



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.12.2009 Bulletin 2009/52

(51) Int Cl.:
G03G 15/00 (2006.01)

(21) Application number: **09162224.1**

(22) Date of filing: **09.06.2009**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK TR**

(30) Priority: **19.06.2008 JP 2008159890**

(71) Applicant: **Konica Minolta Business
Technologies, INC.
Tokyo 100-0005 (JP)**

(72) Inventors:
• **Watanabe, Masayuki**
Tokyo Tokyo 100-0005 (JP)
• **Sugimoto, Eiji**
Tokyo Tokyo 100-0005 (JP)

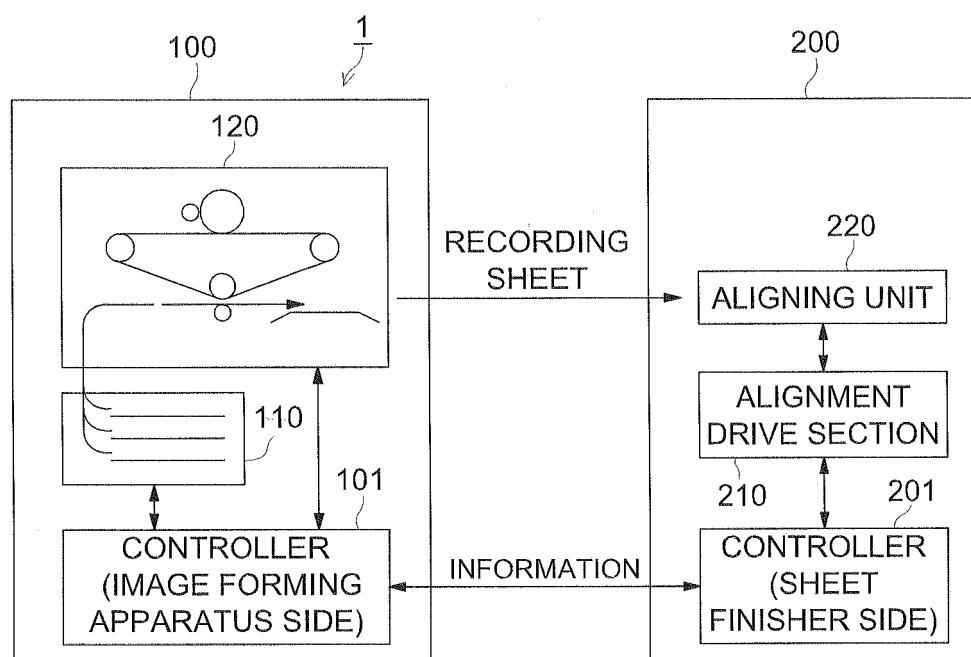
(74) Representative: **Gille Hrabal Struck Neidlein Prop
Roos
Patentanwälte
Brucknerstrasse 20
40593 Düsseldorf (DE)**

(54) **Sheet finisher and image forming system equipped therewith**

(57) A sheet finisher (200) connected to an image forming apparatus (100), includes: an aligning unit (220) having an aligning plate (221,222) which aligns in a primary scanning direction a recording sheet (P) that has been conveyed from the apparatus (100); and a controller

(201) which receives any one of correction information of an image forming position and detection information of a recording sheet edge for each sheet feed tray on a side of the apparatus, and determines an alignment position by referring to any one of the information.

FIG. 1



Description

[0001] This application is based on Japanese Patent Application No. 2008-159890 filed on June 19, 2008, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a sheet finisher that aligns a recording sheet outputted from an image forming apparatus such as a copying machine and a printer, and to an image forming system equipped with the sheet finisher, and in particular, to a sheet finisher capable of aligning efficiently and to an image forming system equipped therewith.

[0003] There is an image forming system that is constituted to align a recording sheet on which an image has been formed by an image forming apparatus, in the primary scanning direction by using an aligning unit of a sheet finisher.

[0004] In this case, when a single recording sheet is ejected from the image forming apparatus, the recording sheet is pressed by aligning plates from both ends in the primary scanning direction at a recording sheet placing position of the sheet finisher, thereby, a bundle of recording sheets turns out to be in the state wherein they are stacked under the condition where an edge portion of the bundle of recording sheets is aligned.

[0005] In this case, positions in the primary scanning direction of the recording sheets outputted from the image forming apparatus are sometimes caused by various main causes to be different each other. Therefore, aligning plates are caused to be on standby at the position representing a size that is larger than a size of the recording sheet in the primary scanning direction, before the recording sheet is outputted, and then, the recording sheet is pressed by the aligning plates from both ends in the primary scanning direction, immediately after the recording sheet is outputted, for positioning.

[0006] In this case, a central position in the primary scanning direction of a recording sheet outputted from an image forming apparatus is sometimes different depending on a sheet feed tray, and further, a central position of a recording sheet outputted sometimes changes depending on a path through which the recording sheet is conveyed in the image forming apparatus.

[0007] Meanwhile, there is a possibility that a central position of a recording sheet in the primary scanning direction in an image forming apparatus is changed by various main causes including sheet skewing in the course of conveyance. Therefore, the aforesaid central position of a recording sheet does not agree with a central position (conveyance path center C2 on the sheet finisher side) in the primary scanning direction of a recording sheet in a sheet finisher in terms of a position, in many cases.

[0008] Therefore, as shown in Fig. 2b, it is necessary to conduct alignment so that C1 may become C2 each time the recording sheet is outputted, by causing an align-

ing plate to stand by at a position for standing by having a margin of 10 mm - 20 mm respectively for the left and right sides, so that the central position of the recording sheet in the primary scanning direction (center C1 in image forming output) may change. In this case, a position for standing by represents an amount obtained by adding an amount of deviation that may be caused by sheet skewing or the like to a difference between C1 and C2.

[0009] In addition, image forming apparatuses have been improved in terms of speed-up, which requires operations of alignment to be improved in terms of speed-up. In this case, it is necessary to increase a speed of a motor that drive pressing operations of aligning plates. However, this speed increase is also related to a torque required for alignment, thus, speed-up of aligning operations is difficult. Namely, when a central position of a recording sheet outputted from an image forming apparatus does not agree with a central position with which the alignment is conducted on the sheet finisher side, either one of them is to be selected. Even in that case, it has been necessary to cause the aligning plate to stand by at a position having a margin for standing by so that a recording sheet outputted from an image forming apparatus may not hit an aligning plate.

[0010] Improvements in aligning operations in a sheet finisher are proposed in Unexamined Japanese Patent Application Publication Nos. 11-189355 and 11-199100.

[0011] In the aforesaid Documents, there are proposed technologies wherein a conveyance roller movable in the primary scanning direction perpendicular to the conveyance direction and a sheet detecting sensor that detects a side end portion of a recording sheet are provided, and aligning operations are raised by moving a recording sheet in the course of movement in the conveyance direction (sub-scanning direction) in the primary scanning direction (direction perpendicular to the conveyance direction).

[0012] In the technologies described in these Documents, it is necessary to provide newly a sensor that detects a side end portion of a recording sheet and a conveyance roller that moves a recording sheet in the course of conveyance in the primary scanning direction (direction perpendicular to the conveyance direction).

[0013] In this case, it is necessary to move a recording sheet in the primary scanning direction that is perpendicular to the conveyance direction while conveying the recording sheet in the conveyance direction. Therefore, existing sheet finishers cannot be used as they are, and an exclusive structure is needed. Further, because of the mechanical control to move an object during its movement in the different direction, there still is a problem that operations to keep the accuracy while stabilizing mechanically are difficult when conveyance of a recording sheet becomes to be high-speed.

SUMMARY OF THE INVENTION

[0014] The present invention has been achieved for

solving the aforesaid problems, and an objective of the invention is to realize a sheet finisher and an image forming system which may match the high-speed aligning operations.

[0015] Namely, an embodiment of the sheet finisher for solving the aforesaid problems, is a sheet finisher that is connected to an image forming apparatus and has an aligning unit that conducts aligning in the primary scanning direction with an aligning plate for a recording sheet sent from the image forming apparatus, wherein there is provided a controller that receives from the image forming apparatus, either one of correction information of image forming position for each sheet feed tray on the image forming apparatus side, and detection information of recording sheet edge, and determines an alignment position by referring to the aforesaid information.

[0016] An embodiment of the image forming system is an image forming system equipped with an image forming apparatus that forms an image on a recording sheet and with a sheet finisher having an aligning unit that conducts aligning in the primary scanning direction with an aligning plate for a recording sheet fed from the image forming apparatus, wherein the aforesaid sheet finisher is equipped with a controller that receives either one of image forming position correction information for each sheet feed tray on the image forming apparatus side and recording sheet end portion detection information from the image forming apparatus, and determines alignment position by referring to the aforesaid information.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Fig. 1 is a structural diagram showing the structure of an image forming apparatus in the embodiment. Figs. 2a - 2b are illustrations wherein aligning operations of the image forming apparatus in the embodiment are compared with those in a convention example.

Fig. 3 is a flow chart for illustrating the state of operations of the image forming apparatus in the first embodiment.

Figs. 4a - 4b are illustrations wherein aligning operations of the image forming apparatus in the second embodiment are shown.

Fig. 5 is a flow chart for illustrating the state of operations of the image forming apparatus in the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] The preferred illustrative embodiment (embodiment) for putting the present invention into practice will be explained in detail as follows, referring to the drawings.

[First Embodiment]

[0019] In this case, there will be detailed the structure of image forming system with image forming apparatus 100 and sheet finisher 200 of the first embodiment, based on Fig. 1 - Fig. 2b.

[0020] Meanwhile, although alignment that is a characteristic portion of the sheet finisher 200 will be explained in this case, the sheet finisher 200 may also be equipped with functions to carry out other sheet finishing such as stapling and punching.

[0021] Incidentally, in Fig. 1 and Figs. 2a - 2b, explanations for general portions which are already-known and are not related directly to characteristic actions and control of the present embodiment are omitted.

[0022] The image forming apparatus 100 is connected with the sheet finisher 200 to constitute an image forming system. The image forming apparatus 100 forms an image on a recording sheet, and this recording sheet is sent to the sheet finisher 200 where sheet finishing operations such as alignment and others are carried out.

[0023] In the image forming apparatus 100, control section 101 is composed of CPU and others for controlling respective parts of the image forming apparatus 100, and has a function to transmit either one of image forming position correction information for each sheet feed tray of sheet feed section 110 and recording sheet end portion detection information to the sheet finisher 200 side.

[0024] The sheet feed section 110 is equipped with a sheet feed tray on which an unrecorded recording sheet is placed, and the sheet feed section 110 feeds recording sheets to print engine 120.

[0025] In this case, the image forming position correction information for each sheet feed tray of sheet feed section 110 is information concerning positional deviation of a recording sheet for each sheet feed tray controlled so that an image may be formed at a desired position within the recording sheet after dissolving the deviation, because a positional deviation in the primary scanning direction of the recording sheet is caused for each sheet feed tray when the sheet is fed out to the image transfer position from each sheet feed tray.

[0026] The print engine 120 is one to form a visible image on a recording sheet supplied from the sheet feed section 110, and it carries out image forming on two sides of the recording sheet by using a reversing mechanism, when an occasion demands. Further, it generates recording sheet end portion detection information by unillustrated various types of sensors, and transmits it to control section 101. Incidentally, this print engine 120 may be either one used for a printer and copying machine of an electrophotographic type, or one of each recording mode such as other inkjet, thermographic or heat-transfer type.

[0027] In the sheet finisher 200, control section 201 is composed of CPU or the like to control respective portions of the sheet finisher 200, and it receives either one of image forming position correction information for each sheet feed tray in image forming apparatus 100 and re-

cording sheet end portion detection information from image forming apparatus 100 (control section 101) to determine an alignment position by an aligning plate in the case of aligning and a position for standing by, referring to the aforesaid information.

[0028] Alignment drive portion 210 is composed of a motor to drive aligning plates (see Fig. 2a - 2b) of aligning unit 220, a motor drive circuit that drives a motor and of a speed-change mechanism, to drive the aligning unit 220 based on instruction of control section 201.

[0029] The aligning unit 220 conducts aligning in the primary scanning direction for a recording sheet fed from the image forming apparatus, by means of aligning plates 221 and 222 shown in Figs. 2a - 2b. In this case, the aligning plates 221 and 222 are waiting at the prescribed positions for standing by until a moment when a recording sheet comes from the image forming apparatus, and then, the aligning plates 221 and 222 conduct aligning, each time a single recording sheet comes. Namely, the aligning plates 221 and 222 conduct aligning by pressing both end portions in the primary scanning direction of a recording sheet sent from the image forming apparatus 100 toward the center position from the position of standing by, and by aligning end portions of plural recording sheets in the primary scanning direction.

[0030] Operations of an image forming system having sheet finisher 200 of the present embodiment will be explained as follows, referring to illustrations in Figs. 2a - 2b and a flow chart shown in Fig. 3.

[0031] First, when the sheet finisher 200 is turned on, control section 201 initializes respective portions of control section 201 to cause respective portions to conduct necessary initializing operations, and in aligning unit 220, aligning plates 221 and 222 are moved to home positions determined in advance through the alignment drive portion 210 (step S301 in Fig. 3). In this case, the alignment drive portion 210 may also confirm whether the aligning plates 221 and 222 are moved to prescribed home positions or not, by an unillustrated home position sensor or the like.

[0032] Then, when image forming is started by image forming apparatus 100 (step S302 in Fig. 3), control section 101 communicates with control section 201. Then, recording sheet size information including size information of the recording sheet in the primary scanning direction and image position correction information that differs from others for each tray to which the recording sheet is fed, are transmitted from control section 101 and are received by control section 201 (step S303 in Fig. 3).

[0033] If a position of the recording sheet in the primary scanning direction is fluctuated when reversing conveyance path is passed through inside image forming apparatus 100 in the case of conducting two-sided image forming, recording sheet end portion detection information detected by a sensor arranged at any position of conveyance path of image forming apparatus 100 is transmitted from control section 101 to control section 201.

[0034] Then, control section 201 that received these

pieces of information calculates an alignment position and alignment waiting position, by referring to recording sheet size information, image forming position correction information for each sheet feed tray and recording sheet end portion detection information (step S304 in Fig. 3).

[0035] It is assumed that a conveyance path center on the sheet finisher 200 side is represented by C2 as shown in Figs. 2a and 2b. On the other hand, it is assumed that a center of the recording sheet in the case of image forming output is represented by C1, although it is changed depending on each sheet feed tray and on passage of reversing conveyance path.

[0036] In the past, aligning processing has been conducted by aligning plates 221 and 222 in a way that center C1 at image forming output may agree with conveyance path center C2 on the sheet finisher 200 side, as shown in Fig. 2b. In this case, a position of standing by for each of aligning plates 221 and 222 has been determined with a margin so that the aligning plate may be within a position that could be changed in terms of a size, because there is a possibility that C1 may be moved by a sheet feed tray itself, passing through a reversing conveyance path and a sheet skewing. In this case, the finally aligned position covering (position shown with solid lines in Fig. 2b) plus about 20 mm has been a position for standing by.

[0037] In contrast to the foregoing, control section 201 on the sheet finisher 200 side which has received recording sheet size information and image position correction information determines center C3 in the case of alignment so that it may agree with center C1 at image forming outputting for image forming apparatus 100, in the present embodiment, as shown in Fig. 2a.

[0038] Namely, an alignment position determined by control section 201 is a position determined by a sheet size in the primary scanning direction whose center is center C3 at alignment that is equal to the center C1 at image forming outputting.

[0039] The a position determined by a sheet size in the primary scanning direction whose center is center C3 at alignment to which the minimum margin (for example, a margin for sheet skewing) of about 5 mm is added may be determined as a position for standing by for alignment.

[0040] In this case, the control section 201 moves aligning plates 221 and 222 of aligning unit 220 to the a position for standing by for alignment, through alignment drive section 210 (step S305 in Fig. 3).

[0041] Then, when a recording sheet comes from image forming apparatus 100, aligning plates 221 and 222 are moved from the position for standing by to the aligning position as shown in Fig. 2a, by an instruction of control section 201 and by driving of the alignment drive section 210, for each of the recording sheet, thus, alignment operations are carried out as sheet aligning processing (step S306 in Fig. 3).

[0042] Hereafter, standing by and aligning operations of the aligning plates 221 and 222 are repeated (steps S305 and S306 in Fig. 3) until the moment when the image forming is terminated (step S 307 in Fig. 3, NO).

[0043] In this case, as is shown in Fig. 2a, positions for standing by for the aligning plates 221 and 222 are closer to the final alignment position, compared with a conventional one in Fig. 2b, whereby, travel distances for the aligning plates 221 and 222 become shorter, resulting in less useless operations which makes high speed aligning operations possible.

[0044] Then, when a series of image forming operations are completed (step S307 in Fig. 3, YES), control section 201 moves aligning plates 221 and 222 of aligning unit 220 to home positions through alignment drive section 210 (step S308 in Fig. 3) to terminate a series of operations.

[0045] In the first embodiment, by receiving information (either one of image forming position correction information for each sheet feed tray on the image forming apparatus side and recording sheet edge portion detection information) concerning a position of a recording sheet in image forming apparatus 100 from the image forming apparatus 100, on the sheet finisher 200 side, it is possible for the control section 201 of sheet finisher 200 that referred to the information to determine a position of alignment by aligning plates 221 and 222 (central position, edge portion position) to an appropriate position without requiring useless operations for alignment, by aligning the position of alignment with a central position of a recording sheet outputted from image forming apparatus 100.

[0046] As a result, even when a position in the primary scanning direction for a transfer sheet outputted from image forming apparatus 100 is fluctuated, it is possible to regulate the fluctuated position to a position of output from the image forming apparatus 100, thus, a required minimum margin has to be provided as a position for standing by for aligning plates 221 and 222, further useless sheet aligning operations are not needed in the case of aligning, and travel distances for aligning plates can be kept to a minimum, resulting in realization of sheet finisher 200 capable of coping with high-speed aligning operations.

[Second Embodiment]

[0047] In this case, there will be given an explanation for image forming system 1 including image forming apparatus 100 and sheet finisher 200 in the second embodiment, based on Fig. 4a - Fig. 5.

[0048] Meanwhile, the structure shown in Fig. 1 is common for the First Embodiment and the Second Embodiment, and overlapped explanations are omitted. Incidentally, although alignment that is a characteristic portion of the sheet finisher 200 will be explained in this case, the sheet finisher 200 may also be equipped with functions to carry out other sheet finishing such as stapling and punching.

[0049] Operations of the image forming system having sheet finisher 200 of the present embodiment will be explained as follows, referring to illustrations in Figs. 4a -

4b and to a flow chart in Fig. 5.

[0050] Incidentally, in this case, there is assumed an occasion wherein recording sheets coming from plural different sheet feed trays are used in a series of image forming about a single job. For example, what is assumed in this case is an occasion wherein a thick sheet or a color sheet is fed out of a different sheet feed tray at the timing to be a break on the half way of image forming for ordinary white sheets.

[0051] First, when sheet finisher 200 is turned on, control section 201 initializes respective portions and instructs necessary initial operations for each portions, and in aligning unit 220, aligning plates 221 and 222 are moved to home positions determined in advance, through alignment drive portion 210 (step S501 in Fig. 5). In this case, the alignment drive portion 210 may also confirm whether the aligning plates 221 and 222 are moved to the prescribed home positions or not by an unillustrated home position sensor.

[0052] Then, when image forming is started by image forming apparatus 100 (step S502 in Fig. 5), control section 101 communicates with control section 201.

[0053] Then, concerning a series of the image forming operations, pieces of information of recording sheet size including size information of the recording sheet in the primary scanning direction are transmitted from the control section 101 and are received by the control section 201 (step S503 in Fig. 5). The control section 201 that has received the aforesaid information calculates a position of alignment by referring to the recording sheet size information coming from the image forming apparatus 100 (step S504 in Fig. 5). In this case, conveyance path center C2 on the sheet finisher 200 side is used as it is, as central position C3 in the case of alignment.

[0054] Or, concerning a series of the image forming operations, pieces of information of recording sheet size including size information of the recording sheet in the primary scanning direction and image position correction information about a tray from which the recording sheets used most frequently are fed out are transmitted from the control section 101 and are received by the control section 201 (step S503 in Fig. 5). The control section 201 that has received the aforesaid information calculates a position of alignment by referring to the recording sheet size information coming from the image forming apparatus 100, or to the recording sheet size information and image position correction information (step S504 in Fig. 5). In this case, central position C3 in the case of alignment becomes the one that agrees with central position C1 in the case of image forming output for the recording sheets used most frequently, without becoming conveyance path center C2 on the sheet finisher 200 side.

[0055] Then, the control section 101 of image forming apparatus 100 transmits image position correction information that is different for each tray from which the recording sheets are fed, and the control section 201 receives that information (step S505 in Fig. 5). Further, when a position of a recording sheet is fluctuated when

the recording sheet passes through a reversing conveyance path inside image forming apparatus 100 in the case of duplex copying, recording sheet end portion detection information that is detected by a sensor arranged at any position of a conveyance path in image forming apparatus 100 is sent to control section 201 from control section 101.

[0056] Then, the control section 201 that has received this information calculates a position of standing by for alignment, referring to image forming position correction information for each sheet feed tray coming from image forming apparatus 100 or to recording sheet end portion detection information (step S506 in Fig. 5).

[0057] In this case, the control section 201 moves the aligning plates 221 and 222 of aligning unit 220 to the aforesaid position of standing by through alignment drive portion 210 (step S507 in Fig. 5).

[0058] Each of Figs. 4a and 4b shows how the recording sheet with center C1 in image forming output that does not agree with center C2 or C3 in terms of a position is outputted. In this case, image forming position correction information or recording sheet end portion detection information is clear for each recording sheet. Therefore, it is possible to take a position for standing by that agrees with a position of the recording sheet in terms of a position, which results in less waste of positions for standing by, compared with a conventional occasion (Fig. 2b). In each of Figs. 4a and 4b, even in the case where central position C1 in image forming output does not agree with C2 or C3, for example, even in the case of a thick sheet or a color sheet in the aforesaid concrete example, it is not necessary to broaden both sides of positions for standing by for aligning plates 221 and 222, and it has only to cause a portion corresponding to the outside in the case of deviation to have a margin of about 5 mm on the outside from a position of a recording sheet end portion. Namely, if the recording sheet end portion is positioned to be inside of the end portion of the aligned recording sheet, it is not necessary to broaden an aligning plate as a position for standing by.

[0059] Further, if C2 is established for recording sheets which are used in high volume, C1 agrees with C2 to be the same condition as in Fig. 2a, and wasteful positions for standing by are also eliminated at both sides.

[0060] Then, if a recording sheet is sent from image forming apparatus 100, aligning plates 221 and 222 are moved to alignment position from a position for standing by through instruction of control section 201 and through drive of alignment drive portion 210 under the conditions shown in Fig. 4a and Fig. 2a, for each recording sheet thus sent, whereby, aligning operations are carried out as sheet aligning processing (step S508 in Fig. 5).

[0061] Hereafter, standing by and aligning operations for the aligning plates 221 and 222 are repeated (steps S505 - S508 in Fig. 5) until the moment when image forming is completed for each recording sheet (step S509 in Fig. 5, NO).

[0062] In this case, as shown in Fig. 4a and Fig. 2a,

the positions for standing by for aligning plates 221 and 222 are closer to the final position for aligning than that in the conventional occasion in Fig. 2b, and travel distances from the aligning plates 221 and 222 become shorter. Therefore, wasteful operations are less and high-speed aligning operations become to be possible.

[0063] Then, when a series of image forming operations are completed (step S 509 in Fig. 5, YES), control section 201 moves aligning plates 221 and 222 of aligning unit 220 to home positions, through aligning drive section 210 (step S510 in Fig. 5) to terminate a series of operations.

[0064] In the second embodiment, when information relating to a position of a recording sheet in image forming apparatus 100 either one of image forming position correction information for each sheet feed tray on the image forming apparatus side and recording sheet end portion detection information is received from the image forming apparatus 100, on the sheet finisher 200 side, control section 201 of the sheet finisher 200 that has referred to the aforesaid information can determine the position for standing by for aligning plates 221 and 222 at an appropriate position without necessity for doing useless aligning operations, by regulating the position for standing by for aligning plates 221 and 222 to prescribed distance from a central position of the recording sheet outputted from the image forming apparatus.

[0065] Further, in the second embodiment, when information relating to a position of a recording sheet in image forming apparatus 100 either one of image forming position correction information for each sheet feed tray on the image forming apparatus side and recording sheet end portion detection information is received from the image forming apparatus 100, on the sheet finisher 200 side, control section 201 of the sheet finisher 200 that has referred to the aforesaid information can determine the position for standing by for aligning plates 221 and 222 at an appropriate position without necessity for doing further useless aligning operations, by regulating aligning positions (a central position and an end portion position) by aligning plates 221 and 222 to the central position of a recording sheet outputted from image forming apparatus, and by regulating the position for standing by for aligning plates 221 and 222 to prescribed distance from a central position of the recording sheet outputted from the image forming apparatus.

[0066] As a result, even when a position in the primary scanning direction for a transfer sheet outputted from image forming apparatus 100 is fluctuated, it is possible to regulate the fluctuated position to a position of output from the image forming apparatus 100, thus, a required minimum margin has to be provided as a position for standing by for aligning plates 221 and 222, further useless sheet aligning operations are not needed in the case of aligning, and travel distances for aligning plates can be kept to a minimum, resulting in realization of sheet finisher 200 capable of coping with high-speed aligning operations.

[Other Embodiments]

[0067] Meanwhile, the aligning operations explained above may either be carried out independently by an aligning unit, or be carried out as aligning operations to be conducted before performing punching, stapling and bookbinding.

[0068] Though Fig. 1 shows a state wherein image forming apparatus 100 is connected directly with sheet finisher 200, the state is a part of an embodiment in which the aforesaid aligning operations are performed in either one of sheet finishers in an image forming system having therein a plurality of image forming apparatuses and a plurality of sheet finishers.

Claims

1. A sheet finisher connected to an image forming apparatus, comprising:

an aligning unit having an aligning plate which aligns in a primary scanning direction a recording sheet that has been conveyed from the apparatus; and
a controller which receives any one of correction information of an image forming position and detection information of a recording sheet edge for each sheet feed tray on a side of the apparatus from the apparatus, and

determines an alignment position by referring to any one of the information.

2. A sheet finisher connected to an image forming apparatus, comprising:

an aligning unit having an aligning plate which aligns in a primary scanning direction a recording sheet that has been conveyed from the apparatus; and
a controller which receives any one of correction information of an image forming position for each sheet feed tray and detection information of a recording sheet edge on a side of the apparatus, and determines a standby position of the aligning plate by referring to any one of the information.

3. The sheet finisher of claim 1, wherein when a sheet is outputted from a plurality of sheet feed trays, the controller determines the alignment position by referring to information on a sheet tray which is used most frequently.

4. The sheet finisher of any one of claims 1 to 3, wherein the aligning plate comprises two aligning plates which press both edges of the recording sheet in the

primary scanning direction that has been conveyed from the apparatus, toward a center position of the sheet from a standby position to align the sheet.

5. The sheet finisher of claim 2, wherein the aligning plate comprises two aligning plates which press both edges of the recording sheet in the primary scanning direction that has been conveyed from the apparatus, toward a center position of the sheet from the standby position to align the sheet.

6. An image forming system comprising:

an image forming apparatus which forms an image onto a recording sheet; and
a sheet finisher comprising:

an aligning unit having an aligning plate which aligns in a primary scanning direction a recording sheet that has been conveyed from the apparatus; and
a controller which receives any one of correction information of an image forming position for each sheet feed tray and detection information of a recording sheet edge on a side of the apparatus, and determines an alignment position by referring to any one of the information.

7. An image forming system comprising:

an image forming apparatus which forms an image onto a recording sheet; and
a sheet finisher comprising:

an aligning unit having an aligning plate which aligns in a primary scanning direction a recording sheet that has been conveyed from the apparatus; and
a controller which receives any one of correction information of an image forming position for each sheet feed tray and detection information of a recording sheet edge on a side of the apparatus, and determines a standby position of the aligning plate by referring to any one of the information.

8. The image forming system of claim 6 or 7, wherein when a sheet is outputted from a plurality of sheet feed trays, the controller determines the alignment position by referring to information on a sheet tray which is used most frequently.

9. The image forming system of any one of claims 6 to 8, wherein the aligning plate comprises two aligning plates which press both edges of the recording sheet in the primary scanning direction that has been conveyed from the apparatus, toward a center position

of the sheet from the standby position to align the sheet.

10. The image forming system of claim 7, wherein the aligning plate comprises two aligning plates which press both edges of the recording sheet in the primary scanning direction that has been conveyed from the apparatus, toward a center position of the sheet from the standby position to align the sheet.

5

10

15

20

25

30

35

40

45

50

55

FIG. 1

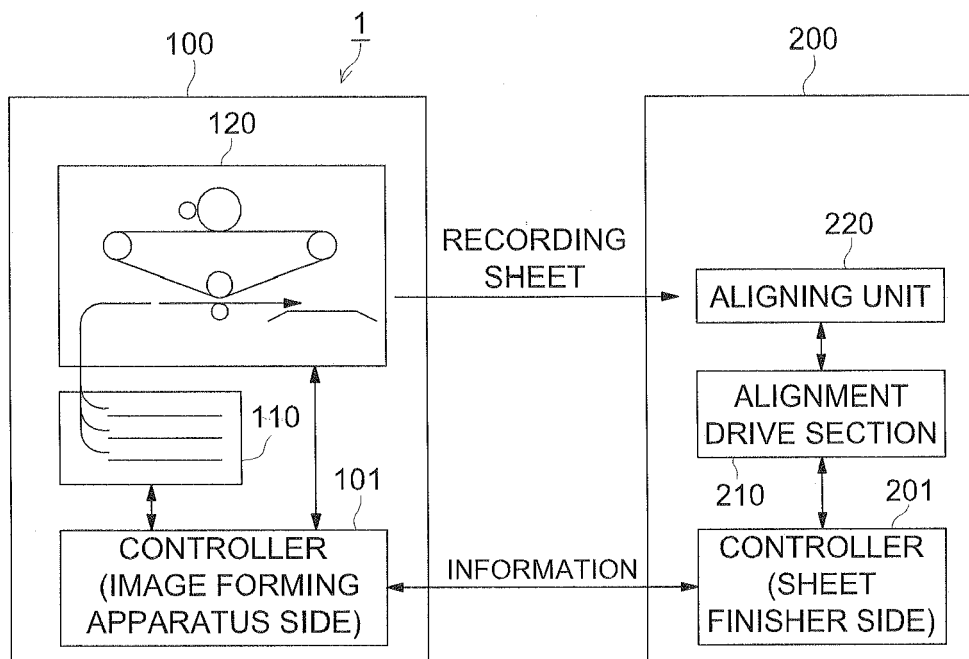


FIG. 2a

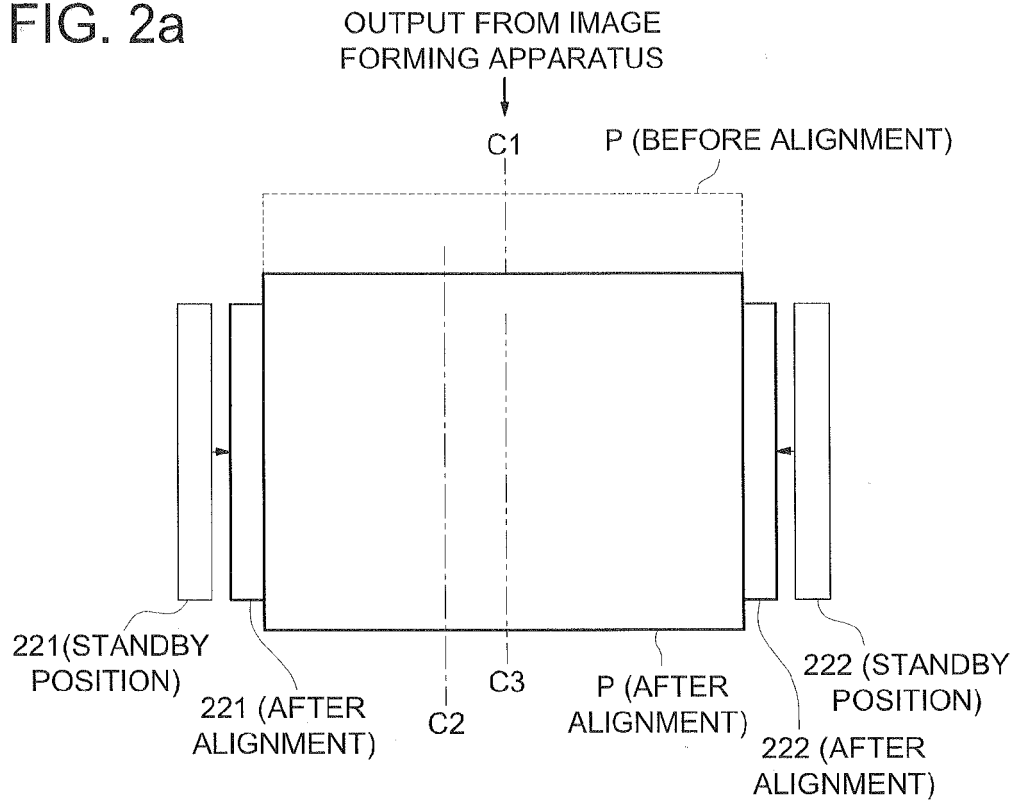


FIG. 2b

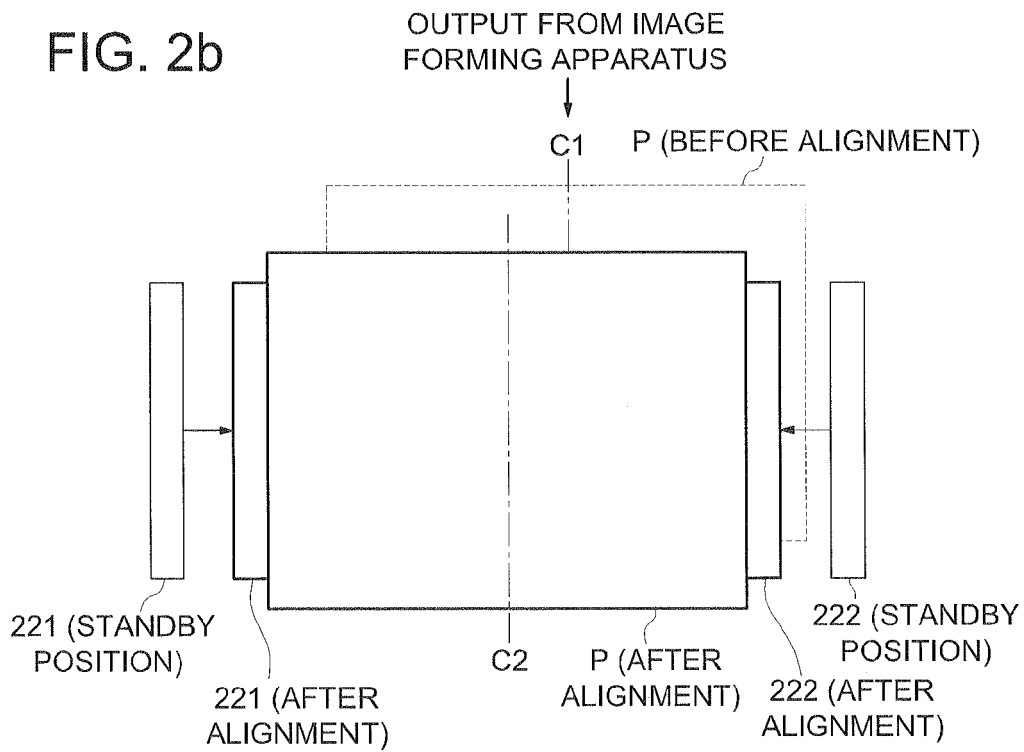


FIG. 3

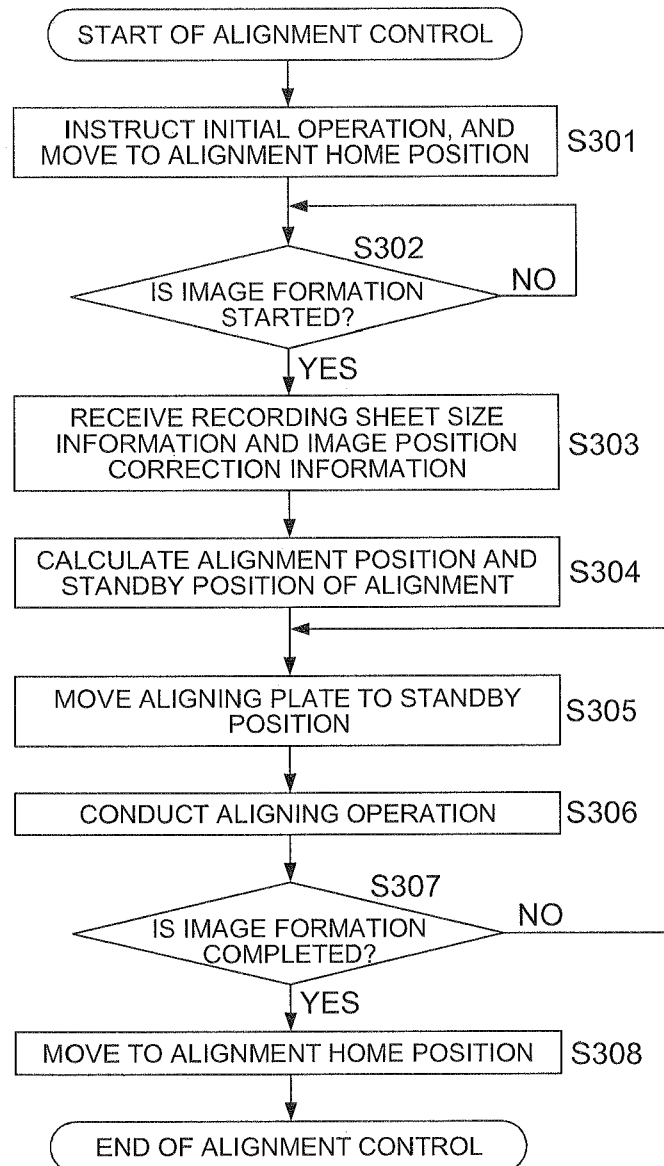


FIG. 4a

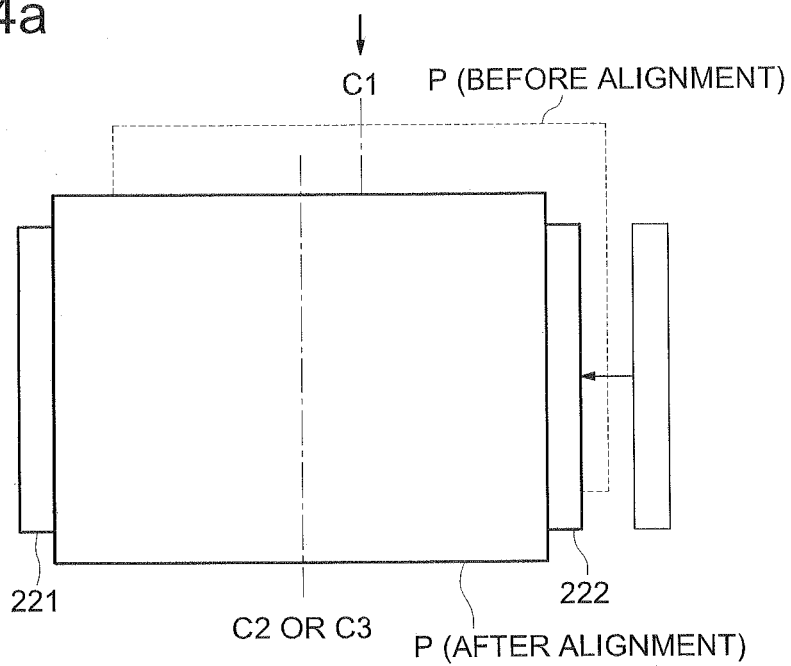


FIG. 4b

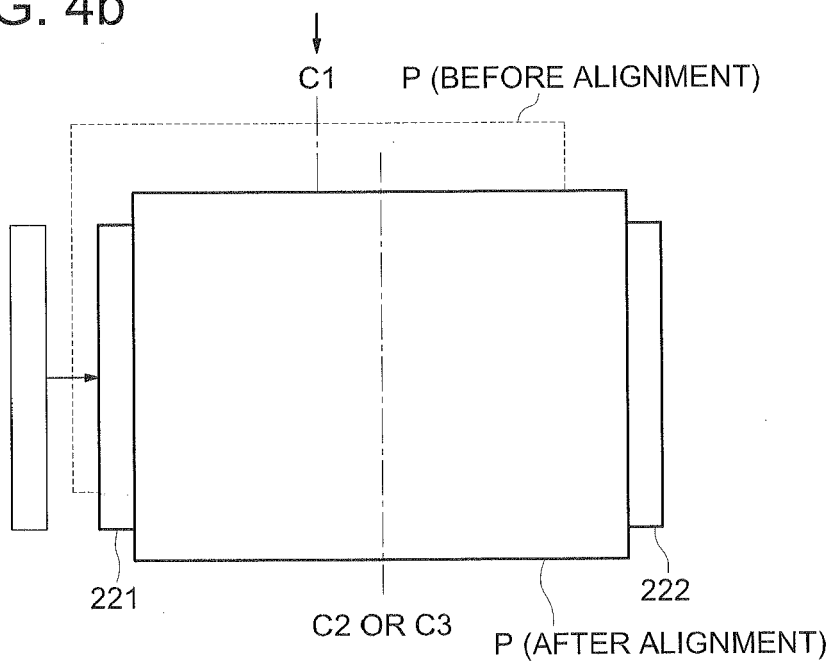
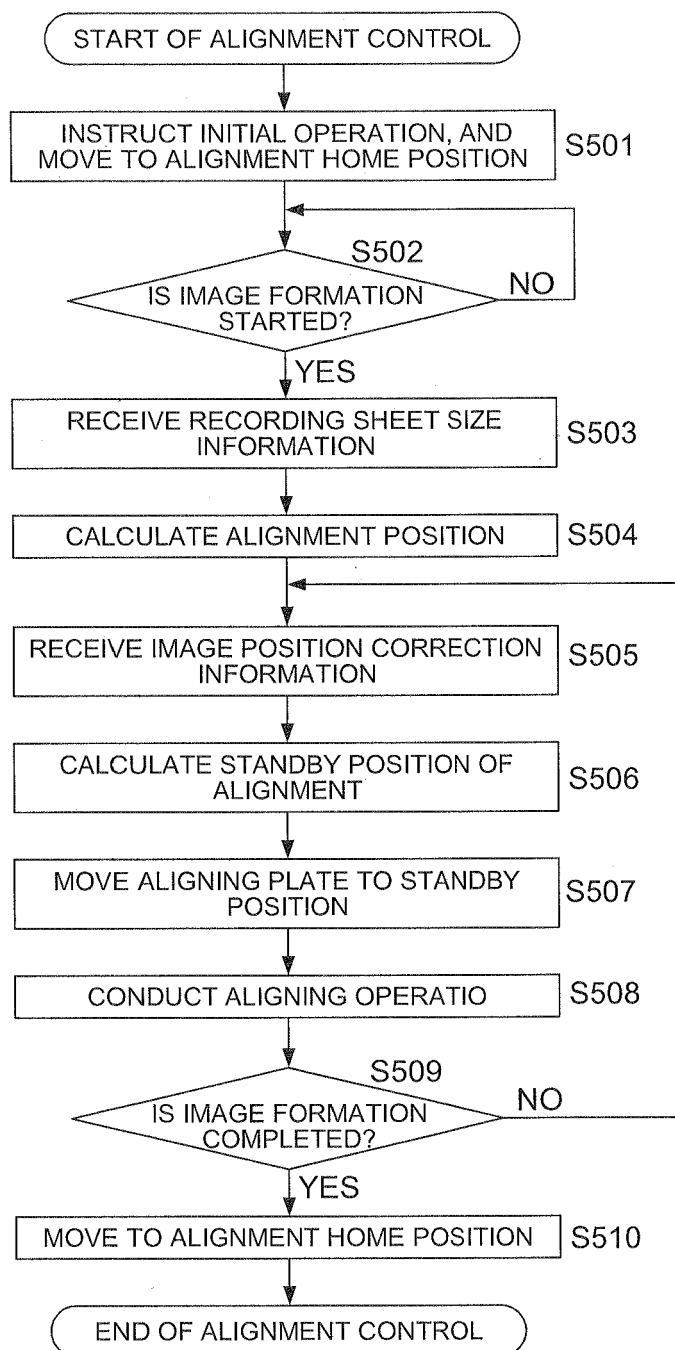


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 09 16 2224

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2004/057744 A1 (KAWAGOE KATSUMI [JP]) 25 March 2004 (2004-03-25) * paragraph [0052] - paragraph [0068] * * paragraph [0091] - paragraph [0092] * * paragraph [0134] * -----	1-10	INV. G03G15/00
X	JP 10 181988 A (CANON KK) 7 July 1998 (1998-07-07) * abstract * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			G03G
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 October 2009	Examiner Götsch, Stefan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

2
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 2224

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-10-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004057744 A1	25-03-2004	NONE	
JP 10181988 A	07-07-1998	JP 3728039 B2	21-12-2005

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- JP 2008159890 A [0001]
- JP 11189355 A [0010]
- JP 11199100 A [0010]