United States Patent [19]

Gazzola et al.

[11] **3,762,319**

[45] **Oct. 2, 1973**

[54] **PLATE WIPING MECHANISM FOR INTAGLIO PRESS**

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[22] Filed: **Aug. 20, 1971**

[21] Appl. No.: **173,555**

[52] **U.S. Cl.** **101/155,** 101/152

[51] **Int. Cl.** **B41f 9/10,** B41f 9/16

[58] **Field of Search** 101/154, 155, 161, 101/164, 167, 169, 152

[56] **References Cited**

UNITED STATES PATENTS

2,178,639	11/1939	Marquardt	101/155
2,548,217	4/1951	Huck et al.	101/169
2,987,993	6/1961	Giori	101/167
3,343,484	9/1967	Dahlgren	101/148
3,486,444	12/1969	Huck	101/155

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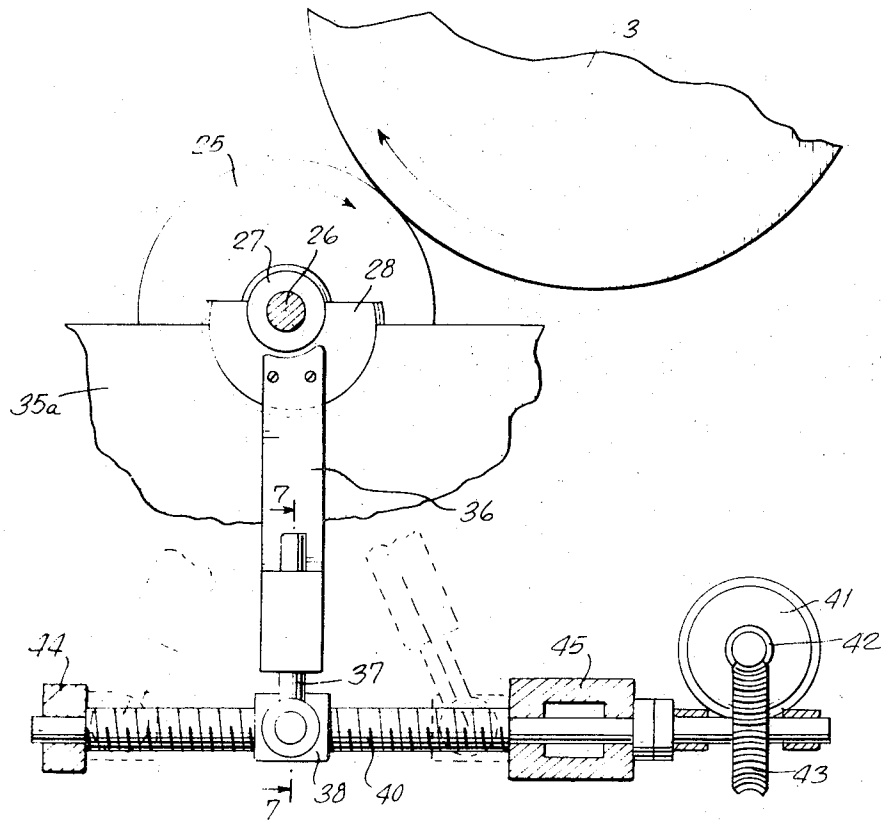
[57] **ABSTRACT**

The plate wiping mechanism includes a wiping roll running in the opposite direction to and having its surface in rubbing contact with the printing plate of the intaglio press. The wiping roll is journaled in the sides of a tank containing an ink solvent, so that the periphery of the wiping roll moves from its position of contact with the plate through a bath of ink solvent, and then moves again to engage the plate. The wiping roll is driven from the main drive of the press through a control system by which the rotational speed of the wiping roll may be set as an adjustable proportion of the speed of the printing plate. The wiping roll is also arranged for endwise reciprocation with respect to the intaglio plate. The motor for driving the wiping roll in its endwise reciprocation is also controlled at a speed adjustably proportional to the speed of the intaglio plate.

The wiping roll is fixed on a shaft whose opposite ends are individually adjustable by means of eccentrics to vary the pressure between the wiping roll and the intaglio plate. These eccentrics are rotatably mounted in the walls of the solvent tank. The joints in which the wiping roll shaft turns are constructed to accommodate rotation, endwise reciprocation, and eccentric adjustment of the shaft position. Furthermore, the driving connections by which the shaft is rotated and by which it is reciprocated are constructed to accommodate withdrawal of the solvent tank and the wiping roll as a unit from its operating position where the roll contacts the plate to a retracted position where the roll is separated from the plate.

6 Claims, 13 Drawing Figures



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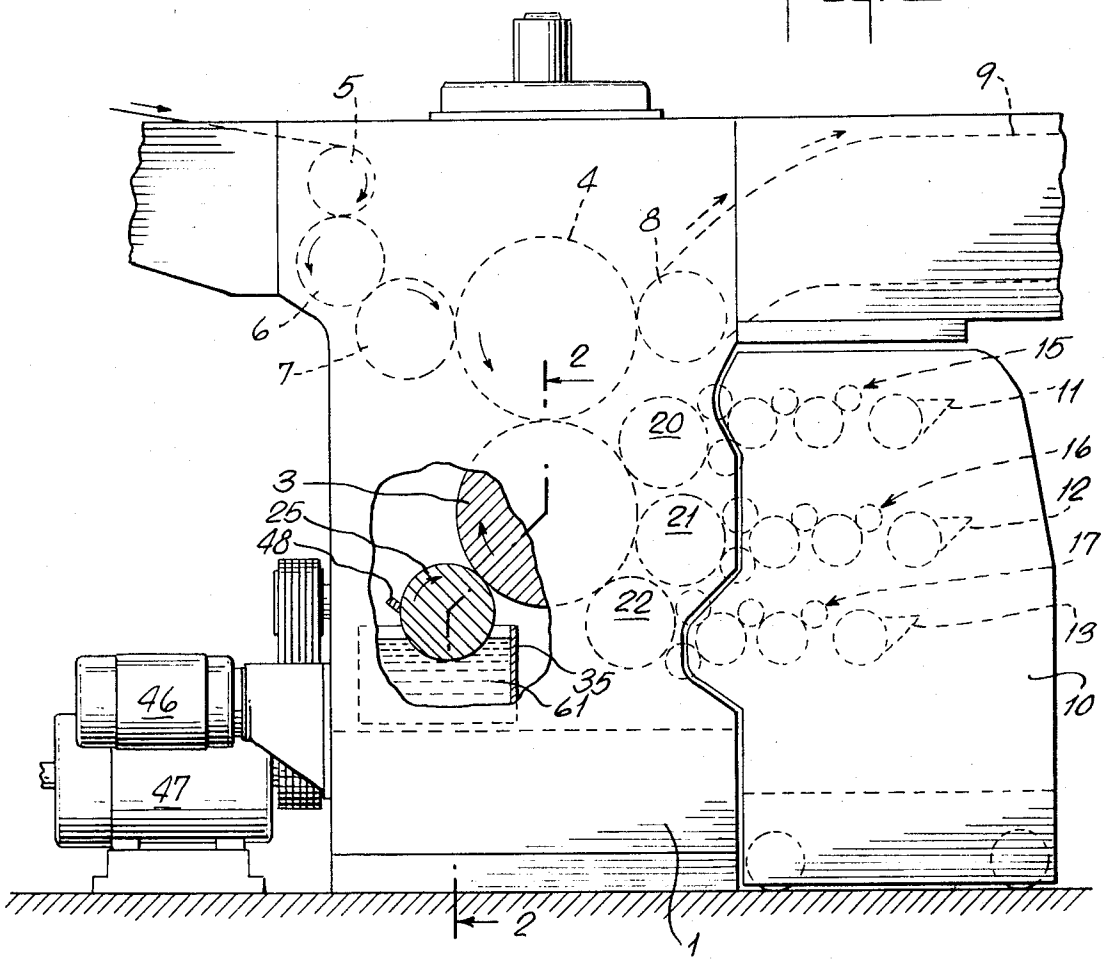
SHEET 1 OF 5

Fig. 1.



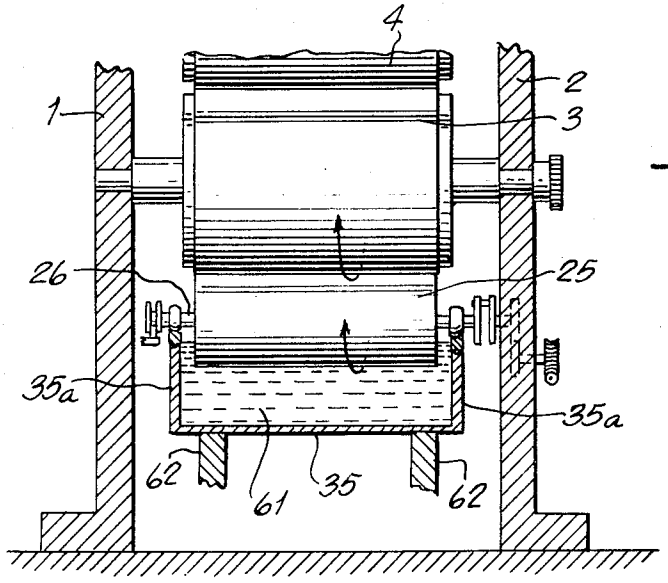


Fig. 2.

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ATTORNEY

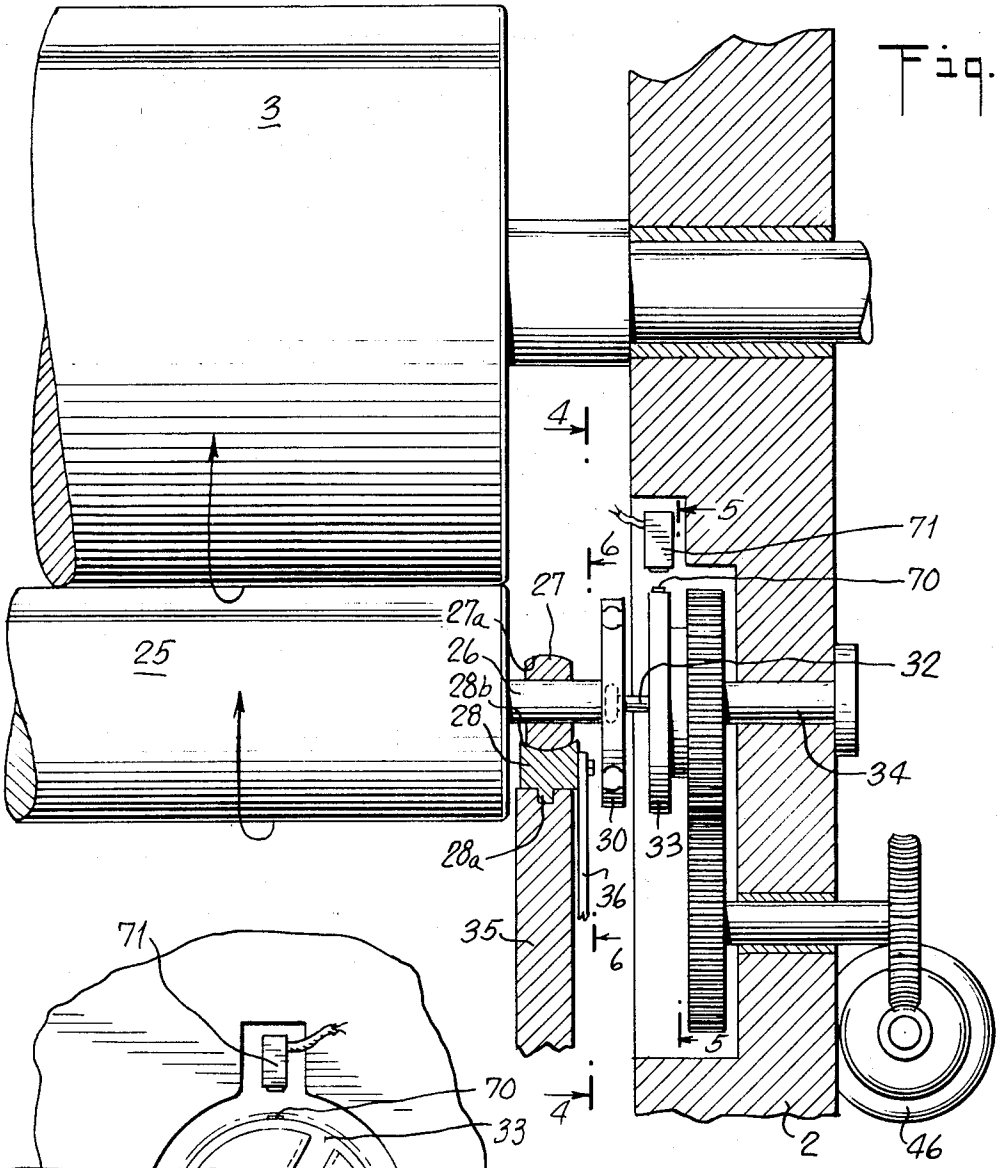
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Fig. 3.

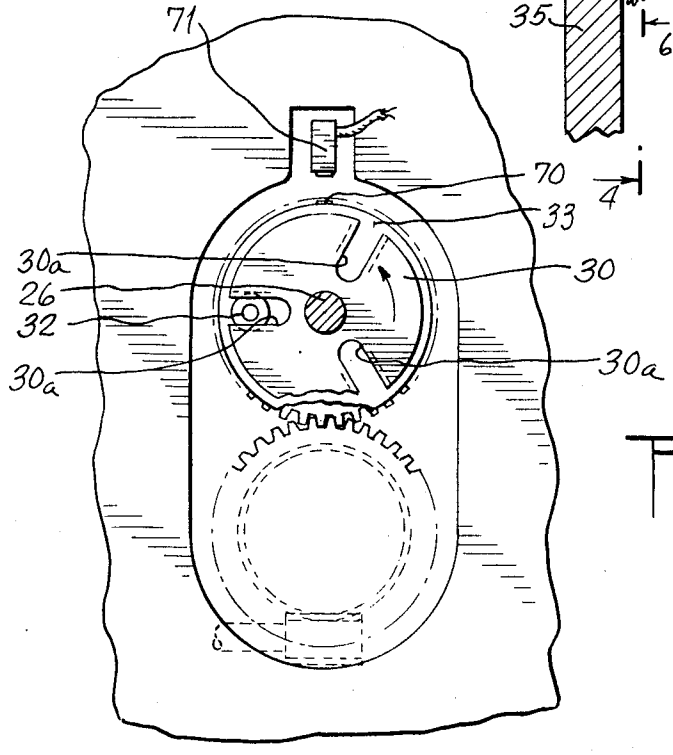
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Fig. 4.

Fig. 5.

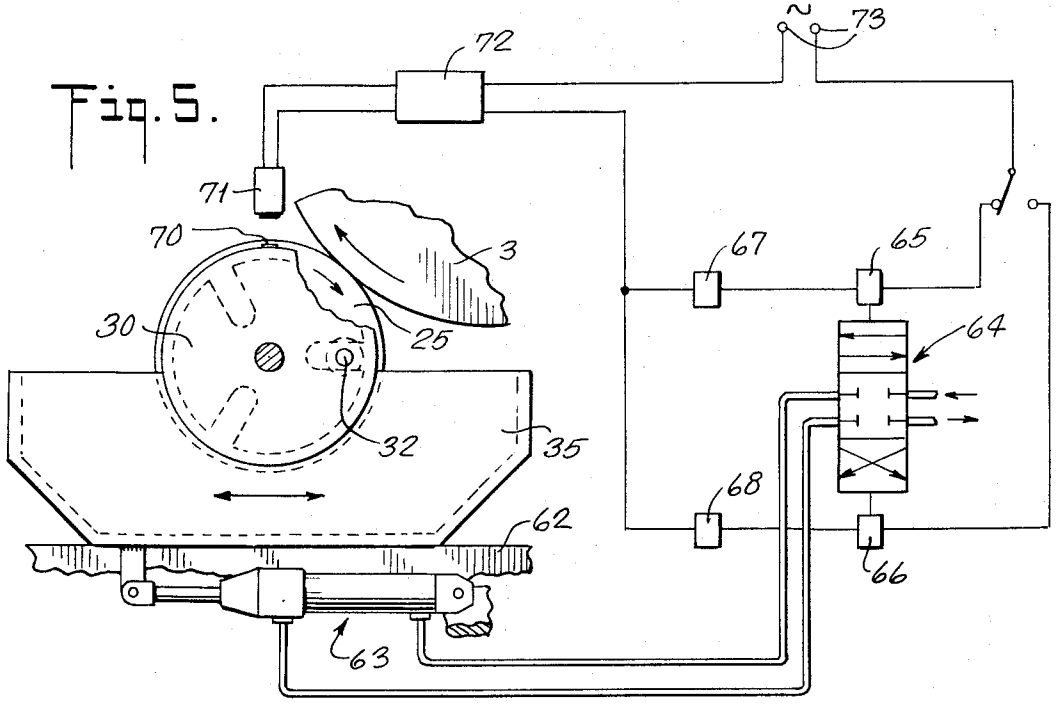


Fig. 6.

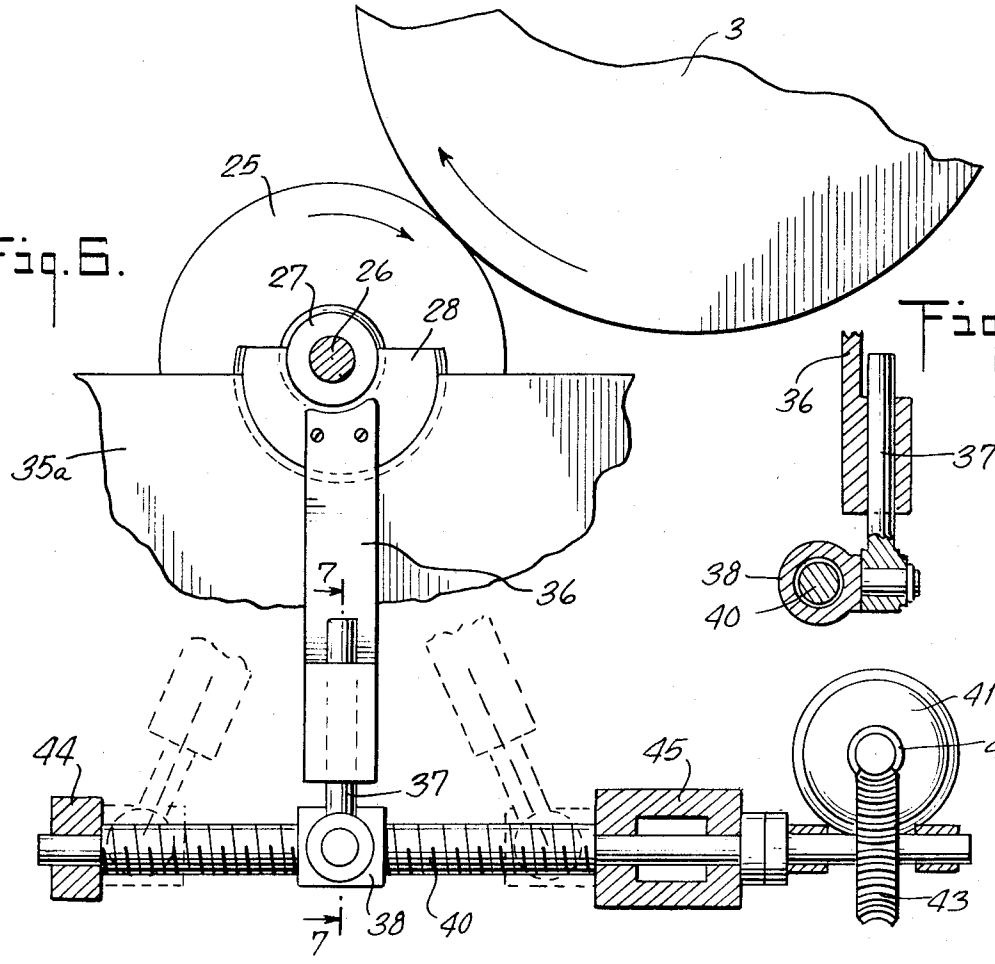
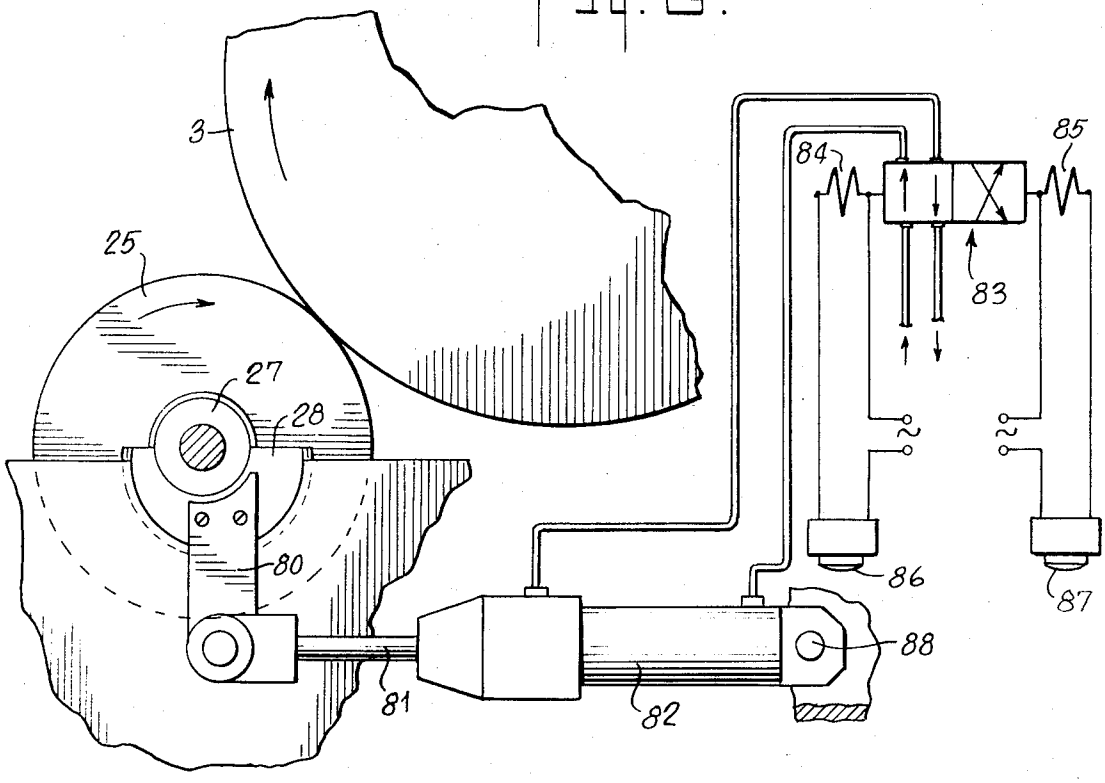


Fig. 7.

Fig. 8.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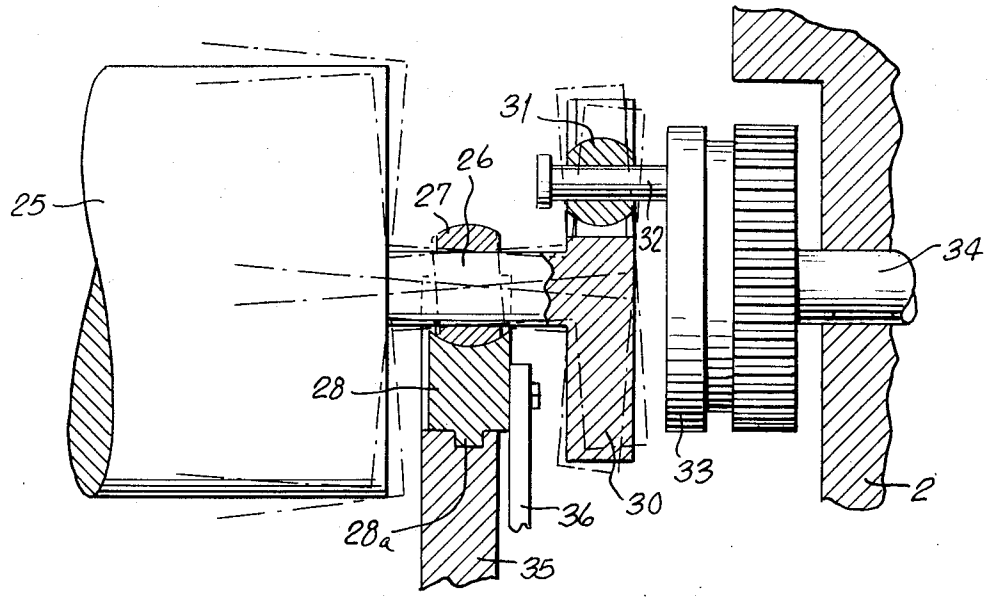
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Fig. 9.

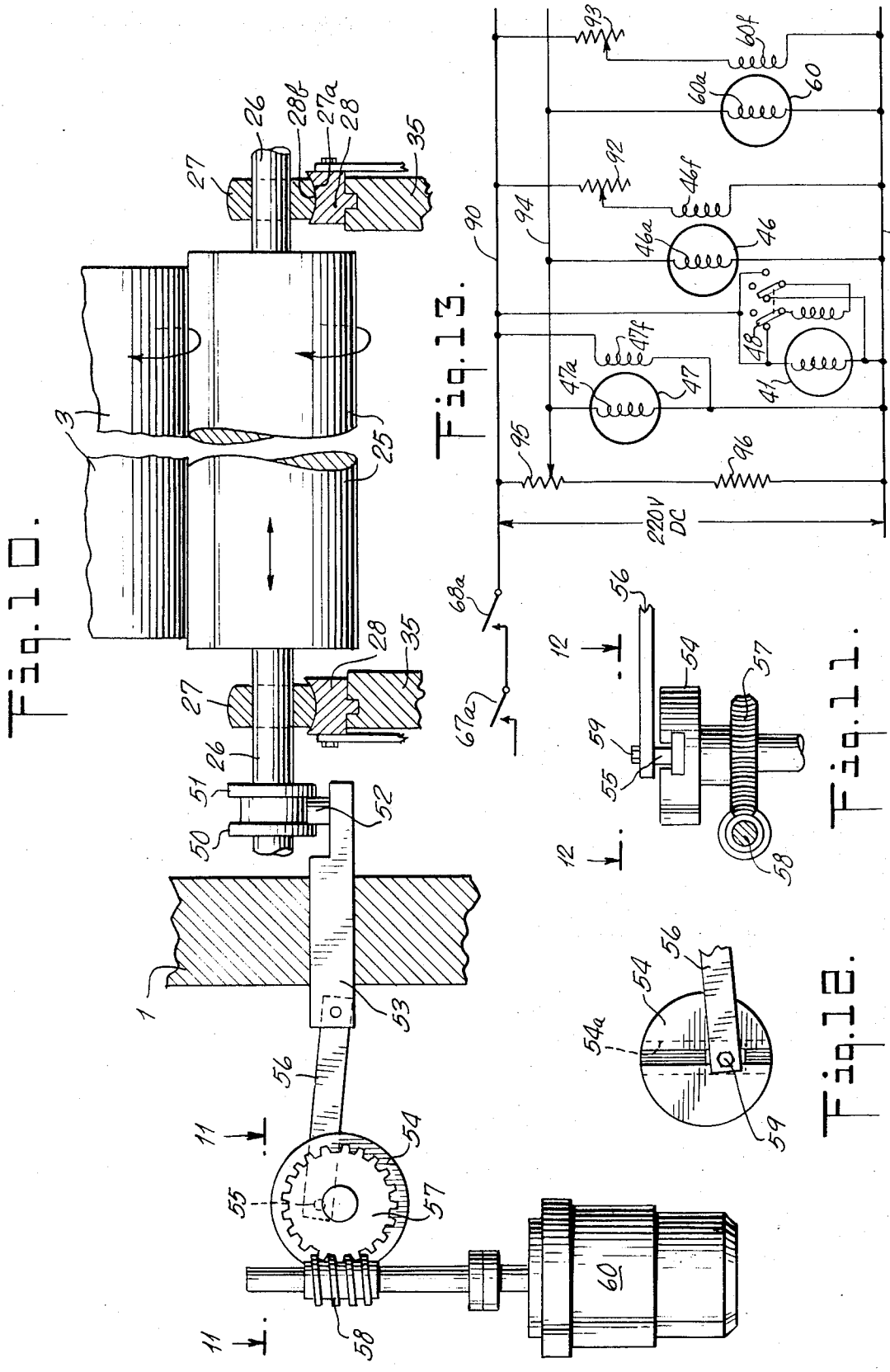
Fig. 10.
Fig. 13.
Fig. 11.
Fig. 12.
220 V DC

PLATE WIPING MECHANISM FOR INTAGLIO PRESS

BRIEF SUMMARY OF THE INVENTION

Intaglio printing involves making impressions from the surface of a smooth plate, usually metal, having recesses, usually in the form of fine lines, in its surface. In making an impression from such a plate, ink is first applied over the entire surface of the plate, covering the smooth surface and the recesses. The ink is then wiped from the smooth surface, leaving the ink only in the engraved recesses in the plate. The plate is then brought into contact with a sheet of paper or other material to be printed, under high pressure, forcing the paper into the recesses, so that the ink therein is transferred to the paper and reproduces the recesses on the plate.

The present invention relates to an improved mechanism for wiping such a plate, and in particular for wiping such a plate when it is mounted on the plate cylinder of a rotary press.

The wiping mechanism of the present invention employs a single wiping roll, mounted on a shaft journaled in the walls of a tank containing a liquid ink solvent. The periphery of the wiping roll runs in wiping engagement with and in the opposite direction to the surface of the intaglio plate on the plate cylinder. The shaft of the wiping roll is rotated at a speed adjustably proportional to the speed of the intaglio plate. The wiping roll shaft is also reciprocated at a speed adjustably proportional to the speed of the intaglio plate.

The tank and the wiping roll journaled in its walls are mounted for removal as a unit from the active position in which the wiping roll engages the surface of the intaglio plate to a retracted position in which either the roll or the solvent may be removed or replaced.

Provision is made to adjust the pressure between the wiping roll and the intaglio plate. Independent pressure adjusting means are provided at the opposite ends of the wiping roll shaft. The shaft rotating drive mechanism is connected to one end of the wiping roll shaft, and the shaft reciprocating drive mechanism is connected to the opposite end. The joints supporting the wiping roll shaft in the walls of the solvent tank and the joints connecting that shaft to the drive mechanisms are constructed to accommodate all the necessary movements of the shaft, namely rotation, reciprocation, eccentric adjustment of the shaft axis (angular and parallel), and removal of the wiping roll and the tank unit from the drive mechanism.

In order to provide a driving connection for the rotating drive, which may be separated for removal of the tank and wiping roll unit, one end of the wiping roll shaft is provided with a disc having a radial slot. A crank is mounted on a fixed support in substantial alignment with the axis of the wiping roll shaft. The crank is provided with a crank pin extending parallel to its shaft. The crank pin carries a bearing slidable along the pin and having an external spherical surface received between cylindrical surfaces defining the walls of the slot in the disc. The cooperating spherical and cylindrical surfaces on the bearing and slot together with the sliding cylindrical surfaces on the bearing and the crank pin accommodate all the necessary relative movements of the crank pin and the shaft of the wiping roll. Furthermore, since the outer end of the slot is open, this construction permits engagement or separation of the driven wiping roll shaft from the driving crank pin at those times when the slot and the crank pin are properly aligned with respect to the path of movement of the wiping roll and tank unit.

DRAWINGS

FIG. 1 is a fragmentary elevational view of an intaglio printing press embodying the invention, with certain parts broken away and others shown in section.

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary view of a portion of FIG. 2, shown on a greatly enlarged scale.

FIG. 4 is a sectional fragmentary view taken on the line 4—4 of FIG. 3.

FIG. 5 is a partly diagrammatic view, partly in section on the line 5—5 of FIG. 3.

FIG. 6 is a view taken on the line 6—6 of FIG. 3, wich coincides with the line 4—4, but looking in the opposite direction.

FIG. 7 is a fragmentary view on line 7—7 of FIG. 6.

FIG. 8 is a view similar to FIG. 6, showing a modification.

FIG. 9 is a fragmentary view similar to part of FIG. 3, still further enlarged.

FIG. 10 is a view similar to FIG. 3, but also showing the opposite end of the wiping roll shaft and the reciprocating drive mechanism.

FIG. 11 is a sectional view taken on the line 11—11 of FIG. 10.

FIG. 12 is a view on the line 12—12 of FIG. 11.

DETAILED DESCRIPTION

As shown in FIGS. 1 and 2, the press includes a front vertical frame member 1 and a rear vertical frame member 2. Between the frame members 1 and 2 are journaled a plate carrying cylinder 3 and a pressure cylinder 4. Sheets of paper to be printed may be supplied by conventional sheet feeding mechanisms to a train of sheet feeding rolls 5, 6, 7, from which they are transferred to the pressure cylinder 4, and pass through the bite between the pressure cylinder and the plate carrying cylinder 3. The printed sheets are than removed by a transfer roll 8, from which they are carried away by a suitable conveyor 9.

The press illustrated is a multicolor press. The ink applying mechanism includes a carriage 10 (FIG. 1) on which are mounted three ink reservoirs 11, 12 and 13 connected by ink conveying roller trains 15, 16 and 17 to roll 20, 21 and 22, which transfer the ink to the plate on the cylinder 3. The rolls 20, 21 and 22 are contoured, so that each contact a portion only of the surface of the cylinder 3. Typically, only one color of ink will be applied to any given portion of the surface of the plate, although it may be arranged that the colors overlap, if desired.

The plate carrying cylinder 3 turns clockwise, as viewed in FIG. 1. A wiping roll 25 is rotatably mounted in the sides of an ink solvent tank 35, as described in detail below. The roll 25 is covered with a material which has suitable friction characteristics, i.e., a low coefficient of sliding friction, and which also resists attack by the solvent employed in the tank 35. For example, if the solvent is trichlorethylene, then the surface of roll 25 may be polyvinyl alcohol. The roll 25 turns clockwise as viewed in FIG. 1, and has its periphery in

rubbing contact with the periphery of the plate cylinder 3. The roll 25 is fixed on a shaft 26 (FIG. 2) The ends of the shaft are slidably received in and supported by a pair of bearings 27 (FIG. 3), having central cylindrical apertures to receive the shaft 26 and external spherical surfaces 27*a*, which are received in seats 28 having mating spherical surfaces 28*b*. The right-hand end of the shaft 26 projects beyond the bearing 27 and has fixed to its end a disc 30, having a plurality of radial slots 30*a* (FIG. 4). The surfaces defining the sides of slot 30*a* are cylindrical in contour, so that they may receive a bearing 31 (FIG. 9) having a spherical external surface and having a cylindrical internal surface which is slidably mounted on a crank pin 32 carried by a crank 33, fixed on a shaft 34 journaled in the frame 2 of the press.

The disc 30 only needs a single slot 30*a*, although three equally spaced slots provide better balance, as shown. The disc 30 may be replaced by a mechanically equivalent member having a single slot, although the balance will not be as good.

Each eccentric 28 is provided with a cylindrical peripheral surface having a projecting guide rib 28*a*, and is seated in a cylindrical recess in each side wall of an ink solvent tank 35. The eccentrics 28 are rotatable about a center which is displaced from the axis of the shaft 26, as best seen in FIG. 6. Rotation of the eccentric 28 is accomplished by means of an arm 36 fixed at one end to the eccentric 28 and having its opposite end telescopingly connected to a rod 37. The end of rod 37 remote from eccentric 28 is pivotally mounted on a nut 38 riding on a lead screw 40 driven by a motor 41 through a worm 42 and a worm gear 43. Motor 41 may be a direct current motor with a shunt field, controlled by a conventional reversing switch 48 (FIG. 13). Lead screw 40 is journaled in fixed frame members 44 and 45. By appropriately controlling the reversible motor 41, the eccentric 28 may be turned on its axis so as to vary the pressure between the wiping roll 25 and the plate cylinder 3. Separate mechanisms are provided for adjusting the eccentrics 28 at the opposite ends of the shaft 26, although only one of the adjusting mechanisms is shown.

The shaft 34 (FIG. 3) is rotated by a motor 46, acting through an appropriate gear train. The motor 46 is controlled so that its speed is adjustably proportional to the speed of the motor 47 (FIG. 1) which drives the plate cylinder 3. Numerous adjustably proportional speed control systems are available in the art, and any suitable one may be employed. A sinple circuit is shown in FIG. 13 and described below.

The left-hand end of the shaft 26, as viewed in FIGS. 2 and 10, carries a pair of parallel flanges 50 and 51. A finger 52 rides between the flanges 50 and 51 at the lower side of the shaft 26. The finger 52 is supported at the end of a slider 53, which is reciprocated by a crank 54 driving a crank pin 55 connected to the slider 53 through a connecting rod 56. The crank 54 is fixed on the same shaft with a worm gear 57 cooperating with a worm 58 driven by a motor 60. The motor 60, like the motor 46, is driven at a speed which is an adjustable proportion of the speed of the motor 47 which drives the plate cylinder 3.

The rotating speed of the wiping roll 25 and its frequency of reciprocation are made adjustable so as to accommodate the wiping effectiveness of the roll 25 to variations in the intaglio plates on the plate cylinder 3. Depending upon the density, width and depth of the engraved recesses on the intaglio plate, it may be necessary to rotate the wiping roll 25 faster or slower, or to reciprocate it faster or slower. It may also be desirable to change the length of the reciprocating stroke, which may be done by adjusting the position of the crank pin 55 on the crank 54. The crank pin 55 has a T-head, which rides in a T-slot 54a on the crank. The radial position of the crank pin 55 in the slot 54a is adjustable by means of a nut 59.

The most effective rotational speed, the most effective frequency of reciprocation, and the most effective length of the stroke of reciprocation are all best determined empirically, and vary from one printing plate to the next.

The tank 35 contains a pool 61 (FIG. 2) of solvent. The periphery of the roll 25 moves from its point of contact with the plate cylinder 3 through a range of positions where it is bathed in the solvent. The surface of the roll 25 is engaged by a doctor blade 48 (FIG. 1) shortly after it leaves the pool of solvent, so that excess solvent is scraped from the roll, and does not contact the plate cylinder 3. The doctor blade may be supported from the shaft 26, by conventional means (not shown) so that it follows all the changes in position of the roll 25.

The solvent tank 35 is supported on a pair of rails 62 for sliding movement between the operating positions shown in the drawings, in which the periphery of the wiping roll 25 rubs against the periphery of the plate cylinder 3, and a retracted position, not shown, in which the cylinders 25 and 3 are separated. As shown in FIG. 5, the wiping roll 25 and the solvent tank 35 may be moved between their operating and retracted positions by means of a hydraulic cylinder 63 controlled by a valve mechanism 64 operated by a pair of solenoids 65 and 66. Energization of solenoid 65 operates valve 64 to apply pressure to the right end of the hydraulic cylinder 63, so that the unit including the tank 35 and the cylinder 25 is moved to the left, toward its retracted position. Energization of solenoid 66 supplies pressure to the left end of hydraulic cylinder 63, so that the tank 35 and cylinder 25 are moved toward their operating positions.

In order that the hydraulic cylinder 63 may move the unit including the tank 35 and the wiping roll 25, it is necessary that the slot 30*a* and the crank pin 32 be properly aligned with respect to the path of movement of the wiping roll and the tank unit. More specifically, both the slot 30*a* and the plane containing the axis of the crank pin 32 and its axis of rotation must be parallel to the path of movement of the wiping roll and tank unit. In the arrangement shown, the wiping roll and tank unit moves horizontally, so that both the slot 30*a* and the plane containing the axis of the pin 32 and its axis of rotation must be horizontal. Furthermore, the open end of the slot 30*a* must be directed toward the plate cylinder (i.e., toward the left as shown in FIG. 4 and toward the right as shown in FIG. 5). The crank pin must also be spaced from its axis of rotation in the same direction, i.e., toward the left as shown in FIG. 4 and toward the right as shown in FIG. 5. In other words, there is only one angular position of crank pin 32 and only one angular position of slot 30*a* which provide the proper alignment. If the crank pin 32 and the slot 30*a* are in these angular positions, then the unit inlcuding the tank 35 and the wiping roll 25 may be moved hori-

zontally in either direction as required to move the crank pin **32** into or out of the open end of slot **30***a*. It is therefore necessary that the controls for the solenoids **65** and **66** be arranged so that neither one can be energized unless the crank pin **32** and the slot **30***a* are properly aligned, as shown in FIGS. **4** and **5**. This is accomplished in the apparatus shown in FIGS. **3–5**, by providing an angular position detector for the crank **33**, which includes a metal aramture **70** on the periphery of the crank and a pick-up coil **71** mounted on the frame of the press adjacent the path of the armature **70**. The armature **70** may be a permanent magnet or may have some other characteristic which is detected by the pick-up coil **71**, when it reaches a position of proximity to that coil. The positions of the armature **70** and the coil **71** are such that they are in proximity only when he crank pin **32** is in the proper angular position, as described above. Referring to FIGS. **4** and **5** (which are viewed from opposit sides), it may be seen that in each figure the armature **70** is in proximity with the coil **71**, and that the slot **30***a* in which the crank pin **32** is riding in horizontal. The pick-up coil **70** controls a gate mechanism **72** (FIG. **5**) which permits the passage of electric current from a source of supply **73** through the solenoids **65** and **66** only when the armature **70** is in proximity to the coil **71**.

A relay **67** has a winding connected in series with solenoid **65** and when energized, opens a normally closed contact **67***a* (FIG. **13**). A relay **68** has a winding connected in series with solenoid **66** and when energized, opens a normally closed contact **68***a* (FIG. **13**). Contacts **67***a* and **68***a* are connected in series in one of the power supply lines for the motors **41, 46, 47** and **60**, FIGS. **10** and **13**). When either of the solenoids **67** or **68** is energized to operate the hydraulic cylinder **63**, then one of the contacts **67***a* or **68***a* is opened to de-energize all of the motors **41, 46, 47** and **60**, as long as either solenoid **65** or **66** remains energized.

It may be seen that the mechanism illustrated permits all the various motions required of the shaft **26**. In other words, the shaft may rotate, reciprocate, or have its axis eccentrically adjusted at either or both of two spaced points, or the tank unit including the shaft **26** and its accompanying roll **25** can be shifted completely away from its operating position to a retracted position to allow for cleaning, repair, or replacement of the roll **25** or the solvent in tank **35**.

Note that the reciprocating mechanism shown at the left end of shaft **26** in FIG. **10** can accommodate the withdrawal of the shaft **26**, since the finger **5** can simply slide out from between the flanges **50** and **51**. Furthermore, in the mechanism of FIG. **6**, the movement of the roll **25** between its operating and retracted positions is accommodated by the telescoping rod **37** and the arm **36**. As the wiping roll **25** is moved bodily, the telescoping rod **37** and arm **36** simply shift their relative positions to accommodate that movement.

FIG. 8

This figure illustrates a modified form of apparatus for rotating the eccentric **28**. This apparatus is somewhat simpler than that illustrated in FIG. **6**. In FIG. **8**, the eccentric **28** is operated by an arm **80** pivotally connected to a piston rod **81** operated by a hydraulic cylinder **82** controlled by a valve mechanism **83** operated between two positions by solenoids **84** and **85**, controlled by push buttons **86** and **87** respectively. By pushing one of the buttons **86** or **87**, the hydraulic cylinder **82** may be energized to drive the piston rod **81** in either desired direction, thereby rotating the eccentric **28** as required.

The cylinder **82** is pivotally mounted on a firxed support at its right-hand end, as shown at **88**, so that the cylinder **82** and the piston rod **81** are supported by the pivotal mounting **88** and by the pivotal connection with the arm **80**. This arrangement allows the cylinder **82** to pivot to accommodate rotational movement of the eccentric **28** during adjustment of the pressure between the wiping roll **25** and the plate cylinder **3**. This mounting of the cylinder **82** also permits the piston and cylinder to cooperate with the arm **80** in accommodating movement of the wiping roll **25** between its operating and retracted positons.

FIG. 13

This figure illustrates a wiring diagram of circuits for controlling the motors **41, 46, 47** and **60**. The motor **41** is controlled by a reversing switch **48** as mentioned above, and is energized through a suitable direct current energy source through contacts **67***a* and **68***a*, also as mentioned above. Motor **47** is the main drive motor for the press, including the plate cylinder **3**. The field winding **47***f* for motor **47** is connected between power supply lines **90** and **91**. The field winding **46***f* for motor **46** is connected between power supply lines **90** and **91** through a variable resistor **92**. The field winding **6** of for motor **60** is connected between supply lines **90** and **91** through a variable resistor **93**. The armatures **46***a*, **47***a* and **60***a* are all connected between a line **94** and the line **91**. The line **94** is connected to a tap on a voltage dividing resistance **95** connected in eries with a fixed resistance **96** between the power supply lines **90** and **91**. Adjustment of the tap on the resistor **95** varies the voltage supplied to the armatures of all three motors **46, 47** and **60**. For example, if the supply voltage is 220 volts DC, the variable resistor **95** may vary the voltage supplied to the armatures between a minimum of 150 volts and a maximum of 220 volts. Varying the setting of resistor **95** changes the spped proportionally on all three motors **46, 47** and **60**. If it is desired to change the ratio of the speeds of motors **46** and **47**, this can be accomplished by varying the resistance of resistor **92**. Similarly, the ratio of the speeds of the motors **47** and **60** may be varied by changing the resistance of resistor **93**.

It is recognized that the arrangement illustrated for controlling the relative speeds of the motors **46, 47** and **60** is simple and works to maintain the ratios constant only approximately, and only over a limited range of speed variation. Furthermore, changes in the speed of the main motor **47** due to variations in its driven load are not reflected in corresponding changes in the speeds of the motors **46** and **60**. However, the speed ratios concerned are not critical and the variations introduced by the simplicity of the circuit of FIG. **13** are not objectionable. If it is desired to ontrol the speed ratios more accurately, a more elaborate system can be utilized, for example the system shown in the patent to Dinger U.S. Pat. No. 3,559,917.

We claim:

1. An intaglio printing press, including:

a. a rotatably supported plate cylinder;

b. an intaglio printing plate on said cylinder having ink-receiving recesses in its surface;

c. means for rotating the plate cylinder;
d. ink applying means for spreading ink over the surface and into the recesses of the intaglio plate, as the plate cylinder rotates;
e. wiping means for removing ink from the plate surface, comprising a wiping roll fixed on a rotatable shaft and having its periphery in wiping contact with the plate on the plate cylinder after the plate passes the ink applying means;
f. a pair of eccentric means, one at each end of the roll, for independently adjusting the pressure between each end of the roll and the plate surface, each said eccentric means including:
1. a projecting end of the shaft at the end of the wiping roll;
2. a bearing supporting said shaft end, said bearing having a cylindrical surface receiving the shaft end and a spherical external surface;
3. a block having an internally spherical recess receiving and rotatably and tiltably supporting said bearing, said block being rotatable about an axis eccentric with respect to the wiping roll axis; and
g. means for rotating said block about its eccentric axis, including:
1. a lead screw;
2. motor means for driving the lead screw;
3. a nut riding along the lead screw;
4. an arm pivotally connected at one end to said nut and having its other end fixed to said block, said arm including two telescoping members shiftable to accommodate different distances between the nut and the block.

2. An intaglio printing press including:
a. a rotatably supported plate cylinder,
b. an intaglio printing plate on said cylinder having ink-receiving recesses in its surface;
c. means for rotating the plate cylinder;
d. ink applying means for spreading ink over the surface and into the recesses of the intaglio plate, as the plate cylinder rotates; and
e. wiping means for receving ink from the plate, surface a wiping comprising roll fixed on a rotatable shaft and having its periphery in wiping contact with the plate on the plate cylinder, after the plate passes the ink applying means;
f. a tank, a pool of ink solvent in the tank;
g. journal means in the walls of the tank rotatably supporting the ends of the wiping roll shaft so that the surface of the roll, after wiping the plate cylinder, passes through the pool of solvent;
h. means for linearly moving the tank and the wiping roll as a unit between a working position in which the wiping roll periphery engages the plate and a retracted position in which the wiping roll is separated from the plate; and
i. means for rotating the wiping roll, including:
1. a member on one end of the wiping roll shaft outside of the tank, said member having a radial slot open at its outer end; and
2. a crank arm rotatable in a stationary support about an axis approximately aligned with the axis of the wiping roll shaft in the working position of the unit, said crank arm carrying a crank pin extending parallel to the crank arm axis, said member being moved to engage and disengage the crank pin in the radial slot, during movement of the unit along its linear path, when the plane containing the axis of the pin and its axis of rotation is parallel to the slot, so that the crank pin is engaged with the member for concurrent rotation when the unit is in its working position, and the crank pin is disengaged from the member when the unit is moved to its retracted position, said pin being slidable in the slot to accommodate minor misalignments of the crank arm axis and the shaft axis.

3. An intaglio printing press as in claim **2**, including:
a. motor means for driving the unit along its linear path;
b. control means for the motor means including means to prevent operation of the motor means unless the plane containing the axis of the crank pin and its axis of rotation is parallel to the path.

4. An intaglio printing press as defined in claim **3**, in which said operation preventing means includes an angular position detector for the crank arm, said detector comprising:
a. a metal projection on the crank arm;
b. a stationary coil cooperating with said projection and effective to produce a signal only when the projection is in proximity to the coil;
c. motor energization preventing means released by a signal from the coil.

5. An intaglio printing press as defined in claim **2** including:
a. eccentric means for shifting the axis of the wiping roll shaft; and
b. a ball slidable on the crank pin and tiltable in the slot for accommodating adjustments of the shaft axis by said eccentric means.

6. An intaglio printing press as defined in claim **5**, including:
a. means for reciprocating the wiping roll endwise of its axis of rotation, comprising:
1. a pair of parallel flanges on the end of the wiping roll shaft opposite said rotating means;
2. a drive pin between said flanges; and
3. means for reciprocating said drive pin parallel to the axis of the wiping roll shaft;
b. said ball and said journal means in the walls of the tank each including means to accommodate endwise reciprocation of the wiping roll shaft.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,762,319 Dated October 2, 1973

Inventor(s) Ivaldo Gazzola, Salvatore F. D'Amato, Chauncey P. Foote

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 6, line 63, the line should read: "Dinger U.S. Pat. No. 3,559,017."

Signed and sealed this 4th day of February 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,762,319 Dated October 2, 1973

Inventor(s) Ivaldo Gazzola, Salvatore F. D'Amato, Chauncey P.Foote

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Title Page, line 5, the inventor's name should read "Ivaldo Gazzola" not "Valdo Gazzola".

Col. 3, line 50, "sinple" should read -- simple --.

Col. 5, line 34, a parenthesis is missing at the beginning of the line. It should read: "(FIGS. 10 and 13).

Col. 6, line 5, "firxed" should read "fixed";

line 34, "eries" should read "series".

line 42, "spped" should read "speed".

line 59, "ontrol" should read "control".

Col. 7, line 41, claim 2e, "receving" should read "removing";

lines 41 and 42, "plate, surface a wiping comprising" should read: "plate surface, comprising a wiping".

Signed and sealed this 17th day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334