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Bildaufnahmegerät

Appareil d'enregistrement d'images

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- **PATENT ABSTRACTS OF JAPAN vol. 10, no. 241 (P-488)(2297), 20 August 1986 ; & JP-A-61 72 276**
- **PATENT ABSTRACTS OF JAPAN vol.9, no. 79 (P-347)(1802), 9 April 1985 ; & JP-A-59 211 062**
- **PATENT ABSTRACTS OF JAPAN, vol. 10, no. 153 (P-484)(2209), 3 June 1986 ; & JP-A-61 7159**

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Description

The present invention relates to an image recording apparatus according to the preamble of claim 1, such as a laser beam printer, more particularly to an image recording apparatus capable of forming images on both sides of a sheet.

There is a recent demand for an image recording apparatus capable of forming images on both sides of a sheet (duplex print). As an exemplary image recording apparatus of this type, laser beam printer is shown in Figure 1.

In this printer, a sheet S0 accommodated in a cassette 100 or 101 is fed out by a pick-up roller 102 or 103, and is fed to a neighborhood of a photosensitive drum 105 at the timing determined by a registration roller 104. While the sheet is being fed in this manner, a latent image is formed on the photosensitive drum 105 with a laser beam from a laser unit 106, and the latent image is developed by a developer such as toner. The toner image is transferred from the drum 105 onto the sheet S0, and the sheet S0 is conveyed to an image fixing device 107 where the image is fixed thereon.

When images are recorded on both sides of the sheet S0, a flapper 108 disposed adjacent to the fixing device 107 is switched to guide the sheet S0 to a switch-back unit 109 disposed in the front side of the apparatus, so that the sheet S0 reaches a reversible roller 110. The reversible roller 110 rotates in a direction for discharging the sheet S0 to the outside of the apparatus. When a sensor 112 detects the passage of the trailing edge of the sheet S0 through the sheet guide 110, the roller 110 is reversed to direct the sheet S0 to the sheet passages 113a, 113b and 113c formed at the bottom side of the apparatus for refeeding the sheet to form an image on the other side. The most downstream sheet passage 113c extends to the registration roller 104. The conveying passage 113c is provided with a sensor 114 for detecting a sheet, and when the leading edge of the sheet is detected by the sensor 114, the sheet S0 is temporarily stopped, so that the timing of the refeeding is controlled for the second side recording. In this manner, the sheet S0 is reversed in the switch-back unit 109, and is conveyed along the sheet passages 113a, 113b and 113c, by which the printed side of the sheet faces down when the second image is recorded on the sheet S0.

When a number N of sheets are subjected to duplex printing operation, a second page image is printed on a first side of a first sheet S1, which is then conveyed into the sheet passages 113a, 113b and 113c, and which is stopped when its leading edge passes by the sensor 114. Then, the second sheet S2 is fed, and it receives an image for its second side, that is, a fourth page image on its first side, and the second sheet S2 is conveyed into the sheet passages 113a, 113b and 113c. At a predetermined interval from the second sheet S2, the first sheet S1 is refed, and it receives an image for its first page on its second side. Thereafter, the sheet S1 is discharged onto the tray 116 through a discharge passage 115, with the first page facing down. At a predetermined interval from the refeeding of the first sheet S1 for the second page recording, a third sheet S3 is fed, and an image for its second side, that is, the sixth page image is formed on its first side.

In the similar manner, an image for a second page side (first side) for an n-th sheet, that is, a 2n-th page image; an image for a first page side (second side) of a (n-1)th sheet, that is, a (2n-3)th page image; an image for a second page side of a (n+l)th sheet, that is, (2n+2) th page image; ---; an image for a second page side of an N-th sheet, that is, a 2N-th page image; an image for a first page side of (N-1)th sheet, that is, (2N-3)th page image; and an image for a first page side of the N-th sheet, that is, (2N-1)th page image; are formed on the respective sheets. Finally, the N-th sheet S_N is discharged on the tray 116 with its second page side, that is, the 2N-th page facing up.

Since, however, the conventional arrangement includes the switch-back unit just downstream of the fixing device 107 at an end of the apparatus, the following problems arise:

(1) At least a switch-back mechanism is projected from the main assembly portion of the apparatus, and the space extending from the reversible roller 110 through a length substantially equal to the length of the sheet is required for the switching back operation. This results in that the apparatus has a total length which is a sum of a length of a cassette, a length of the sheet conveying passage and the length of the switch-back station. This sum is approximately three times the length of the sheet, which results in a bulky apparatus.

(2) When the second side of the sheet is to be recorded, the sheet stops when it passes by the sensor 114. The stoppage time is not constant but changes in accordance with a signal coming to the main apparatus. In addition, the switch-back station is disposed between the fixing device 107 and a reversing sheet conveying passage 113a, and therefore, the sheet can not be stopped half way. For those reasons, it is not possible for the next sheet to be fed, recorded or introduced into the sheet passage 113a. Therefore, when two or more sheets are to be subjected to the duplex printing operations, the interval between the first sheet and the second sheet are relatively large, so that longer time loss is necessitated particularly when a small number of sheets are duplex-printed, repeatedly.

In order to solve those problems, it is considered that the sheet stopping position is disposed after the switch-back station. However, it will result in a complicated structure of the sheet passages, and it requires a complicated sheet conveying control in accordance with the sizes of the sheet, with the result of increased cost.

In the duplex recording in the conventional arrangement, the length of the recording sheet passage through which the sheet is conveyed during the second side recording (a first page image) is much longer than when the first side is to be recorded for the second page image, and therefore, the recording sheet is laterally (perpendicular to the direction of the sheet conveyance), deviated and therefore, the position of the second side image is deviated.

To obviate this problem, it is considered that an abutment guide or the like for controlling the lateral position of the recording sheet S0 is disposed at a proper position, for example, a position indicated by a reference C in a passage for the second side recording. By the guide, the recording sheet S0 is refed to the recording station 105 after it is adjusted in its lateral position (the adjustment will hereinafter be called "lateral registration").

When, however, this method is used, the abutment guide has to be adjusted each time the size of the recording sheet changes, which is cumbersome. In addition, because of the complicated structure, the recording sheet is more easily jammed, and the apparatus becomes bulky with increase of cost.

In the document US-A-4,272,180 there is disclosed an image recording apparatus according to the preamble of claim 1. This generic apparatus comprises cassettes which have two sections for accomodating sheet material, one lower section for accomodating and feeding sheet material on which no image has been recorded and another, upper section for accomodating and re-feeding sheet material on which an image has already been recorded. The two sections are separated by a plate which must be removed by the operator when loading sheet material on which no image has been recorded.

It is a principal object of the present invention to provide an image recording apparatus capable of forming a duplex print or a superposed print which is small in size and wherein the sheets are conveyed efficiently.

It is another object of the present invention to provide an image forming apparatus wherein the lateral registration is assured without difficulty for various sizes of the sheets with a simple structure, and wherein the recording sheet is not easily jammed.

The object of the invention is achieved by means of an image forming apparatus according to claim 1. Preferable embodiments of the invention are defined in claims 2 to 7.

In operation for the duplex print for the sheet in the apparatus, a sheet having received an image on its first side is reversed in its facing orientation by the sheet reversing means and is refed to the image recording means through a refeeding passage. At this time, the sheet is reversed in a projection area of the sheet feeding means, and therefore, the space for the sheet reversing is not extended out of the apparatus horizontally.

Since the sheet reversing means is disposed downstream of the sheet refeeding means with respect to the sheet conveyance direction, the second sheet is recorded at a predetermined interval and can be introduced into the refeeding passage at the time of plural sheet duplex printing operation even if the first sheet is waiting for the refeeding. This is because the vacant passage is sufficient for accommodation of the second sheet.

In the apparatus, the sheet reversing action for the second image formation on the same sheet is performed in the projection area of the sheet feeding means, and therefore, the switch-back station is not projected out of the main assembly, whereby the size of the entire apparatus can be reduced.

In addition, since the sheet reversing means is disposed downstream of the sheet refeeding means, the time loss otherwise required for the first and second sheet recording during the continuous duplex print operation, can be reduced. In addition, the control of the sheet reversing means can be easily and independently performed, the length of the refeeding passage can be reduced, and the first print can be quickly produced.

According to the present invention, the sheet reversing means of the image forming apparatus comprise a sheet reversing station wherein the reversing station and the feeding station are formed as a unit, and a lateral registration means for lateral registration of the recording sheet is provided in the reversing station.

In operation, during the reversing operation after the recording sheet receives the first image on its first side, the lateral registration is adjusted.

With the structure, the lateral registration can be performed without the conventional cumbersome operation even if the size of the recording sheet changes. In addition, since the adjusting means and the sheet feeding station constitute a unit, the size of the recording apparatus is not increased. In addition, even if the sheet is jammed, the recording sheet can be easily removed by taking the feeding station out.

These and other objects, features and advantages of the present invention will become more apparent upon a consideration of the following description of the preferred embodiments of the present invention taken in conjunction with the accompanying drawings.

Figure 1 shows a longitudinal section of a conventional image recording apparatus.

Figure 2 is a longitudinal sectional view of an image recording apparatus according to an embodiment of the present invention.

Figure 3 is an exploded perspective view of a sheet feeding station and a sheet reversing section.

Figure 4 illustrates the recording sheet reversing operation.

Figure 5 is a perspective view of a driving roller and a follower roller.

Figure 6 is a sectional plan view illustrating a follower roller and a bearing.

Figure 7A is a partly broken-away perspective view of the sheet feeding station.

Figure 7B is a perspective view wherein a recording sheet setting plate and a guiding plate are formed as a

unit.

Figure 8 illustrates the recording sheet which is conveyed to the reversing station.

Figure 9 is a partly broken-away side view when the recording sheet is set on the guiding plate by the weight thereof.

Figure 10 is a longitudinal sectional view of the image forming apparatus according to a further embodiment of the present invention.

In Figure 2, an image recording apparatus 51 includes a detachably mountable sheet feeding station 52 in the form of a sheet feeding cassette or a sheet feeding tray accommodating recording sheets P to be fed into the image recording apparatus 51. As shown in Figure 3, the sheet feeding station 52 has recording sheet setting plates 52a and 52b for regulating lateral positions of the recording sheets P, and a raising plate 52c for raising the leading edge P' of the recording sheet P to a predetermined level.

A sheet feeding roller 53 is rotatable in the direction indicated by an arrow to feed the recording sheet P out of the feeding station 52. The sheet is then conveyed by a registration roller 54 to a recording station which will be described hereinafter.

The image recording apparatus further comprises a laser scanner 55, a reflection mirror 56, the recording station 57 which includes a photosensitive drum 57a, a charger 57b, a developing device 57c and a cleaner 57d. Therefore, the laser beam 55' emitted from the laser scanner 55 is projected onto the photosensitive drum 57a through the reflection mirror 56 to form an electrostatic latent image thereon. The latent image is visualized by the developing device 50c, and is recorded on the recording sheet P by the charger 7b.

In an image fixing station 58, the image recorded on the recording sheet P by the recording station 57 is fixed on the recording sheet. A flapper 59 disposed at the outlet of the fixing station 58 is operated to move in the directions d and e.

Discharging rollers 60 are disposed above the fixing station 58 to discharge to the discharge tray 61 the recording sheet P conveyed along the conveying passage A after the image fixing.

Reversible rollers 62 function to convey to the reversing station the recording sheet P conveyed through the conveying passage and then to a sheet refeeding passage D. The reversing rollers 62 include a driving roller 62 driven by a driving motor M1 and a plurality of follower rollers 62 contacted to the driving roller 62 to rotate following the rotation of the driving roller 62. The driving motor M1 is driven through a control system (not shown) containing a timer when the duplex print mode is selected on an operation panel (not shown). As shown in Figure 4A, during the conveyance of the recording sheet P to the reversing station, the timer is activated to once stop the rotation of the driving roller 62a when the detecting means K detects the trailing edge of the recording sheet P, as shown in Figure 4B. After a predetermined period of time, the timer is deactuated to rotate the driving roller 62a in the reverse direction, as shown in Figure 4C.

As shown in Figure 5, the follower roller 62b is supported through a shaft 62d in a groove 62c' of a bearing 62c which is vertically movable by the rotation of the driving gear 62e driven by a motor M2. The motor M2 is driven by the above-mentioned control system (not shown), and when the detecting means K detects the trailing edge of the recording sheet P, an unshown timer is actuated to rotate the driving gear 62e in the direction X to move the follower roller 62b away from the driving roller 62a to stop it. After a predetermined period of time, the timer is deactuated to rotate the driving gear 62e in the direction Y to bring the follower roller 62b into contact with the driving gear 62a.

As shown in Figure 6, the groove 62c' is formed so as to have a larger width adjacent one end of the shaft 62d. The follower roller 62b is horizontally swingable within a predetermined angle, as shown by the chain lines.

Referring back to Figure 3, the reversing station for reversing the recording sheet P is integrally formed at a lower side of the recording sheet feeding station 52. The reversing station 63 is to reverse the recording sheet P which has been conveyed through the recording station 57, the fixing station 58, the conveying passage B and the conveying roller B'. The reversing station 63 is provided with adjusting means 64 which adjusts the lateral position of the recording sheet P conveyed to the reversing station 63. The adjusting means 64, in this embodiment, is in the form of a pair of guiding members 64a spaced from each other with an interval equal to the width of the recording sheet P accommodated in the sheet feeding station 52. The guiding members 64a are extended in the direction of the sheet conveyance.

Figures 7A and 7B show another example of the adjusting means. A pinion 72d is rotatable supported adjacent a center between the recording sheet setting plates 72a and 72b, and the opposing surfaces of the recording sheet setting plates 72a and 72b are formed into a projections 72a' and 72b' having racks 2e meshable with the pinion 72d. A groove 72f is formed in a bottom surface of the feeding station 72. A connecting part 72g is extended from the bottom surface of each of the recording sheet setting plates 72a and 72b toward the reversing station 83, and a diving member 84a is connected to the connecting portion 72g. As shown in Figure 7B, when the recording sheet setting plate 72a and 72b are sliden as indicated by arrows f and g in accordance with the size of the recording sheet P, the guiding members 84a also slide in the lateral direction.

Figure 10 shows a further embodiment, wherein the present invention is applied to an image forming apparatus of a two stage cassette type. The process of recording an image on the recording sheet is the same as the foregoing embodiments, and therefore, the detailed description thereof is omitted. The conveyance of the re-

cording sheet in the duplex print mode will be described.

The recording sheet P fed out of the upper cassette 202A is subjected to the image fixing operation by the fixing device 58 for the first image. By the flapper 59, it is conveyed to the conveying roller B' along the conveying passage B. By the flapper 230, it is passed through conveying passages 233 and 234, and further by a flapper 235, it is passed through a conveying passage 236. The sheet is then advanced by a reversing roller 217A into the reversing station 213 disposed below the cassette 52A. Thereafter, the sheet is subjected to the lateral registration operation which has been described in the foregoing embodiment. Then, the sheet is fed along the conveying guide 237 by the reversing roller 217A, so that it is subjected to the image recording operation on the other side, that is, the side opposite to the side having the first image.

The recording sheet P fed from the lower cassette 202B is conveyed through the conveying passage 234, and is advanced into the recording station 57 through the conveyance passage 238 by the flapper 235, so that a first image is recorded on the recording sheet P. The sheet is then subjected to the image fixing operation by a fixing device 58 for the first image. Then, the sheet is conveyed to the conveying roller B′ through the conveying passage B by the flapper 59. The sheet is directed to the conveying passage 231 by the flapper 230, and is conveyed by the reversing roller 217B into the reversing station 213 disposed below the cassette 202B. Thereafter, the lateral registration operation is imparted to the recording sheet P which is the same as the operation described in the foregoing embodiment. The sheet is then conveyed by the reversing roller 217B along the conveying guide 232, 234 and 238, so that a second image is recorded on the opposite side, that is, the side opposite to the first image bearing side. In this embodiment, the two cassette type is taken, but it is possible that it has three or more cassettes. In any case, the duplex printing mechanism for various sizes can be provided with a simple structure.

In the embodiment shown in Figure 2, the reversing roller 62 is provided in the image recording apparatus 51 side, but it may be disposed in the sheet feeding station 52. It is a possible alternative that a one sheet separating means (for example, a vertically movable feeding roller is provided to the adjusting means side of the roller 62, and the sheets are separated one by one by the roller 62) is provided to temporarily accommodate the plural recording sheets. The present invention is not limited to the case of the duplex print, but is applicable to the superimposing print.

In operation, the recording sheet P in the feeding station 52 is fed out by the feeding roller 53 and is fed into the recording station 56 through the registration roller 54. The sheet is then subjected to the image recording operation on the first side, and thereafter, the image is fixed on the recording sheet P in the fixing station 58. When a simplex print is selected, the flapper 59 takes the position indicated by an arrow d, so that the recording sheet P after the image fixing operation is discharged onto the discharging tray 61 through the conveying passage A and the discharging roller 60.

When images are to be formed on both sides of the recording sheet P, the recording sheet P is introduced into the fixing station 58 in the similar manner described above. At this time, the flapper 59 is rotated in the direction e, so that the recording sheet P is conveyed to the reversing roller 62 through the conveying passage B and the conveying roller B' (Figure 4A). As shown in Figure 4B, when the detecting means K detects the trailing edge of the recording sheet P, the motor M1 for rotating the driving roller 62a stops, and the timer is actuated, and simultaneously the motor M2 is actuated to drive the driving gear 62e in the direction X. In the operation, when the recording sheet P is deviated in the lateral direction by the amount P1, as shown in Figure 8, the leading edge is abutted to the guiding member 62a. Since the follower roller 62b is swingable in the predetermined angle, the recording sheet P is conveyed into the reversing station 63 along the guiding member 64a, sliding on the driving roller 62a (P2), and finally the lateral position is adjusted completely as indicated by P3. Even if it is not completely adjusted as shown by chain lines in Figure 9, the bearing 62c moves upwardly by the rotation of the driving gear 62e so that the follower roller 62b is spaced away from the recording sheet P, and therefore, the recording sheet P is set at a proper position by its weight at a proper position between the guiding members 64a, as -shown by solid lines. Thereafter, the timers controlling the motors M1 and M2 are deactuated, by which the driving roller 62a starts to rotate in the backward direction as indicated in Figure 4C, so that the follower roller 62b is brought into contact with the recording sheet P, by which the recording sheet P is conveyed into the refeeding passage D. In this manner, the recording sheet P which has been subjected to the reversing and lateral registration operations is conveyed into the recording station 56 through the registration roller 54. Thus, in the recording station 56, the image is formed on the second side, that is, the side opposite to the side having the first image. The sheet is discharged onto the discharging tray 61 through the image fixing station 58, the conveying passage A and the discharging rollers 60. At this time, the flapper 59 has been rotated in the direction indicated by d. As regards the structure shown in Figure 10, the operations are the same as with Figure 2 embodiment.

While the invention has been described with reference to the structures disclosed herein, it is not confined to the details set forth and this application is intended to cover such modifications or changes as may come within the purposes of the improvements or the scope of the following claims.

As described above, the image recording apparatus includes a sheet material accommodating device for accommodating sheet materials, a sheet material feeding device for feeding the sheet materials from the sheet ma-

terial accommodating device, an image recording device for recording images on the sheet materials fed by the feeding device, sheet material refeeding device for refeeding to the image recording device through a refeeding passage the sheet material on which an image has been formed by the image recording device, a sheet material reversing device for reversing the sheet material and conveying it to the image recording device, the sheet material reversing device being disposed downstream of the refeeding passage with respect to a movement direction of the sheet material substantially within a projection area of the sheet material accommodating device.

Claims

1. An image recording apparatus, comprising:

   a sheet feeding station (52; 72) for accommodating sheet materials (S) on which no image has been recorded;
   a sheet material feeding means (53) for feeding the sheet materials from said sheet feeding station;
   image recording means (57) for recording images on the sheet materials fed by said feeding means;
   sheet material refeeding means (B') for refeeding to said image recording means through a refeeding passage (B, C) the sheet material on which an image has been formed by said image recording means; and
   sheet material reversing means (62, 63, 64; 83, 84a; 217A, 213, 202A; 217B, 213, 202B) for reversing the sheet material and conveying it to said image recording means, said reversing means comprising a sheet reversing station (63, 64, 64a; 83, 84a; 213, 202A; 213, 202B), formed integrally said sheet feeding station, **characterized in that**
   said sheet reversing station (63, 64, 64a; 83, 84a; 213, 202A; 213, 202B) is formed at the lower side of said sheet feeding station (52; 72), and
   said sheet reversing station is formed as a sheet reversing passage accommodating only a single sheet material with the trailing end thereof remaining between pinch rollers (62; 217A; 217B) disposed in front of said sheet reversing station for conveying the sheet material to and from said sheet reversing station.

2. An apparatus according to claim 1, **characterized in that**

   said sheet reversing station comprises a lateral registration means (64a; 84a) for lateral registration of the sheet material with respect to its conveying direction.

3. An apparatus according to claim 2, **characterized in that** said lateral registration means (84a) are adjustable in accordance with the size of the sheet material accommodated in said sheet feeding station (72) and are interrelated with a lateral registration means (72a, b, d) provided in said sheet feeding station.

4. An apparatus according to claim 3, **characterized in that** said lateral registration means (84a; 72a, b, d) are connected by a connection part (72g).

5. An apparatus according to claim 1, **characterized in that** said sheet feeding station (52; 72) is in the form of a cassette (72; 202A, 202B).

6. An apparatus according to claim 1, **characterized in that** a switch-back means (K) is provided at said sheet reversing station (63) for reversing the conveying direction of said sheet material (S).

7. An apparatus according to claim 1, **characterized by** a further sheet feeding station (52) which is arranged substantially vertical.

Patentansprüche

1. Bildaufaufnahmevorrichtung, mit:

   - einer Blattzufuhreinrichtung (52; 72) zum Bevorraten von mindestens einem Blatt (S), auf dem noch kein Bild aufgezeichnet ist;
   - einem Blatteinzugsmittel (53) zum Zuführen des mindestens einen Blattes aus der Blattzufuhreinrichtung;
   - einer Bildaufzeichnungseinrichtung (57) zum Aufzeichnen von Bildern auf dem von dem Einzugsmittel zugeführten Blatt;
   - einer Blatt-Wiederbeschickungseinrichtung (B'), um das mindestens eine Blatt, auf dem von der Bildaufzeichnungseinrichtung ein Bild erzeugt wurde, durch einen Wiederzufuhrkanal (B, C) der Bildaufzeichnungseinrichtung wieder zuzuführen;
   - einer Blattumkehreinrichtung (62, 63, 64; 83, 84a; 217A, 213, 202A; 217B, 213 202B), um das mindestens eine Blatt umzukehren und zur Bildaufzeichnungseinrichtung zu transportieren, wobei die Blattumkehreinrichtung eine Blattreversiereinheit (63, 64, 64a; 83, 84a; 213, 202A; 213, 202B) aufweist, die mit der Blattzufuhreinrichtung einteilig ausgebildet ist;
     dadurch gekennzeichnet, daß
     die Blattreversiereinheit (63, 64, 64a; 83, 84a;

213, 202A; 213, 202B) unterhalb der Blattzufuhreinrichtung (52; 72) angeordnet ist, und die Blattreversiereinheit als Blattumkehrkanal ausgebildet ist, der lediglich ein Blatt aufnimmt, das an seiner Hinterkante zwischen Ausführungsrollen (62; 217A; 217B) angeordnet bleibt, die sich am vorderen Ende der Blattreversiereinheit befinden, um das mindestens eine Blatt zu der Blattreversiereinheit und von dieser weg zu transportieren.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Blattreversiereinheit eine Lateral-Einstelleinrichtung (64a; 84a) aufweist, um das mindestens eine Blatt quer zu seiner Vorschubrichtung einzustellen.

3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet,** daß die Lateral-Einstelleinrichtung (84a) in Übereinstimmung mit der Größe des mindestens einen, in der Blattzufuhreinrichtung (72) bevorrateten Blattes einstellbar ist und mit einer an der Blattzufuhreinrichtung angeordneten Seiten-Einstelleinrichtung (72a, b, d) gekoppelt ist.

4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet,** daß die Einstelleinrichtungen (84a; 72a, b, d) über ein Verbindungsstück (72g) miteinander verbunden sind.

5. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Blattzufuhreinrichtung (52; 72) als Kassette (72; 202A, 202B) ausgestaltet ist.

6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß an der Blattreversiereinheit (63) eine Umschalteinrichtung (K) vorgesehen ist, um die Vorschubrichtung für das mindestens eine Blatt (S) umzukehren.

7. Vorrichtung nach Anspruch 1, **gekennzeichnet** durch eine zusätzliche Blattzufuhreinrichtung, die im wesentlichen lotrecht angeordnet ist.

Revendications

1. Appareil d'enregistrement d'images, comprenant:

un poste d'amenée de feuilles (52; 72) pour loger des feuilles S pour lesquelles aucune image n'a été enregistrée;
un moyen d'amenée de feuilles (53) pour amener les feuilles depuis ledit poste d'amenée de feuilles;
un moyen d'enregistrement d'images (57) pour enregistrer des images sur les feuilles amenées par ledit moyen d'amenée;
un moyen de retour de feuille (B') pour retourner audit moyen d'enregistrement d'images, via un passage de retour (B, C), la feuille sur laquelle une image a été formée par ledit moyen d'enregistrement d'images; et
des moyens d'inversion de feuilles (62, 63, 64; 83, 84a; 217A, 213, 202B) pour inverser la feuille et la transporter vers ledit moyen d'enregistrement d'images, ledit moyen d'inversion comprenant un poste d'inversion de feuilles (63, 64, 64a; 83, 84a; 213, 202A; 213, 202B) formé d'un seul tenant avec ledit poste d'amenée de feuilles,
caractérisé en ce que
ledit poste d'inversion de feuilles (63, 64, 64a; 83, 84a; 213, 202A; 213, 202B) est formé du côté inférieur dudit poste d'amenée de feuilles (52; 72), et
ledit poste d'inversion de feuilles est réalisé sous la forme d'un passage d'inversion de feuilles logeant une seule feuille, tandis que son extrémité arrière reste entre des rouleaux de pincement (62; 217A, 217B) disposés à l'avant dudit poste d'inversion de feuilles, pour transporter la feuille vers et depuis ledit poste d'inversion de feuilles.

2. Appareil selon la revendication 1, caractérisé en ce que

ledit poste d'inversion de feuilles comprend un moyen d'enregistrement latéral (64a; 84a) pour effectuer un enregistrement latéral de la feuille par rapport à sa direction de transport.

3. Appareil selon la revendication 2, caractérisé en ce que ledit moyens d'enregistrement latéral (84a) est réglable en fonction de la taille de la feuille logée dans ledit poste d'amenée de feuilles (72) et est mis en relation avec un moyen d'enregistrement latéral (72a, b, d) prévu dans ledit poste d'amenée de feuilles.

4. Appareil selon la revendication 3, caractérisé en ce que lesdits moyens d'enregistrement latéraux (84a; 72a, b, d) sont connectés par une partie des connexions (72g).

5. Appareil selon la revendication 1 à 3, caractérisé en ce que ledit poste d'amenée de feuilles (52; 72) se présente sous la forme d'une cassette (72; 202A, 202B).

6. Appareil selon la revendication 1, caractérisé en ce qu'un moyen de commutation de retour (K) est prévu audit poste d'inversion de feuilles (63) pour inverser la direction de transport de ladite feuille (S).

7. Appareil selon la revendication 1, caractérisé par un autre poste d'amenée de feuilles (52) qui est disposé sensiblement verticalement.

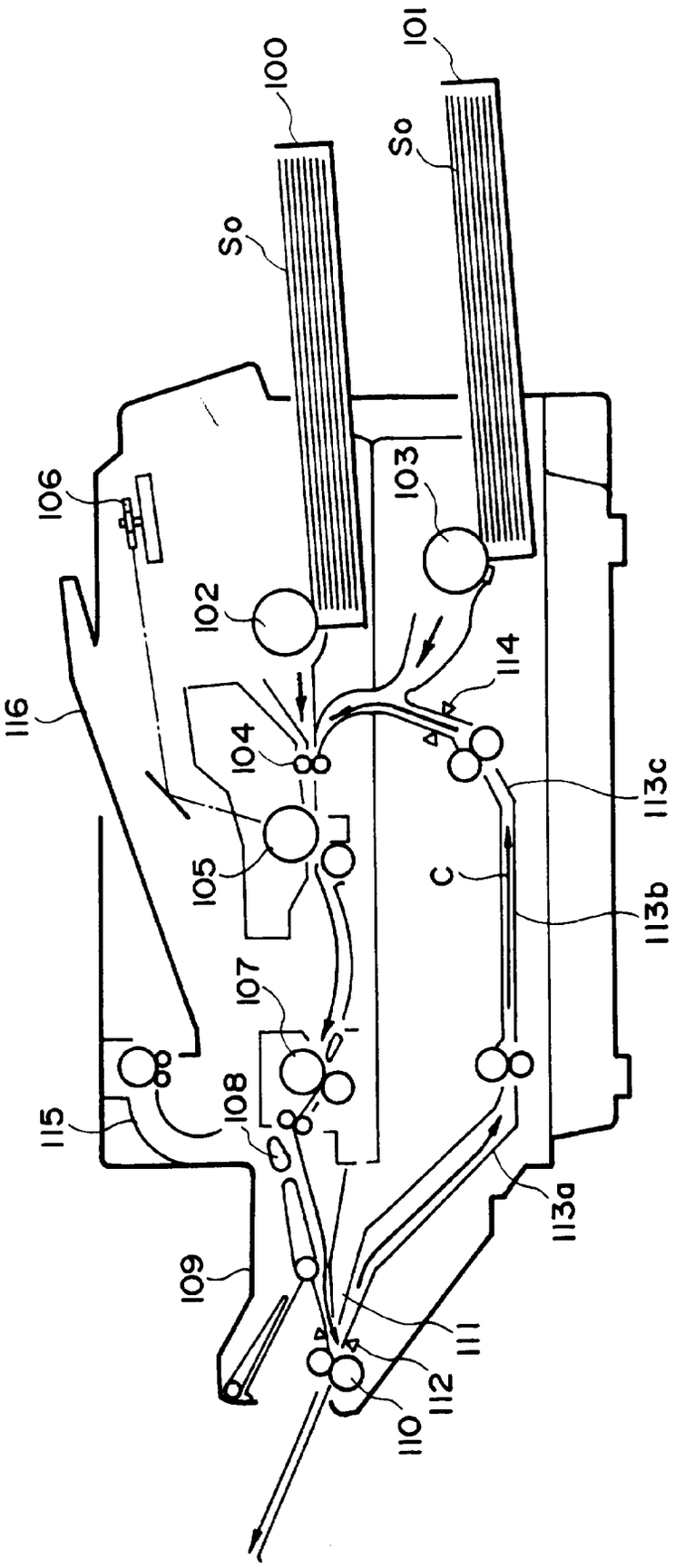

100
101
So
So
103
106
102
114
116
104
113c
105
C
113b
107
108
115
113a
109
111
112
110

FIG. 1

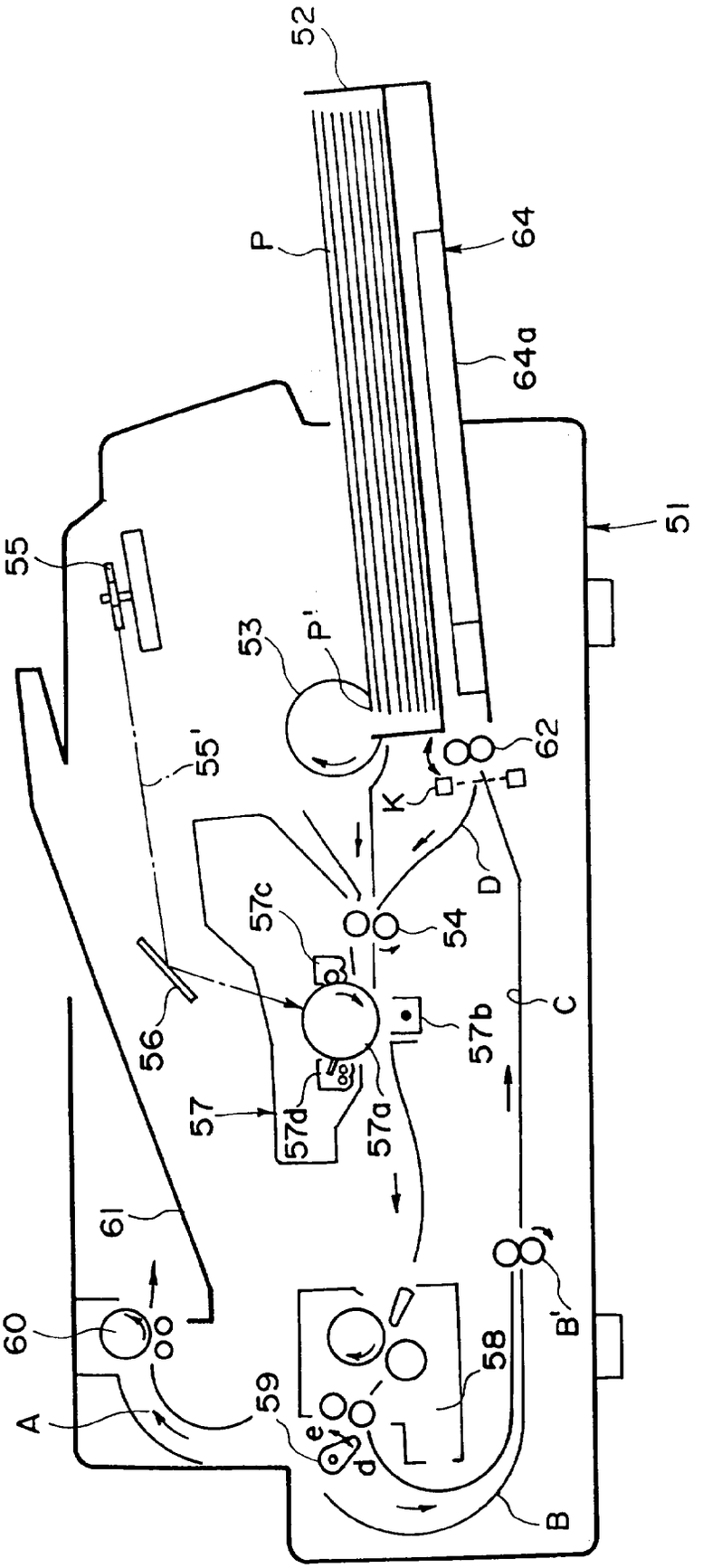

52
P
64
64a
51
55
53
P'
55'
62
K
D
57c
54
56
57b
C
57
57d
57a
61
60
A
59
e
d
58
B'
B

FIG. 2

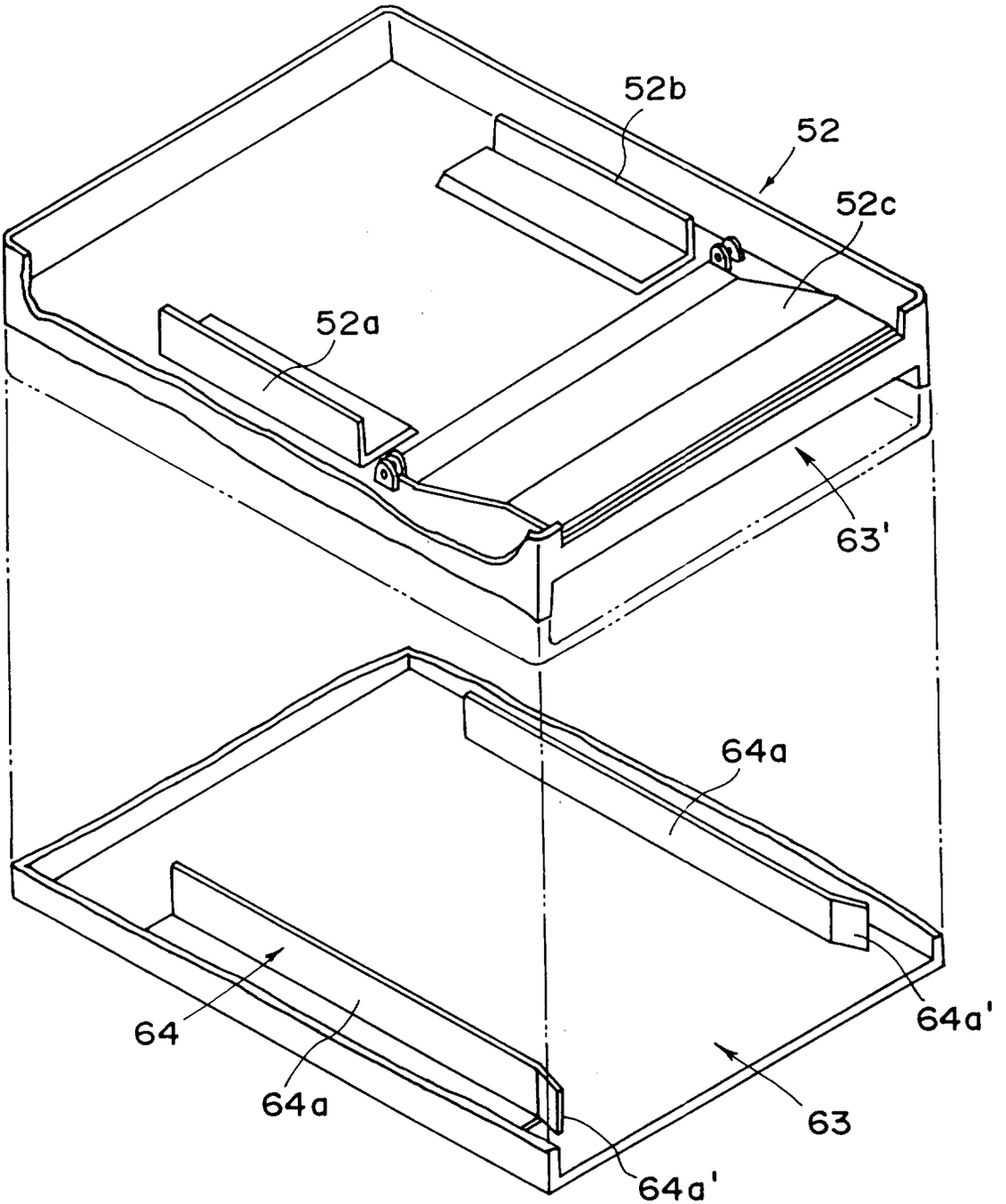


FIG. 3

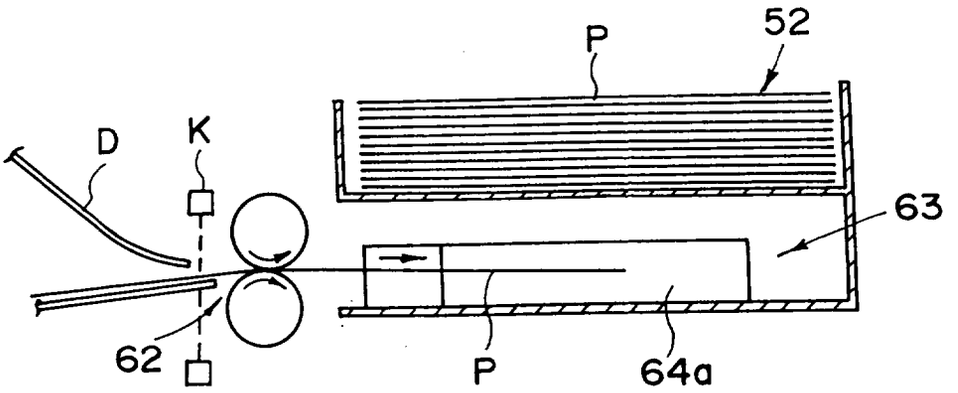


FIG. 4A

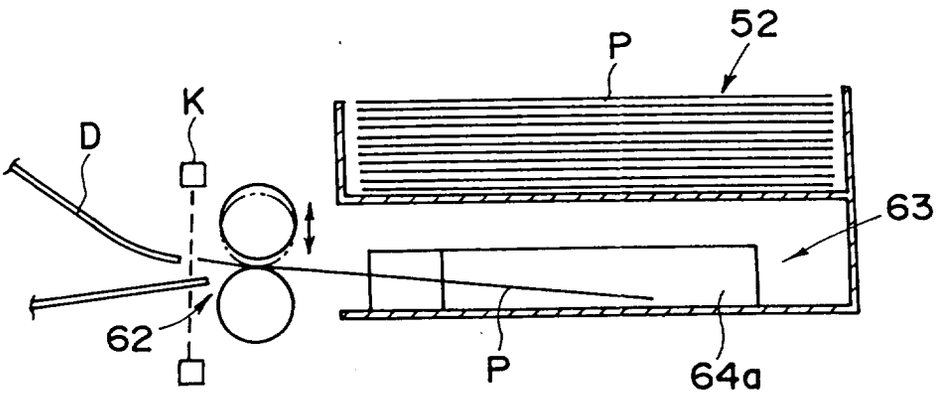


FIG. 4B

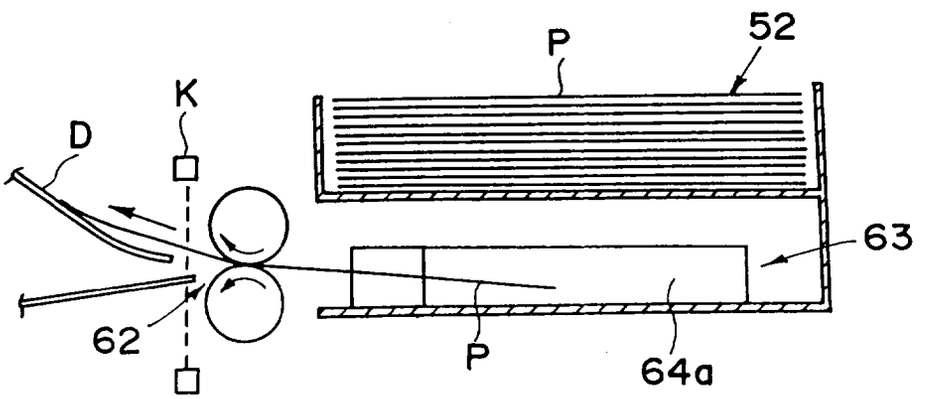


FIG. 4C

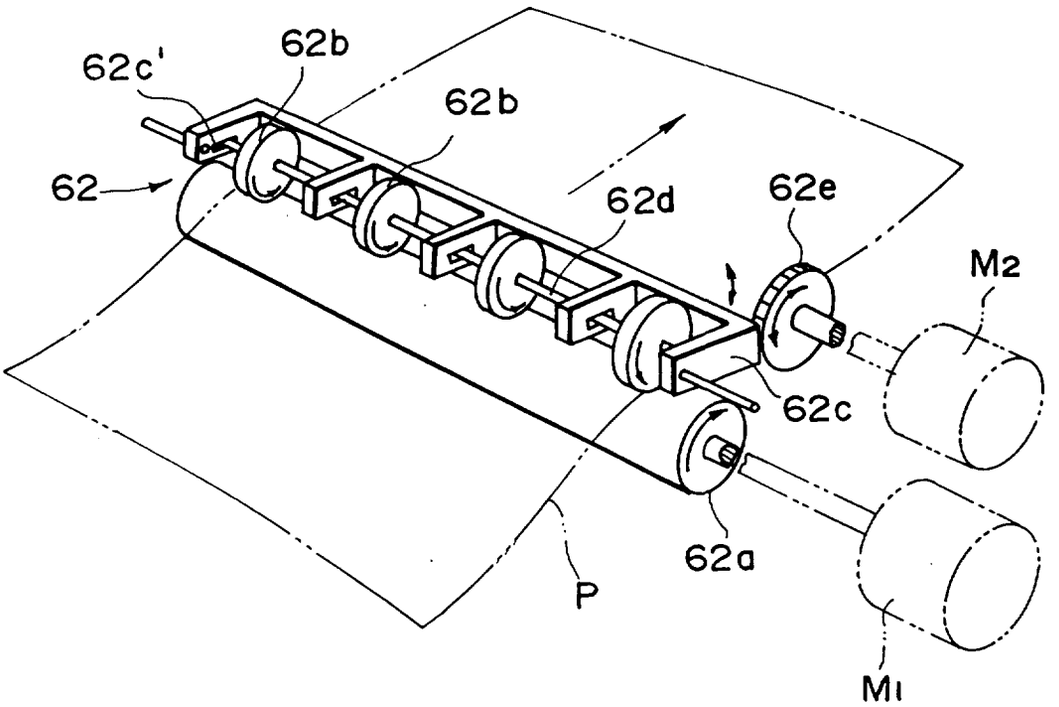


FIG. 5

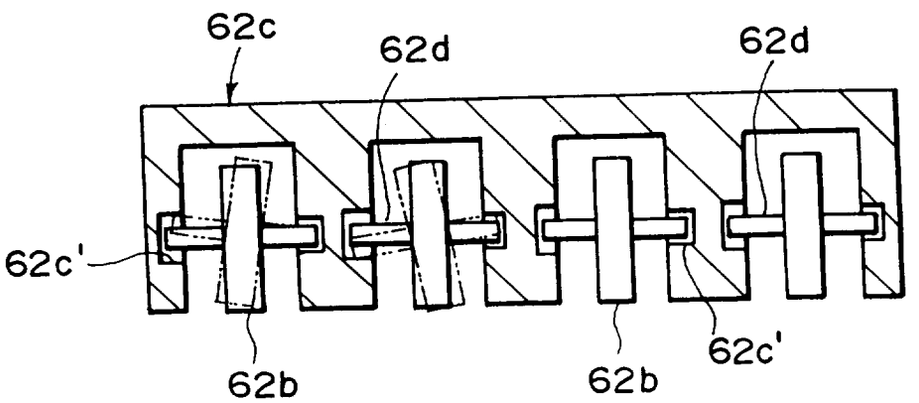


FIG. 6

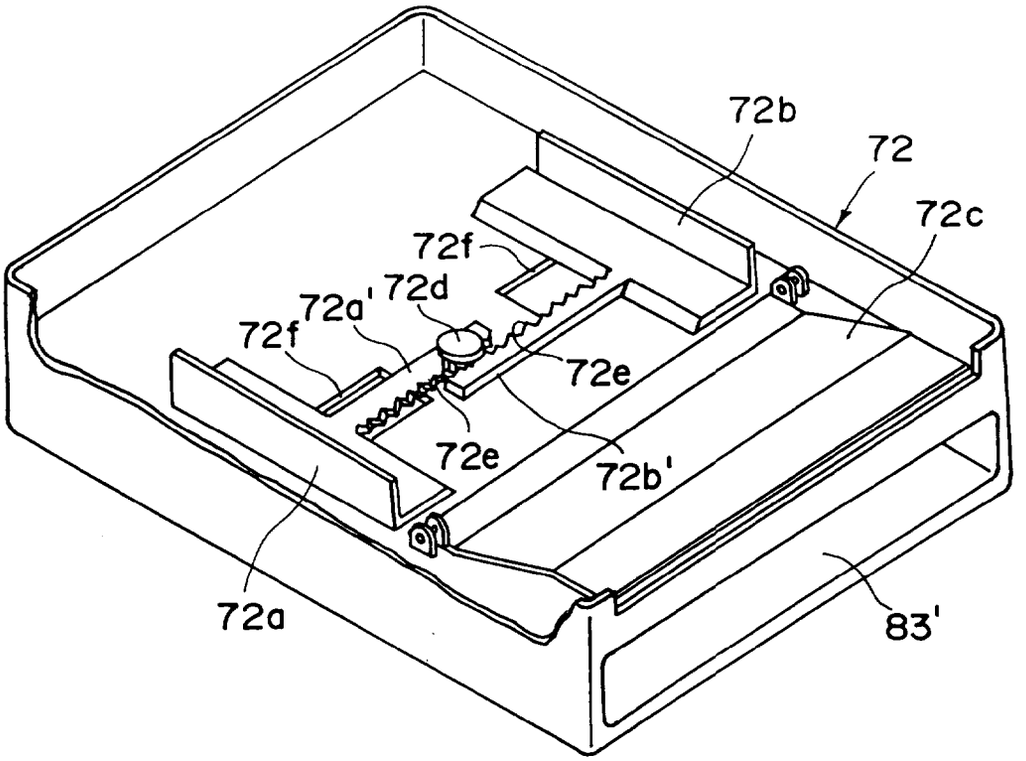

72b
72
72c
72f
72d
72a'
72f
72e
72e
72b'
72a
83'

FIG. 7A

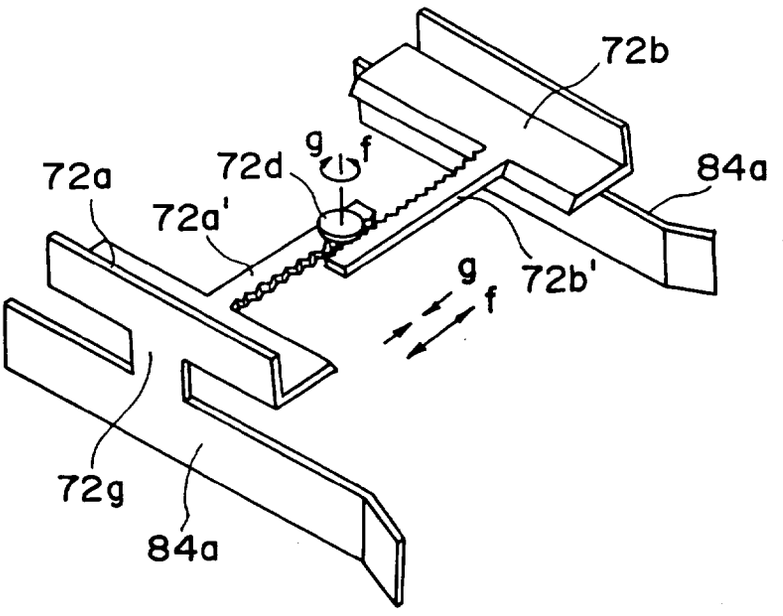

72b
g
f
72d
84a
72a
72a'
g
f
72b'
72g
84a

FIG. 7B

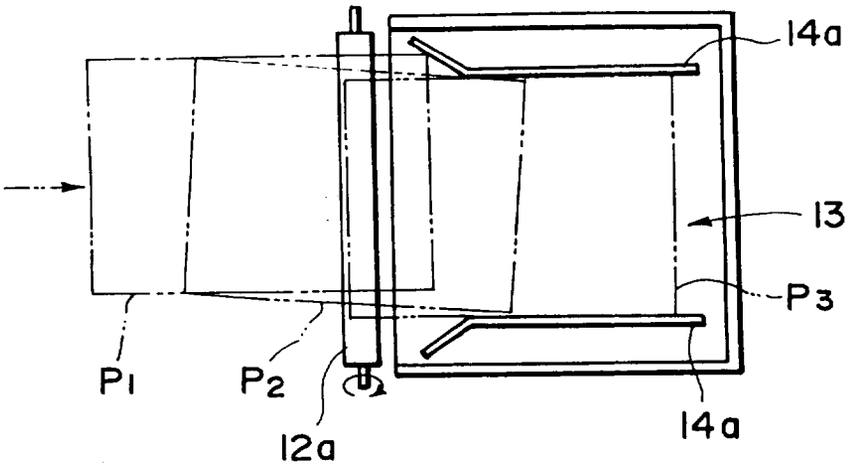


FIG. 8

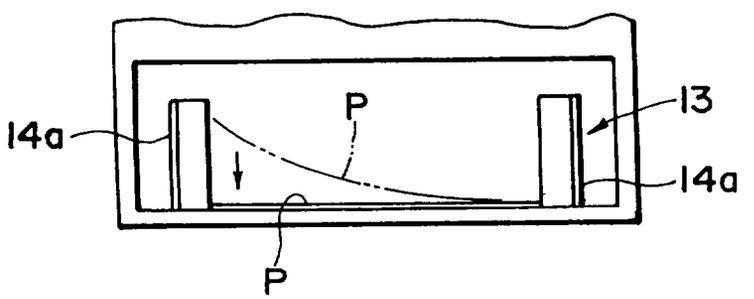


FIG. 9

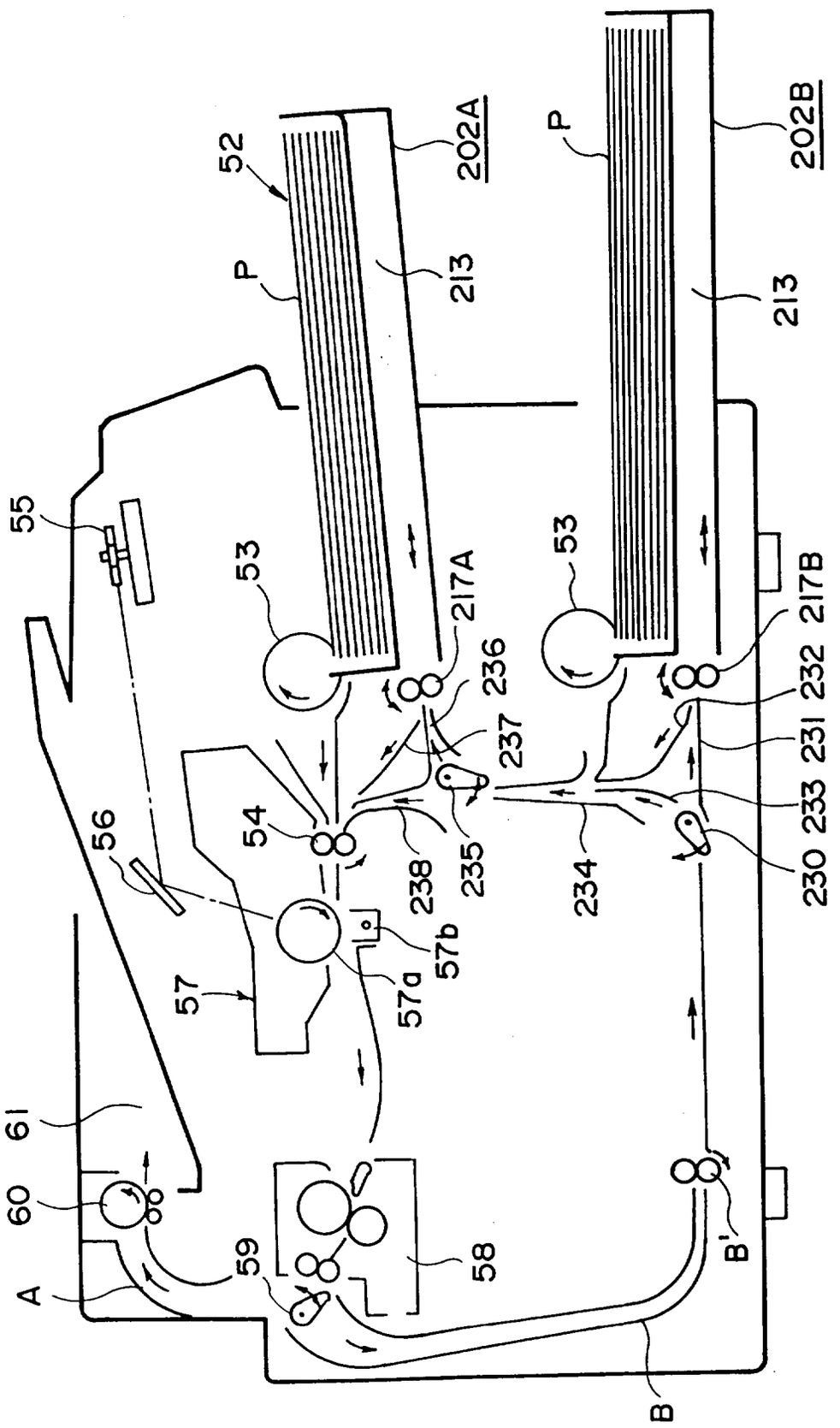

52
202A
P
213
202B
P
213
55
53
217A
53
217B
236
232
237
231
56
54
233
238
235
234
230
57b
57a
57
61
60
59
58
A
B'
B

FIG. 10