July 18, 1961 J. B. ROOZEE 2,992,609

INKING ROLLER SYSTEM

Filed Aug. 26, 1958 4 Sheets-Sheet 1

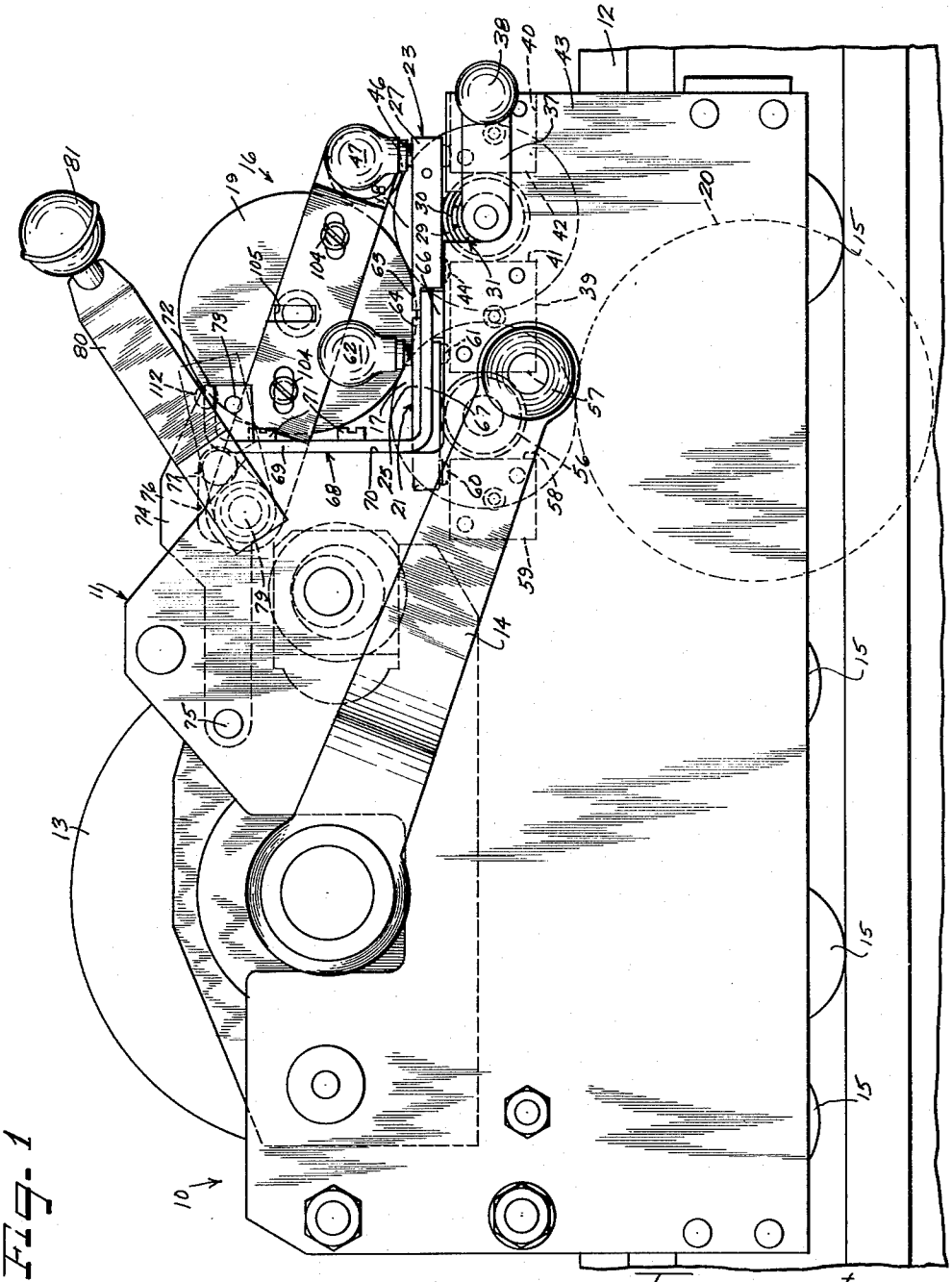


Fig. 1

Inventor
James B. Roozee

by Hill, Sherman, Meroni, Gross & Simpson Attys

July 18, 1961 J. B. ROOZEE 2,992,609

INKING ROLLER SYSTEM

Filed Aug. 26, 1958 4 Sheets-Sheet 2

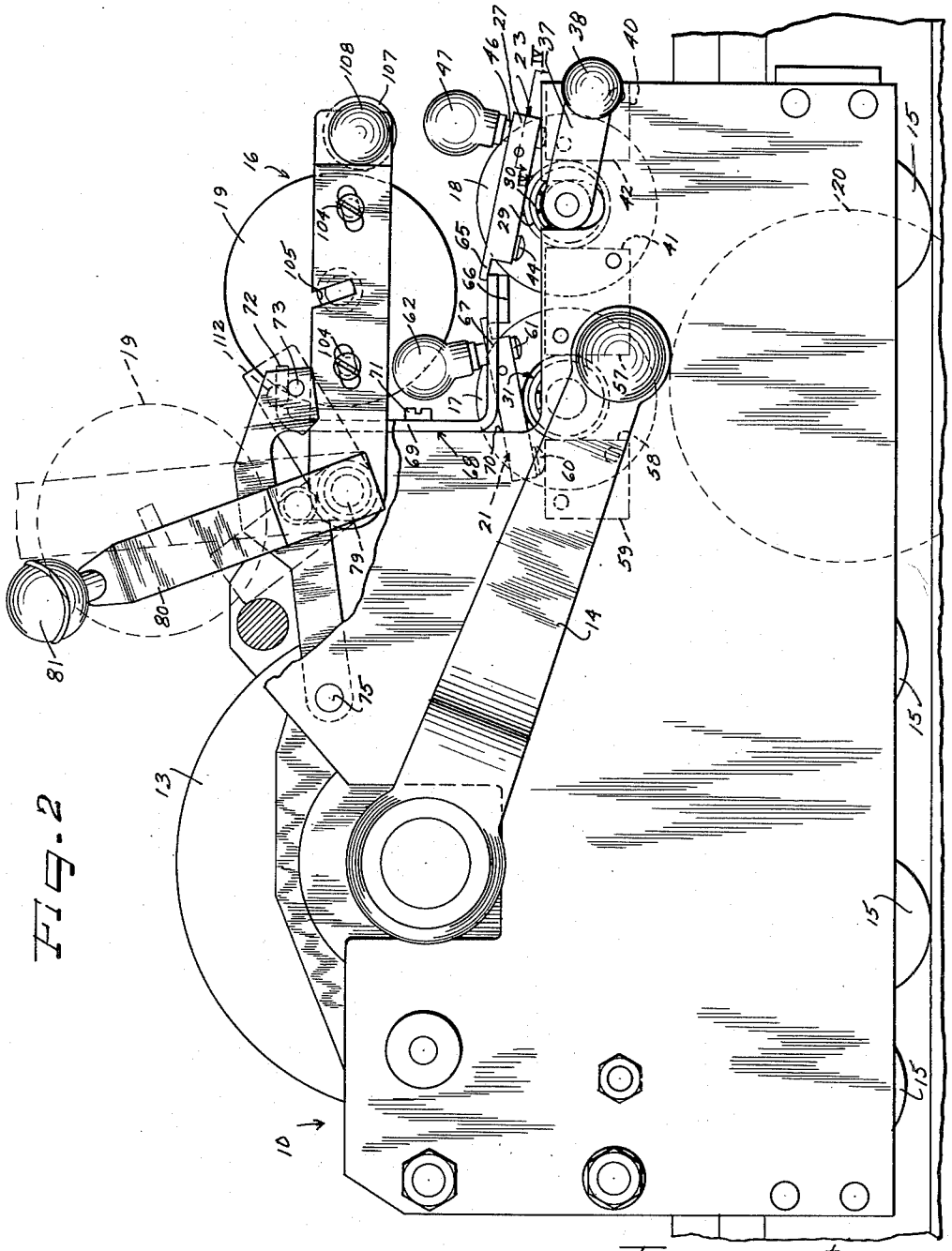


Fig. 2

Inventor
James B. Roozee

by Kill, Sherman, Merriam, Cross & Singleton Attys

July 18, 1961 J. B. ROOZEE 2,992,609

INKING ROLLER SYSTEM

Filed Aug. 26, 1958 4 Sheets-Sheet 3

Fig. 3

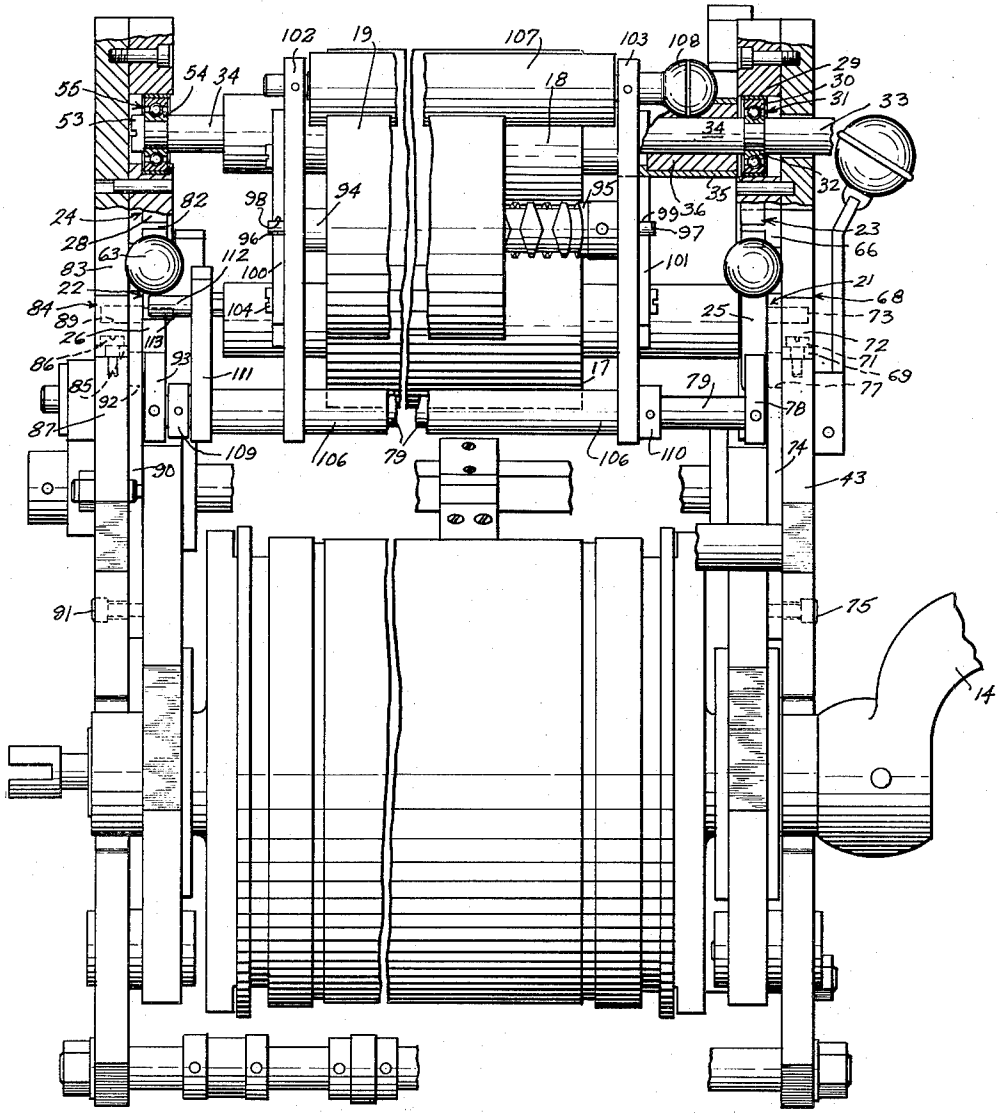
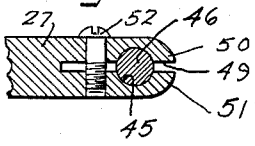


Fig. 4



Inventor
James B. Roozee

by Hill, Sherman, Meroni, Gross & Simpson Attys

July 18, 1961 J. B. ROOZEE 2,992,609

INKING ROLLER SYSTEM

Filed Aug. 26, 1958 4 Sheets-Sheet 4

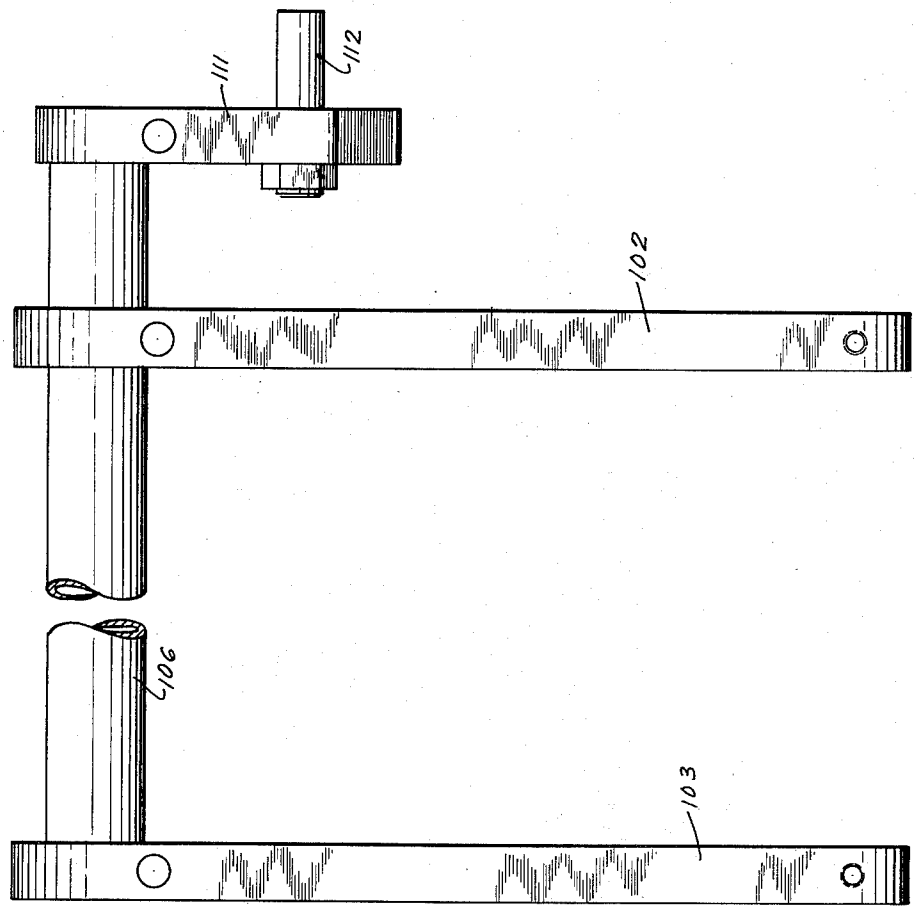


Fig. 6

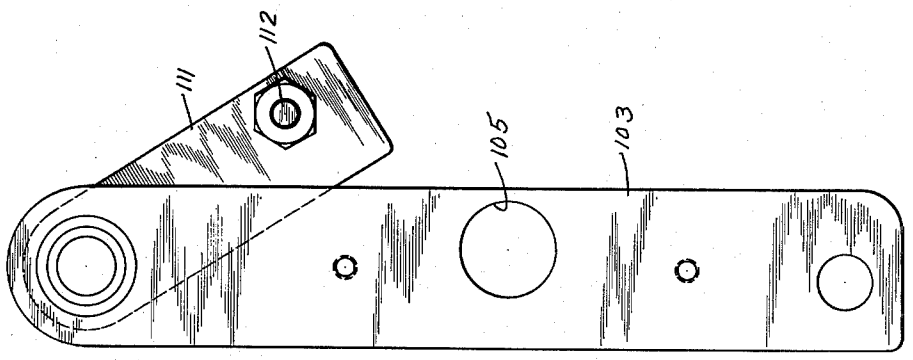


Fig. 5

Inventor
James B. Roozee

by Hill, Sherman, Morris, Gross & Simpson Attys

United States Patent Office

2,992,609

Patented July 18, 1961

2,992,609

INKING ROLLER SYSTEM

James B. Roozee, Arlington Heights, Ill., assignor to Vandercook & Sons, Inc., Chicago, Ill., a corporation of Delaware

Filed Aug. 26, 1958, Ser. No. 757,406
12 Claims. (Cl. 101—354)

This invention relates to an inking roller system and more particularly to an inking system for a proof press of the type including a form-supporting bed and a carriage reciprocable along the bed.

In this type of press, a pair of form rollers are mounted in the carriage and are adapted to apply ink to a form supported in the bed as the carriage is moved in one direction. An impression cylinder is also supported by the carriage and is adapted to carry paper to be impressed against the form after ink is applied thereto by the form rollers. To apply ink to the form rollers, one of the rollers may engage an inking drum within the press bed and an axially reciprocable vibrator or distributor roll may be mounted above the form rollers to engage both of the form rollers. The inking drum is driven to cause transfer of ink from one roller to another, and obtain uniform distribution of the ink on the form rollers.

For satisfactory operation of this type of press, it is essential that the vertical position of the form rollers be accurately controlled in relation to the forms, to properly apply ink thereto. In previous arrangements, it has been a difficult and time-consuming operation to properly adjust the positions of the form rollers. For example, in one previous arrangement, the ends of the form roller shafts are journalled in a first pair of bars supported from a second pair of bars, the second pair of bars being supported on a pair of rods journalled in the carriage in positions parallel to the roller axis. Each of the first pair of bars is secured to one of the second pair of bars by a pair of spaced screws, with a third screw intermediate the pair of screws. By adjustment of the three screws, the vertical positions of the form rollers may be adjusted at each side of the carriage. However, such is a very difficult operation, particularly since the adjustment of the vertical position of one form roller affects the adjustment of the vertical position of the other.

A further disadvantage of prior art arrangements has been that the rolls and rollers have not been readily accessible for cleaning and inspection operations.

An important object of this invention is to provide an inking roller system in which the positions of the form rollers can be readily and accurately adjusted to obtain proper contact with the forms.

Another object of the present invention is to provide an inking roller system, in which the rolls or rollers may be made readily accessible for cleaning or inspection.

A further object of the invention is to provide an inking roller system in which the rollers can be made readily accessible and/or in which the positions of the rollers can be accurately adjusted, such mechanism being efficient and reliable in operation and yet readily manufacturable from a minimum number of component parts.

According to an important feature of this invention, the form rollers are supported within the carriage by means including four independent devices adjustable to adjust the vertical position of each roller. With this feature, the positions of the rollers may be quickly and accurately adjusted, particularly since the adjustment of one roller does not affect the adjustment of the other.

A more specific feature of the invention is in the design of the devices for controlling the vertical positions of the ends of the form rollers, the design being comparatively simple and yet being such that the adjustment may be quickly made and being preserved when once made.

A further feature of the invention is in a support arrangement for the form rollers which not only permits quick and accurate adjustment thereof, but also permits access to and removal of the form rollers for cleaning or inspection.

Another feature of the invention relates to a support for the vibrator or distributor roll in which it is readily accessible.

Still another feature of the invention is in a mechanism for moving both the inking rollers and the vibrator roll in which the vibrator roll is moved out of engagement with the form rollers after which the form rollers are lifted to an inoperative position.

This invention contemplates other more specific objects, features and advantages which will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate a preferred embodiment and in which:

FIGURE 1 is a side elevational view of a printing press carriage together with a portion of the printing press bed, incorporating an inking roller system constructed according to the principles of this invention;

FIGURE 2 is a side elevational view similar to FIGURE 1, but illustrating the vibrator roll and inking rollers actuated to inoperative positions;

FIGURE 3 is a top plan view of the carriage shown in FIGURE 1;

FIGURE 4 is a sectional view taken substantially along line IV—IV of FIGURE 2;

FIGURE 5 is a side elevational view of a frame used for support of the vibrator roll in the assembly of FIGURE 1; and

FIGURE 6 is a plan view of the frame of FIGURE 5.

Reference numeral **10** generally designates a printing press constructed according to the principles of this invention, which includes a carriage **11** mounted for reciprocable movement along a form-supporting bed **12**, only a broken away portion of the bed **12** being illustrated in FIGURES 1 and 2. The carriage **11** carries an impression cylinder **13** to which a sheet of paper may be attached for engagement with a form supported on the bed **12**. A crank **14** may be attached to the cylinder **13** for rotating the same, and a gear rotatable with the cylinder **13** engages teeth along the bed **12** to cause movement of the carriage **11** along the bed **12**. Suitable rollers **15** are provided on the carriage **11** for engagement in guide ways along the bed **12** to maintain the carriage **11** in a certain position vertically with respect to the bed **12**.

This invention relates to an inking roller system generally designated by reference numeral **16**, used for applying ink to a form supported in the bed **12**.

The system **16** comprises a pair of form rollers **17** and **18** arranged to have ink applied thereto and to apply the ink to a form supported in the bed **12** when the carriage is moved therealong. An axially reciprocable vibrator or distributor roll **19** is mounted above the form rollers **17** and **18** to engage both of the rollers. In one position of the carriage, the form roller **17** engages an inking drum **20** journalled in the bed **12** and driven by a suitable drive motor. When the form roller **17** is engaged with the drum **20** and the drum **20** is so driven, the ink will be transferred from one roller to another and after an interval of time will be uniformly distributed on the rolls or rollers.

An important feature of the invention is in the support of the form rollers **17** and **18** from the carriage **11**. In accordance with this feature, a pair of devices **21** and **22** are provided at opposite ends of the form roller **17** and another pair of devices **23** and **24** are provided at opposite ends of the form roller **18**. These devices are inde-

pendent and are independently adjustable to adjust the vertical position of each end of each roller.

The devices 21—24 respectively comprise generally horizontal bars 25—28 with bearing assemblies being supported from the underside of intermediate portions of the bars. For example, a ring 29 is welded or otherwise secured to the underside of the bar 27 and supports the outer race 30 of a ball bearing assembly 31 having an inner race 32. The inner race 32 is disposed on the reduced diameter portion of a shaft 33, the inner end of which is threaded into a shaft 34 which supports the form roller 18. The shaft 34 is disposed within a sleeve 35 on which the roller 18 is formed, a spacer sleeve 36 being disposed between the shaft 34 and the sleeve 35. The shaft 33 is connected to a crank 37 on which a knob 38 is disposed, for manual rotation of the form roller 18 when desired.

The ring 29 is guided for vertical movement in the carriage by means of a pair of blocks 39 and 40 having facing vertical surfaces 41 and 42 spaced apart a distance substantially equal to the external diameter of the ring 29, the blocks 39 and 40 being secured to the inside surface of a side plate 43 of the carriage 11.

A screw or pin 44 having a rounded head is secured to the underside of the bar 27 adjacent one end thereof (the left-end as viewed in FIGURE 1) and rests against the top surface of the block 39 to provide a support which allows generally pivotal movement of the bar 27 about an axis parallel to the axis of the roller 18. Adjacent the other end of the bar 27 (the right-end as viewed in FIGURE 1) an internally threaded opening 45 is provided (see FIGURE 4) through which a vertical screw 46 is threaded, the lower end of the screw 46 being engaged with the upper surface of the block 40. A knob 47 is secured to the upper end of the screw 46, and it will be appreciated that by rotation of the knob 47, the bar 27 may be tilted upwardly or downwardly to adjust the vertical position of one end of the form roller 18.

A specific feature of the invention is in the provision of a vertical slot 49 extending inwardly from the right-hand end of the bar 27 to intersect the opening 45 and divide the end portion of the bar into two portions 50 and 51, to thus provide a bifurcated end portion. A screw 52 extends through the portion 50 and is threaded into the portion 51 for drawing the portions together and providing an adjustable degree of friction between the bar 27 and the screw 46. With this arrangement, there is no backlash in the adjustment, and once the proper adjustment is made, it will be retained.

The constructions of the devices 21, 22 and 24 are generally the same as the construction of the device 23 as above described, it being noted that screws may be used in place of the shaft 33 and crank 37. For example, a screw 53 is used in connection with the adjustment assembly 24, to secure the inner race 54 of a ball bearing assembly 55 to the shaft 34. It may be noted that the assembly 21 includes a ring 56 secured to the underside of the bar 25 and guided between a vertical surface 57 of the block 39 and a vertical surface 58 of a block 59. A pin 60 is secured to the underside of the bar 25 and has a rounded head engaging the upper surface of the block 59, while a screw 61 similar to the screw 46 is threaded through an opening in the bar 25 and engages the upper surface of the bar 39. A knob 62 is secured to the screw 61. The assembly 22 includes a similar knob 63. The remainder of the assembly 22 is substantially identical to the construction of the assembly 21. The knob and other parts of the assembly 24 are not illustrated in detail, but it will be understood that the assembly 24 is substantially identical to the assembly 23.

To elevate the form rollers 17 and 18 to inoperative positions, the adjacent ends of the bars 25 and 27 are respectively formed with projections 64 and 65 which overlie a plate 66 which is secured to the underside of and projects inwardly from the end portion of a horizontal arm 67 of a vertically movable bracket 68. It will be appreciated that when the bracket 68 is moved upwardly, the inner end of the plate 66 will engage the underside of the projections 64 and 65 and thereby lift the bars 25 and 27 upwardly, to lift the ends of the form rollers 17 and 18 upwardly.

To guide the bracket 68 for vertical movement, it has a vertical portion 69 disposed against a vertical surface 70 of the side plate 43, and a pair of screws 71 have shank portions extending through vertically elongated slots in the portion 69 and threaded into the side plate 43.

For actuation of the bracket 68, it has an arm portion 72 projecting forwardly from the upper end of the vertical portion 69 and disposed over a pin 73 which is carried by a lever 74 pivotally secured to the side plate 43 by means of a pin 75. The lever 74 is formed with a recessed portion 76 extending upwardly from the underside thereof, which is engaged by a cam roller 77 carried on an arm 78 which is affixed to a shaft 79, the shaft 79 being journaled by the carriage on an axis generally parallel to the roller axes. An actuating arm 80 is affixed to one end of the shaft 79, a knob 81 being secured to the terminal end of the arm 80.

When the arm 80 is pivoted from the position illustrated in FIGURE 1 to the position illustrated in FIGURE 2, the cam roller 77 acting against the recess portion 76 of the lever 74 will lift the lever, to move it in a counterclockwise direction about the pin 75. The pin 73 will then engage the portion 72 of the bracket 68 to lift the bracket and thereby lift the plate 66 into engagement with the projections 64 and 65 of the bars 25 and 27, to thereby lift the ends of the form rollers 17 and 18.

A substantially identical assembly is provided at the other side of the carriage, for lifting the bars 26, 28. In particular, a plate 82 is adapted to engage under projections from adjacent ends of the bars 26 and 28, and is carried by an arm 83 of a bracket 84 having a vertical portion 85 held by screws 86 against a vertical portion of a carriage side plate 87, the bracket 84 having an arm 88 projecting from the upper end of the vertical portion 85 over a pin 89 carried by a lever 90 which is pivoted on the inner side of the side plate 87 by means of a pin 91. The lever 90 has a recess similar to the recess 76 of the lever 74, which is engaged by a cam roller 92 carried by an arm 93 affixed to the shaft 79. It will be appreciated that when the lever 80 is actuated, all of the bars 25—28 will be elevated, to lift both ends of both of the form rollers 17 and 18.

The vibrator roll 19 is mounted on a shaft 94 which carries a double threaded worm 95 engaged by a follower within the roll 19, to form a traversing mechanism causing the vibrator roll 19 to be axially reciprocated as it is rotated. The ends of the shaft 94 are cut away to form flat portions 96 and 97 of generally rectangular cross section which are respectively disposed in generally vertical slots 98 and 99 of a pair of plates 100 and 101, the slots being of sufficient length to allow vertical movement of the vibrator roll while restraining the shaft 94 against rotation. The plates 100 and 101 are respectively carried by a pair of arms 102 and 103, by means of screws 104, which are threaded into the arms 102 and 103 and extend through generally horizontal slots in the plates 100 and 101, thus to allow horizontal displacement of the vibrator roll 19. It may be noted that openings are provided in the arms 102 and 103 which are sufficiently larger than the shaft diameter to allow the required freedom of movement of the vibrator roll 19, the opening through the arm 103 being shown in FIGURE 1 and being indicated by reference numeral 105.

The inner ends of the arms 102 and 103 are affixed to a sleeve 106 which is freely rotatable on the shaft 79, and the outer ends of the arms 102 and 103 are connected by a rod 107. A knob 108 is secured to the outer end of

arm **103** for use in manual movement of the vibrator roll **19** when desired.

To restrain the sleeve **106** against axial movement on the shaft **79**, a pair of collars **109** and **110** are affixed on the shaft **79** adjacent the opposite ends of the sleeve **106**.

To rotate the sleeve **106** on the shaft **79** and lift the vibrator roll **19**, an arm **111** is affixed to the sleeve **106** and carries a pin **112**, the underside of which is engageable by a pin **113** carried on the lever **90** and preferably formed integrally with the pin **89**.

The assembly of the arms **102**, **103** and **111** on the sleeve **106** is illustrated in FIGURES 5 and 6.

In operation, when the handle **80** is moved from the position shown in FIGURE 1 toward the position shown in FIGURE 2, the levers **74** and **90** are elevated by the cam rollers **77** and **92** and the pin **113** engages the pin **112** to elevate the arm **111** and thus cause rotation of the sleeve **106** in a counter-clockwise direction as viewed in FIGURES 1 and 2, to cause the arms **102** and **103** to be elevated and thus lift the vibrator roll out of engagement with the form rollers **17** and **18**. After the vibrator roll **19** is moved clear of the form rollers **17** and **18**, the pins **73** and **89** engage arms **72** and **88** of the brackets **68** and **84** to elevate the brackets as previously described and lift the form rollers **17** and **18** to an inoperative position.

When the arm **80** is moved to the limit of its travel in a counter-clockwise direction, the parts will be in a position as illustrated in FIGURE 2. In this position, it will be noted that cam roller **77** and also the cam roller **92** are disposed in positions beyond a generally vertical plane through the axis of shaft **79**, such that the force of gravity acting on the vibrator or distributor roll **19**, as well as on the form rollers **17** and **18** in associated parts, acts to urge the shaft **79** and lever **80** against rotation back in the clockwise direction. Accordingly, the parts are maintained in the position of FIGURE 2 until the arm **80** is manually moved in a clockwise direction to initially allow return of the form rollers **17** and **18** to their operative positions and to then lower the vibrator roll **19** into engagement with the form rollers **17** and **18**.

It is important to note that the vibrator roll **19** may be manually lifted beyond the full line position of FIGURE 2, to a position as illustrated in dotted lines in FIGURE 2 in which it is completely accessible for cleaning and inspection. When the vibrator roll **19** is so moved, the form rollers **17** and **18** are also readily accessible. It should further be noted that with the independent support arrangement of the form rollers **17** and **18**, one roller may be removed without removal of the other, as is oftentimes desirable.

This invention thus provides an inking roller system in which the positions of the form rollers may be readily and accurately adjusted and in which the rollers may be readily moved to positions for cleaning and inspection.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of this invention.

I claim as my invention:

1. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means supporting said form rollers and projecting from both ends of both rollers, and means supporting said shaft means on said carriage including four independent devices, one on each end of said shaft means, said devices being independently adjustable to adjust the vertical position of each end of each roller, each of said devices comprising: a bar pivotally supported at one end on the carriage for movement about an axis parallel to the roller axis, means at the other end of said bar for pivoting said bar about its pivotal support, and means supporting said shaft means from an intermediate portion of said bar.

2. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means supporting said form rollers and projecting from both ends of both rollers, and means supporting said shaft means on said carriage including four independent devices, one on each end of said shaft means, said devices being independently adjustable to adjust the vertical position of each end of each roller, each of said devices comprising: a bar pivotally supported at one end on the carriage for movement about an axis parallel to the roller axis, a vertical adjustment screw threaded through the other end of said bar and engageable with the carriage to pivot said bar about its support, and means supporting said shaft means from an intermediate portion of said bar.

3. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means supporting said form rollers and projecting from both ends of both rollers, and means supporting said shaft means on said carriage including four independent devices, one of each end of said shaft means, said devices being independently adjustable to adjust the vertical position of each end of each roller, each of said devices comprising: a bar pivotally supported at one end thereof on the carriage for movement about an axis parallel to the roller axis, means for pivoting said bar about its pivotal support, means supporting said shaft means from an intermediate portion of said bar, and means for guiding said shaft means for vertical movement in the carriage.

4. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means supporting said form rollers and projecting from both ends of both rollers, and means supporting said shaft means on said carriage including four independent devices, one on each end of said shaft means, said devices being independently adjustable to adjust the vertical position of each end of each roller, each of said devices comprising: a bar pivotally supported at one end on the carriage for movement about an axis parallel to the roller axis, said bar having a vertical internally threaded opening therethrough adjacent the other end thereof and a vertical slot extending inwardly from said other end and intersecting said opening, a vertical adjustment screw threaded through said opening and engageable with the carriage, a second screw extending transversely through a portion of said bar on one side of said slot and threaded into the portion on the other side thereof for drawing said portions together to provide an adjustable degree of friction between said bar and said vertical adjustment screw, and means supporting said shaft means from an intermediate portion of said bar.

5. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means for supporting said form rollers and projecting from both ends of both rollers, four bearings supporting said shaft means and each including an outer ring, four generally horizontal bars having intermediate portions respectively secured to said outer rings of said bearings, means supporting one end of each bar for pivotal movement about an axis parallel to the roller axes, and means for pivoting said bars about their pivotal support.

6. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers, shaft means for supporting said form rollers and projecting from both ends of both rollers, four bearings supporting said shaft means and each including an outer ring, four generally horizontal bars having intermediate portions respectively secured to said outer rings of said bearings, means supporting one end of each bar for pivotal movement about an axis parallel to the roller axes, means for pivoting said bars about their pivotal sup-

ports, and means defining four pairs of spaced facing vertical surfaces on said carriage on opposite sides of said rings for guiding said bearings for vertical movement.

7. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers in spaced parallel relation transverse to said carriage, shaft means for supporting said form rollers and projecting from both ends of both rollers, a first pair of independent devices for supporting the shaft means at one side of the carriage, a second pair of independent devices for supporting the shaft means at the other side of the carriage, said devices being independently adjustable to adjust the vertical position of each end of each roller, and means for engaging under the devices of each of said pairs for lifting the same upwardly to move said rollers upwardly.

8. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers in spaced parallel relation mounted on the carriage, a distributor roll mounted on said carriage and disposed above and engageable with both of said rollers for transfer of ink from one to another, shaft means for supporting said form rollers and projecting from both ends of both rollers, means for supporting said shaft means including devices for adjusting the vertical position of each end of each roller, means for lifting said distributor roll, means for lifting said devices to lift said form rollers, a manually actuatable member connected to both of said lifting means and movable from a first position to a second position to initially lift said distributor roll out of engagement with said form rollers and to thereafter lift said form rollers to an inoperative position.

9. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers in spaced parallel relation transverse to the carriage, shaft means for supporting said form rollers and projecting from both ends of both rollers, a first pair of bars for supporting the shaft means at one side of the carriage, a second pair of bars for supporting the shaft means at the other side of the carriage, means for adjustably lifting one end of each of said bars to adjust the vertical position of each end of each roller, a first member disposed under adjacent ends of said first pair of bars, a second member disposed under adjacent ends of said second pair of bars, and means for simultaneously lifting both of said members to lift said bars and thereby lift said form rollers.

10. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers supported in said carriage in spaced parallel relation transverse thereto, a distributor roll disposed above and engageable with both of said rollers, shaft means supporting said distributor roll and projecting from both ends thereof, a pair of arms supporting said shaft means and pivoted on a common axis parallel to and spaced above and horizontally from said form rollers, and means for actuating said arms comprising a first lever pivotal on an axis in spaced parallel relation to said common axis and extending thereover, means carried by said arms and engageable by said first lever to move said arms upwardly upon upward movement of said lever, cam means rotatable about said common axis and engageable with the under side of said first lever for elevating the same, and a second lever for actuating said cam means.

11. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers supported in said carriage in spaced parallel relation transverse thereto, a distributor roll disposed above and engageable with both of said rollers, shaft means supporting said distributor roll and projecting from both ends thereof, a pair of arms supporting said shaft means and pivoted on a common axis parallel to and spaced above and horizontally from said form rollers, and means for actuating said arms comprising a first lever pivotal on an axis in spaced parallel relation to said common axis and extending thereover, means carried by said arms and engageable by said first lever to move said arms upwardly upon upward movement of said lever, cam means rotatable about said common axis and engageable with the under side of said first lever for elevating the same, and a second lever for actuating said cam means, said cam means being movable from a position on one side of a vertical plane through said common axis to a position on the other side thereof to effect elevation of said distributor roll and being retained in said position on the other side of said plane by the weight of said distributor roll.

12. In a printing press including a form-supporting bed and a carriage reciprocable along said bed, a pair of form rollers in spaced parallel relation transverse to the carriage, a distributor roll disposed above and engageable with both of said rollers for transfer of ink from one to another, shaft means for supporting said form rollers and projecting from both ends of both rollers, a first pair of independent devices for supporting the shaft means at one side of the carriage, a second pair of independent devices for supporting the shaft means at the other side of the carriage, said devices being independently adjustable to adjust the vertical position of each end of each roller, lifting means for engaging under the devices of each of said pairs for lifting the same upwardly to move said rollers to an inoperative position, means for lifting said distributor roll, a manually actuatable member connected to both of said lifting means and movable from a first position to a second position to initially lift said distributor roll out of engagement with said form rollers and thereafter lift said form rollers to said inoperative position.

References Cited in the file of this patent

UNITED STATES PATENTS

280,127	Brooks	June 26, 1883
382,979	Hawkins	May 15, 1888
552,790	Splithoff	Jan. 7, 1896
1,497,766	Balkwill	June 17, 1924
1,922,533	Elliott	Aug. 15, 1933
2,343,910	Kunz	Mar. 14, 1944
2,561,423	Sinkovitz	July 24, 1951