Dec. 10, 1940. A. A. WITTNEBEL 2,224,331

INKING MECHANISM FOR ROTARY STEEL PLATE PRINTING MACHINE

Filed Aug. 8, 1939 2 Sheets-Sheet 1

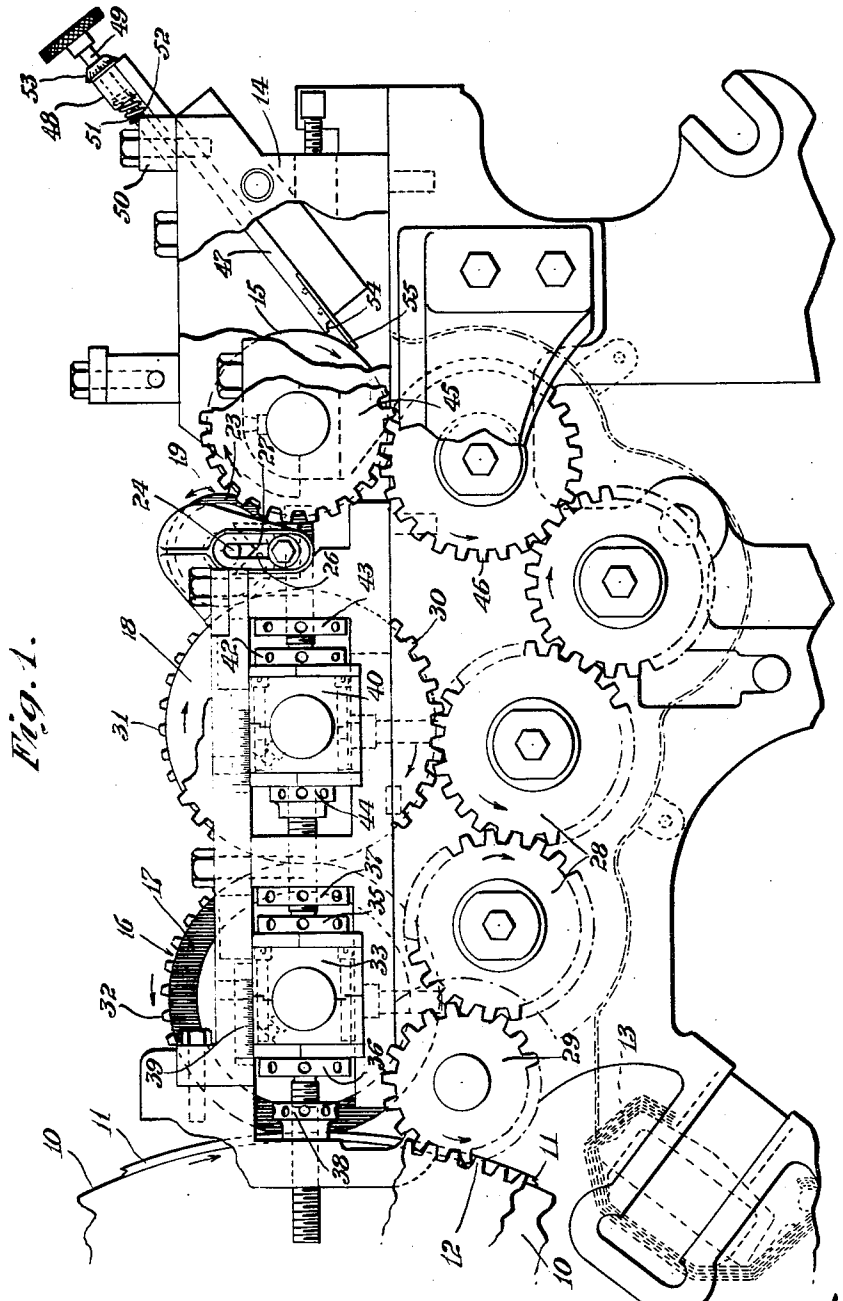

Fig. 1.

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Fig. 2.

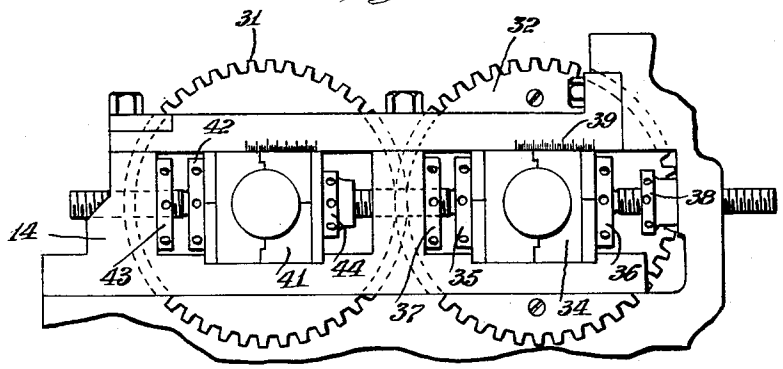


Fig. 3.

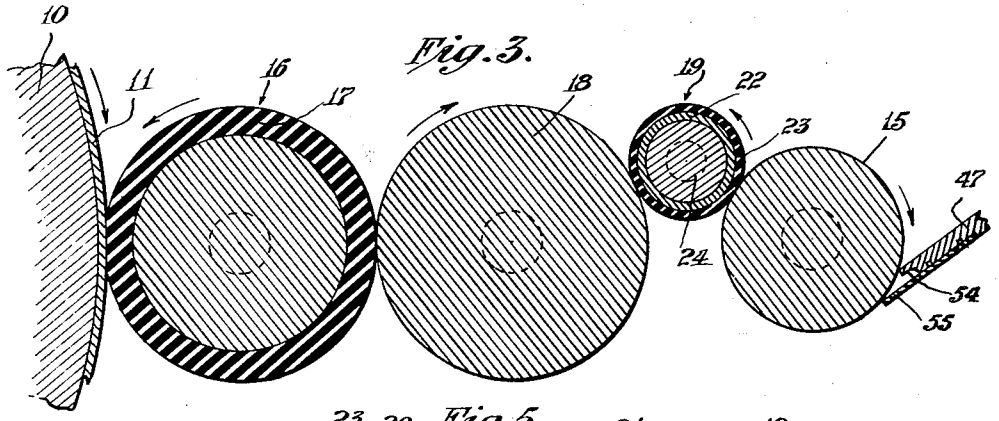
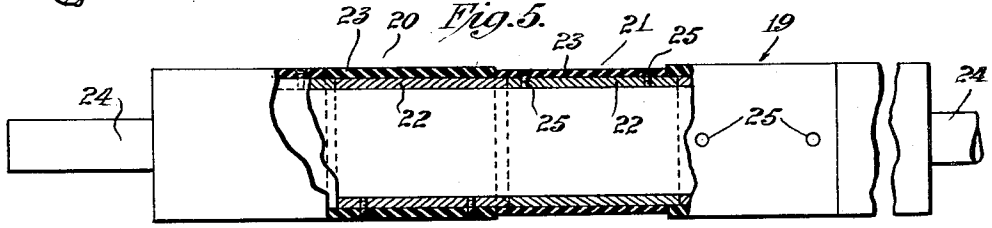


Fig. 5.



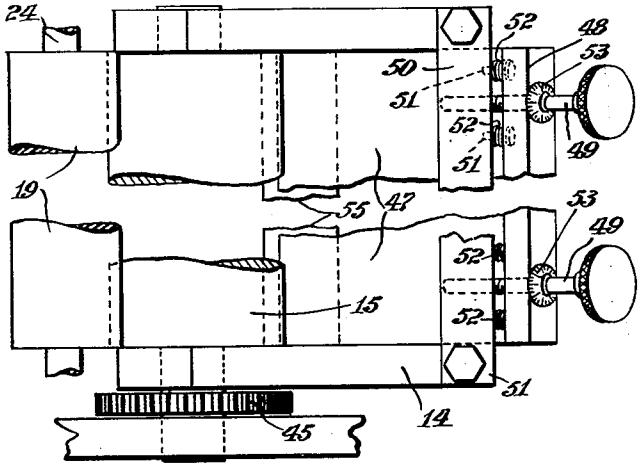


Fig. 4.

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Patented Dec. 10, 1940

2,224,331

UNITED STATES PATENT OFFICE

2,224,331

INKING MECHANISM FOR ROTARY STEEL PLATE PRINTING MACHINE

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Application August 8, 1939, Serial No. 288,905

17 Claims. (Cl. 101—351)

The invention relates to inking mechanisms for rotary steel plate printing machines, and more particularly to an inking mechanism adapted for use in a rotary steel plate printing machine in which the plate cylinder is rotated at high speeds.

For many years the practice has been to operate the plate cylinders of rotary steel plate printing machines at a speed which will result in a travel of the plate at the rate of approximately 70 feet per minute. There has recently been developed a printing machine of this type in which the plate cylinder has a peripheral speed of between 175, and in some instances as high as 275 feet per minute.

In rotary steel plate printing machines, it is necessary to apply ink to the plate to fill all of the intaglio, engraved or undersurface lines and provide excess ink upon the top or non-printing surface of the plate. While most of the surface ink is removed by the wiper and polisher webs, some of it is used in packing the lines of the plate. The lines of a plate differ in depth and width in different portions of the design, and in some instances portions of the plate require a greater quantity of ink than other portions thereof.

Great difficulty has been experienced in properly inking a plate traveling at high speed. There is a tendency, with variation in the peripheral speed of the plate and of the inking roller, to either fail to fill lines throughout transverse streaks upon the plate caused by a lower speed of the inking roller relative to that of the plate, or to drag ink from different portions of the plate due to a speed of the inking roller relatively higher than that of the plate.

With higher speeds of the plate cylinder, a greater quantity of ink must be applied to the plate by the inking roller within a given time interval, and this has been found to require a finer adjustment of the blade of the ink fount than is required with lower speeds of the plate. Even with such finer adjustment there is a tendency for the ink to creep past this blade and drop upon portions of the machine positioned below the ink fount.

When using an ink fount blade of the type used with low speed rotary steel plate printing machines, it was found that closer adjustment of the plate had a tendency to buckle it in a manner to result in a different contacting relation between the blade and the ink fount roll at different points of the length of these parts. This not only resulted in an uncontrolled, unequal distribution of ink throughout the surface of the ink fount roller, but a considerable wastage of ink because of drip of that ink which passed between the blade of the fount and the roller and fell from the blade instead of being applied to the roller, and by said roller to the distributing and inking rollers.

In a high speed rotary machine, considerable pressure between the inking roller and the steel plate is required to avoid a lineal contact between this roller and the plate, and such pressure is one factor in the development of those imperfections in the resilient surface of the roller which require the re-finishing of the roller from time to time, and a consequent periodic reduction in the diameter of this roller.

With the above conditions in mind, I have provided an inking mechanism wherein the inking roller is positively driven, and develops a peripheral speed substantially coincident with the peripheral speed of a plate upon the plate cylinder. The angular speed of the inking roller may be changed from time to time to ensure a desired peripheral speed irrespective of the use of inking rollers having different diameters.

To permit the proper adjustment of the machine to attain the above effect, and at the same time ensure the proper pressure engaging relation between the resilient inking roller and the plate, it is necessary to provide means whereby the inking roller may be adjusted toward and from the plate cylinder; whereby the main distributing roller may be adjusted in relation to said inking roller and to the ductor-distributing roller, and the ductor-distributing roller may be adjusted in relation to the distributing roller and the ink fount roller.

The bottom blade of the ink fount is adjustable toward and from the ink fount roller by a mechanism which will not only permit the convenient removal of this blade from the fount, but will prevent any such buckling of the blade during adjustment as will result in the formation of crevices at any or different points along the roller through which ink in excess of that required in the inking operation may escape from the ink fount and drip upon parts of the machine below the ink fount.

To secure a proper application of ink to this ink fount roller and effect the saving of what would otherwise be waste ink, I provide upon and below this bottom blade, a supplemental blade forming a pocket in which any drip from the main blade will be accumulated and applied to the ink fount roller, thus supplying ink to that roller

from two different sources and permitting a closer adjustment of both blades in relation to the roller.

The ink fount blade and its adjusting mechanism are so constructed as to not only prevent buckling of this blade in the manner above referred to, but to permit an accurately controlled minute adjustment of the blade.

In an inking mechanism embodying the invention, I have found that the ink may be properly worked upon the distributing rollers without the use of vibrator rollers commonly used in inking mechanisms. Furthermore, the construction and arrangement of these rollers is such that the area or width of the plate to which ink is applied, may be varied during the makeready of the press, and thus save a substantial percentage of ink not required to fill lines of the plate. Furthermore, the ductor-distributor roller may be so constructed as to convey ink in different volume to different portions of other distributing rollers and therethrough to the inking roller, thus supplying a greater quantity of ink to some portions of the plate where such is required, and a lesser quantity of ink to portions thereof where excess ink is both unnecessary and wasteful. This results in a further saving of ink, since in machines which have long been used for steel plate printing, ink has been applied throughout the entire inked portion of the plate in volume demanded by portions of the plate having deeper and wider lines.

The invention consists in an inking mechanism for rotary steel plate printing machines embodying therein the novel features of construction and combination of parts hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings,

Fig. 1 is a side view of an inking mechanism embodying the invention and the contiguous portions of a rotary printing machine;

Fig. 2 is a similar view of a portion of the opposite side of the machine showing the manner of driving the inking roller;

Fig. 3 is a schematic view showing the arrangement of the various rollers of the inking mechanism and a plate upon a plate cylinder associated therewith;

Fig. 4 is a plan view of the ink fount; and

Fig. 5 is a view, partly in section, of the ductor-distributor roller.

Like numerals refer to like parts throughout the several views.

In the embodiment of the invention shown in the drawings, 10 indicates a portion of a plate cylinder; 11 a portion of the plate carried thereby; 12 a portion of the plate cylinder gear, and 13 a portion of the wiper mechanism.

The ink fount is shown at 14 and the ink fount roller, which is made of metal, at 15.

The inking roller proper is shown at 16, this roller consisting of a metal core having a resilient jacket 17 preferably consisting of soft vulcanized rubber. In constant contact with the surface 17 of the inking roller is a distributing roller 18 which may be, and preferably is, made of metal.

Mounted in suitable vertical bearings intermediate the ink fount roller 15 and the distributing roller 18 is a ductor-distributor roller 19 which is capable of movement in its bearings, so as to constantly engage both rollers 15 and 18. This roller 19 is preferably composed of a plurality of short cylindrical sections such as 20—21 as shown in Fig. 5, each consisting of a tubular metal core 22 having a resilient surface 23, preferably of soft vulcanized rubber.

As shown particularly in Fig. 5, the jacket at one end of the tubular core overhangs the core so as to have a sliding fit with the exposed portion of the end of the core of an adjacent section. Each section of the core is secured in relation to a shaft 24 by means of a set screw 25 passing through the jacket and the tubular core and engaging the shaft. The head of this set screw is forced below the surface of the jacket to an extent to avoid engagement of the same with either roller 15 or 18.

By employing a ductor-distributor roller of the construction above referred to, the length of this roller during the makeready of a press may be varied according to the width of a plate 11, thus limiting the application of ink removed from the ink fount roller and applied to the distributing roller, and through the inking roller to the plate, to a width required by the width of the plate. A material saving of ink results from such a practice, since all ink which is not passed to the distributing roller by said ductor-distributor roller is returned to the ink fount, or is carried over by the ink fount roller with succeeding revolutions thereof.

In steel plate work, different portions of a plate may have a design thereon, the lines of which are wider and deeper than the lines of other parts of the plate. Such portions of the design require more ink than portions with narrower and shallower lines.

Prior to the present invention, it has been necessary to apply to the entire surface of a plate, ink in sufficient quantity to properly fill those lines in isolated portions of the plate which are deeper and wider than in other portions of the plate, the result being excessive ink upon the top or nonprinting surface of a major portion of the plate.

By making one or more sections, such as 21, of the ductor-distributor roller of slightly smaller diameter than the abutting sections of this roller, and locating this section on the shaft 24 approximately corresponding with the portion of the plate having the design composed of wider and deeper lines, it is possible to apply a stripe of ink of greater thickness along the length of plate including that portion of the design, and a thinner application of ink to other portions of the plate. Where the entire design upon the plate is repeated in a number of parallel rows, an undersize ductor-distributor roller section may be used in relation to each row of designs. In this manner, over-inking of large areas of a plate may be avoided.

The difference in the diameter between sections 21 and other sections 22 of a ductor-distributor roller may amount to only about .001 of an inch, but even with this small difference, the saving of ink in the day's run of a machine will be substantial.

Adjacent each vertically slotted bearing 26 for the roller 19 is a vertically adjusted bracket 27 having a V top as shown, which forms supports for the arbors of the roller. The vertical adjustment of said brackets permits the roller to be raised and held out of engaging relation with the ink fount roller 15 and the distributing roller 18. This bracket does not act as a bearing for the arbors of the roller 19, since this roller is supported by engagement with the rollers 15 and 18. The bracket 27 is merely for the purpose of facil-

itating the cleaning of the inking mechanism upon the completion of a run.

When operating a steel plate printing machine at higher speeds, I have found it necessary to have the inking roller of resilient, non-ink absorbent material, and to cause this roller to exert considerable pressure upon the plate in order to fill the lines with ink. The contacting area between this inking roller and the plate, instead of being a light lineal contact, is a surface contact throughout a considerable area, possibly one-half to three-quarters of an inch in width, and throughout the entire width of the plate, the resilient surface 17 of the inking roller yielding in order to secure this surface contact area.

I have also found it necessary that the peripheral speed of the inking roller shall be substantially the same as that of a plate upon the plate cylinder, since, as heretofore stated, any material variance in these speeds will result in an improper inking of the plates, which cannot be corrected by the wiping webs, and thus result in a high percentage of imperfect impressions.

When using a rubber jacketed inking roller and operating the press at high speeds with pressure of the roller against the plate, the surface of the jacket is in time forced out of true cylindrical form. It may also become slightly pitted from action of the ink thereon or rapid compression and expansion of the resilient surface. This also will result in unsatisfactory inking, and to correct this condition, said inking roller is from time to time removed from the machine and ground to a true circular form.

Such grinding of the roller to restore it to a true cylindrical form results in a condition in the cylinder similar to that present in the copper cylinder of rotogravure printing machines and introduces a serious problem in the operation of the machine as a whole.

With an inking roller of smaller diameter, the desired contact relation between it and the plate 11 is lost, and even after adjustment of the roller so as to restore the desired contact relation, the relative peripheral speeds of the plate and of this roller would be lost, were not means provided for increasing the angular speed of the roller to compensate for its lessened diameter. This is particularly true as in the operation of the machine the inking roller must be positively driven.

The construction by which the roller 16 is given a peripheral speed corresponding with that of the plate 11 will now be described.

It is not only necessary that the inking roller be positively driven, but that the distributing roller 18 and the ink fount roller 15 also be positively driven. The ductor-distributor roller 19 is driven by frictional contact with the ink fount roller 15 and the distributing roller 18, and the positive driving of this roller is not necessary. The distributing roller 18 and the ink fount roller 15 are positively driven by a gear train 28, the first gear 29 of which is enmeshed with the gear 12 upon the plate cylinder. The number and arrangement of the gears of this train is such as to impart movement to the rollers 15 and 18 in the direction indicated by the arrows thereon.

Upon one of the arbors of the roller 18 is a gear 30 enmeshed with one of the gears of the gear train 28, and upon the other arbor of said roller is a gear 31 enmeshed with a gear 32 (see Fig. 2) upon one of the arbors of the inking roller 16. This gear 32 is removably secured to the roller 16 so as to permit its removal therefrom and the substitution therefor of another gear having a different number of teeth.

By the use of interchangeable gears for the inking roller, variance in the diameter of this roller may be compensated for by the substitution of one gear 32 for another, and thus maintain the desired peripheral speed of the inking roller in relation to the plate upon the plate cylinder. This construction requires accurate control of the grinding operation in reducing the diameter of the roller, since the diameter of the roller must be nicely proportioned with relation to the different gears used.

It is also necessary to provide in a mechanism embodying the invention, means whereby the inking roller may be accurately adjusted toward and from the plate cylinder, not only to compensate for different diameters of this roller, but to control the pressure relation between the inking roller and the plate, which may vary according to the designs upon different plates.

With any adjustment of the inking roller 16, there must be corresponding adjustment of the distributing roller 18, although the ductor-distributor roller 19 will automatically adjust itself, by gravity, in relation to the ink fount roller 15 and the distributing roller 18. This adjustment of the inking and distributing rollers is an important feature in the mechanism of the invention, since it is a primary contributing factor in the proper inking of a plate.

To permit adjustment of the inking roller 16, its arbors are mounted in blocks 33 and 34 mounted in slideways upon opposite sides of the frame of the machine. Acting upon the block 33 are adjusting screws 35 and 36, having associated therewith respectively a lock nut 37—38. Similar adjusting screws and lock nuts act upon the bearing block 34. The blocks 34 are sectional, as shown, and the frame of the machine is provided with gauge markings 39 by means of which and the parting line, accurate adjustment of the blocks at opposite ends of the roller may be made. The adjusting screws 35 and 36 permit accurate setting of the bearing blocks, and the lock screws 37 and 38 prevent any loss of adjustment due to vibrations about the machine.

Since any adjustment of the inking roller requires a corresponding adjustment of the distributing roller 18, the arbors of this roller are also mounted in blocks 40 and 41. Acting upon the block 40 is an adjusting screw 42 and two lock nuts 43 and 44, the former of which is mounted upon the screw 42, and the latter of which is mounted upon the adjusting screw 35. A similar adjusting screw and lock nuts act upon the bearing block 41.

It will be noted that two adjusting screws act upon the bearing blocks 34, and but one adjusting screw upon each of the blocks 40 and 41. The adjusting screw 36 is used to supplement the action of the adjusting screw 35 in securing nicety in the adjustment of the pressure relation between the inking roller and a plate 11. A similar nice adjustment is not required to control the pressure relation between the distributing roller 18 and the inking roller 16, although the lock nuts 44 permit a sufficiently nice adjustment of said distributing roller. The adjusting screws 35, 36 and 42 are mounted in webs upon the side frames of the machine.

The bearing blocks 40 and 41, like the bearing blocks 33 and 34, are split blocks, and the frame of the machine adjacent these blocks is provided with gauge markings co-operating with the part-

ing line in the two block sections in determining accuracy in the adjustment of the distributing roller 18. These gauge markings permit an accurate right line adjustment of the roller as a whole.

The ink fount roller 15 is mounted in fixed bearings and is positively driven by a gear wheel 45 upon one arbor of this roller enmeshed with the last gear 46 of the gear train 28.

The quantity of ink conveyed by this roller 15 from the ink fount and delivered to the ductor-distributor roller 19 is controlled by an ink fount blade 47 which is adjustable along the bottom of the ink fount toward or from the roller 15.

To avoid buckling of this blade as a result of the action of adjusting screws thereon, I provide the upper edge of the blade with an enlarged head 48 through which adjusting screws 49 pass and enter a cross bar 50 positioned upon the ink fount above the blade, so that the adjusting pressure exerted by the screws 49 has a tendency to force the blade downwardly against the bottom of the ink fount, instead of bulging it upwardly.

The cross bar 50, upon opposite sides of each adjusting screw 49 has a stud 51 surrounded by a spring 52, which springs bear between the head 48 and the bar 50 so that adjustment of the blade is against the tension of these springs. Each screw is provided with a collar 53 bearing upon the head 48 and having gauge markings thereon permitting accuracy in the adjustment of the opposite ends of the blade. The top of the head 48 is provided with a gauge marking co-operating with each collar 53.

The blade 47 is provided with an undercut lower edge 54, and secured to and flush with the bottom of this blade, and projecting beyond same in the manner shown in the drawings, is a supplemental blade 55. By this construction, all ink which passes between the edge 54 of the blade and is not carried over by the ink fount roller, falls upon the supplemental blade 55 and any accumulation of ink in this pocket is in part applied to the ink fount roller.

The length of the supplemental blade 55 is such as to compensate for the curvature of the roller and to secure a differential spacing, with adjustment of the ink fount blade, of the edge 54 of the blade and the edge of the supplemental blade 55, the latter being spaced from the ink fount roller at all times a distance slightly greater than the spacing of the main blade from said roller. The difference may amount only to a few thousandths of an inch, but by the use of a plurality of blades successively acting upon the ink fount roller, there is a more uniform application of ink throughout the entire roller and wastage of ink to a material extent is avoided.

The ink fount roller 15, like all the other rollers of the mechanism, is continuously driven at uniform speed through the gear train 28.

The operation of the herein described mechanism is substantially as follows:

While a machine is in operation, the peripheral speed of the plate upon the plate cylinder exceeds 175 feet per minute and but a single plate upon the cylinder 10 can be used and yet secure a product in the machine greater than was possible with older machines in which the plate cylinder carried two plates.

With a higher speed of the plate, a greater volume of ink per minute must be conveyed from the ink fount to the plate by the rollers 15, 19, 18 and 16, and this volume must be nicely controlled.

By driving the inking roller 16 at the same peripheral speed as the plate, and by using a flexible jacket 17 upon this roller, it is possible to compress the jacket throughout an area of engagement with the plate which will ensure the ink being forced into the lines of a plate, and avoid any tendency toward a spotty inking or the dragging of ink from the lines, notwithstanding the limited time for inking the plate.

By positively driving the inking roller 16 from the distributing roller 18, these rollers, irrespective of the diameter of the roller 16, will have the same peripheral speed and thus ensure uniformity in the thickness of the film of ink transferred from the distributing roller 18 to the resilient jacket 17 of the roller 16. The ductor-distributor roller 19 is in continuous contact with the distributing roller 18 and with the ink fount roller 15, oscillation of the ductor roller, common to many forms of inking mechanims, being absent from the inking mechanism of the invention. This permits a more accurate control of the ink carried by the ink fount roller 15 from the fount and applied to the roller 19.

The pressure relation between the inking roller and the plate varies with the designs upon different plates, and by adjusting the bearing blocks 33 and 34 toward or from the plate cylinder by means of the adjusting screws 35 and 36, a desired pressure relation may be established, and this pressure relation may be varied at will during the operation of a machine.

Under ordinary conditions, with adjustment of the inking roller, similar adjustment of the distributing roller is also necessary, but the ductor-distributor roller 19, by reason of its free vertical movement, will automatically adjust itself to any setting of the distributing roller 18.

After a long run of the machine, the jacket 17 of the inking roller may become slightly out of true, or may become pitted so that it is necessary, from time to time, to grind this roller to restore it to a true cylindrical form and remove any pits. Whenever a roller is thus ground, its diameter may be changed by a fraction of an inch, but even this change will interfere with the desired proper rapid inking of the plate if means are not provided to increase the angular speed of the roller in order to maintain the peripheral speed thereof coincident with that of the plate 11.

When it is necessary to grind an inking roller, this work is done without regard to the depth of the pits or the extent of deformation of the roller, the amount of the jacket removed being a fixed definite amount so that a gear 32 upon the shaft may be removed and replaced by another gear having a less number of teeth, so as to maintain a proper peripheral speed of the inking roller notwithstanding changes in its diameter.

After each grinding operation and change of gears 32 upon the roller 16, the blocks 33, 34, 40 and 41 are adjusted by means of the feed screws operating upon each, in order to secure a proper pressure engaging relation between the rollers 16 and 18 and the proper pressure engaging relation between the former and the plate upon the plate cylinder.

The use of lock nuts 38, 43 and 44 is merely for the purpose of avoiding accidental loss of the setting of the rollers 16 and 18.

The use of gauge markings is merely to permit accuracy in the setting of opposite ends of each of the rollers.

The advantages of using an ink fount blade ad-

justable by means of pressure applied above the blade have heretofore been referred to.

It is essential to accurately control the amount of ink carried by the ink fount roller 15 from the fount and applied to the ductor-distributor roller 19. This, with the continuously rotating rollers, not only permits a higher speed of the various rollers, but also permits the closer setting of the ink fount blade 47 than would otherwise be possible. The undercut lower edge 54 of the blade is set fairly close to the roller 15, and the supplemental blade 55 is of a length to be positioned slightly more remote from the roller than the edge 54. The edge 54 cannot be set so close to even a metallic roller, as to avoid ink in excess of that required from passing the plate and dripping downwardly from the edge 54. The supplemental blade 55, however, will catch any drip and, by reason of its inclination, this ink will flow toward and be applied to the roller 15, thus slightly increasing the thickness of the film of ink applied to this roller.

Any ink upon the roller 15 which is not transferred to the roller 19 of course will be carried back to the fount. By using the supplemental blade 55, a rapid, more uniform application of ink to the roller 15 is assured, and wastage of ink is avoided.

Proper working of the ink upon the distributing roller is possible without the use of any vibrator rollers.

The brackets 27 are used merely to raise and hold the roller 19 out of contacting relation with the rollers 15 and 18 when cleaning the rollers. If desired, during cleaning up of the machine, the rollers 16 and 18 may be moved respectively out of engagement with a plate and with each other.

By removing the bar 50 from the ink fount, the entire ink fount blade mechanism may be removed from the fount.

The gears for operating the various rollers, and particularly the gear 32, should be hardened to minimize wear, since any substantial back lash will impair the inking operation.

By using a ductor-distributor roller composed of sections, the over-all length of the roller may be varied during the makeready of a press to correspond with the width of the plate 11 to be used. In many plates there are isolated portions of the plate which contain a mass of wide and deep lines, such as in a vignette used in a bank note.

Prior to the present invention, enough ink had to be applied to the entire surface of the plate to meet the requirements of such isolated portions of the design, since the lateral movement of the wiper bars was not sufficiently great to utilize ink, other than that closely adjacent the vignette, in completing the filling and packing of the ink in the lines.

The effective length of the roller 19 may be determined by the number of sections 20—21, or the length of such sections.

By using a ductor-distributor roller made up of short sections as described, and avoiding the use of vibrators, one or more sections of this roller may be made of slightly smaller diameter, possibly .001 or .002 of an inch, than the adjacent rollers and thus cause a greater quantity of ink to be applied to the plate in a stripe, including the vignette or other heavily lined portions of the design. In this manner, ink may be distributed throughout the plate in varying thicknesses, according to the requirements of the design upon the plate.

The detailed construction of the bearing blocks 33, 34, 40 and 41 is immaterial to the invention. They may be mounted in the openings in the side frames of the machine by means of overhanging side flanges, dovetails or in any other desired manner not shown in detail in the drawings.

In actual practice, the diameter of the inking roller is reduced approximately one-eighth of an inch with each grinding operation, and the various interchangeable gears 32 have pitch diameters which correspond in variation with the changes in diameter of the roller.

The gears are secured to the cylinder ends by means of bolts as shown, and, if desired, by means of metal dowel pins passing through the gear and entering the body of the cylinder.

It is not my intention to limit the invention to the detailed construction and arrangement of parts shown in the accompanying drawings, it being obvious that such may be varied without departing from the spirit and scope of the invention.

It is essential, however, that the inking roller shall be positively driven at an angular speed which will ensure a peripheral speed, irrespective of the diameter of the roller, substantially equalling that of the plate upon the plate cylinder, and that said inking roller shall be capable of adjustment toward and from the cylinder to establish and maintain a proper pressure engaging relation between the cylinder and the plate to ensure the filling of the lines of the plate without possibility of an improper application of ink thereto or the dragging of ink from the lines of the design.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:

1. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, means positively driving said inking roller indirectly from the plate cylinder with a peripheral speed substantially coincident with that of a plate upon said plate cylinder to which ink is to be applied, and means applying ink from said ink fount to said inking roller.

2. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an inking roller having a resilient surface, bearings therefor adjustably mounted in relation to a plate cylinder, means acting upon each of said bearings whereby the pressure engaging relation of said roller with a plate may be varied to regulate the amount of deformation of said resilient surface, means positively driving said inking roller indirectly from the plate cylinder with a peripheral speed substantially coincident with that of a plate upon said plate cylinder to which ink is to be applied, and means applying ink from said ink fount to said inking roller.

3. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said

resilient surface, a distributing roller co-operating with said inking roller, means transferring ink from said ink fount roller to said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, and a gear meshing therewith carried by said inking roller, said last named gear being so proportioned in relation to the gear upon the distributing roller as to impart peripheral travel to said inking roller substantially coincident with that of said distributing roller and a plate upon said plate cylinder, irrespective of the diameter of said inking roller.

4. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, bearings therefor adjustably mounted in relation to a plate cylinder, means acting upon each of said bearings whereby the pressure engaging relation of said roller with a plate may be varied to regulate the amount of deformation of said resilient surface, a distributing roller co-operating with said inking roller, bearings therefor, means acting upon each of said bearings whereby said distributing roller may be adjusted in relation to said inking roller, means transferring ink from said ink fount roller to said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, and a gear meshing therewith carried by said inking roller, said last named gear being so proportioned in relation to the gear upon the distributing roller as to impart peripheral travel to said inking roller substantially coincident with that of said distributing roller and a plate upon said plate cylinder, irrespective of the diameter of said inking roller.

5. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, means transferring ink from said ink fount roller to said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, a gear meshing therewith carried by said inking roller, and means detachably connecting said gear with said roller, whereby with the reduction of the diameter of said inking roller when refinishing same, gears having a different number of teeth may be mounted upon said roller to impart peripheral travel thereto substantially coincident with that of said distributing roller and a plate upon said plate cylinder.

6. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller idly mounted in vertical bearings intermediate said ink fount roller and said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, and a gear meshing therewith carried by said inking roller, said last named gear being so proportioned in relation to the gear upon the distributing roller as to impart peripheral travel to said inking roller substantially coincident with that of said distributing roller and a plate upon said plate cylinder, irrespective of the diameter of said inking roller.

7. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller having a resilient jacket, idly mounted in vertical bearings intermediate said ink fount roller and said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, and a gear meshing therewith carried by said inking roller, said last named gear being so proportioned in relation to the gear upon the distributing roller as to impart peripheral travel to said inking roller substantially coincident with that of said distributing roller and a plate upon said plate cylinder, irrespective of the diameter of said inking roller.

8. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller co-operating with said distributing roller and said ink fount roller composed of a shaft, a plurality of closely abutting short sections each having a resilient surface, each section being removably secured to said shaft whereby the effective length of said roller may be varied, and means positively driving said inking roller indirectly from the plate cylinder with a peripheral speed substantially coincident with that of a plate upon said plate cylinder to which ink is to be applied.

9. An inking mechanism for rotary steel plate printing machines embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller co-operating with said distributing roller and said ink fount roller composed of a shaft, a plurality of closely abutting short sections each having a resilient surface, the different sections varying slightly in diameter, whereby the quantity of ink applied to different portions of a plate may be varied, and means positively driving said inking roller with a peripheral speed substantially coincident with that of a plate to which ink is to be applied.

10. An inking mechanism for rotary steel plate printing machines embodying therein an ink fount,

an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller co-operating with said distributing roller and said ink fount roller composed of a shaft, a plurality of closely abutting short sections each having a resilient surface, the different sections varying slightly in diameter, whereby the quantity of ink applied to different portions of a plate may be varied, each section being removably secured to said shaft whereby the effective length of said roller may be varied, and means positively driving said inking roller with a peripheral speed substantially coincident with that of a plate to which ink is to be applied.

11. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, a cross bar upon said fount, an ink fount blade positioned below said cross bar and having a head along the upper edge thereof, adjusting screws engaging said head co-operating with screw threads in said cross bar, whereby said blade may be adjusted toward and from said ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, means positively driving said inking roller indirectly from the plate cylinder with a peripheral speed substantially coincident with that of a plate to which ink is to be applied, and means applying ink from said ink fount roller to said inking roller.

12. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, a cross bar upon said fount, an ink fount blade positioned below said cross bar and having a head along the upper edge thereof, adjusting screws engaging said head co-operating with screw threads in said cross bar, whereby said blade may be adjusted toward and from said ink fount roller, springs positioned between said cross bar and the head of said blade adjacent each said adjusting screw, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, means positively driving said inking roller indirectly from the plate cylinder with a peripheral speed substantially coincident with that of a plate to which ink is to be applied, and means applying ink from said ink fount roller to said inking roller.

13. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, a main ink fount blade, a supplemental blade carried thereby and spaced below and projecting beyond same toward the ink fount roller, to form a pocket for accumulating ink passing the main blade and applying it to the ink fount roller, means whereby both said blades may be simultaneously adjusted toward and from the ink fount roller, an inking roller, and means applying ink from said ink fount roller to said inking roller.

14. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, a main ink fount blade having an undercut edge adjacent the ink fount roller, a supplemental blade carried thereby and spaced below and projecting beyond same toward the ink fount roller, to form a pocket for accumulating ink passing the main blade and applying it to the ink fount roller, means whereby both said blades may be simultaneously adjusted toward and from the ink fount roller, an inking roller, and means applying ink from said ink fount roller to said inking roller.

15. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, a main ink fount blade, a supplemental blade carried thereby and spaced below and projecting beyond same toward the ink fount roller, to form a pocket for accumulating ink passing the main blade and applying it to the ink fount roller, said supplemental blade being of a length to always be spaced from the ink fount roller a slightly greater distance than the main blade, means whereby both said blades may be simultaneously adjusted toward and from the ink fount roller, an inking roller, and means applying ink from said ink fount roller to said inking roller.

16. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an ink fount, an ink fount roller, an inking roller having a resilient surface, means whereby said roller is brought into engaging relation with a plate upon the cylinder with sufficient pressure to deform said resilient surface, a distributing roller co-operating with said inking roller, a ductor-distributor roller having a resilient jacket, idly mounted in vertical bearings intermediate said ink fount roller and said distributing roller, means whereby said ductor-distributor roller may be held out of engaging relation with said ink fount roller and said distributing roller, means positively driving said distributing roller at a peripheral speed coincident with that of a plate upon said plate cylinder, a gear carried by said distributing roller, and a gear meshing therewith carried by said inking roller, said last named gear being so proportioned in relation to the gear upon the distributing roller as to impart peripheral travel to said inking roller substantially coincident with that of said distributing roller and a plate upon said plate cylinder, irrespective of the diameter of said inking roller.

17. An inking mechanism for rotary steel plate printing machines of the type having a plate cylinder embodying therein an inking roller having a resilient surface, bearings therefor adjustably mounted in relation to a plate cylinder, means acting upon each of said bearings whereby the pressure engaging relation of said roller with a plate may be varied to regulate the amount of deformation of said resilient surface, a distributing roller co-operating with said inking roller, bearings therefor, means acting upon each of said bearings whereby said distributing roller may be adjusted in relation to said inking roller, means supplying ink to said inking roller comprising an ink fount, an ink fount roller, a main ink fount blade, a supplemental blade carried thereby and spaced below and projecting beyond same toward the ink fount roller, to form a pocket for accumulating ink passing the main blade and applying it to the ink fount roller, means whereby both said blades may be simultaneously adjusted toward and from the ink fount roller, a ductor-distributor roller having a resilient jacket, idly mounted in vertical bearings intermediate said ink fount roller and said distributing roller, and

means positively driving said inking roller, said distributing roller and said ink fount roller at the same peripheral speed as a plate to be inked, comprising a gear train including a gear upon the plate cylinder, gears enmeshed respectively with said distributing roller and with said ink fount roller, a gear upon said distributing roller, and a gear meshing therewith detachably connected with said inking roller, whereby with the reduction of the diameter of said inking roller when refinishing same, gears having a different number of teeth may be mounted upon said inking roller to impart peripheral travel thereto substantially coincident with that of said distributing roller and a plate upon said plate cylinder.

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