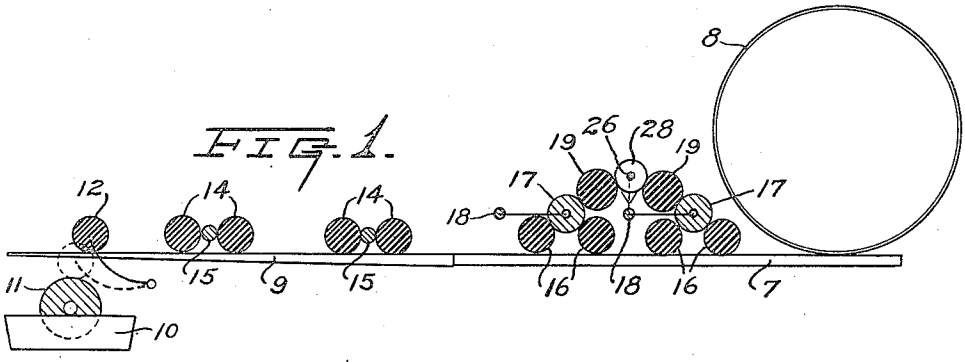
Dec. 27, 1949 R. R. RICHTER 2,492,181

INK SEPARATOR FOR PRINTING APPARATUS

Filed July 5, 1946

FIG. 1.



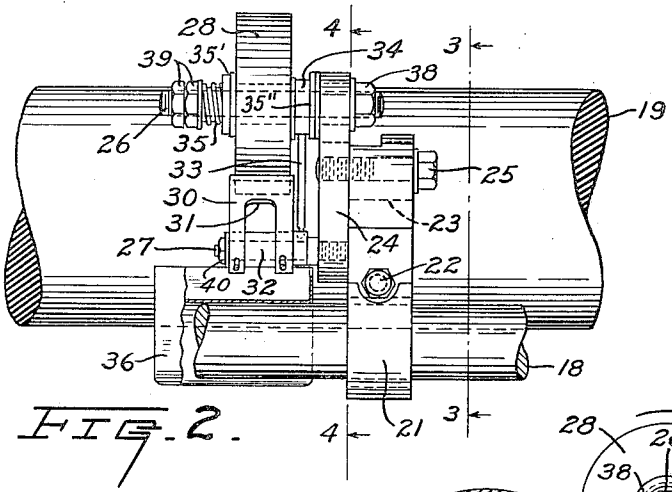


FIG. 2.

FIG. 3.

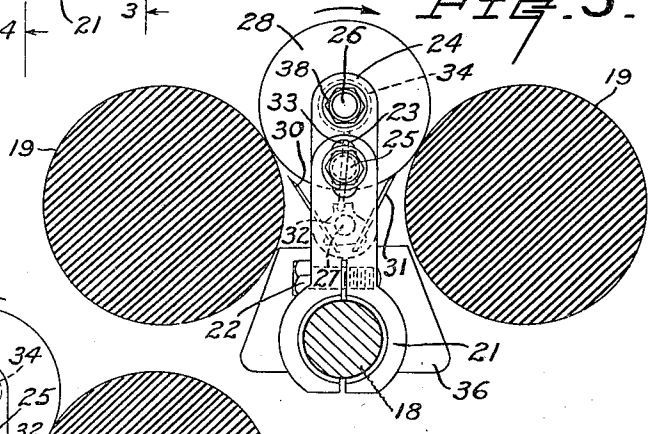
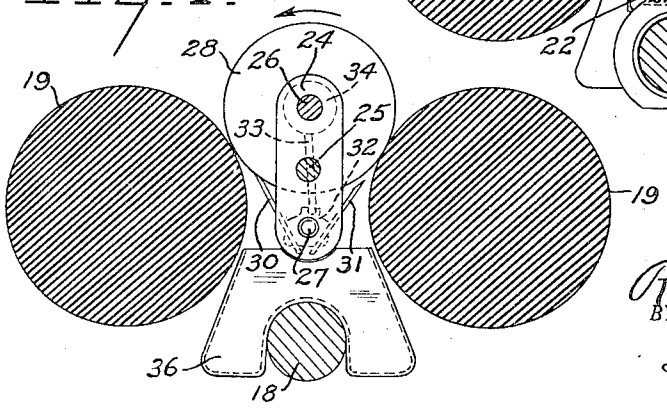


FIG. 4.



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INK SEPARATOR FOR PRINTING APPARATUS

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12 Claims. (Cl. 101—203)

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The present invention relates in general to improvements in the art of printing, and relates more specifically to improvements in the construction and operation of devices for segregating adjoining impressions which are simultaneously applied to sheets being printed in the same press.

The primary object of my invention is to provide improved instrumentalities for effectively separating adjoining impressions being applied simultaneously in a common printing press.

In the art of printing, it is frequently desirable to simultaneously print two or more forms in different colors, with the aid of a common press; and when doing so, considerable difficulty has heretofore been encountered in separating the adjoining differently colored impressions and in preventing mixing of the inks at the adjacent edges of the forms and of the final impressions. When utilizing a Miehle type of press, it has heretofore been attempted to eliminate such undesirable ink mixing and resultant messy borders, by either grooving the ink transfer and distributing rollers along the adjoining edges of the variant impressions, or by providing separate sets of these rollers for each color being utilized. While this prior method has proven fairly satisfactory, it is tedious and costly to employ because of the necessity of providing differently spaced ink separation grooves or new rollers every time a form of different width is utilized; and I have discovered a simple mode of effecting highly satisfactory separation of such variantly colored impressions in a rapid manner and without grooving or replacing the ink distribution and transfer rollers.

It is therefore a more specific object of the present invention to provide improved mechanism for separating impressions applied in different colors by the same printing press, without changing, grooving or otherwise disturbing any of the normal ink transfer and distribution rollers.

Another specific object of this invention is to provide simple, compact and highly efficient means for producing clean segregation of differently colored printed impressions applied simultaneously to successive sheets, together with means whereby the widths of the impressions may be conveniently varied by merely making a few minor adjustments.

A further specific object of the invention is to provide an effective impression separating attachment which may be applied at moderate cost to various types of standard printing presses,

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and which may be quickly attached or removed when not desired.

Still another specific object of my invention is to provide a new and highly useful color print impression segregator which functions to automatically and effectively produce clean cut margins along the adjacent edges of variably colored adjoining impressions being simultaneously applied by the same press.

These and other specific objects and advantages of the present invention will be apparent from the following detailed description.

A clear conception of a typical embodiment of my invention, and of the mode of constructing and of utilizing devices built in accordance therewith, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a diagram of a typical Miehle type printing press showing the ink distribution and transfer rollers and the approximate location of my improved separator with respect to these rollers;

Fig. 2 is an enlarged front elevation of one of the improved ink separating units, showing the same cooperating with an ink transfer and distribution roller and with the pivotal mounting shaft for the roller;

Fig. 3 is a similarly enlarged side view of the assemblage shown in Fig. 2, showing one ink removing knife in action during rotation of the separator roll in one direction, and also showing a transverse section through the shaft and roller taken along the line 3—3 of Fig. 2; and

Fig. 4 is a likewise enlarged transverse section through the same assemblage taken along the line 4—4 of Fig. 2, and showing the other ink removing knife in action during reverse rotation of the separator roll.

While the invention has been illustrated and described herein as being advantageously applicable to printing presses of the Miehle type, it is not my desire or intent to unnecessarily restrict the scope or the utility of the improvement by virtue of this limited embodiment.

Referring especially to Fig. 1 of the drawing, the typical commercial printing press shown diagrammatically therein, comprises in general a horizontally reciprocable form plate bed 7 adapted to support any desired number of printing plates or forms and which is movable back and forth beneath a paper carrying cylinder 8 so as to deposit successive impressions upon the paper during each return stroke of the bed 7; an ink

plate 9 disposed in horizontal alinement and reciprocable with the bed 7; one or more ink supply fountains 10 each having a metal ink delivery roller 11 therein cooperating with an initial swingably suspended rubber transfer roller 12 to deposit successive batches of ink upon the moving plate 9; and several series or sets of ink distributing and transfer rollers coacting with the upper surfaces of the plate 9 and of the forms carried by the bed 7 so as to uniformly distribute the ink and to transfer the same to the type or printing plates during reciprocation of the ink plate and form plate bed.

As shown, two sets of initial ink distribution rollers extend completely across and coact with the inking plate 9, and each of these initial sets comprises a pair of spaced parallel rubber or composition rollers 14 and an intervening metal roller 15 coacting with the peripheries of both rollers 14 of the set. Two sets of final ink distributing and transfer rollers also extend entirely across and coact with the forms or printing plates carried by the bed 7, and each of these final sets comprises a pair of parallel laterally spaced lower rubber or composition rollers 16 resting upon the bed 7, a metal roller 17 swingably suspended from a pivot shaft 18 and resting upon the peripheries of the two adjacent rollers 16, and an upper rubber or composition roller 19 bearing against the metal roller 17 of the set. The upper ink distributing rollers 19 of the two sets are disposed above and on opposite sides of the front pivot shaft 18 and the metal rollers 17 are adapted to be locked in coaction with the lower rollers 16 by means of retaining mechanism not shown, but may be swung out of active position in a well known manner.

The press assemblage above described is of old and well known construction, and any desired number of adjacent forms or printing plates may be mounted upon the common reciprocating bed 7, and may be caused to cooperate with ink supply fountains 10 containing different colored inks, so as to simultaneously print adjacent differently colored impressions upon the paper which is brought in contact with the form plates carried by the bed 7. The initial rollers 14 are adapted to engage only the ink plate 9, and this plate 9 is brought forward into contact with the lower rollers 16 whenever the form plate bed is moved forwardly, thus causing the rollers 16 to rotate in one direction during forward movement of the bed 7 and to deliver ink to the revolving rollers 16. During the return stroke of the ink plate 9 and bed 7, these elements contact the rollers 16 and cause them to rotate in the opposite direction, thus causing all of the rollers 16, 17, 19 to alternately revolve in opposite directions during normal operation of the press. While the lower rollers 16 are supplied with abundant quantities of ink by the reciprocating plate 9, this relatively tacky printers ink must be uniformly distributed upon these transfer rollers 16, and the metal rollers 17 cooperate with the upper rollers 17, 19 to effect such distribution. However, when simultaneously printing differently colored adjacent impressions from plates or forms mounted upon the common bed 7, the adjacent colors tend to spread out and intermingle at the margins of the impressions, and some means for preventing such intermingling of colors must be provided in order to produce sharp and unmarred boundaries.

As shown in detail in Figs. 2, 3 and 4, I have provided simple, compact and highly efficient means for separating the different colored inks along the

longitudinally reciprocating margins of the forms or printing plates, and the improved means comprises independent units adapted to be supported upon and adjustable to any position along the pivot shaft 18. Each of these color separating and surplus ink removing units consists of a supporting arm or bracket 21 having a split lower end embracing the shaft 18 and adapted to be clamped thereto by a clamping screw 22, and being provided at its upper end with an elongated slot 23; a link 24 having its medial portion provided with a clamping screw 25 passing through and movable along the slot 23, while its upper end carries a stub shaft 26 and its lower end is provided with a pivot shaft 27 both firmly secured to the link 24; a metallic ink removing roll 28 journalled for rotation upon the upper stub shaft 26 and adapted to snugly engage the peripheries of both of the upper rubber ink distributing rollers 19; a pair of ink scraper blades or knives 30, 31 carried by a block 32 which is swingably mounted upon the lower pivot shaft 27, these blades being alternately engageable with the periphery of the roll 28; a toggle arm 33 secured to a friction collar 34 which embraces the upper shaft 26 and coacts with the roll 28, the arm 33 having its lower end cooperable with the knife carrying block 32 to swing the blades 30, 31 in opposite directions as the direction of rotation of the roll 28 is reversed; a helical compression spring 35 for frictionally urging the roll 28 against the toggle actuating collar 34; ball bearings 35', 35'' having the stationary rings thereof coacting respectively with spring 35 and link 24 and the movable rings coacting respectively with roll 28 and collar 34; and a surplus ink catching receptacle 36 removably mounted upon the shaft 18 beneath the knives 31, 32.

Obviously each of these surplus ink removing units may be positioned at any desired location along the supporting shaft 18 by merely manipulating the clamping screw 22, and the ink removing roll 28 is preferably formed of hard metal such as steel and with a smooth periphery of approximately the same width as the distance between adjacent forms or printing plates carried by the bed 7. The smooth periphery of each roll 28 may be caused to bear against the adjacent soft rubber rollers 19 with considerable pressure sufficient to cause the ink to be transferred from the contacted areas of these rollers 19 to the roll periphery, with the aid of the slots 23 and clamping screws 25, and the roll 28 of each active unit is constantly rotated by the revolving rollers 19. The upper stub shaft 26 which carries the roll 28 may be firmly secured to the vertically adjustable link with the aid of a clamping nut 38, and the tension of the spring 35 which frictionally confines the toggle collar 34 may be varied with the aid of nuts 39 coacting with the free end of the stub shaft 26. The scraper blades or knives 30, 31 which may be secured to the toggle block 32 in any suitable manner, are preferably formed U-shaped as shown in Fig. 2, in order to prevent removed ink from lodging upon the block 32; and this block 32 is retained upon the lower pivot shaft 27 by a nut 40 and is provided with an upper socket with which the lower end of the toggle arm 33 coacts, as shown in Figs. 3 and 4. The surplus ink catching receptacle 36 is loosely and removably suspended from the pivot shaft 18 as shown in Fig. 4, and may be of any desired capacity but shaped so as not to interfere with upward swinging of the adjacent rollers 17, 19.

During normal operation of the press and use

of the improved surplus ink separators and removers, the units may be readily applied to the pivot shaft 18 in any desired location so that the rolls 28 will be located in the planes of the dividing strips between the adjacent colored impression areas. The brackets 21 should then be clamped to the shaft 18 with the aid of the clamping screws 22, and the rolls 28 should be caused to bear snugly against the peripheries of the relatively soft ink distribution rollers 19 by adjusting the links 24 relative to the frames or brackets 21 with the aid of the clamping screws 25 and slots 23. The tension of the springs 35 should also be adjusted so as to cause the rolls 28 to frictionally clamp or engage the adjacent toggle collars 34, and the blades or knives, 30, 31 should be provided with sharp edges adapted to engage the smooth peripheries of the adjacent ink removal rolls 28.

When the assemblages or units have been thus properly applied to the press, and the press is being operated, ink will be withdrawn from the fountains 10 and applied to the ink plate 9 in a well-known manner, after which the ink will be initially distributed by the relatively soft rollers 14 coacting with the ink plate. Both the ink plate 9 and the form plate bed 7 will be continuously reciprocating so as to produce successive impressions upon the paper coacting with the cylinder 8, and the soft rollers 16 will cooperate with the hard metal rollers 17 so as to apply and distribute the ink upon the forms or type plates carried by the bed 7. The upper soft rollers 19 will be pressed firmly against the metal rollers 17, and the separating rolls 28 will remove the ink from the rollers 19 along the marginal areas between the successive colored impressions during both forward and reverse rotation of the ink distribution rollers 16, 17, 19. The ink thus removed from these local zones will be scraped from the peripheries of the rolls 28 and deposited into the receptacles 36 by the knife blades 30, 31. During clockwise rotation of the rolls 28 as viewed in Figs. 3 and 4, the knife-blades 31 will be effective to remove the surplus ink, and when reversal of the rolls 28 takes place, the toggle arms 33 will withdraw the blades 31 from the adjacent rolls 28 and will cause the other blades 30 to become effective as ink removers. This alternate shifting of the blades 30, 31 takes place automatically as the direction of rotation of the rolls 28 is reversed, and is effected by the friction collars 34 and toggle arms 33 with the aid of the springs 35. By thus removing the ink along the marginal areas of the impressions, intermingling of different colors is definitely avoided and clear-cut borders along the opposite sides of the impressions result.

From the foregoing detailed description of the construction and operation of the improved surplus ink remover and color impression separator, it will be apparent that my present invention provides a simple, compact, and automatically functioning device for most effectively separating the adjacent impressions and for preventing intermingling of the differently colored inks. The improved units positively avoid necessity of grooving or otherwise marring or separating the ink transfer rollers 19, and may be shifted to any position longitudinally of these rollers 19 so as to cooperate with forms or printing plates of different widths, and each unit may be readily adjusted so as to insure most effective functioning thereof. The removed ink may drop freely through the U-shaped blades 30, 31 into the receptacles

36, and these receptacles are conveniently removable for cleaning. The rolls 28 may be formed of any desired width and diameter, and may be caused to cooperate with either one or both of the adjacent rollers 19, and the improved appliance has proven highly satisfactory and successful in actual commercial use and may be applied to various types of printing presses. The improved devices may obviously be applied or removed with very little effort, and may be manufactured and sold at moderate cost for effective cooperation with standard presses, and the toggle assemblage for automatically shifting the blades 30, 31, functions with a snap action so as to maintain one of these scraper knives effective at all times.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. An ink separating device for a press assemblage having a pair of elongated parallel soft ink distribution rollers for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery drivingly engaging and removing the ink from the portions of both distributing rollers which coact with the area between adjacent impression plates, and a pair of blades for scraping the removed ink from the roll periphery.

2. An ink separating device for a press assemblage having a pair of elongated parallel soft ink distribution rollers for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery drivingly engaging and removing the ink from the portions of both distributing rollers which coact with the area between adjacent impression plates, a pair of blades for scraping the removed ink from the roll periphery, and means for effecting adjustment of said roll for cooperation with said rollers at any locality throughout the length of the latter.

3. An ink separating device for a press assemblage having a pair of elongated parallel soft ink distribution rollers for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery drivingly engaging and removing the ink from the portions of both distributing rollers which coact with the area between adjacent impression plates, a pair of blades alternately cooperable with said roll to scrape the removed ink from the roll periphery, and toggle mechanism operable upon reversal of the direction of rotation of said roll for alternately moving one of said blades into active and the other into inactive position.

4. An ink separating device for a press assemblage having a pair of elongated parallel soft ink distribution rollers for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery drivingly engaging and removing the ink from the portions of both distributing rollers which coact with the area between adjacent impression plates, a pair of blades alternately cooperable with said roll to scrape the removed ink from the roll periphery, toggle mechanism operable upon reversal of the direction of rotation of said roll for alternately moving one of said blades into active and the other into inactive position, and means for effecting adjustment of said roll for cooperation with said rollers at any locality throughout the length of the latter.

5. In an ink separating device for a press assemblage having a pair of spaced ink distribution rollers for supplying differently colored ink to adjacent impression plates, a roll for constantly separating ink from the portions of both of the distributing rollers coacting with the area between the impression plates, and a pair of knife blades for alternately scraping the separated ink from said roll, said blades being alternately movable into and out of contact with said roll by reversal of the direction of rotation of the latter to place one blade into active position whenever the other is inactive and vice versa.

6. In an ink separating device for a press assemblage having a relatively soft cylindrical ink distribution roller for transferring different colored inks from sources of supply to adjacent impression members, a roll having a hard and smooth cylindrical peripheral surface contacting and separating ink from a local selected surface portion of the distribution roller between adjacent impressions without defacing the soft contacted roller surface, and means for constantly removing the separated ink from the roll periphery.

7. In an ink separating device for a press assemblage having a relatively soft rotary cylindrical ink distribution roller for transferring different colored inks from sources of supply to adjacent impression members, a cylindrical relatively hard roll contacting a local selected peripheral portion of the rotary ink distribution roller and being driven thereby without deforming the contacted roller periphery to separate ink between adjacent impression regions, and means for constantly removing the separated ink from said rotating roll.

8. The method of removing surplus ink from a relatively soft rotary cylindrical ink distribution roller while transferring different colored inks from sources of supply to adjacent impression members, which comprises, subjecting a local peripheral portion of the rotating distribution roller to a rolling pressure action to separate the ink therefrom between adjacent differently colored impression regions while avoiding deformation of the soft roller surface, and constantly removing the separated surplus ink.

9. In an ink separating device for a press assemblage having an elongated soft peripherally continuous and smooth ink distribution roller for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery formed with straight line generatrices and positioned with said periphery snugly engaging a peripheral portion of the distributing roller without indenting the adjacent surface thereof but engaging said roller with sufficient pressure to remove ink from the peripheral area of contact to the periphery of said roll upon rotation of said roller, and a scraper blade for constantly removing the separated ink from the roll periphery.

10. In an ink separating device for a press assemblage having an elongated soft peripherally continuous and smooth ink distribution roller for applying different colored ink to adjacent impression plates, a roll having a hard and smooth periphery formed with straight line generatrices and positioned with said periphery snugly engaging a peripheral portion of the distributing roller without indenting the adjacent surface thereof but engaging said roller with sufficient pressure to remove ink from the peripheral area of contact to the periphery of said roll upon rotation of said roller, a scraper blade for constantly removing the separated ink from the roll periphery, and means for effecting adjustment of said roll for cooperation with said roller at any locality throughout the length of the latter.

11. In an ink separating device for a press assemblage having a relatively soft cylindrical rotary ink distribution roller having a smooth continuous surface for transferring different colored ink from sources of supply to adjacent impression members, a roll having a smooth peripheral surface formed with straight line generatrices and engaging a selected local peripheral surface portion of the ink distribution roller and positioned to effect such engagement without indentation of the surface of said roller, said roll being operable by the revolving contacted surface of the roller to remove ink from the area of contact with said roller and to segregate the differently colored inks being transferred.

12. In an ink separating device for a press assemblage comprising an elongated relatively soft peripherally continuous and smooth ink distribution roller for applying different colored ink to adjacent impression surfaces, a roll having a hard and smooth periphery snugly engaging and separating ink from a peripheral portion of the distribution roller which coacts with the area between the adjacent impression surfaces without indenting the adjacent periphery, a pair of scraper blades alternately cooperable with said roll to scrape the removed ink from the roll periphery, and means operable upon reversal of direction of rotation of said roll for alternately moving one of said blades into active and the other into inactive position.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
381,708	MacDonald	Apr. 24, 1888
699,853	Seymour	May 13, 1902
976,155	Crump	Nov. 22, 1910
1,058,040	Crump	Apr. 8, 1913
2,164,270	George	June 27, 1939