Dec. 14, 1948. E. J. JANKE 2,456,282

INKING SYSTEM FOR PRINTING MACHINES

Filed June 27, 1945 4 Sheets-Sheet 1

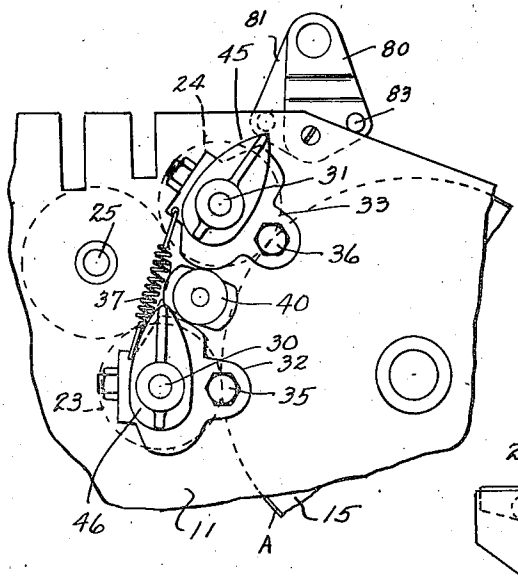


FIG. 2

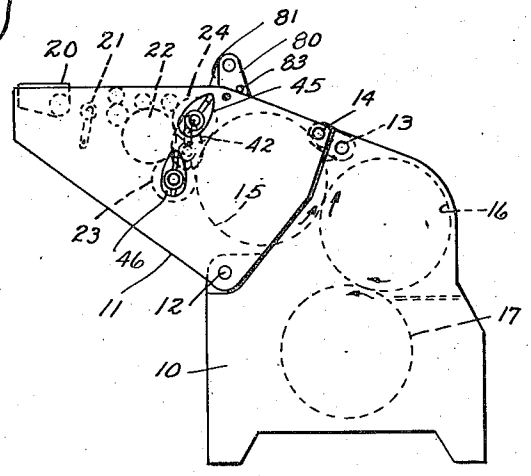


FIG. 1

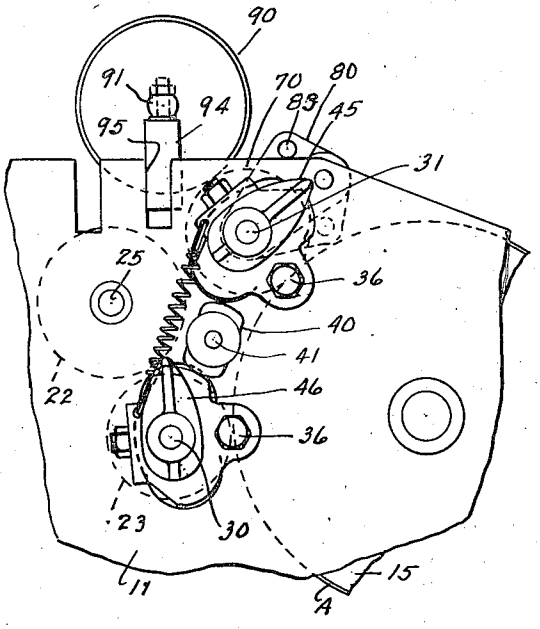


FIG. 3

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INKING SYSTEM FOR PRINTING MACHINES

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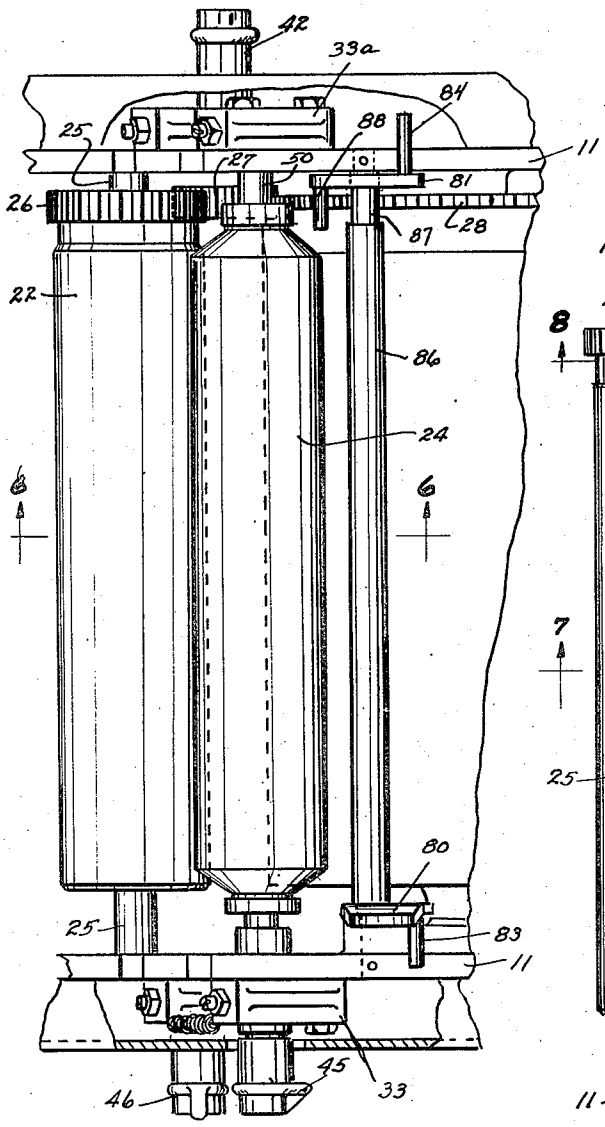
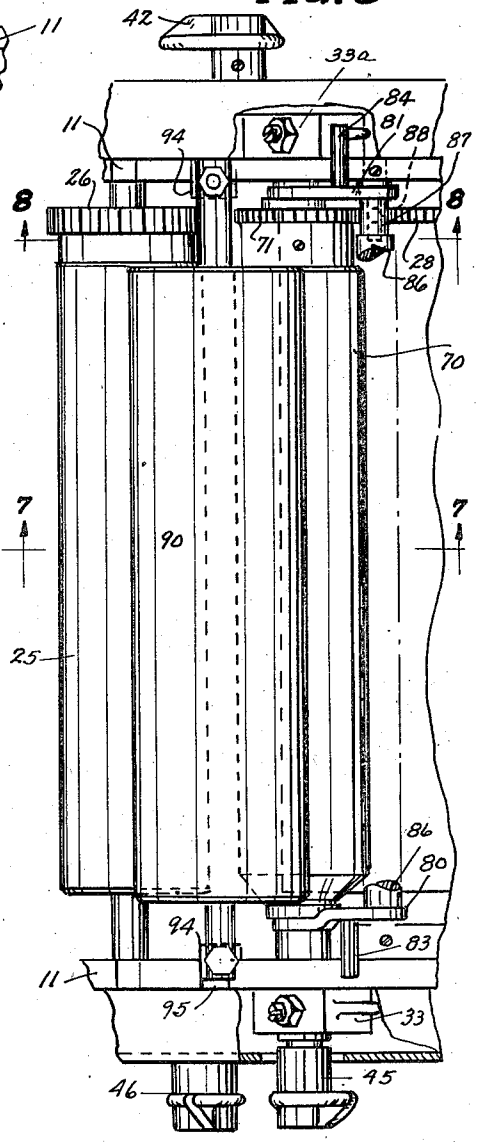


FIG. 4

FIG. 5



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INKING SYSTEM FOR PRINTING MACHINES

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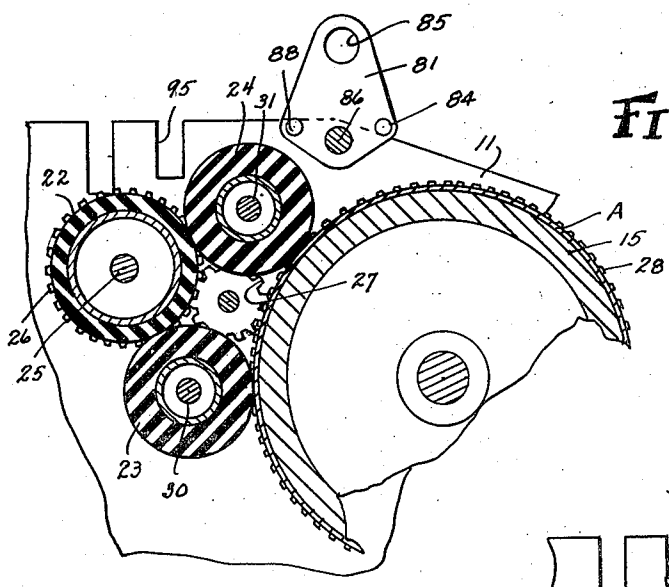


FIG. 6

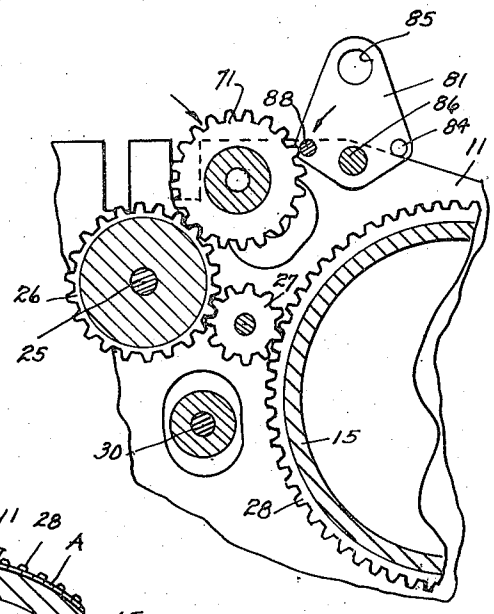


FIG. 8

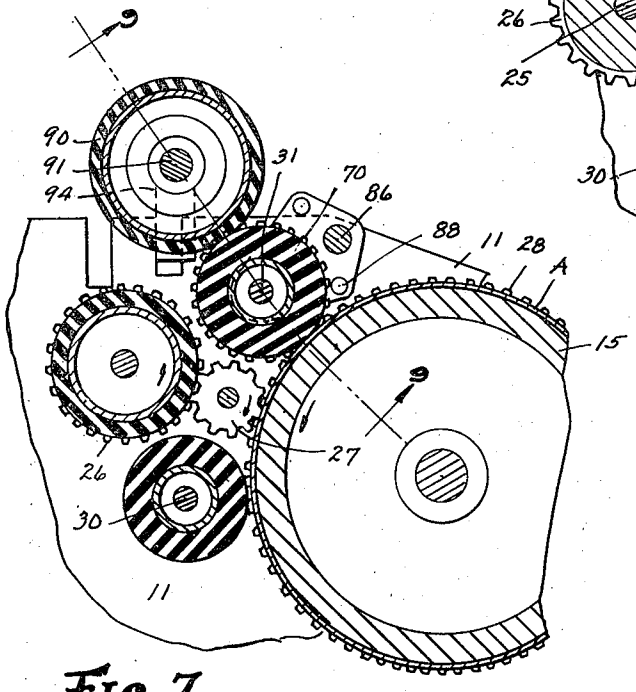


FIG. 7

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INKING SYSTEM FOR PRINTING MACHINES

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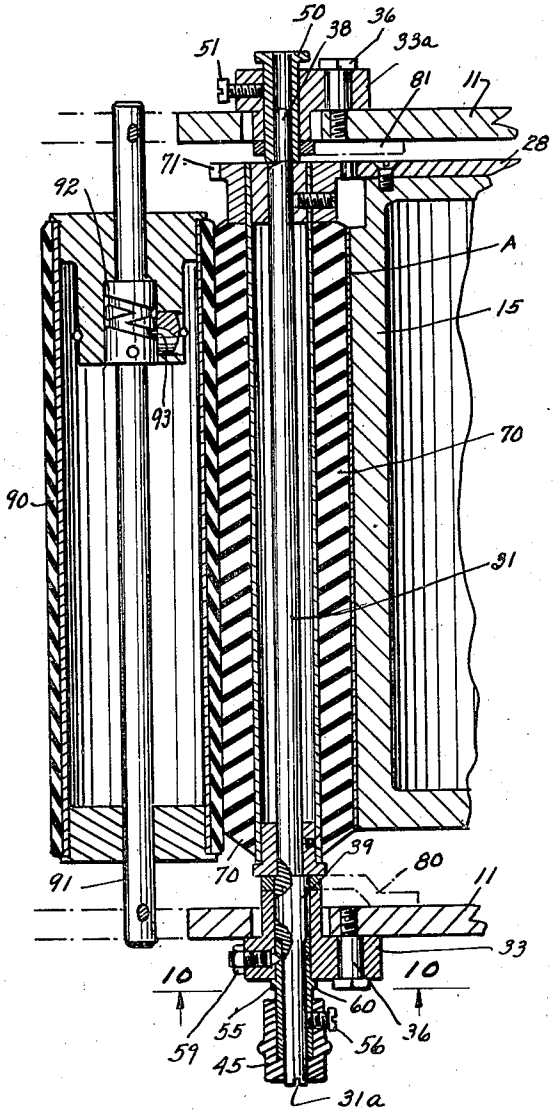


FIG. 9

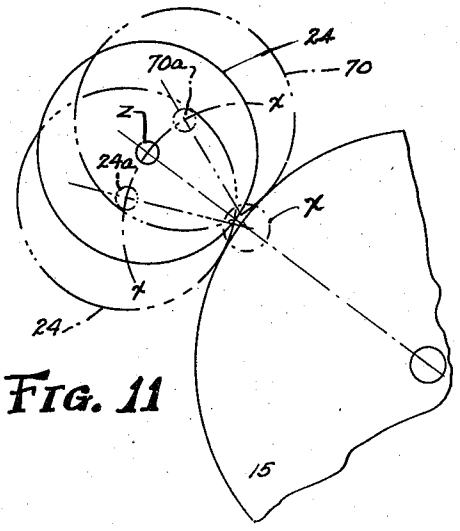


FIG. 11

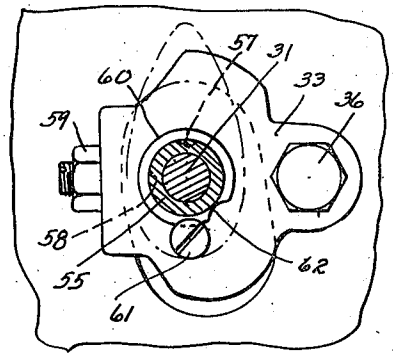


FIG. 10

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2,456,282

UNITED STATES PATENT OFFICE

2,456,282

INKING SYSTEM FOR PRINTING MACHINES

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Application June 27, 1945, Serial No. 601,820

29 Claims. (Cl. 101—352)

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This invention relates to a printing system for printing machines, wherein there is both a normal ink supply and applying means for the same, and a supplemental means which may apply ink from a different source to the same printing surface. Such supplemental application is very useful, for instance, in printing a portion of a form in a different color from that supplied in the normal inking, or for short runs where it is desired to avoid the necessity of working up the ink on the regular system.

It is an object of the invention to provide a supplemental system in a very simple form which may be placed in operative condition to ink the printing surface without disturbing the adjustments of the normal system. Another object is to provide the supplemental system with a gear-driven form roll and means for readily substituting such roll in place of one of the normal frictionally driven form rolls.

Another object of the invention is to enable the use of the same shaft and bearings therefor of one of the friction-driven form rolls for carrying the gear-driven form roll while providing means for holding such shaft and bearings in a different position from their normal portion. In this connection it is a further object to provide means for preventing the mounting of the gear-driven form roll in any position where its gear would mesh with oppositely moving gears of the machine.

My invention is hereinafter more fully explained in connection with the accompanying drawings, which illustrates a printing drum, normal ink-applying means therefor and my supplemental ink-applying means.

In the drawings, Fig. 1 is a side elevation of a complete offset printing machine, the mechanism being set for normal printing operation; Fig. 2 is a fragmentary elevation on an enlarged scale of a portion of the mechanism, a side cover having been removed to illustrate more clearly the internal mechanism; Fig. 3 is an elevation similar to Fig. 2, but with the normal inking mechanism thrown out of operation and a supplemental inking mechanism applied to the machine; Figs. 4 and 5 are fragmentary plan views partially in section of that portion of the mechanism shown in Figs. 2 and 3 respectively; Figs. 6 and 7 are vertical sections taken through the corresponding numbered lines on Figs. 4 and 5; Fig. 8 is a sectional view illustrating the gearing mechanism, the plane of the section being indicated by the line 8—8 on Fig. 5, in this view, however, the form roll in the supplemental inking mechanism is in the process of being inserted; Fig. 9 is an

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axial section through the rolls, the plane of the section being indicated by the lines 9—9 on Fig. 7, this view however showing the gear-driven form roll substituted for one of the normal friction-driven form rolls; Fig. 10 is a sectional detail, the plane of the section being indicated by the line 10—10 in Fig. 9; and Fig. 11 is a diagram illustrating the relative positions of the axes of the form rolls under various positions relative to the printing drum.

Fig. 1 illustrates by way of example a main frame 10, a supplemental frame 11 pivoted thereto at 12 and connected near the upper edge by links 13 controlled by an eccentric shaft 14. Mounted in the supplemental frame is the printing drum 15 carrying a master sheet or other printing form, and in the main frame is an offset drum 16 coacting therewith, and a platen 17 coacting with the offset drum. The operation of the eccentric shaft serves to separate the master drum from the offset drum when the machine is idle. The machine thus outlined may, for instance, be of the form shown in Patent No. 1,968,849, issued August 7, 1934, to Multigraph Company as assignee of L. H. Morse. It is illustrated in Fig. 1 merely for the purpose of completeness, as my invention is not concerned with the details thereof and may be used with any printing drum, intended to be illustrated by the drum 15.

Fig. 1 illustrates an inking system which may be employed in my invention. As there shown, 20 indicates an inking fountain; 21 a ductor roll; 22 a distributor roll with which may be associated various rolls to work up the ink, and 23 and 24 a pair of form rolls coacting with the oscillating distributing roll and also with the plate on the master drum. My invention is concerned directly only with the oscillating distributor 22, the two form rolls 23 and 24, and the drum 15 suitably carrying a plate indicated at A in Figs. 6 and 7.

I will describe first the normal application of ink from the oscillating distributor 22 to the two form rolls 23 and 24 and thence to the plate. The distributor 22 is mounted on a suitable shaft 25 stationarily held in operation and carrying internal mechanism, not shown but well understood, for causing the roll to oscillate axially as it rotates. The roll is provided with a wide gear 26 meshing with an idler 27 which meshes with a gear 28 on the drum 15. The distributor is therefore positively driven by the rotation of the printing drum. Two form rolls 23 and 24 obtain their rotation by frictional contact with the dis-

tributor roll, and supply ink from thence to the printing plate A, with which they contact during the printing operation.

The two form rolls **23** and **24** are rotatably mounted on shafts **30** and **31** respectively, which are journaled in bearings carried respectively by shiftable brackets **32** and **33**. These brackets are pivoted at **35** and **36** (Fig. 2) to the frame **11** and are constrained toward each other by tension springs **37** attached to both brackets. The brackets at their inner edges abut a cam **40**, which in the position shown in Fig. 2 allows the form rollers to engage the distributor and printing plate and in the position shown in Fig. 3 holds the form rolls out of contact with both the distributor and the plate. The cam **40** and the corresponding cam at the other side of the machine, which operates the brackets corresponding to **32** and **33**, are mounted on a shaft **41** journaled in the frame **11** and carrying a suitable operating lever **42**.

The manner in which the form rolls are supported in their respective brackets is the same for each form roll, and hence the description of one will suffice. The shaft **31**, which in the normal inking system carries the form roll **24**, is mounted in bearings provided by the bracket **33** at what may be called the front side of the machine and a corresponding bracket **33***a* similarly formed and carried at the rear side of the machine. The mounting of the shaft in the brackets is eccentric and the shaft is provided with a hand lever **45** whereby it may be turned to change the presentation of the form roll. The shaft **30** is similarly mounted in the bracket **32** and its mate at the other end of the shaft and is provided with a similar hand lever **46**.

The shafts **30** and **31** being mounted in their respective brackets in an identical manner, I will describe only the mounting of the shaft **31** as shown in Fig. 9. The shaft **31** at its rear end has a reduced eccentrically placed portion **38** which occupies an eccentric bore in a bushing **50** locked to the bracket **33***a* by a set screw **51**. The purpose of making the bore of the bushing **50** eccentric is merely to provide an aligning adjustment so that when the parts are installed the axis of the shaft may be truly parallel to the drum axis. After once being aligned the locking by the set screw **51** is not disturbed.

Near its front end, the shaft **31** has an eccentric enlargement **39** which is journaled in a sleeve-like portion of the bracket **33**. Beyond the enlargement in a concentrically reduced portion the shaft is surrounded by a sleeve **55** which is clamped to the shaft by a set screw **56**. As shown in Fig. 9, the hub of the lever **45** extends over the sleeve **55** and the same set screw **56** clamps it to the sleeve and shaft.

The sleeve **55** is provided with two depressions **57** and **58**, Fig. 10, with which a spring-pressed detent carried by the bracket **33** may coact. Such detent may be in the form of a ball pressed by a spring mounted in a cavity in the bracket and backed by a threaded plug as indicated at **59** in Fig. 9. The detent and the depressions **57** and **58** hold the shaft against accidental displacement and serve to indicate to the operator the position as he swings the lever to turn the shaft. The depressions are preferably 90° apart and one of them may hold the shaft against accidental displacement with the shaft in position where the form roller is free from the form, while the other holds it in position with the form roller in engagement with the form. Accordingly, the swinging of the hand lever **45** may readily position the roller idly or actively as desired.

To change the amount of pressure of the roller on the form, it is only necessary to change the position of the shaft **31** with reference to the sleeve **55** with which the detent coacts. Such change is effected by loosening the set screw **56** sufficiently only to free the shaft and then turning the shaft in the sleeve, such turning being readily effected by the application of a screw driver to a diametric notch **31***a* in the end of the shaft. Since the screw **56** passes through holes in the sleeve and lever which must register, the lever always maintains the same position with reference to the sleeve and detent though its position with reference to the shaft may be varied.

To hold the shaft **31** normally in position, while allowing it to be readily withdrawn to change the form rollers, I provide the locking feature shown in Figs. 9 and 10. This comprises a collar or flange **60** formed integrally on the sleeve **55** and engaged by the head of a screw **61** passing into the bracket **33**. A suitable notch **62** is made in the flange, this notch being out of registration with the screw at either the "off" or "on" position of the shaft determined by the detent notches **57** and **58**.

To remove the shaft **31** it is only necessary to turn the sleeve and shaft by the lever **45** beyond the normal "off" position sufficient to bring the notch **62** into registration with the head of the screw **61**. Then the shaft with the sleeve **55** and lever **45** may be drawn entirely out of the machine, thus freeing the form roller.

As already mentioned, the construction for supporting the shaft **30** and operating it to shift the form roller **23**, is the same as that above described for the shaft **31** and the form roller **24**.

It will be seen that the mechanism provides for an original alignment of the axes of the shafts to make them parallel to the axis of the drum; for changing the angular relation of the shafts to their holding detents and operating levers to change the pressure on the printing plate; for turning each shaft by its lever to shift the form roller into and out of contact with the distributing roll and printing plate. Finally there are means for spreading the two brackets which carry the form roll shafts to separate both of them from the distributor and printing plate. This last mentioned separation is that ordinarily performed at the end of a run when it is intended that the machine should stand idle for sometime, as over night for instance, and it is desired to maintain the form rollers out of contact with any cooperating members.

In my invention, in behalf of the greatest simplicity, I propose to substitute for the form roll **24** a gear-driven form roll and to supply such roll directly from ink manually applied to a supplemental distributing roll. Now as the new form roll must have the pitch circle of its gear aligning with the ink-applying periphery, such gear, if the new form roll were in the same position as the normal form roll, would mesh with both the printing drum gear and the distributor gear and might collide with the idler connecting those gears. I find I can avoid this difficulty, and still utilize the same shaft and bearings, by providing means to hold the bearings in a different position from the position they have in the normal inking application, and this is one of the features of my invention.

In Figs. 5, 7 and 9, I show a form roll **70** carrying a gear **71** having its pitch circle the same

as the periphery of the roll, and I show this roll in Fig. 9 mounted on the shaft 31 and with the gear 71 meshing with the gear 28 on the printing drum 15. The shaft is mounted the same as heretofore described in the brackets 33 and 33a, but the position of those brackets is different from their normal position, so that the shaft is located upward of its normal position, and thus the roll 70 while in coaction with the printing plate is so located that its gear, while meshing with the gear 28, entirely clears the idler 27 and the distributing roller gear 26, as shown in Fig. 7.

The means for holding the brackets 33 and 33a in the new position mentioned comprise a pair of holding brackets 80 and 81 which are pivoted as at 86 to the frame 11. These brackets normally extend upwardly into idle position as indicated in Figs. 6 and 8. They have outwardly extending pins 83 and 84 which extend over the frame so that the brackets may normally stand by gravity in the upwardly extending position shown.

When it is desired to mount the gear-driven form roll 70, the shaft 31 and roll 24 having been withdrawn, the brackets 80 and 81 are swung down, as indicated by arrow in Fig. 8. The bracket 81 has an opening 85 large enough to embrace the bushing 50, and that bracket is swung down in front of that bushing and then shifted outwardly over the bushing, thus holding the bushing in an elevated position determined conjointly by the coacting brackets 33a and 81.

Now when the gear driven roller is put in place and the shaft returned, the shaft is passed through the bracket 33 and thence through the opening in the bracket 80 and through the gear-driven roller into the bushing 50 of the bracket 33a. The bracket 80 holds the shaft at that end in its new position with the bearing in alignment with the bearing at the other end. It results from the above outlined manner of repositioning the shaft bearings that the gear-driven form roller has its axis definitely held by its normal bearings and the normal brackets at the normal radial distance from the periphery of the drum but shifted arcuately away from the normal gear train, as shown in Fig. 7.

The relative positions of the friction-driven form roll 24 and the position of the gear-driven form roll 70 is illustrated in the diagram, Fig. 11. The friction-driven form roller 24 when in its active position coacting with the plate on the drum 15, is indicated by the broken line circle designated 24, the axis of the roller being at 24a, this being the condition when the cam 40 is in the position shown in Fig. 2. The position of the gear-driven form roller is indicated in the diagram by the circle designated 70 with its axis at 70a. In this diagram X indicates the pivot of the brackets 33 and 33a carrying one roller or the other, and x—x the arc through which those brackets may carry the form roller axes.

Now as the x—x arc is swung about a shorter radius than the radius from either form roller axis to axis of the drum, it follows that the swinging of the shaft 31 upwardly from its normal active position 24a to the position Z (where the axis of the shaft aligns with the bracket pivot and the drum axis) moves the friction-driven form roller away from the drum, and then the swinging of the shaft farther upwardly from the same distance into the position 70a (where it is retained by the brackets 80, 81) causes the gear-driven form roller 70 to assume substantially the same contact relationship to the drum, but in an opposite direction from the intermediate off position, as the friction-driven form roller 24 had when active.

In other words, the brackets 80, 81 are so dimensioned that they hold the gear-driven form roller axis the same distance above the zero position of the brackets 33, 33a, as the axis of the friction-driven form roller when active is below such zero position, as allowed the cam 40 when in the position of Fig. 2. Accordingly, the friction-driven form roller and gear-driven form roller when they are active, have the same presentation to the drum under the control of the hand lever 45, and the same eccentricity is available to change the printing pressure for each of them.

I find it convenient to pivot the two brackets 80 and 81 by mounting them on a cross rod 86 carried by the frame. As I desire to shift the bracket 81 axially to bring its eye portion down in front of the bushing 50 and then carry it toward the frame plate so as to pass over the bushing (instead of disturbing the adjustment by withdrawing the bushing and restoring it) I make the bracket shiftable axially on the rod 86. I effect this by reducing the diameter of the shaft for a short distance, as shown at 87. Ordinarily the bracket extends upwardly closely adjacent to the vertical frame plate. However, the pin 84 is long enough so that the bracket will still remain in the upright position if shifted, as far as allowed by the reduced portion of the rod 86. When it has been shifted and swung down it is in position to pass in front of the bushing 50 and then may be shifted outwardly over that bushing without disturbing the bushing.

The ink is supplied to the gear-driven form roll 70 by a special distributor roll 90, Figs. 3, 5, 7 and 9. This roller is mounted on a stationary shaft 91 which carries internally of the roller means to cause the roller to reciprocate axially as it is rotated. As shown, the shaft 91 carries the well-known right and left hand thread grooves on a collar 92 with which a pin 93 in the hub of the roller coacts. The shaft may have its end portions secured to suitable rectangular blocks 93, 94 which may be mounted in slots in the two frame members 11, one of such slots being indicated at 95 in Fig. 6.

In behalf of simplicity, I prefer to provide no fountain or ductor or work-up rollers for supplying the supplemental distributor 90, the required operation being merely to smear the same with ink by a suitable knife. I have found this quite sufficient for the occasional printing of headings or the occasional filling in of matter in a different collar on sheets, the body of which was printed by the regular inking system. It is to be understood, however, that if desired an inking fountain and ductor and rolls to work up the ink, similar to that indicated in Fig. 1 for the regular inking system, could be employed to supply ink to the supplemental distributing roll.

To insure against inadvertent mounting of the gear-driven form roller without re-positioning the brackets in position for the shaft to pass through them, I provide a pin 88 on the bracket 81. This pin is normally idle, but if an attempt were made to insert the gear-driven form roller into position while the bracket is elevated, this could not be done as the gear would strike the pin and the roller could not be put into position. If the roller be moved toward position axially the face of the gear will hit the end of the pin. Nor

can the roller be shoved in radially, for there is not room for the gear to pass between the pin and the distributor gear, as shown in Fig. 8. It is only when the bracket 81 has been turned down into position to receive the shaft that the pin is retained out of the way (indicated in Fig. 7) where it cannot be abutted by the gear.

It will be seen from the description given that I have provided, in a comparatively simple manner, means for enabling a printing machine to print when desired in another color without disturbing the regular inking system. This same means is available for printing short runs in any color without taking the time to work up the ink by the regular inking system and covering of the rolls thereof with ink which might otherwise have to be cleaned after a very minor use. The change from normal inking to the supplemental inking is very readily effected without disturbing the aligning or pressure adjustments. By gearing the substitute form roll to the drum I am able to drive the distributor merely by its frictional engagement with the gear-driven form roll, thus contributing to the simplicity of the substitute inking.

I claim:

1. In a printing machine, the combination of a rotary drum, bearings adapted to carry a form roller in coaction with the drum, means for holding said bearings in either of two active positions, whereby a form roller mounted in the bearings with the bearings in one position may coact with the drum and a form roller mounted in the bearings in their other active position may coact with the drum.

2. In a printing machine, the combination of a rotary drum, shiftably mounted bearings, adapted to carry an inking form roller in coaction with the drum, resilient means acting on the bearings to hold them in one active position, and other means acting on the bearings to hold them in another active position.

3. In a printing machine, the combination of a rotary drum, bearings adapted to carry a form roller in coaction with the drum, means for holding said bearings in either of two active positions, an ink-supplying roller in position to coact with a form roller when in one of the active positions, and means for carrying a second ink-supplying roller adapted to coact with a form roller when in the other active position.

4. The combination of a drum adapted to carry a printing image, a train of inking rolls for supplying ink thereto including a friction-driven form roll adapted to contact with the printing plate, and means for positioning and connecting a gear-driven form roll in place of said friction-driven form roll and out of contact with the normal inking system, and means for supplying ink to the said gear-driven form roll.

5. The combination of a printing drum having a gear with its pitch circle corresponding to the periphery of a plate on the drum, a normal inking system having a friction-driven form roll adapted to engage said plate independently of said gear, another form roll having a gear meshing with the gear on the drum, means for supplying ink to the latter form roll, and means for rendering the normal inking system idle.

6. The combination of a printing drum having a gear with its pitch circle corresponding to the periphery of a plate on the drum, a normal inking system having a distributor roll gear-driven by said gear on the drum and a friction-driven form roll adapted to coact with said distributor roll and with the printing plate, another form roll having a gear meshing with the gear on the drum, another distributor roll rotated by frictional contact with the gear-driven form roll, and means for rendering the normal printing system idle.

7. The combination of a printing drum, a normal inking system therefor including a friction-driven inking form roll adapted to coact with a plate on the drum, another form roll gear-driven to have the same peripheral speed as the plate on the drum, a distributor roll coacting with the latter form roll to supply ink thereto, said latter mentioned distributing roll being removably mounted and being self-reciprocating as it rotates, its rotation being by frictional contact with the gear-driven form roll.

8. In a printing machine, the combination of a rotary drum adapted to carry a printing plate, a normal inking system having a friction-driven form roll adapted to engage said plate, a gear rotatable with the drum, another form roll having a gear-driven by the gear on the drum and a self-reciprocating distributor roll and rotated by frictional contact therewith, whereby the plate may be inked from an ink supply on said distributor roll, and means whereby either of said inking systems may be rendered idle when the other is active.

9. In a printing machine, the combination of a rotary drum adapted to carry a printing plate, an inking system therefor including a friction-driven form roll adapted to engage the plate, a movable support in which such form roll is mounted, a gear rotating with said drum, means for mounting a form roll having a gear in the same support which normally carries the friction-driven form roll, and means for holding said support in a different position from that which it occupies when carrying the friction-driven form roll in its active position, which different position enables the gear on the gear-driven form roll to mesh with the gear rotating with the drum.

10. In a printing machine, the combination of a rotary drum adapted to carry a printing plate, an inking system therefor including a form roll adapted to engage the plate, a pair of movable brackets in which the form roll is mounted, means for mounting a geared form roll in the same brackets which normally carry the friction-driven form roll, and means for holding said brackets in different position from that which they occupy when carrying the friction-driven form roll in its active position, which different position enables the gear on the gear-driven form roll to mesh with a driving gear, and a reciprocating distributor roll removably mounted and when in position adapted to contact frictionally with said gear-driven form roll when the latter is in position engaging the printing plate.

11. In a printing machine, the combination of a drum adapted to carry a printing plate and equipped with a gear rotatable with the drum, an inking system including a form roll adapted to engage the plate on the drum, a distributing roll adapted to engage the form roll, gearing between the distributor roll and the gear on the drum, said form roll being driven frictionally by contact with the distributor roll and the drum, a pair of movable brackets carrying the form roll, means for swinging said brackets to engage or disengage the form roll with the distributing roll and plate, means for mounting a geared form roll in the same brackets with its gear meshing with the gear on the drum, and means for

holding the brackets in such position that the gear-driven form roll carried thereby will have its gear out of range of the gear on the distributor roll.

12. In a printing machine, the combination with a drum adapted to carry a printing plate, a pair of brackets movably mounted, a shaft removably carried by the brackets, a form roll adapted to be carried by the shaft and be frictionally driven in engagement with the plate on the drum, said brackets being adapted to carry a second form roll provided with a gear adapted to be mounted on the same shaft when the brackets are in a different position from that mentioned, and a gear meshing with the gear on the substituted form roll for positively driving said roll.

13. The combination of a rotary drum adapted to carry a printing plate, a form roll, means for pivotally mounting said form roll to swing about an axis spaced from the axis of the roll, means for swinging the roll about said pivotal axis in one direction to cause the roll to coact with the plate and be frictionally driven thereby, said pivotal mounting being adapted to carry a second form roll adapted to be seated against the plate by swinging of the mounting in the opposite direction from that first described, and means for positively driving the second form roll.

14. In a printing machine, the combination of a printing drum adapted to carry a printing form, an inking system therefor including a form roll, a shaft on which the form roll is removably mounted, a pivotal mounting for said shaft adapted to be swung from active to idle position, means for positioning a second form roll having a gear in said shaft in the same mounting, and a pair of retaining devices carried by the frame of the machine and adapted to hold the pivotal mounting for the shaft in a new position with the gear on the new form roll in engagement with a driver and out of engagement with the normal inking system.

15. In a printing machine, the combination of a drum adapted to carry a printing form and having a gear, an inking system therefor geared with the drum and having a friction-driven form roll, a pair of pivotally mounted brackets each carrying a bearing for a shaft, a shaft mounted in said bearings and adapted to carry either the friction-driven or a gear-driven form roll, and a pair of retaining devices adapted to hold said backets in a position where the bearings will support the shaft in such position that the geared form roll mounted on the shaft may have its gear mesh with the gear on the drum and be out of contact with any gear on the normal inking system.

16. The combination of a rotary printing drum adapted to carry a printing form, an inking system therefor including a form roll adapted to engage the form, means for supporting and driving a gear-driven form roll substituted for the form roll first-mentioned, and means to prevent the mounting of the gear-driven form roll unless the support therefor is in position to cause the gear on such form roll to clear the normal inking system.

17. The combination of a rotary drum adapted to carry a printing form, an inking system therefor having a form roll adapted to coact with the drum, a distributing roll adapted to coact with the form roll, gearing between the drum and the distributing roll, means for substituting a second form roll having a gear for the friction-driven form roll in the same bearings but in a shifted position, and means to prevent the mounting of a geared form roll in a position where its gear might contact with the gear on the distributor roll of the normal ink supply.

18. The combination of a rotary printing drum adapted to carry a printing form, an inking system therefor including a form roll adapted to engage the form, means for supporting a gear-driven form roll substituted for the form roll first-mentioned, said supporting means comprising pivoted brackets carrying bearings for a shaft which may carry either form roll, and a pair of retaining devices adapted to hold said brackets in an abnormal position with the gear on the gear-driven roll meshing with a driving gear, and a pin on one of the retaining devices adapted to project into the region to be occupied by the geared roll except when that retaining device is in position to cause the gear on the latter form roll to clear the normal ink supplying system.

19. In a printing machine, the combination of a rotary printing drum, bearings adapted to carry a form roller in coaction with the drum, means for holding said bearings in either of two active positions with an idle position between them, whereby a form roller mounted in the bearings may coact in one position with the drum and a substituted form roller mounted in the same bearings may coact in another position with the drum, springs acting on the bearings tending to hold them in the first-mentioned active position, mechanism for moving the bearings from such active position to an idle position, and means to hold the bearings in the second active position where the form roller carried thereby may coact with the drum.

20. The combination of a printing drum, a gear-driven inking system therefor including a friction-driven form roll adapted to engage the form on the drum and engage an ink supply, a shaft carrying the form roll, bearings for opposite end portions of the shaft, pivoted brackets carrying said bearings, the shaft being eccentrically mounted in the bearings and provided on one end with a hand lever to enable the form roll to be changed from active to inactive position, a manually controlled device to shift the brackets as a unit to carry the form roller into and out of contact with its supply roller, said shaft being adapted to be withdrawn from its bearings, and means coacting with the brackets, bearings and shaft to hold them in an abnormal position where the shaft may carry a second form roller having a gear on one end thereof with the gear on the second form roller meshing with a driving gear therefor and out of contact with any gear on the distributing roller which supplies the normal friction-driven form roller, the said holding means comprising a pair of pivotally mounted brackets on the frame normally idle but each adapted to be swung and then coact with the newly positioned bearings and shaft and hold the same in such new position.

21. The combination of a printing drum adapted to carry a printing plate, an inking system therefor having two form rolls adapted to contact the plate and a distributor roll adapted to engage both form rolls for feeding ink thereto while the form rolls are frictionally driven, one of said form rolls being removably mounted, means for carrying a gear-driven form roll in

active position with reference to the printing drum and in place of said removably mounted form roll and in a position different therefrom, and means for holding the retained frictional driven form roll in an inactive position relative to the printing drum without disturbing the active position of the substitute roll.

22. The combination of a plate cylinder, a form roll, a pair of pivoted brackets to removably support the form roll, a distributor roll, gearing connecting said distributor roll with the plate cylinder, means to move said brackets to move the form roll to a position in contact with the plate and distributor roll and to another position out of contact with the plate and distributor roll, said brackets being adapted to support a gear driven form roll, in place of said first named form roll, means to hold a gear driven roll and said brackets in a new position wherein a gear driven roll may contact with the plate and with a substitute ink supply roll while out of contact with said distributor roll.

23. In a printing machine, the combination of a rotary drum adapted to carry a printing plate, a gear on the drum having a pitch circle corresponding to the periphery of the plate, an inking system for the plate comprising a form roll adapted to engage the plate and be frictionally driven, a distributor roll adapted to engage the form roll, said distributor roll having a gear with its pitch circle corresponding to the periphery of the distributor roll, said gear on the distributor roll being connected by intermediate idler gearing with the gear on the drum, a pair of movably mounted brackets, means to hold said brackets in one position, a frictionally driven form roller removably mounted in said brackets in said position, said brackets being adapted to support a gear-driven form roll in place of the frictionally-driven form roll, holding means independent from the first named means to hold the gear-driven roll and said brackets in another position with a gear on the gear-driven roll meshing with the gear on the drum and clearing the gear on the distributor roll and with the gear-driven roll in engagement with the plate and out of engagement with the distributor roll.

24. In a printing machine, a plate cylinder, a pair of movable brackets, a shaft mounted in said brackets and adapted to carry an inking roll, means acting on the brackets to hold them in either of two positions in one of which the roll carried thereby is in contact with the plate cylinder and in the other out of contact therewith, and independent means to hold the shaft and brackets in a third position with the roll carried by the shaft in contact with the plate cylinder.

25. In a printing machine, a plate cylinder, a pair of pivoted brackets, a shaft mounted in said brackets and adapted to carry any one of a plurality of form rolls, means to hold the shaft and brackets in one position with the roll in contact with the plate cylinder, means to hold the shaft and brackets in another position with the roll in contact with the cylinder, and means to hold the shaft and brackets in an intermediate position with the roll out of contact with the plate cylinder.

26. In a printing machine, a frame having a plate cylinder mounted therein, a pair of brackets pivoted to said frame, a shaft mounted in said brackets, a form roll carried by the shaft, said brackets being swingable about their pivots to move the roll from a position in contact with one portion of the cylinder into another position in contact with another portion of the cylinder, the pivot of said brackets being disposed intermediate the axis of the roll and the axis of the cylinder whereby movement of the roll away from either contact position causes the roll to first move out of contact with the cylinder, means to hold the roll in one contact position means to hold the roll in another contact position, and means to hold the roll in an intermediate position out of contact with the cylinder.

27. In a printing machine, the combination of a plate cylinder, a pair of aligned brackets movably mounted, a removable shaft adapted to be mounted in said brackets and carry a form roll, means for holding the brackets and shaft in either of two positions, whereby the form roll may be caused to engage a plate on said cylinder or be free therefrom respectively, and means adapted to hold the brackets and shaft in a third position, whereby a form roll on the shaft may be caused to coact with the plate on the cylinder.

28. In a printing machine, the combination of a plate cylinder, a pair of aligned brackets movably mounted, a removable shaft adapted to be mounted in said brackets and carry a form roll between the brackets, means engaging the brackets for holding them in either of two positions, whereby the form roll may be caused to engage a plate on said cylinder or be free therefrom respectively, and means adapted to engage the shaft and hold it and the brackets in a third position, whereby a form roll on the shaft may be caused to coact with the plate on the cylinder.

29. A printing machine having a rotary drum adapted to carry a printing plate, a normal inking system therefor including a friction-driven form roll adapted to coact with the plate and with means for supplying ink to said roll, mechanism for removably supporting said friction-driven form roll, means for rendering the normal ink supply mechanism inactive, and means for carrying a gear-driven form roll in the same supporting mechanism in place of the friction-driven form roll but in a position different therefrom and where it may contact with the printing plate while out of contact with the normal inking system and where it may be supplied with ink independently of the normal inking system.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
917,037	Ford	Apr. 6, 1909