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54 **Drive unit for an ink roller array.**

57 In a rotary press having an ink roller array provided in an inking unit of a print unit thereof, to supply ink necessary for a next printing process to an ink applying roller during preparation of the running of the rotary press, a drive unit for the ink roller array is provided so that the ink roller array can be driven by an ink source motor for driving an ink source roller while the print unit is not in operation and that an ink call roller can be brought into contact with the ink source roller and an ink transfer roller.

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DRIVE UNIT FOR AN INK ROLLER ARRAY

BACKGROUND OF THE INVENTION:

Field of the invention:

This invention relates to a drive unit adapted to independently drive an ink roller array provided in a print unit of the rotary press.

Description of the Prior Art:

Fig. 4 shows ink roller arrays provided in a print unit of an offset rotary press. A back-print ink roller array A (and a front-print ink roller array B) comprises an ink source roller 19 (19'), a call roller 18 (18'), a transfer roller 17 (17'), reciprocating rollers 16, 11, 9 and 6 (16', 11', 9' and 6'), kneading rollers 15, 14, 13, 12 and 10 (15', 14', 13', 12' and 10'), and applying rollers 5, 7 and 8 (5', 7' and 8'). Among them, the reciprocating rollers 16, 11, 9 and 6 (16', 11', 9' and 6') are rotated and reciprocated, the call roller 18 (18') is swung, and the ink source roller 19 (19') is rotated. The other rollers are held in pressure contact with the foregoing rollers driven so as to be driven thereby. The ink applying rollers 5, 7 and 8 (5', 7' and 8') are held in pressure contact with a plate cylinder 4 (4') during printing which is in turn held in pressure contact with a blanket (rubber) cylinder 3 (3'), and are adapted to separate from the plate cylinder 4 (4') when a printing plate is to be detached.

In Figs. 4, 5 and 6, the reciprocating rollers 9, 11, 16 and 6 and their gears 9a, 11a, 16a and 6a are rotated by a line shaft 1 via a gear 3a (P.C.D. is illustrated by the one-dot chain line) of the back rubber cylinder 3, a gear 4a of the back plate cylinder 4, a gear 4b attached to the shaft of the back plate cylinder 4 concentrically to the gear 4a, these gears being driven by a drive unit 2 composed of a pair of bevel gears and a plurality of gears not shown, and a back-print ink clutch gear 20a which takes an ON and OFF position upon actuation of an eccentric link mechanism being controlled by a rotary actuator 40 or a handle, and via a gear train which comprises the gears 9a, 21a, 11a, 23a, 24a, 16a, 22a and 6a and is adapted to drive the back-print ink roller array A. Further, the reciprocating rollers 9, 11, 16 and 6 are reciprocated by reciprocating units 6r and 9r which comprise worms attached to the other shaft ends of the reciprocating rollers 6 and 9 (opposite to their one shaft ends where the gears 6a and 9a are attached), mating worm wheels, and a link mechanism (these components are well known in the art,

thus not shown in the drawings). Specifically, the reciprocating rollers 16 and 11 are reciprocated by swinging mechanisms 25 and 26, respectively.

In Fig. 6, the call roller 18 is swung by rotating a shaft 31, to which an arm 32 for supporting the call roller 18 is attached, via a cam follower 28, a link 29 and a lever 30, by a cam 27 (illustrated by the broken line) attached concentrically to a shaft 26 for supporting a gear 26a which is rotated via a gear 25a by a gear 3b of the back rubber cylinder 3. This swinging motion is stopped by separating the cam follower 28 from the cam 27 by actuating an air cylinder 33.

In Fig. 5, the ink source roller 29 is rotated via gears 35, 36, a worm 38 and a worm wheel 39 by an ink source motor 34. However, no mechanism is provided to drive the gear train for driving the ink roller array A by the ink source motor 34.

The front-print ink roller array B is driven via a front-print ink clutch gear 20a' by the gears 3a, 3a' and 4a' of the back rubber cylinder 3, front rubber cylinder 3' and front plate cylinder 4'. The mechanism or arrangement after the front-print ink clutch gear 20a' is identical with the foregoing back-print unit with respect to the rotation of the ink roller array, reciprocation of the reciprocating roller, swinging of the call roller, and driving of the ink source roller.

According to the conventional rotary press, the ink roller array of the print unit is driven by the line shaft via the gear of the print cylinder (plate cylinder), ink clutch gear and gear train of the print unit. Further, the call roller of the ink roller array is swung by the gear of the print (rubber) cylinder via the link mechanism.

Therefore, since the ink roller array is not in motion while the print unit is not in operation, it is impossible to previously apply ink necessary for a next printing process to each of the rollers, from the ink source roller to the ink applying roller, in accordance with a given ink distribution during preparation of the running of the rotary press.

SUMMARY OF THE INVENTION:

It is an object of the present invention to provide a drive unit for an ink roller array which makes it possible to independently drive the ink roller array while a print cylinder is not in operation.

Although the foregoing object will be accomplished by providing a motor for exclusively driving the ink roller array, this is accomplished according to the present invention, without increasing cost, by (1) using an ink source motor as a drive source, (2)

bringing a gear provided on the output shaft of a speed reducer being rotated by the ink source motor, via an independent driving electromagnetic clutch (hereinafter referred to simply as an electromagnetic clutch) and a plurality of gears, into gear with any gear of a gear train for driving the ink roller array (which is driven by a print cylinder gear), (3) releasing the engagement of an ink clutch gear, when to drive the ink roller array by the ink source motor, and (4) bringing a call roller into contact with the ink source roller and a transfer roller.

Therefore, (1) the ink roller array can be driven independently by the ink source motor while a print unit is not in operation, (2) a print cylinder can never rotate while the ink source motor is driving the ink roller array because the ink clutch gear is out of engagement, and (3) since the call roller never swings when the print cylinder is not in rotation, ink is not taken out from the ink source roller.

Accordingly, by bringing the call roller into contact with the ink source roller and the transfer roller, ink is sent from the ink source roller through various ink rollers to an ink applying roller in accordance with the flow (distribution) of ink.

BRIEF DESCRIPTION OF THE DRAWINGS:

Fig. 1 is a side view showing the drive system of a drive unit to an ink roller array according to the present invention;

Fig. 2 is a schematic diagram showing a gear train of the drive unit which is driven by an ink source motor to drive the ink roller array;

Fig. 3 is a side view showing the mechanism of the drive unit which brings a call roller into pressure contact with the ink source roller and a transfer roller;

Fig. 4 is a side view showing ink roller arrays of a print unit of an offset rotary press;

Fig. 5 is a side view showing a conventional gear train for driving the ink roller array of the rotary press; and

Fig. 6 is a side view showing a mechanism for swinging the call roller of the ink roller array shown in Fig. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

A drive unit for an ink roller array according to the present invention is shown in Figs. 1, 2 and 3 in which the identical components with those shown in Figs. 4 through 6 are designated by the same reference numerals.

In Figs. 1 and 2, a gear 51 is attached to a

shaft 59 of the worm wheel 39 held in gear with the worm 38 which is driven by the ink source motor 34 via the gears 35 and 36. An electromagnetic clutch 54 is attached to a support shaft 53 of a gear 52 held in gear with the gear 51. When the electromagnetic clutch 54 is energized to transmit rotational motion, a gear 56 is driven via a gear 55 attached to the support shaft 53. This gear 56 is attached to a shaft 23 of the reciprocating-roller driving intermediate gear 23a included in the gear train of the ink roller array A which is driven via the ink clutch gear 20a by the gear 4b of the back plate cylinder 4.

In Fig. 3, a contactless sensor 57 detects when the swinging call roller 18 comes into contact with the ink source roller 19, thereby stopping the call roller 18 while holding it in pressure contact with the ink source roller 19. Then, an air cylinder 58 is actuated in the direction of the arrow, so that the transfer roller 17 is moved from the (one-dot chain line) position occupied thereby when the call roller 18 swings to the solid line position, coming into pressure contact with the call roller 18. The degree of pressure contact (nip pressure) is regulated by an adjusting bolt 59.

The procedure will be described that is for switching the drive mechanism from the state wherein the ink roller array A (B) is rotated by the back (front) plate cylinder 4 (4') via the ink clutch 20 (20') and the gear train to a drive mode for independently driving the ink roller array. (1) The contactless sensor 57 (57') is put in operation when the print unit stops, so that the call roller 18 (18') comes into pressure contact with the ink source roller 19 (19') and stops in place (Fig. 3). (2) After the back (front) plate cylinder 4 (4') and the ink roller array A (B) stop, the degree of opening of plural ink keys (not shown) provided in the source roller 19 (19') in its axial direction is set in accordance with a pattern to be then printed. (3) The ink clutch gear 20a (20a') is brought to its OFF position, so that it comes out of engagement with the gear 9a (9a') of the gear train A (B) (the OFF position). (4) The air cylinder 58 (58') shown in Fig. 3 is actuated in the direction of the arrow, so that the transfer roller 17 (17') is brought into pressure contact with the call roller 18 (18') which is held in pressure contact with the ink source roller 19 (19'). (5) Then, the electromagnetic clutch 54 (54') is energized. (6) The ink source motor 34 (34') is rotated.

Although the steps (3) through (6) of the foregoing procedure can be performed manually, if a changeover switch of a control unit not shown is provided and switched to an independent drive position such that the rotary actuator 40 (40') is actuated, the ink clutch gear 20a (20a') comes out of engagement with the gear 9a (9a') as in the step

(3), whereby the step (4) and the steps after step (4) can be performed automatically by the control unit.

Then, if the foregoing changeover switch is switched to a normal drive position to bring the state wherein the ink roller array A (B) rotates normally (to cause printing), (1) the ink source motor 34 (34') is stopped, (2) the electromagnetic clutch 54 (54') is deenergized, (3) the air cylinder 58 (58') is actuated in the direction opposite to the arrow direction, so that the transfer roller 17 (17') is returned to the initial (one-dot chain line) position, (4) the ink clutch gear 20a (20a') is brought into gear with the gear 9a (9a') by the rotary actuator 40 (40') (the ON position), and (5) the ink source motor 34 (34') takes a rotatable state.

In the drive unit for the ink roller array according to the present invention, to supply ink necessary for a next printing process to the ink applying roller during preparation of the running, the ink roller array forming the inking unit provided in the print unit of the rotary press is driven by the ink source motor for driving the ink source roller of the inking unit while the print unit is not in operation, and the ink call roller is brought into contact with the ink source roller and the ink transfer roller. Therefore, the following advantages are provided: (1) Ink necessary for a next printing process is applied to the ink roller array in accordance with a given ink distribution during preparation of the running of the rotary press; thus, a printing paper is wasted little at the beginning of the print operation. (2) The application of ink to the ink roller array is performed by the drive unit for independently driving the ink roller array without rotating the print cylinder; thus, ink can be applied to the ink roller array even while retaining the paper in the print unit. (3) By performing the application of ink to the ink rollers during other steps of the procedure, the time necessary for preparation can be shortened.

gear train for driving the ink roller array is released when the ink roller array is driven by the ink source roller.

Claims

1. A drive unit for an ink roller array of an inking unit provided in a print unit of a rotary press, structured so that the ink roller array of an inking unit can be driven by an ink source motor for driving an ink source roller of the inking unit while the print unit is not in operation, and that an ink call roller can be brought into contact with the ink source roller and an ink transfer roller, whereby ink necessary for a next printing process can be sent up to an ink applying roller during preparation of the running of the rotary press.

2. A drive unit for an ink roller array according to claim 1, wherein the engagement of a gear of a plate cylinder with an ink clutch gear in gear with a

Fig. 1

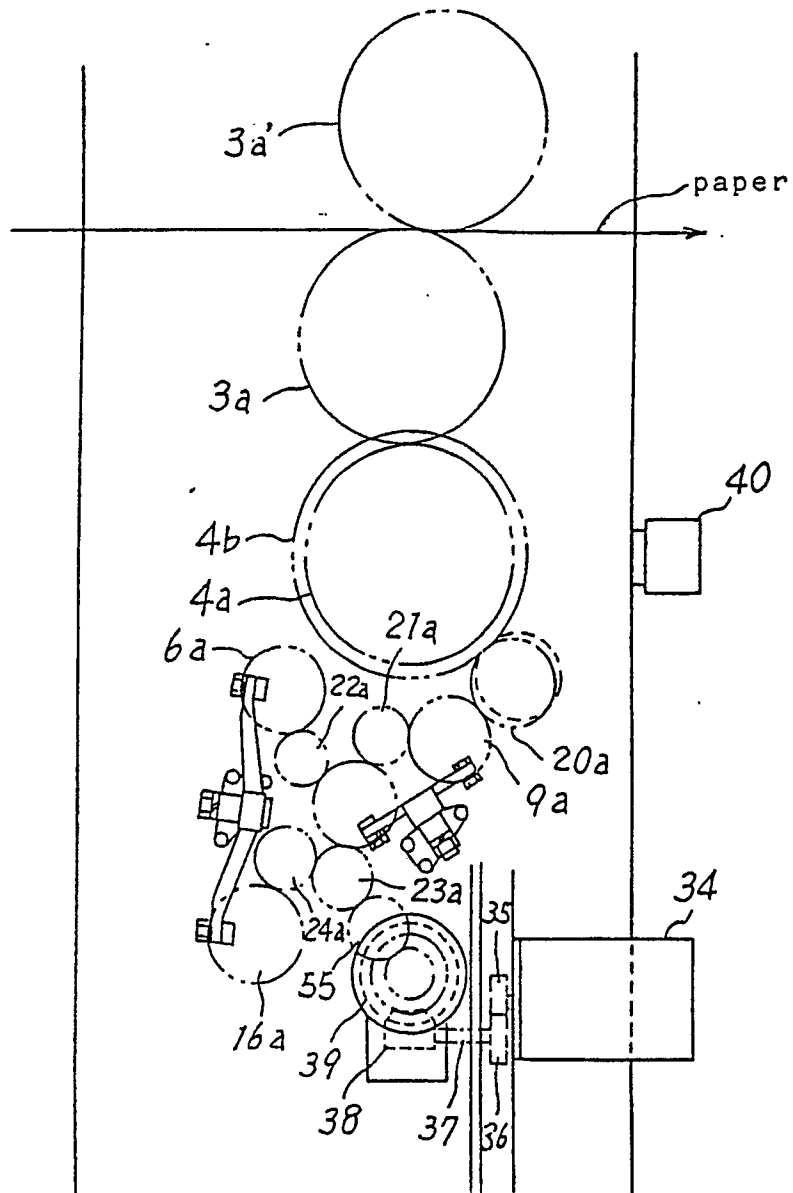


Fig. 2

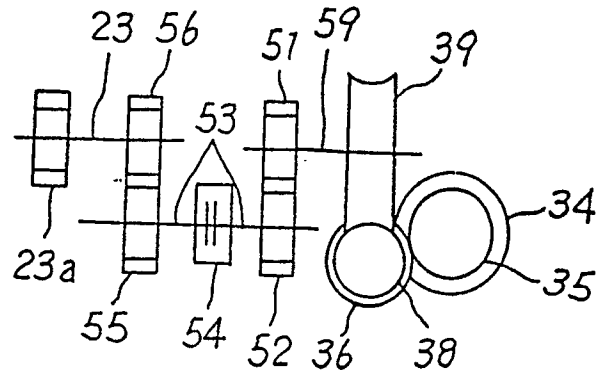


Fig. 3

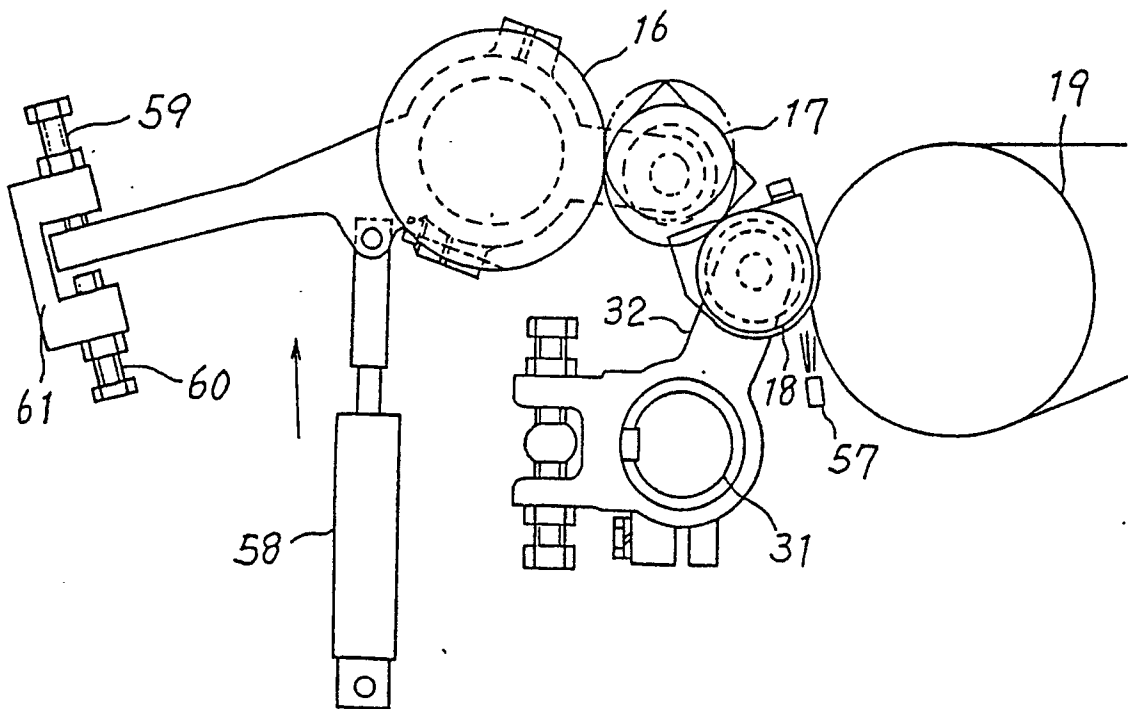


Fig. 4 (Prior Art)

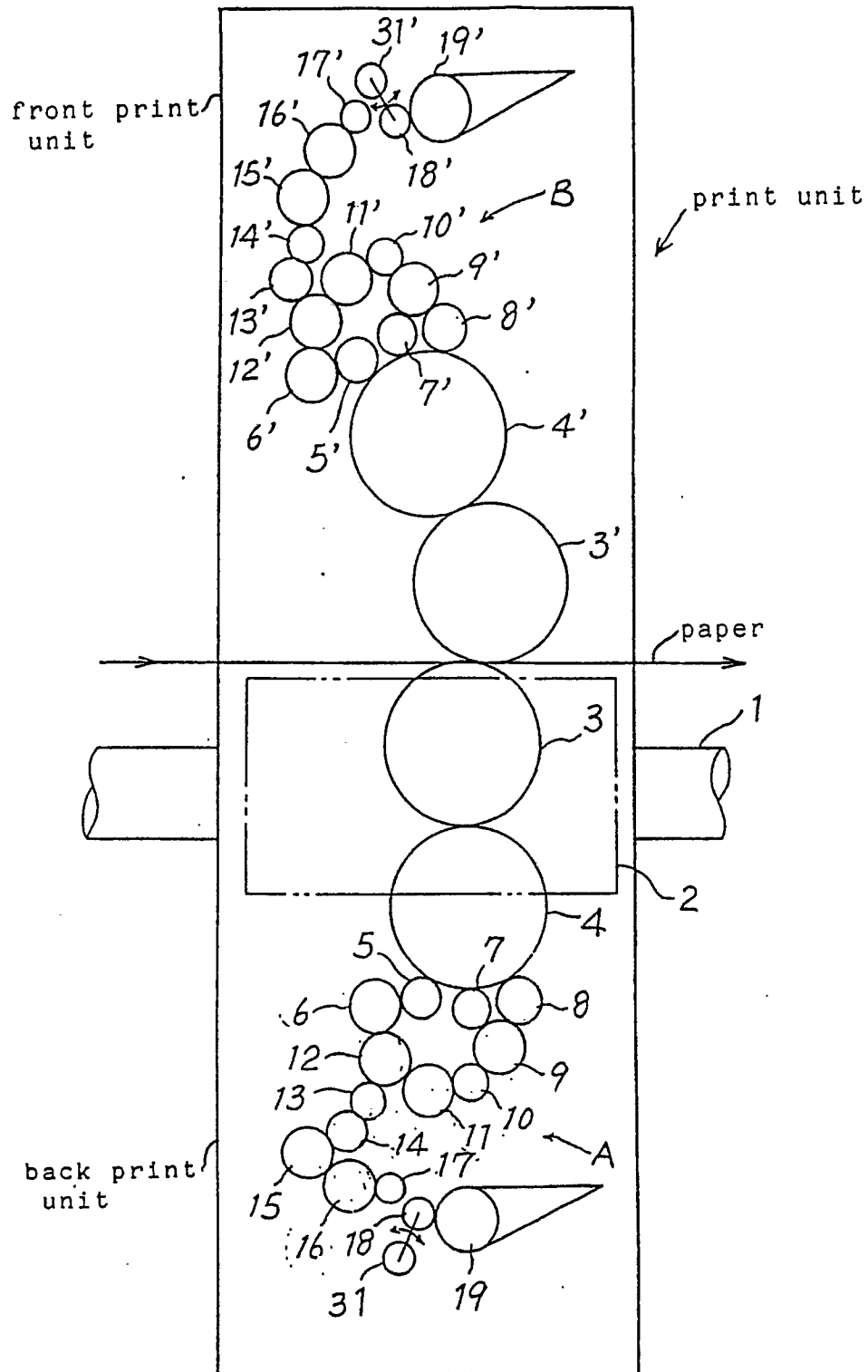


Fig. 5 (Prior Art)

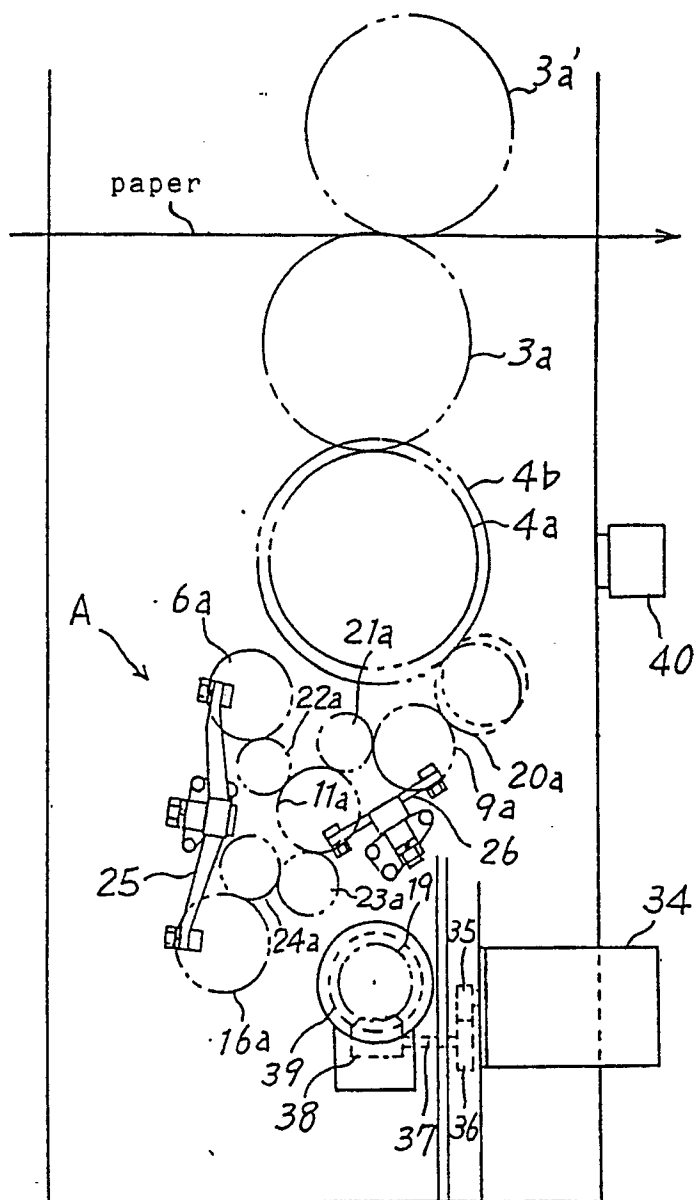


Fig. 6 (Prior Art)

