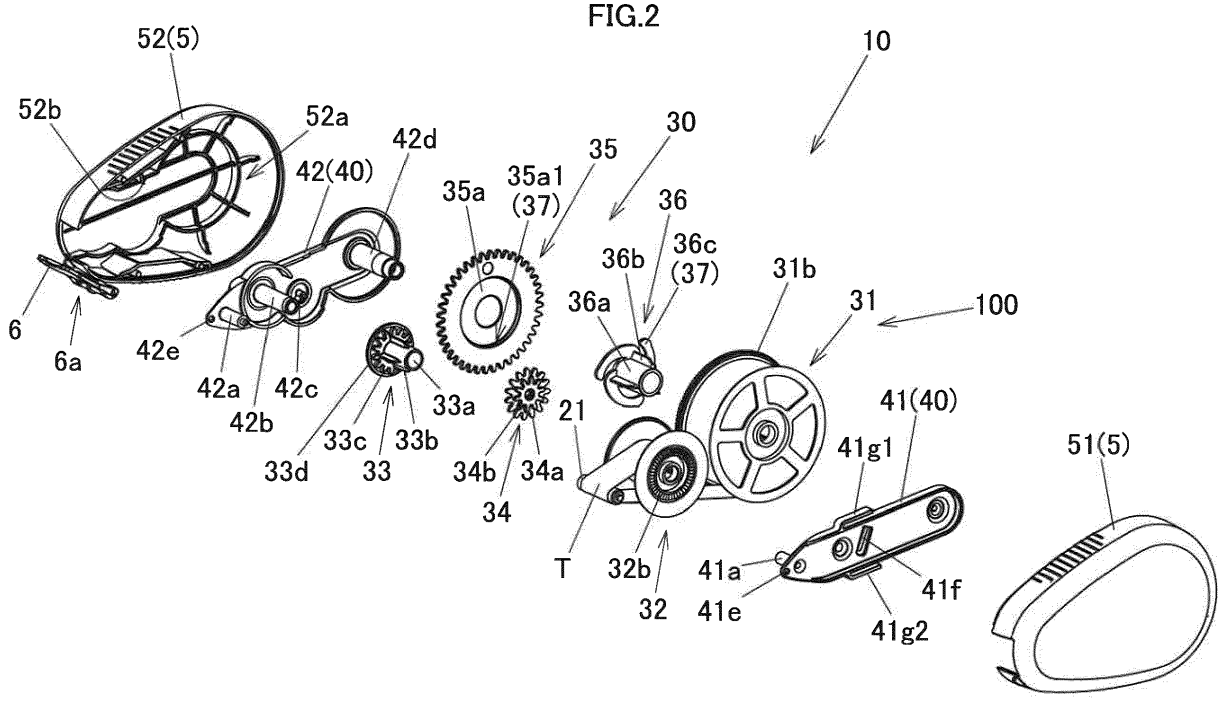
(54) **FILM TRANSFER TOOL**

(57) A film transfer tool includes a case (5), a transfer unit (10) including a supply bobbin (31) around which a transfer tape T, which is not used, is wound, a take-up bobbin (32) around which the transfer tape T, which is used, is wound, a rotational coupling mechanism (30) configured to couple together the supply bobbin and the take-up bobbin rotationally via a clutch portion, and a head portion (20) configured to transfer a transfer layer of the transfer tape T on to a transfer target surface, and configured to be installed in the case movably back and forth, biasing members (41g1, 41g2) configured to bias the transfer unit forwards, and a lock portion fixed to the case, and in the film transfer tool, the lock portion is configured to be disengaged from a locking portion (52b) formed on the supply bobbin by the transfer unit moving backwards.

FIG.2



EP 3 643 656 A1

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a film transfer tool for transferring a transfer layer of a transfer tape to a transfer target surface.

Description of the Related Art

[0002] Conventionally, there have been disclosed film transfer tools in which a supply bobbin can be locked so as not to rotate when not in use, while the supply bobbin can be released from the locked state when in use. In a film transfer tool disclosed in Japanese Patent Laid-Open No. 2016-124131, an elongated base member configured to rotate on a pivot is provided in a case. A head portion is provided at a distal end of the base member, and a lock pawl configured to be locked in a locking tooth of a supply bobbin is formed at a rear end side of the base member. The locking tooth is an internal gear formed on the supply bobbin , and the locking pawl is a projection that projects from the base member towards the internal gear.

[0003] The base member is biased in a direction in which the locking pawl and the locking tooth are locked together by a torsion coil spring that is wound around the pivot in order to lock the rotation of the supply bobbin when the transfer tool is not in use. When the head portion is pressed against the transfer target surface (that is, when the transfer tool is in use), the base member rotates against the biasing force of the torsion coil spring, whereby the locking pawl is disengaged from the locking tooth to thereby unlock the supply bobbin to rotate.

[0004] During transfer work, when the head portion, having a spatula-like shape, is pressed against the transfer target surface, a spatula-shaped surface of the head portion is sometimes pressed against the transfer target surface, and depending upon a situation, there may occur a case where a distal end portion of the spatula-like head portion, which is formed into a roller-like shape sometimes, is wanted to be pressed against strongly. For example, in the case where a transfer layer of a tape glue having a relatively strong adhesive force is transferred to a transfer target surface having a small friction coefficient (slippery) from a film transfer tool, there may be a situation in which the transfer layer cannot be transferred well to the transfer target surface unless a distal end of a head portion of the film transfer tool is pressed against the target transfer surface strongly. In this case, in the film transfer tool disclosed by Japanese Patent Laid-Open No. 2016-124131, since a pressing force is applied in a radial direction in which the base member rotates from the head portion, the pivot receives the pressing force, and the base member does not rotate in the unlocking direction of the supply bobbin while the film transfer tool is in use, resulting in a situation in which the transfer work is interrupted from time to time.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide a film transfer tool that can facilitate smooth transfer work.

[0006] According to an aspect of the present invention, there is provided a film transfer tool including a case, a transfer unit including a supply bobbin around which a transfer tape, which is not used, is wound, a take-up bobbin around which the transfer tape, which is used, is wound, a rotational coupling mechanism configured to couple together the supply bobbin and the take-up bobbin rotationally via a clutch portion, and a head portion configured to transfer a transfer layer of the transfer tape on to a transfer target surface, and configured to be installed in the case movably back and forth, a biasing member configured to bias the transfer unit forwards, and a lock portion fixed to the case, and in the film transfer tool, the lock portion is configured to be disengaged from a locking portion formed on the supply bobbin by the transfer unit moving backwards.

[0007] According to the present invention, a risk of the transfer work being interrupted is reduced, whereby the transfer work can be carried out smoothly.

BRIEF DESCRIPTION OF THE SEVERALS VIEWS OF THE DRAWINGS

[0008]

Fig. 1A is a perspective view of a film transfer tool according an embodiment of the present invention, showing a state where a cap is closed;

Fig. 1B is a perspective view of the film transfer tool according to the embodiment of the present invention, showing a state where the cap is opened to thereby expose a transfer roller of a head portion;

Fig. 2 is an exploded perspective view of the film transfer tool according to the embodiment of the present invention as seen from a left side thereof;

Fig. 3 is an exploded perspective view of the film transfer tool according to the embodiment of the present invention as seen from a right side thereof;

Fig. 4 is a perspective view of a transfer unit of the film transfer tool according to the embodiment of the present invention;

Fig. 5A is a side view of a left frame, a left case and the cap of the film transfer tool according to the embodiment of the present invention, showing states thereof when the film tool is not in use (a state where the head portion is not brought into abutment with and pressed against the transfer target surface);

Fig. 5B is a side view of the left frame, the left case and the cap of the film transfer tool according to the embodiment of the present invention, showing states thereof when the film transfer tool is in use (a state

where the head portion is brought into abutment with the transfer target surface to thereby be subjected to a pressing force);

Fig. 6A is a side view of a right frame, a right case, a supply reel, and the cap of the film transfer tool according to the embodiment of the invention, showing states thereof when the film transfer tool is not in use (a state the head portion is not brought into abutment with and pressed against the transfer target surface);

Fig. 6B is a side view of the right frame, the right case, the supply reel, and the cap of the film transfer tool according to the embodiment of the present invention, showing states thereof when the film transfer tool is in use (a state where the head portion is brought into abutment with the transfer target surface to thereby be subjected to a pressing force).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0009] Next, referring to drawings, an embodiment of the present invention will be described. In a film transfer tool 10 shown in Figs. 1A, 1B, a head portion 20 projects from a distal end of a case 5 having an egg-like shape. In the following description, in the film transfer tool 10, an end where the head portion 20 is provided is referred to as front, while an opposite end thereto is referred to rear. In addition, when the film transfer tool 10 is seen from the rear towards the front, a left side is referred to as left, while a right side is referred to as right. In Figs. 1A, 1B, in the film transfer tool 10, an upper side is referred to as top, while a lower side is referred to as bottom.

[0010] A cap 6 is provided on the case 5 in a position that lies below the head portion 20, and this cap 6 is allowed to rotate around a hinge portion 6a. When the film transfer tool 10 is not in use, as shown in Fig. 1A showing a state where the cap 6 is closed, the cap 6 is located in a position where the cap 6 covers the head portion 20 from below. When the film transfer tool 10 is in use, the cap 6 is rotated from the position shown in Fig. 1A towards the rear to expose the head portion 20 as shown in Fig. 1B showing a state where the cap 6 is opened. In the state (the state in Fig. 1A) where the cap 6 is closed and the state (the state in Fig. 1B) where the cap 6 is opened, the cap 6 can be fixed in place so as not to rotate around the hinge portion 6a.

[0011] The head portion 20 transfers a transfer layer of a transfer tape T on to a transfer target surface via a transfer roller 21. Here, the transfer tape T is referred to as glue in the form of a tape, or tape glue.

[0012] Next, an internal structure of the film transfer tool 10 will be described. Figs. 2, 3 show exploded perspective views of the film transfer tool 10 and a transfer unit 100. Here, the transfer unit 100 includes, as shown in Fig. 4, the head portion 20, a supply bobbin 31, a take-up bobbin 32, a rotational coupling mechanism 30, and the like, and is installed in the case 5 in such a manner as to move back and forth, as will be described later.

[0013] To describe in detail, as shown in Figs. 2, 3, the transfer unit 100 includes a transfer unit main body 40 that is formed by a left frame 41 and a right frame 42 that are made up of two substantially plate-like members. As shown in Fig. 2, a joint shaft 42a, a take-up bobbin support shaft 42b, an intermediate gear support shaft 42c, and a supply bobbin support shaft 42d are provided on an inner surface (a left side surface) of the right frame 42 sequentially in that order from a distal end of a tapered shape of the right frame 42 in such a manner as to project therefrom as shafts formed into a cylindrical shape. Circumferences of the take-up bobbin support shaft 42b, the intermediate gear support shaft 42c, and the supply bobbin support shaft 42d protrude substantially into a circle to receive support targets such as the take-up bobbin 32, an intermediate gear 34, and the supply bobbin 31, respectively.

[0014] As shown in Fig. 3, a distal end portion of the left frame 41 is tapered, while a rear end is formed into an arc-like shape, and upper and lower edge portions of the left frame 41 are formed into straight lines that are parallel to each other. The joint shaft 42a, the take-up bobbin support shaft 42b, and the supply bobbin support shaft 42d on the right frame 42 shown in Fig. 2 are brought into engagement with a joint shaft boss 41a, a take-up bobbin support shaft boss 41b, and a supply bobbin support shaft boss 41d, respectively, that are formed on an inner surface (a right side surface) of the left frame 41 that is disposed opposite to the right frame 42. Plate springs 41gl, 41g2 are formed on upper and lower edge portions of the left frame 41 in such a manner as to extend to the rear.

[0015] Support holes 41e, 42e, each configured to support the transfer roller 21, are formed at distal ends of the left frame 41 and the right frame 42. The transfer roller 21 is supported rotatably in both the support holes 41e, 42e at ends thereof. Distal end portions of the left frame 41 and the right frame 42 (the transfer unit main body 40) that are tapered and include the transfer roller 21 are made into the head portion 20.

[0016] A take-up bobbin gear 33 is provided rotatably on the take-up bobbin support shaft 42b. As shown mainly in Fig. 2, the take-up bobbin gear 33 includes a plurality of ribs 33b that are formed on a circumference of a cylindrical engagement shaft 33a in such a manner as to extend in an axial direction of the engagement shaft 33a. A gear 33c is formed on an outer circumference of a base portion of the engagement shaft 33a. The gear 33c is formed on a left side surface of a disc-like base plate 33d at an opposite end to a projecting end of the engagement shaft 33a, that is, a proximal end of the engagement shaft 33a. Ribs 32a, which are configured to be brought into engagement with the ribs 33b of the take-up bobbin gear 33, are formed on an inner circumferential surface (refer to Fig. 3) of a shaft hole of the take-up bobbin 32 around which the transfer tape T that is used is wound.

[0017] The take-up bobbin support shaft 42b is insert-

ed into the engagement shaft 33a of the take-up bobbin gear 33, and the engagement shaft 33a is inserted into the take-up bobbin 32, whereby the take-up bobbin gear 33 and the take-up bobbin 32 are allowed to rotate together around the take-up bobbin support shaft 42b.

[0018] Latch teeth 32b are formed on a left side surface of the take-up bobbin 32. The latch teeth 32b are formed in such a manner that a latch claw at a distal end of a latch portion 41f, which is formed into the shape of a plate spring on the left frame 41, can be brought into engagement with the latch teeth 32b, whereby a reverse rotation preventing structure is formed.

[0019] The intermediate gear 34 includes a first gear 34a and a second gear 34b formed smaller in diameter than the first gear 34a that are formed in two stages and is supported rotatably on the intermediate gear support shaft 42c on the right frame 42. The first gear 34a meshes with the gear 33c of the take-up bobbin gear 33. The second gear 34b meshes with a supply-side gear 35, which will be described later.

[0020] The supply-side gear 35 is provided rotatably on the supply bobbin support shaft 42d. The supply-side gear 35 has a large diameter, and an annular recessed portion 35a is formed at a central portion on a left side surface of the supply-side gear 35. A clutch shaft 36 is further provided rotatably on the supply bobbin support shaft 42d. The clutch shaft 36 includes a cylindrical shaft 36a, a plurality of ribs 36b that are formed along an axial direction of the shaft 36a, and three spring portions 36c each formed into an arc-like shape, the cylindrical shaft 36a, the ribs 36b, and the spring portions 36c being formed on the clutch shaft 36. These spring portions 36c are brought into abutment with an annular circumferential wall that rises from the annular recessed portion 35a of the supply-side gear 35 at distal end portions thereof in a spring-back fashion, whereby a clutch portion 37 is formed.

[0021] A plurality of ribs 31a are formed on an inner circumferential surface (refer to Fig. 3) of a shaft hole of the supply bobbin 31 around which the transfer tape T, which is not used, wound in such a manner as to extend along an axial direction of the shaft hole. The ribs 36b of the clutch shaft 36 are brought into engagement with the ribs 31a of the supply bobbin 31. Consequently, the clutch shaft 36 and the supply bobbin 31 rotate together. The supply-side gear 35 rotates together with the supply bobbin 31 via the clutch portion 37. A locking portion 31b, which is made up of ratchet teeth, is formed on an outer circumference of one (a right side) of flange portions of the supply bobbin 31.

[0022] In this way, the supply bobbin 31 and the take-up bobbin 32 are rotationally coupled together via the clutch portion 37 by the rotational coupling mechanism 30 including the supply-side gear 35, the intermediate gear 34, and the take-up bobbin gear 33.

[0023] When the film transfer tool 10 is used, the supply bobbin 31 rotates clockwise, that is, in a feed-out direction, causing the rotational coupling mechanism 30 (the intermediate gear 34, the take-up bobbin gear 33) to rotate, and then, the rotational coupling mechanism 30 transmits the rotation of the supply bobbin 31 to the take-up bobbin 32, whereby the take-up bobbin 32 rotates counterclockwise, that is, in a take-up direction. Here, a take-up amount of the transfer tape T on the take-up bobbin 32 is set to be always greater than a feed-out amount of the transfer tape T on the supply bobbin 31 based on a relationship among the numbers of teeth of the constituent gears of the rotational coupling mechanism 30, a diameter of a barrel portion of the supply bobbin 31, and a diameter of a barrel portion of the take-up bobbin 32. Then, a difference between the feed-out mount and the take-up amount is controlled by the clutch portion 37, which is made up of side surfaces of the distal end portions of the spring portions 36c and the circumferential wall 35a1 of the annular recessed portion 35a of the supply-side gear 35, sliding (operating) as required. This applies an appropriate tension to the transfer tape T at all times to thereby reduce a risk of looseness occurring in the transfer tape T.

[0024] The transfer unit 100 is installed in the case 5 in such a manner as to move back and forth therein. A moving distance of the transfer unit 100 in a front-rear direction is of the order of 0.5 mm, for example. As shown in Figs. 2 or 3, and 5, 6, forward and backward movements of the transfer unit 100 are guided by frame guide portions 51a, 52a that are formed on inner surfaces of a left case 51 and a right case 52, respectively. The frame guide portions 51a, 52a are each formed into a frame shape having substantially the same shape as an external shape of the left frame 41 and the right frame 42.

[0025] As shown in Fig. 5, plate spring receiving frames 51b1, 51b2 are formed on an inner side surface of the left case 51 so that the plate spring receiving frames 51b1, 51b2 can install therein the plate springs 41g1, 41g2 on the left frame 41, respectively, the plate springs 41g1, 41g2 constituting biasing members, which will be described later. The plate spring receiving frames 51b1 and 51b2 are each formed in a frame shape that is long in the front-rear direction. In the plate spring receiving frames 51b1, 51b2, a front restricting portion 511 is formed at a front end side, and an engagement step portion 512 is formed at a rear end side. An inclined portion 513 connecting with the engagement step portion 512 is formed in such a manner as to extend to the rear from the engagement step portion 512. A rear restricting portion 514 is formed in such a manner as to rise in an up-down direction from a rear end of the inclined portion 513. A length from an inner side surface of the front restricting portion 511 to an inner side surface of the engagement step portion 512 substantially coincides with lengths of the plate spring receiving frames 51b1, 51b2, whereby end portions of the plate spring receiving frames 51b1, 51b2 are brought into abutment with the corresponding engagement step portions 512. End portions of the plate springs 41g1, 41g2, which now ride on the inclined portions 513 from the engagement step portions

512, are brought into abutment with the corresponding restricting portions 514.

[0026] On the other hand, as shown in Fig. 6, a lock portion 52b, which is made up of a ratchet pawl, is formed on an inner side surface of the right case 52 (also, refer to Fig. 2) . The lock portion 52b is provided in such a manner as to correspond to the locking portion 31b on the supply bobbin 31. The lock portion 52b is disengaged from the locking portion 31b formed on the supply bobbin 31 when the transfer unit 100 moves backwards. This disengagement operation is performed as follows.

[0027] In Fig. 5A, the plate springs 41g1, 41g2 are positioned between the front restricting portions 511 and the engagement step portions 512. At this time, the end portions of the plate springs 41g1, 41g2 may be in abutment with or spaced closely away from the corresponding engagement step portions 512. That is, when the transfer unit 100 moves forwards, the engagement step portions 512 may be biased forwards by the corresponding plate springs 41g1, 41g2, or no load may be applied to the engagement step portions 512 by the corresponding plate springs 41g1, 41g2. The lock portion 52b is locked in the locking portion 31b as shown in Fig. 6A corresponding to Fig. 5A when the transfer unit 100 moves as far as a forward limit. Consequently, the rotation of the supply bobbin 31 is restricted.

[0028] When the film transfer tool 10 is used, the transfer roller 21 of the head portion 20 is pressed against a transfer target surface. Then, as a process of shifting from Fig. 5A to Fig. 5B, the end portions of the plate springs 41g1, 41g2 ride on the inclined portions 513 from the engagement step portions 512. At this time, a clicking sensation can be generated as a result of the end portions of the plate springs 41g1, 41g2 being dislocated from the engagement step portions 512. Then, the plate springs 41g1, 41g2 are curved to bias the left frame 41 (the transfer unit main body 40, the transfer unit 100) to the front as shown in Fig. 5B when the end portions of the plate springs 41g1, 41g2 ride on the corresponding inclined portions 513. Then, the end portions of the plate springs 41gl, 41g2 are brought into abutment with the corresponding rear restricting portions 514 to thereby be restricted from moving to the rear (moving to the rear relative to the case 5) as shown in Fig. 5B.

[0029] The lock portion 52b is disengaged from the locking portion 31b as shown in Fig. 6B corresponding to Fig. 5B when the transfer unit 100 moves as far as a rear moving limit (a reversing limit), whereby the supply bobbin 31 can rotate. When continuing the transfer work, the transfer work is carried on with the head portion 20 being pressed against the transfer target surface against the biasing forces of the plate springs 41g1, 41g2. The film transfer tool 10 can be used in the way described above.

[0030] The transfer unit 100 is biased to the front by the plate springs 41g1, 41g2 when the transfer roller 21 of the head portion 20 is released from the transfer target surface after the transfer layer of the transfer tape T is transferred on to the target transfer surface over a predetermined length. That is, the transfer unit 100 is positioned at the forward limit shown in Figs. 5A, 6A the instant the transfer roller 21 of the head portion 20 is released from the transfer target surface. Consequently, the lock portion 52b is locked with the locking portion 31b almost the instant the transfer roller 21 of the head portion 20 is released from the transfer target surface, whereby the rotation of the supply bobbin 31 is restricted.

[0031] In this way, since the rotation of the supply bobbin 31 is restricted almost the instant the transfer roller 21 of the head portion 20 is released from the transfer target surface, even when for example, tape glue having strong adhesive force is used as the transfer tape T, a risk of occurrence of a so-called "stringing" phenomenon is reduced. That is, in the related art, in the case where tape glue having strong adhesive force is used, when the transfer layer (the adhesive layer) of the transfer tape T remaining on the head portion 20 (the transfer roller 21) and the transfer layer transferred on to the transfer target surface are pulled to each other even after the head portion 20 is released from the transfer target surface, even though the rotational coupling mechanism 30 does not rotate to transmit no rotation as a result of the take-up bobbin 31 not rotating, the clutch portion 37 operates, causing the supply bobbin 31 to rotate, whereby the transfer tape T, which is not used, is fed out, and eventually, long stringing may be caused to occur between the head portion 20 and the transfer target surface from time to time. According to the film transfer tool 10 of this embodiment, however, since the supply bobbin 31 is locked to be prevented from rotating the instant the head portion 20 is released from the transfer target surface, a risk of occurrence of such long stringing is reduced.

[0032] There is a situation where the transfer tape T having strong adhesive force is used to be applied to a piece of cloth in handicraft. In this case, since the cloth constitutes a slippery transfer target surface, the head portion 20 needs to be pressed strongly against a surface of the cloth. Thus, since the film transfer tool 10 includes the head portion 20 that can be pressed strongly against a transfer target surface as by being pushed against the surface, the film transfer tool 10 is suitable for handicraft use.

[0033] Then, in the film transfer tool 10, since the supply bobbin 31 is released from the locked state by pressing the head portion 20 against the transfer target surface, the supply bobbin 31 can be locked and released from the locked state smoothly, whereby the transfer work can also be performed smoothly.

[0034] Thus, while the embodiment of the present invention has been described heretofore, the present invention is not limited to the embodiment but can be modified variously. For example, while the head portion 20 is described as including the transfer roller 21, a head portion may be adopted which includes a spatula-like transfer portion. In addition, while the lock portion 52b is described as being formed on the inner surface of the right

case 52, the lock portion 52b only needs to be fixed relatively to the right case 52. Similarly, the locking portion 31b may also be formed at any other locations other than the location on the outer circumference of the flange portion of the supply bobbin 31, provided that the locking portion 31 is formed on the supply bobbin 31. Further, the plate springs 41g1, 41g2, which constitute the biasing members, may be other means such as coil springs. However, the film transfer tool 10 can be formed with the simple structure by use of the lock portion 52b, the locking portion 31b, and the plate springs 41g1, 41g2.

Claims

1. A film transfer tool comprising:

a case;
a transfer unit comprising a supply bobbin around which a transfer tape, which is not used, is wound, a take-up bobbin around which the transfer tape, which is used, is wound, a rotational coupling mechanism configured to couple together the supply bobbin and the take-up bobbin rotationally via a clutch portion, and a head portion configured to transfer a transfer layer of the transfer tape on to a transfer target surface, and configured to be installed in the case movably back and forth;
a biasing member configured to bias the transfer unit forwards; and
a lock portion fixed to the case,

wherein the lock portion is configured to be disengaged from a locking portion formed on the supply bobbin by the transfer unit moving backwards.

2. The film transfer tool according to claim 1,
wherein the lock portion is a ratchet pawl, and the locking portion is a ratchet tooth formed on an outer circumference of the supply bobbin.

3. The film transfer tool according to claim 1 or 2,
wherein the biasing member constitutes a plate spring projecting from the transfer unit and configured to be brought into engagement with an engagement portion formed on the case.

4. The film transfer tool according to claim 3,
wherein the engagement portion comprises an engagement step portion that is formed into a step-like shape so as to be brought into abutment with an end portion of the plate spring, and an inclined portion formed so as to be connected to the engagement portion, allowing the end portion of the plate spring to ride on the engagement portion from the engagement step portion.

5. The film transfer tool according to any one of claims 1 to 4,
wherein the transfer unit comprises a transfer unit main body configured to support the supply bobbin, the take-up bobbin, and the rotational coupling mechanism from left and right sides by use of two plate-like members.

FIG.1A

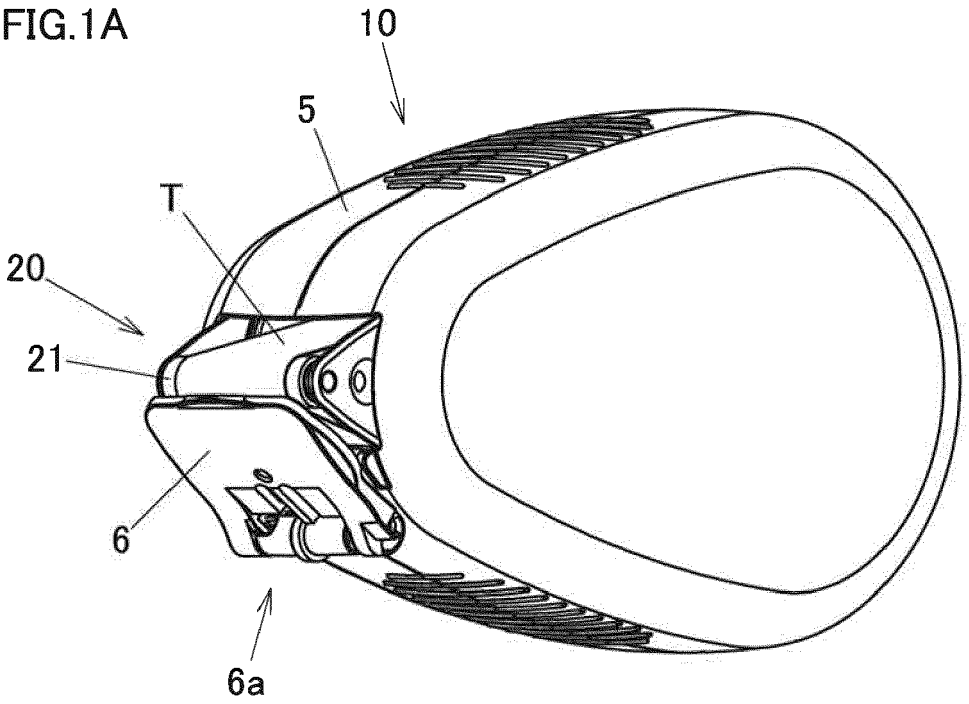


FIG.1B

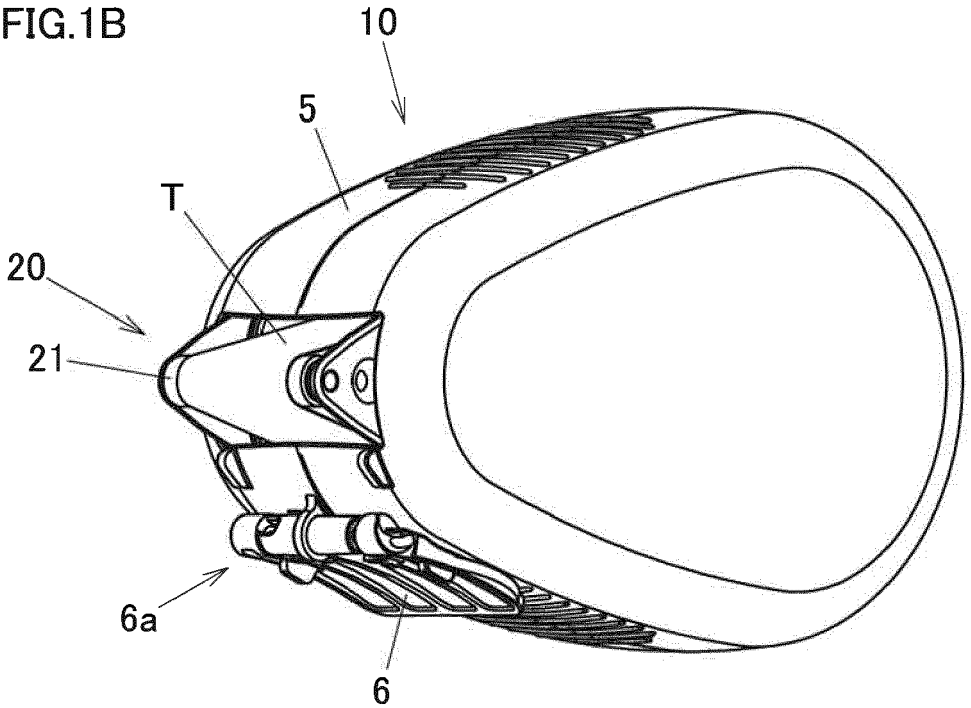
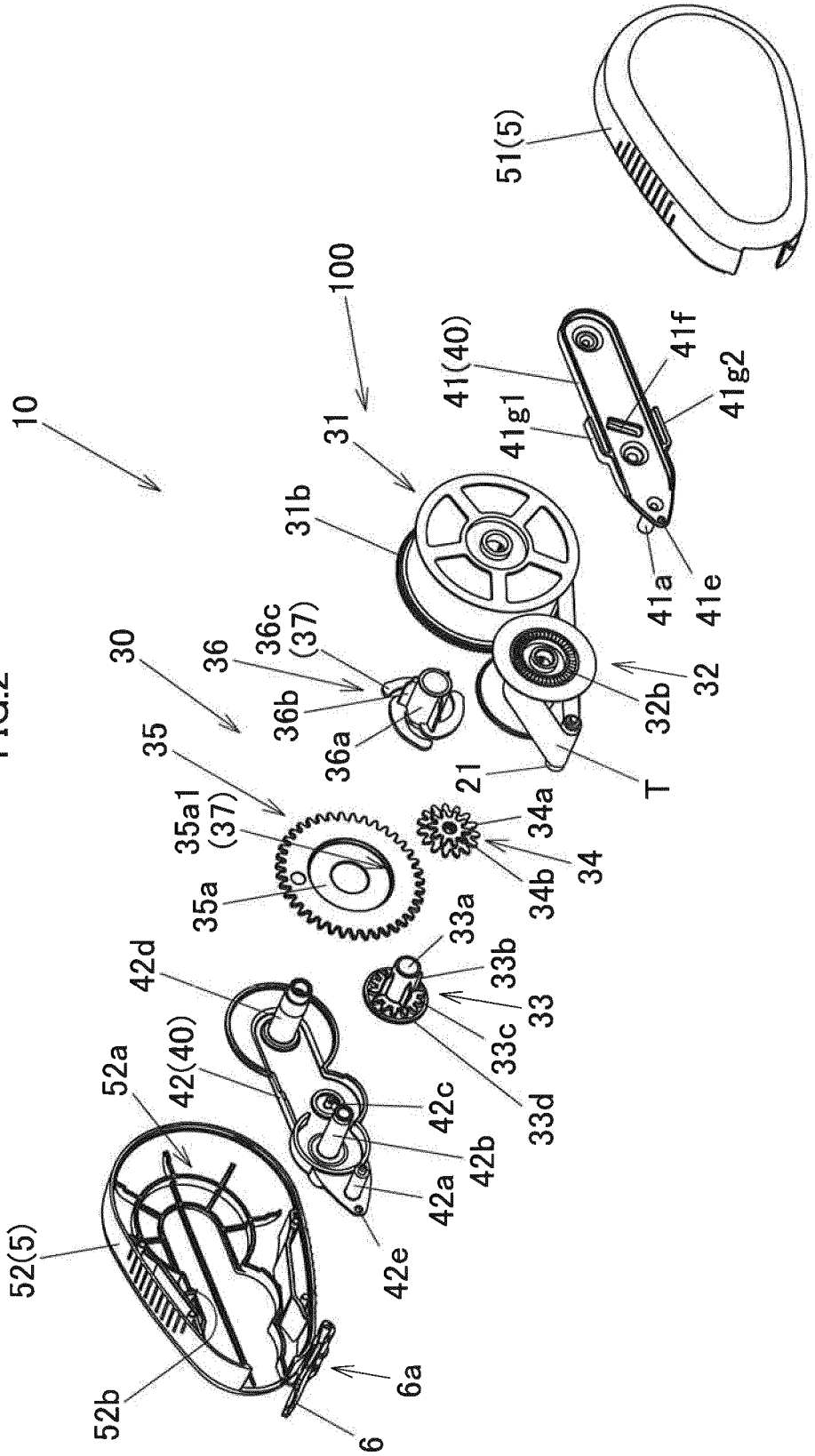


FIG.2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52a
52(5)
52b
6
6a
42e
42a
42b
42c
33
33a
33b
33c
33d
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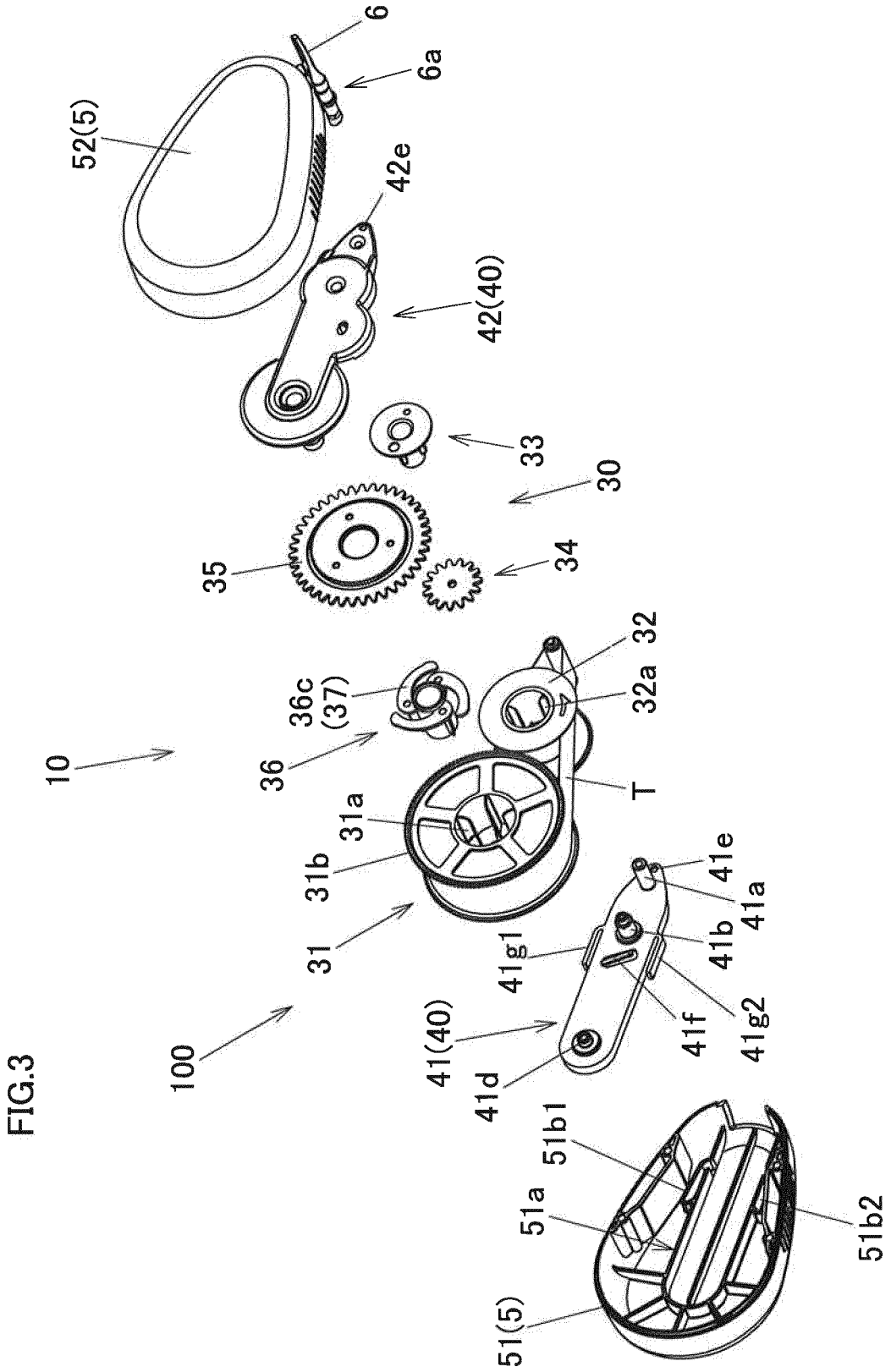
51(5)

FIG.3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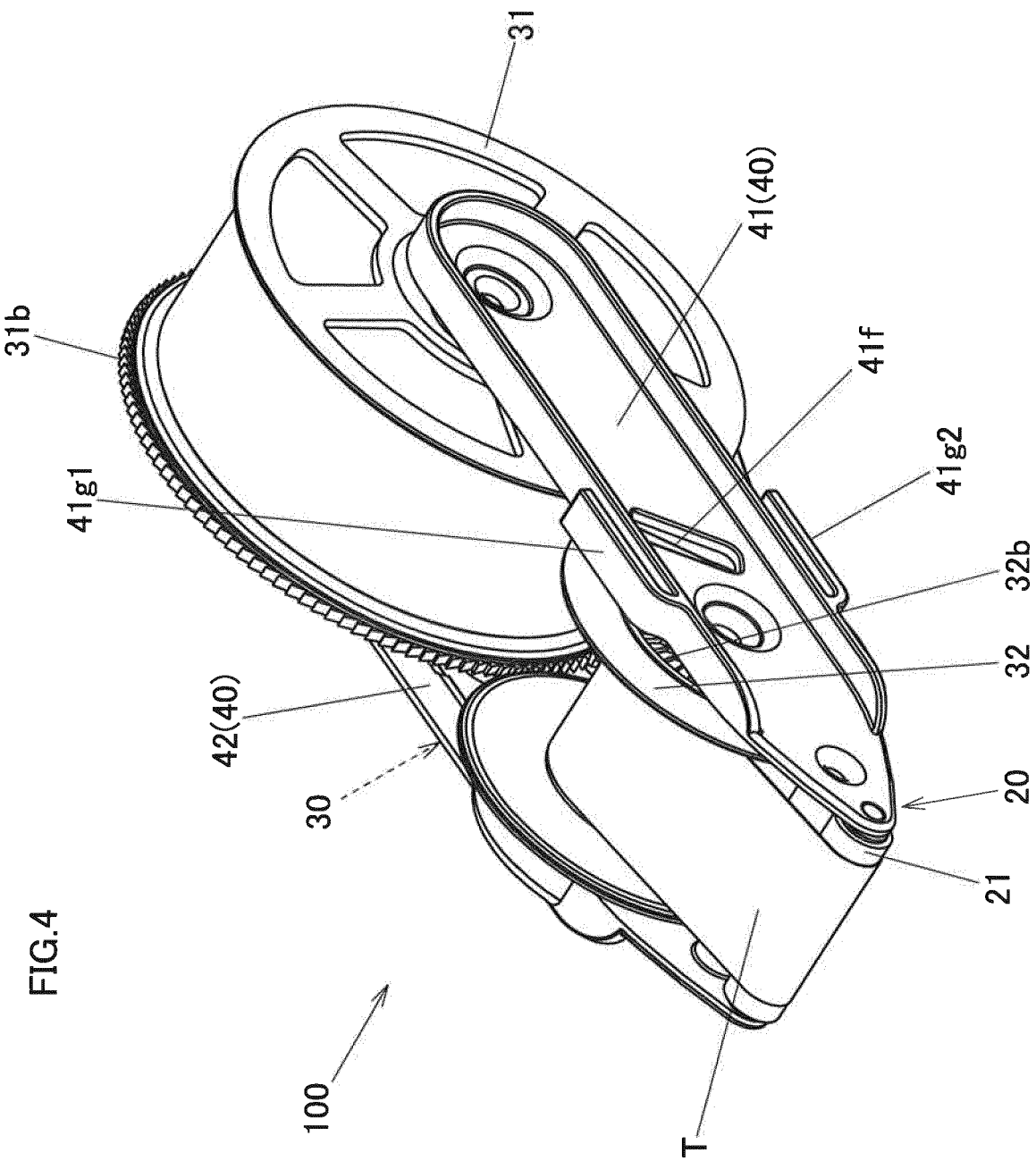
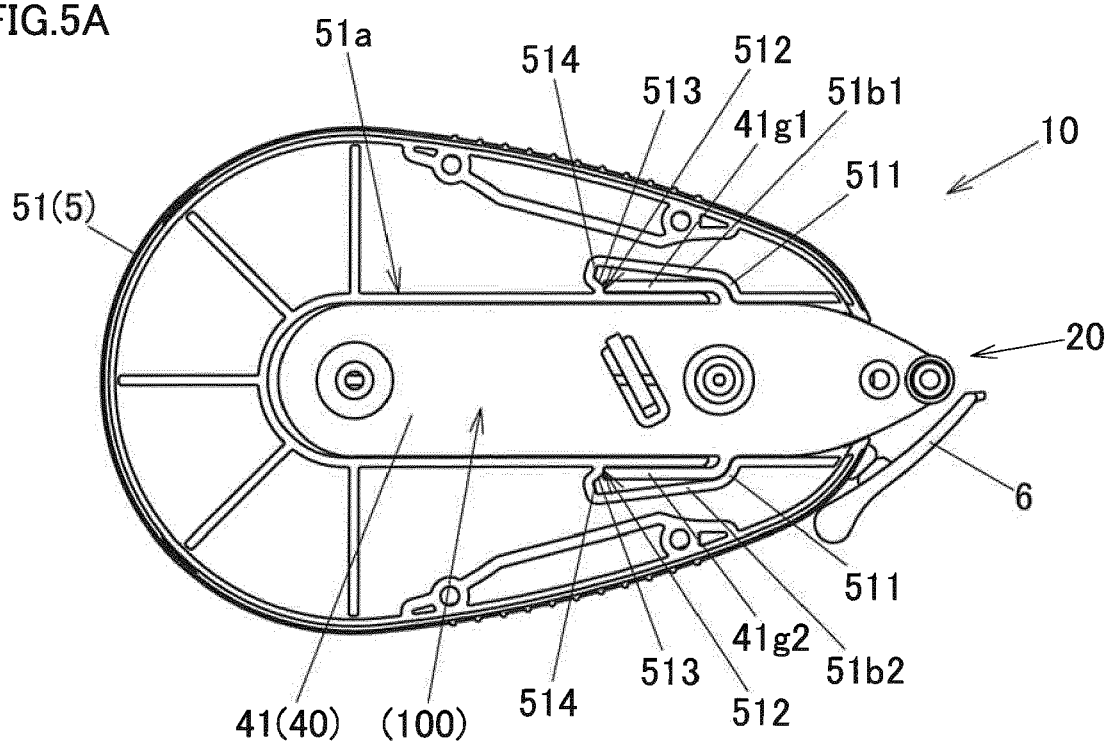


FIG.4

FIG.5A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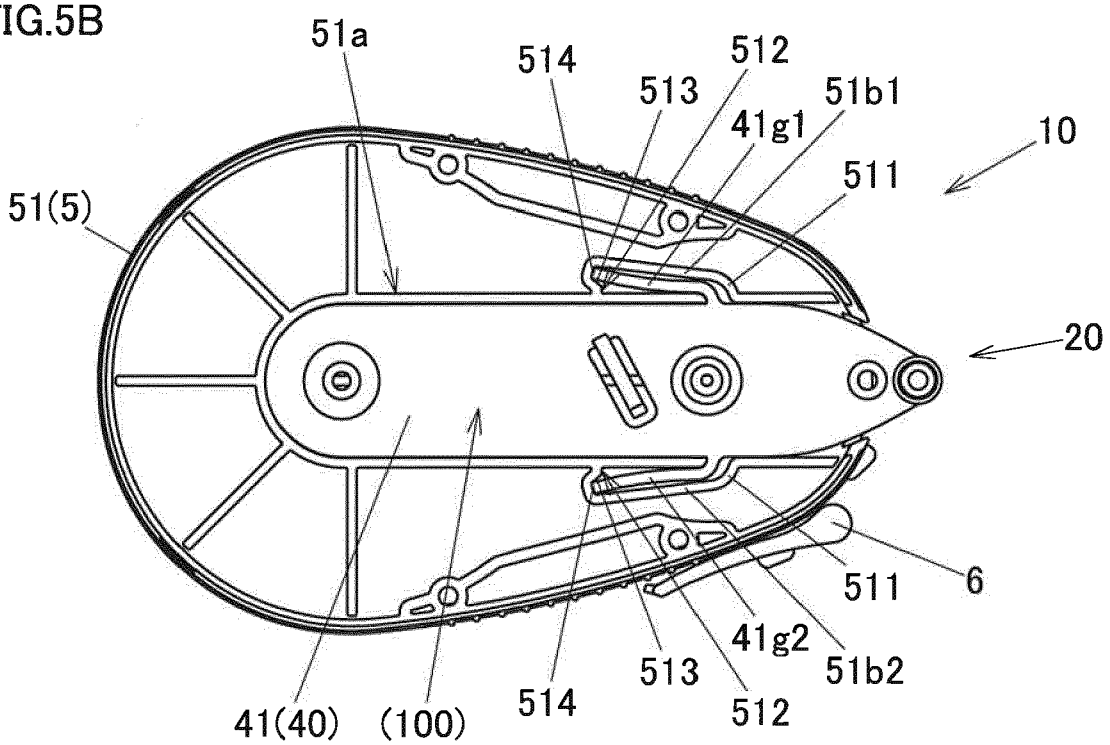
(100)

FIG.5B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512
41(40)
(100)

FIG.6A

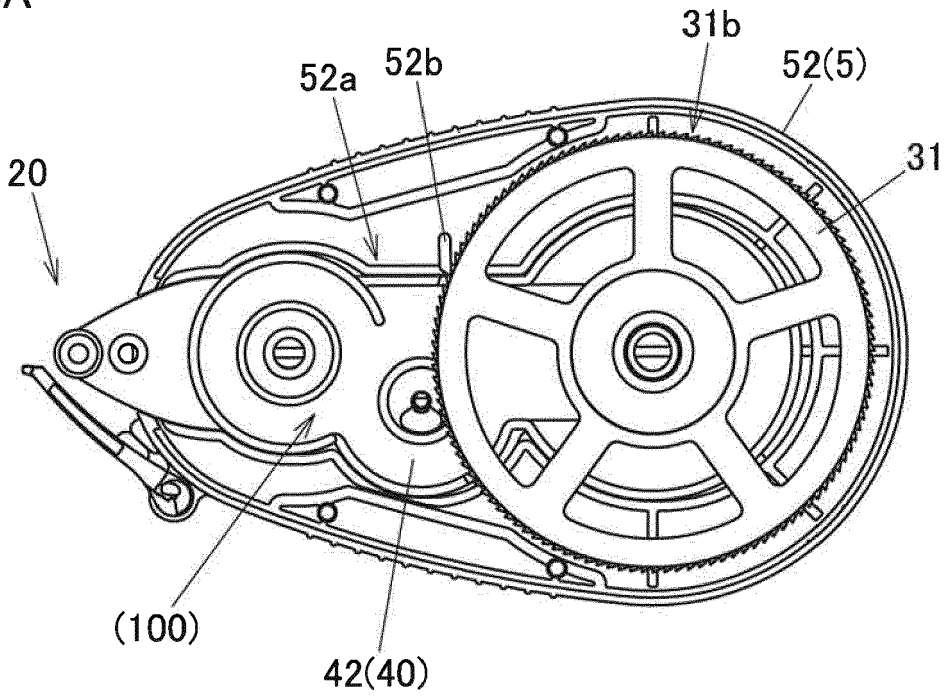
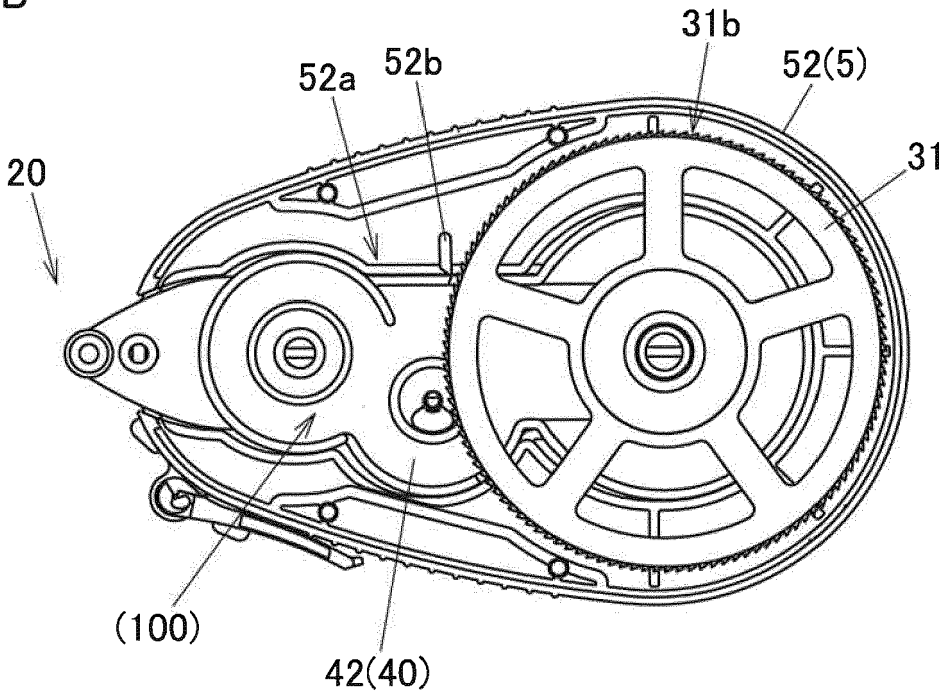


FIG.6B



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EUROPEAN SEARCH REPORT

Application Number
EP 19 19 9575

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Place of search	Date of completion of the search	Examiner
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