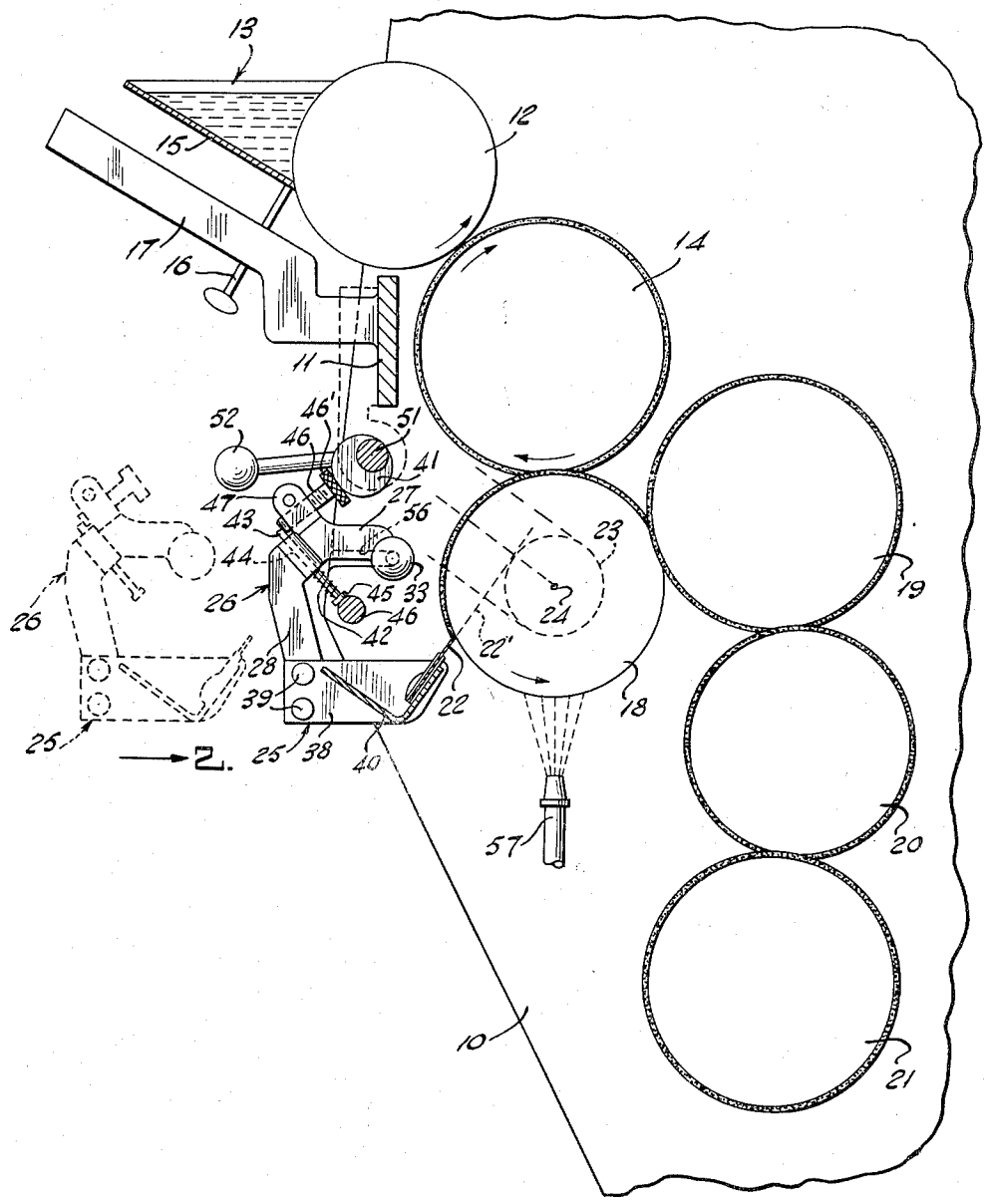
Feb. 7, 1961 H. W. GEGENHEIMER 2,970,541

MACHINE FOR CLEANING OF PRINTING ROLLERS

Filed April 17, 1958 5 Sheets-Sheet 1

Fig. 1.



Harold W. Gegenheimer INVENTOR

BY

Morgan, Finnegan, Durham & Pine

ATTORNEYS.

Feb. 7, 1961 H. W. GEGENHEIMER 2,970,541

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Filed April 17, 1958

5 Sheets-Sheet 2

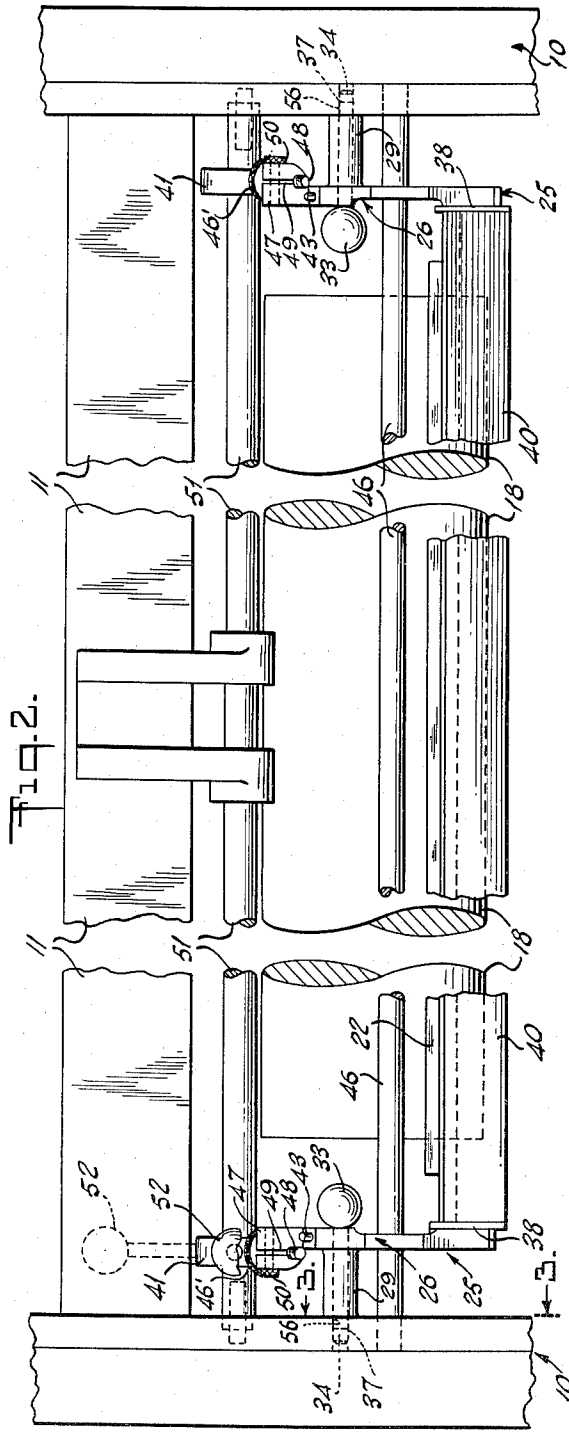


Fig. 2.

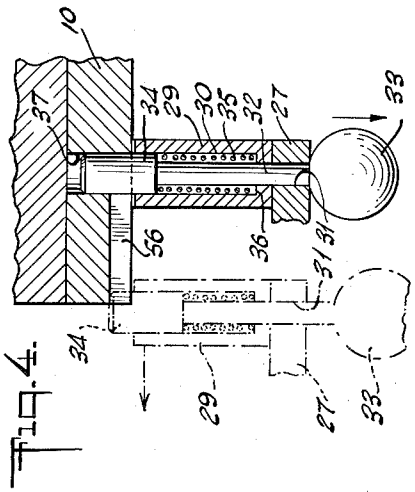


Fig. 4.

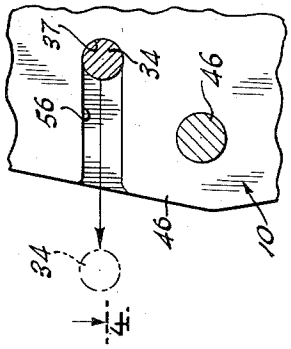


Fig. 3.

Harold W. Gegenheimer. INVENTOR

BY Morgan Finnegan Durham & Pine

ATTORNEY

Feb. 7, 1961 H. W. GEGENHEIMER 2,970,541

MACHINE FOR CLEANING OF PRINTING ROLLERS

Filed April 17, 1958 5 Sheets-Sheet 3

Fig. 5.

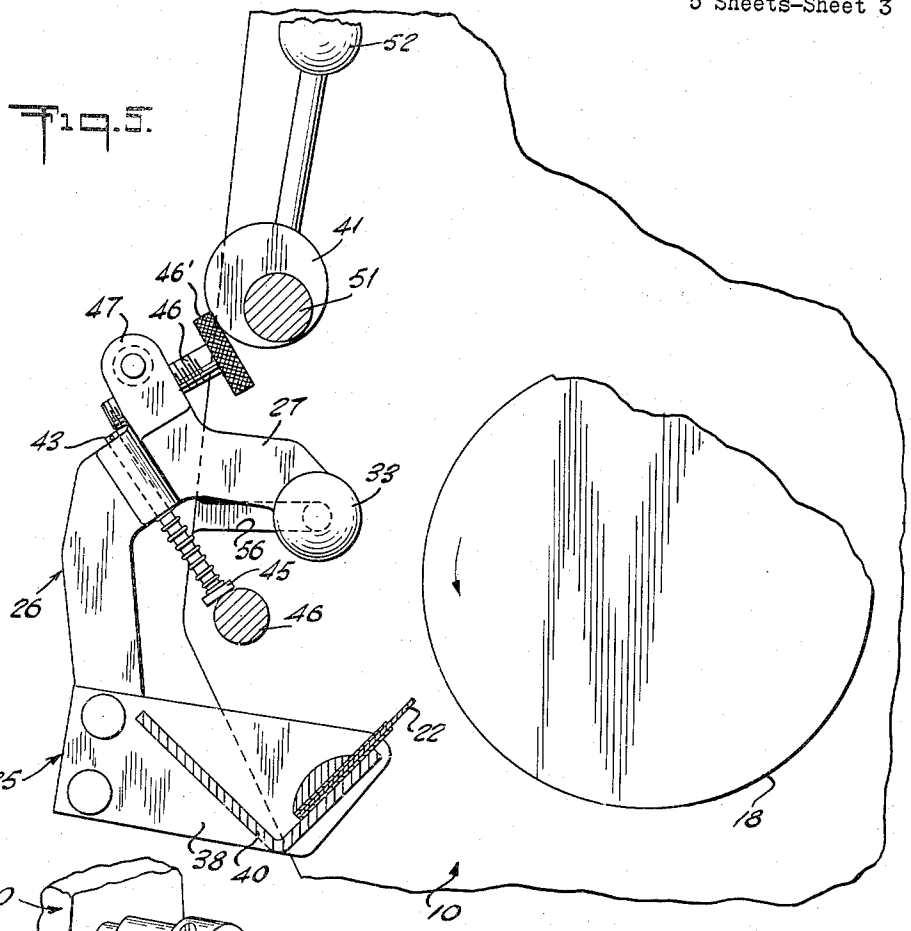
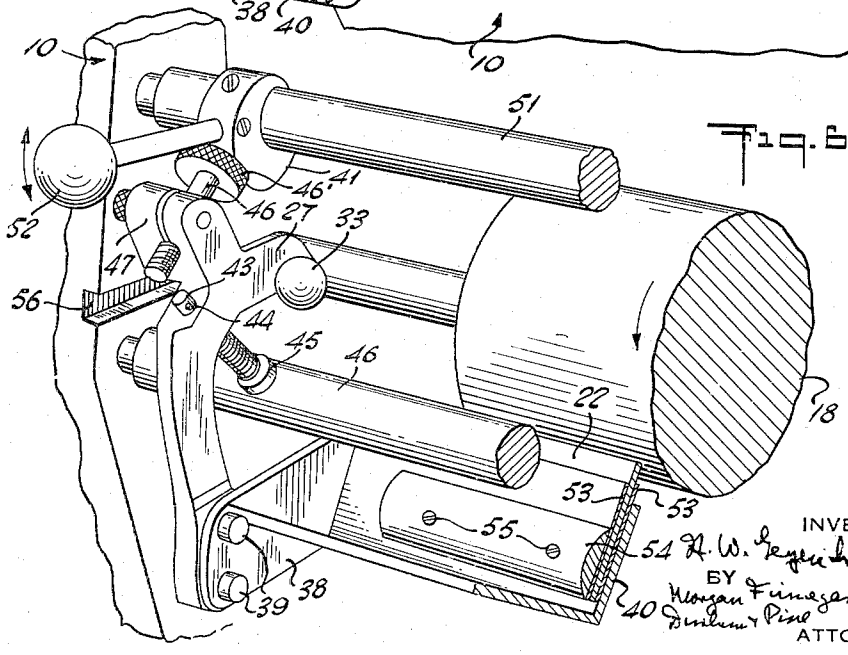


Fig. 6.



INVENTOR
H. W. Gegenheimer
BY
Morgan Finnegan, Durham & Pine
ATTORNEYS.

Feb. 7, 1961 H. W. GEGENHEIMER 2,970,541

MACHINE FOR CLEANING OF PRINTING ROLLERS

Filed April 17, 1958

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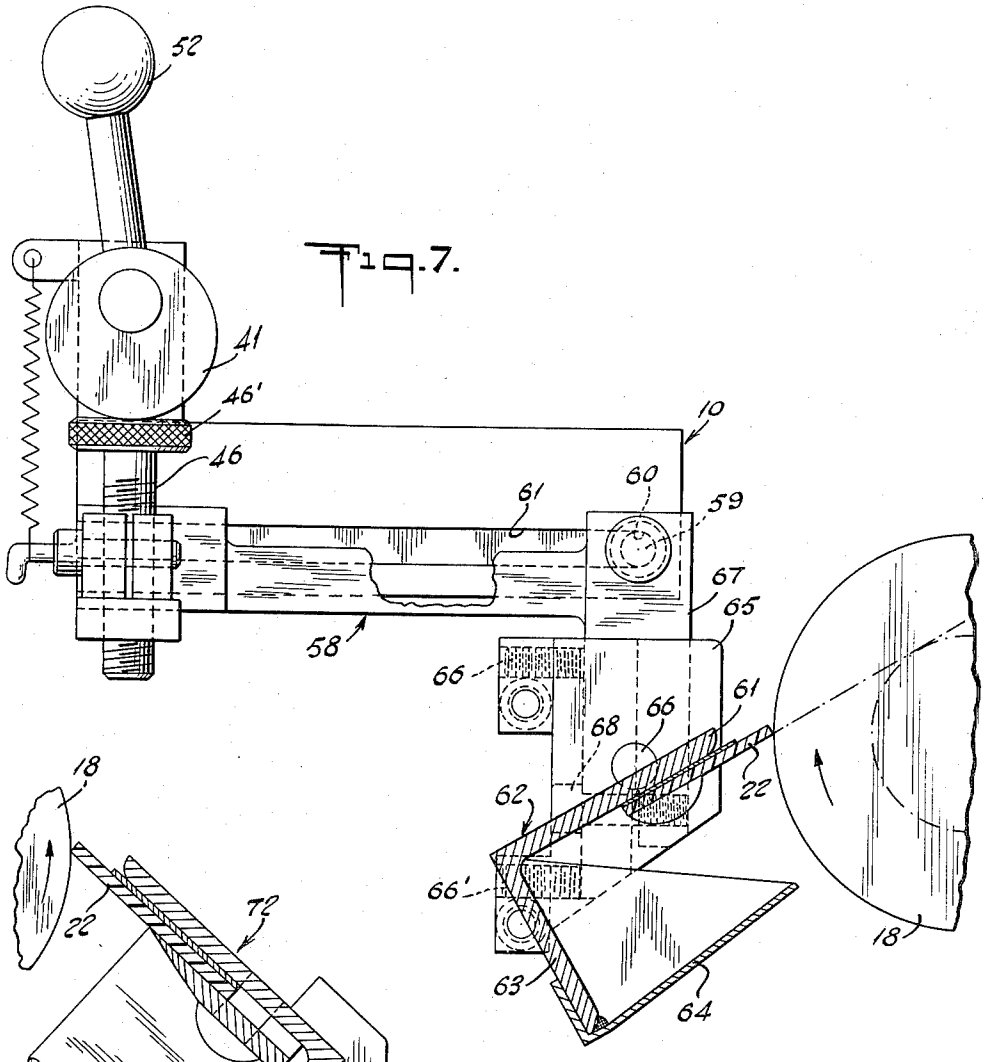


Fig. 7.

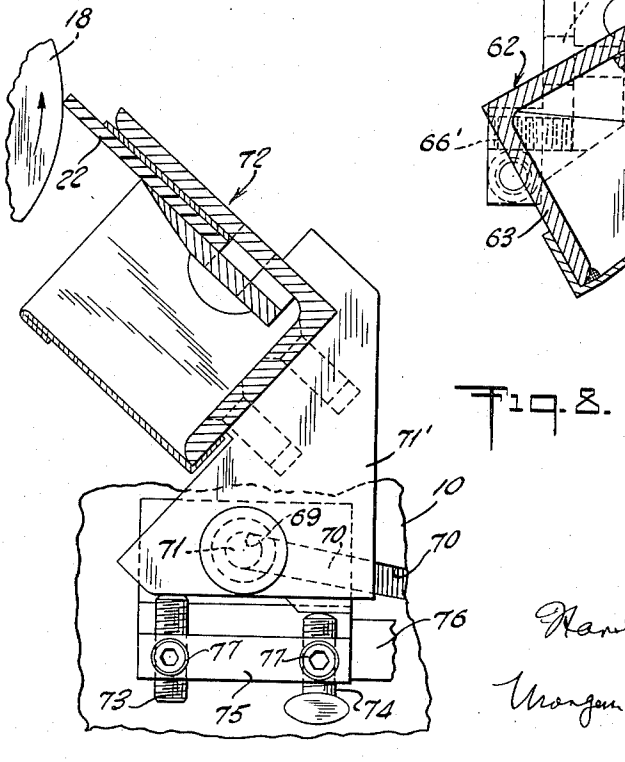


Fig. 8.

Harold W. Gegenheimer INVENTOR

BY Morgan Finnegan Durham & Pine

ATTORNEYS

Feb. 7, 1961 H. W. GEGENHEIMER 2,970,541

MACHINE FOR CLEANING OF PRINTING ROLLERS

Filed April 17, 1958 5 Sheets-Sheet 5

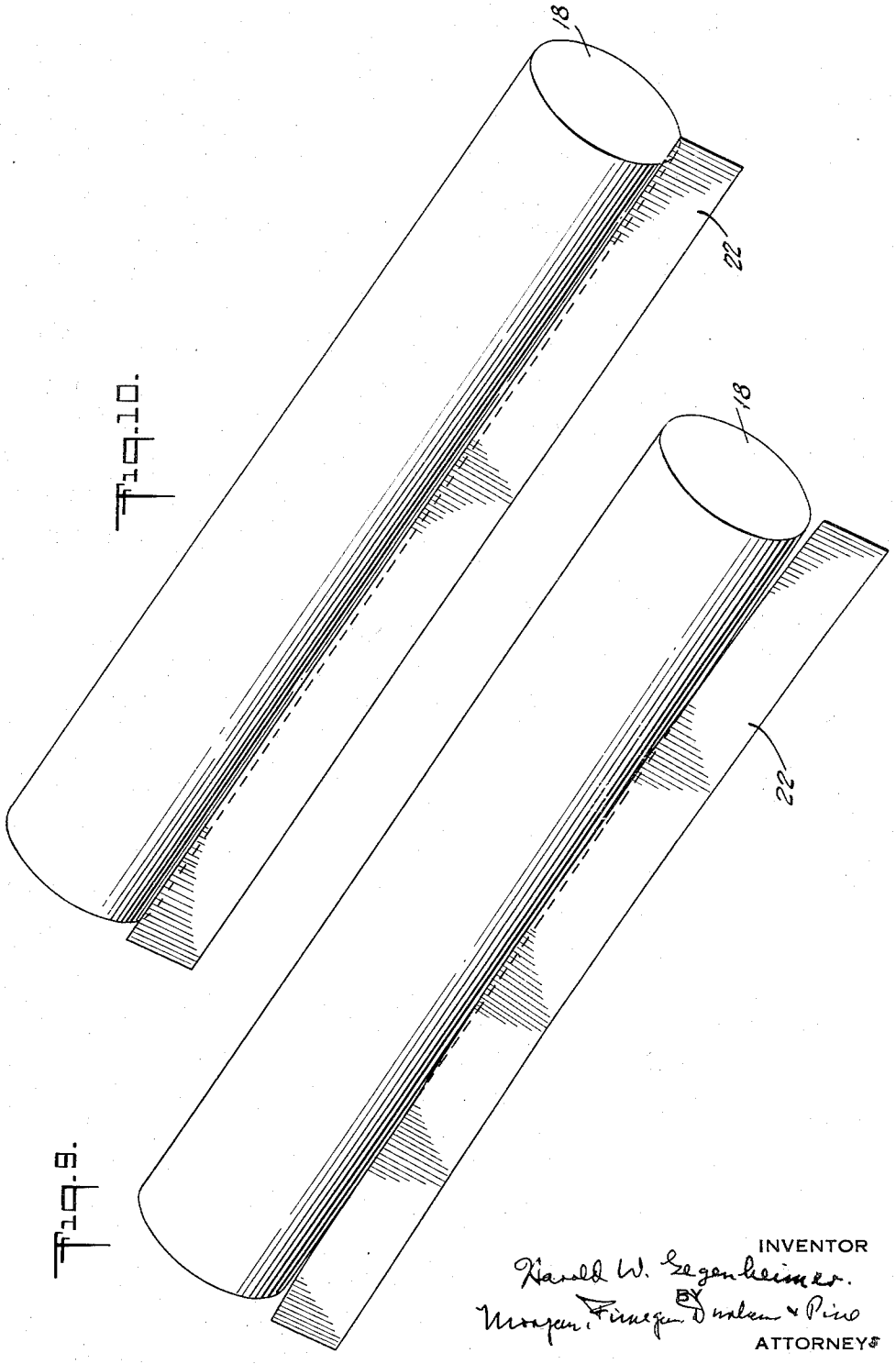


Fig. 10.

Fig. 9.

INVENTOR
Harold W. Gegenheimer.
BY
Morgan, Finnegan, Durham & Pine
ATTORNEYS

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MACHINE FOR CLEANING OF PRINTING ROLLERS

Harold W. Gegenheimer, Darien, Conn., assignor to William Gegenheimer Co., Inc., Brooklyn, N.Y., a corporation of New York

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15 Claims. (Cl. 101—425)

This invention relates to printing equipment and more specifically to a novel and improved method and apparatus useful among other things, for washing and cleaning ink rollers such as rollers used in printer-slotters and other printing equipment.

The objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the parts, combinations and steps pointed out in the appended claims.

The invention consists in the novel steps, construction arrangements, combinations and improvements herein shown and described.

The accompanying drawings referred to herein and constituting a part hereof, illustrate several embodiments of the invention and, together with the description, serve to explain the principles of the invention.

In the drawings:

Figure 1 is a vertical cross sectional view of ink roller cleaning apparatus in accordance with the invention and showing the ink rollers in diagrammatic form;

Figure 2 is an elevational view of apparatus in accordance with the invention and taken generally in the direction of the arrow 2 of Figure 1;

Figure 3 is a cross sectional view of Figure 2 taken along the line 3—3 thereof;

Figure 4 is a cross sectional view of Figure 3 taken along the line 4—4 thereof;

Figure 5 is an enlarged cross sectional view of a fragmentary portion of Figure 3 showing the cleaning apparatus in accordance with the invention out of engagement with the roller to be cleaned;

Figure 6 is a perspective view of the apparatus shown in Figures 1 through 5;

Figure 7 is a cross sectional view of a modified support for a cleaning or doctor blade in accordance with the invention;

Figure 8 is a cross sectional view of still another embodiment of a cleaning or doctor blade support in accordance with the invention; and

Figures 9 and 10 are perspective views illustrating an improved blade in accordance with the invention.

Proper cleaning and care of ink rollers in printing equipment is vitally important to the attainment of efficient and dependable results. Periodic cleaning of ink rollers, for instance, to remove dried or caked ink, is essential to the proper operation of the press, and prior known cleaning procedures have either involved long, tedious processes or have been otherwise unsatisfactory. Through a novel and improved method and arrangement and coordination of cleaning elements in accordance with the invention, cleaning of the ink rollers can be carried out quickly, efficiently and thoroughly with substantial savings in both time and cost.

The invention further contemplates the provision of a novel and improved support for roller cleaning blades that affords means for easily and quickly moving the blade into and out of the cleaning position with the blade always assuming a predetermined angular position and roller pressure when in the roller engaging position.

Another advantage of the invention resides in an improved engagement of the blade support and operating mechanism with the frame of the printing machine to facilitate installation and removal of the mechanism. This is particularly important inasmuch as the space available for cleaning apparatus is often limited and the blade nevertheless must be removable for cleaning and replacement when necessary.

Still another object of the invention resides in the provision of an improved wiper blade for cleaning rollers on printing presses and the like that will afford substantially uniform pressure throughout its length to efficiently and effectively remove surface materials thereon without damaging or otherwise affecting the roller itself.

The invention further contemplates an improved cooperation of a blade and a roller to be cleaned thereby in order to effect thorough and complete cleaning.

A still further object of the invention resides in the provision of a novel and improved method and apparatus for cleaning rollers and particularly ink rollers of a printing press.

For purposes of illustration, the invention has been shown as applied to a printing press having a plurality of rollers for feeding ink from a fountain to the form roller. The cleaning apparatus in accordance with the invention is arranged to cooperate with one of the intermediate rollers generally termed the upper vibrator roller and it will be shown that with this apparatus the entire series of rollers can be quickly and easily cleaned.

Figure 1 illustrates in diagrammatic form the series of rollers which usually comprises a printer-slotter. The rollers are generally carried between a pair of frame members 10 interconnected by suitable cross plates such as the plate 11. The uppermost roller 12 is the ink fountain roller and it cooperates with the ink fountain 13 to transfer ink from the fountain to the ductor roller 14. The fountain blade 15 bears against the roller 12 and is adjusted by the shaft 16 extending through the printer-slotter frame portion 17.

In the normal operation of the apparatus the ink transferred to the roller 14 from the roller 12 is fed successively to the upper vibrator roller 18, a transfer roller 19 and a lower vibrator roller 20 to the form roller 21. Inasmuch as the ink may dry and cake on one or more of the several rollers, or when colors are changed, it is important that they can be cleaned frequently to insure proper functioning of the apparatus. It has been found that with cleaning means in accordance with the invention, and with but a single blade engaging one of the rollers of the series, the entire series of rollers can be cleaned quickly and effectively, thereby avoiding the difficulties encountered with prior tedious and time-consuming procedures.

The cleaning blade, forming part of the invention and denoted by the numeral 22, is shown in Figure 1 in engagement with the upper vibrator roller 18 for the removal of ink from that roller as well as the other rollers forming part of the printing press. The blade 22 is preferably formed of nylon or other similar non-metallic material and is positioned relative to the roller so that the plane of the blade is substantially tangential to the cylindric plane described about the axis of the roller at a radius approximately half the radius of the roller. This is illustrated in Figure 1 with the dotted circle 23 formed about the axis 24 of the roller at a radius equal to one half of the radius of the roller. The plane of the blade 22 is denoted by the dotted line 22' and it is tangential to the dotted circle or cylinder 23.

The blade supporting structure is generally denoted

by the numeral 25 and is operable to move the blade into and out of the roller engaging position. By reason of an improved construction and arrangement of elements comprising the supporting mechanism 25 the blade 22 will always be moved against the roller 18 at a predetermined angular position and with a predetermined pressure. In addition, the blade and supporting mechanisms can be quickly and easily removed from the apparatus and requires little space for installation and removal.

In the illustrated embodiment of the invention a pair of blade supports or side members 25 are used to support the blade 22 and associated blade carrier, though it will become apparent as the description proceeds that one or more intermediate supports may also be employed if desired.

Each of the blade supports 25 includes a generally L-shaped bracket member 26 having an upper, generally horizontal leg 27 and a downwardly inclined leg 28. The upper leg 27 is provided with a tubular boss or spacer 29 having the central opening 30 aligned with a cooperating opening 31 in the leg 27. The openings 31 and 30 slidably receive a rod 32 having a ball shaped handle 33 on the inner end thereof and a plunger 34 on the outer end. A spring 35 surrounds the rod 32 and is retained between the plunger 34 and the inner shoulder 36 of the cylindrical member 29. This spring functions to move the plunger 34 outwardly of the opening 30 for engagement with a hole or socket 37 in the frame member 10. With this arrangement each plunger or pivot pin acts to pivotally secure its blade support 25 to the frame 10 of the machine and provides the pivoting means about which the blade 22 is moved into and out of the roller engaging position (see Figs. 1 and 5).

The lower leg 28 of each L-shaped frame 26 carries an inwardly extending bracket 38 secured to the leg 28 by rivets 39 or other suitable means. A longitudinal ink receiving trough 40 extends between the brackets 38, as may be seen in Figure 2 and may be welded or otherwise secured to these brackets.

The blade 22 is moved into and out of the roller engaging position by the cooperating action of a cam 41 and a spring 42 on each of the supports 25. Each spring 42 is carried by a rod 43 extending through a cooperating opening 44 in the support frame 26. The rod 43 has an enlarged end portion 45 to retain the spring and it bears against a transverse rod 46 extending between the frame members 10 of the machine. With this arrangement the spring 42 functions to urge each assembly 25 outwardly away from the roller 18 to disengage the blade 22 from the roller.

Movement of the blade 22 into the roller engaging position is effected by the cooperation of the cam 41 with a screw 46 adjustably carried by each support frame 26. More specifically, each support frame includes an outwardly and upwardly extending bifurcated member 47 having a threaded opening 48 extending therethrough and a slot 49 extending outwardly from the opening. The screw 46 having an enlarged portion 46' threadably engages the opening 48 and is locked in said opening by a locking screw 50 which threadably engages the bifurcated member 47 as will be observed more clearly in Figure 2. The cams 41 are fixedly secured to a shaft 51 extending between the frame member 10 of the machine. Each cam is eccentrically mounted on the shaft 51 and one of the cams carries a handle 52 for rotation of the shaft and both cams. With the cams 41 in the position shown in Figure 1, the screws 46 are adjusted to urge the blade 22 against the roller 18 with the desired pressure. Since the blade 22 is made of nylon or other similar material, its resilience will offer some degree of latitude in the adjustment of the screws 46. To release the blade 22 the cams 41 are moved to the position shown in Figure 5, whereupon the springs 42, as previously described, urge the assembly outwardly about the pivots 34 as shown and described in connection with Figure 4. Inasmuch as the rod 51 which carries the cams 41 is rotated by the operation of the handle 52, it will automatically rotate both cams 41 on the blade supports 25 so that both supports will move simultaneously and be controlled by a single operation. Intervening supports, if desired, may be similarly controlled and operated by a single handle 52.

The blade 22 may be supported in any desired manner and in the embodiment of the invention shown in Figures 1 through 6, inclusive, the blade is clamped between a pair of longitudinal plates 53 riveted together and the assembly is secured to the leading edge of the trough 40 by means of a longitudinal clamping member 54 and screws 55 which extend through the assembly and threadably engage the trough 40.

Inasmuch as space is often a critical factor in printing equipment, novel and improved means have been provided by this invention for installation and removal of the blade and supporting elements. For this purpose the side frames 10 of the machine, in addition to having sockets 37 for receiving the spring loaded plungers 34, are each provided with an elongated, substantially horizontal slot 56 having a width slightly greater than the diameter of the plunger 34 and a depth somewhat shallower than the socket 37. To mount the cleaning apparatus on the machine it is merely necessary to first engage the plungers 34 with the slots 56 and this may readily be accomplished from the sides of the apparatus. Once the assembly is engaged in the slots 56 it is then merely necessary to push it inwardly toward the roller 18 until the plungers 34 snap into their respective openings 37. Removal of the apparatus from the machine can also be easily accomplished, inasmuch the plungers can be withdrawn for movement into the slots 56 without the necessity of the workmen supporting the entire weight of the apparatus after the plungers have been disengaged from their sockets. Thus, the first step is to pull the plunger outwardly a sufficient distance to permit each associated support to be moved outwardly just a slight distance to be sure the plungers are in their associated grooves or channels 56. After this has been accomplished, the entire assembly can then be moved outwardly and removed from the machine without further manipulation of the spring loaded pivots.

In the use of the apparatus thus far described, cleaning of the series of rollers may be accomplished by moving the cam operating handle 52 to the position shown in Figure 1. This causes the blade 22 to engage the roller 18. The rollers then are rotated and during this time an appropriate solvent is sprayed on the roller 18 by a nozzle 57 illustrated diagrammatically in Figure 1. While only one roller is engaged by the blade 22, the use of this blade, together with a solvent functions to clean all of the rollers in the series, and the dissolved ink will be collected in the trough 40 for disposal. While the blade 22 may be set at any desired angle, it has been found that the most effective operation will be attained by the adjustment of the blade as previously described.

Another aspect of the invention is diagrammatically illustrated in Figures 9 and 10 of the drawings. In these figures the blade 22, together with the roller 18, depict the action of the blade and the roller when the former is moved into engagement with the latter. In Figure 9 it will be observed that the blade 22 is slightly bowed inwardly toward the roller so that the center portion of the blade before contacting the roller is slightly forward of the end portions. This bowing effect is attained by imparting a slight bow to the blade and supporting elements so that as the blade is urged against the roller 18 as shown in Figure 10, substantially uniform pressure will be obtained between the roller and blade throughout the entire line of contact. In actual practice the blade supports are adjusted so that the cams 41 will urge the respective ends of the blade inwardly against the roller

and apply slightly greater pressure on the blade than is required to cause it to assume the position shown diagrammatically in Figure 10. This will ensure equal and uniform pressure throughout the entire length of the blade.

A modification of the invention is shown in Figure 7. In this instance the support assembly generally denoted by the numeral 58 functions in substantially the same manner as in the case of the embodiment of the invention shown in Figures 1 to 6, inclusive. For example, it is secured to the apparatus by retractable pivot members 59 engaging sockets 60 and grooves 61 in the frame member 10. In this embodiment of the invention, however, the blade 22 is carried on the underside of the leg 61 of an L-shaped bracket 62 which extends between the blade supports 58. The leg 61 of the member 62 is inclined upwardly at an angle that will provide the desired blade angle, as previously described. The downwardly extending leg 63 of the L-shaped member 62 carries an upwardly inclined member 64 which cooperates with the leg 63 to form an ink receiving channel. The L-shaped member 64 is carried by a pair of end plates 65 pivotally secured at 66 to a downwardly extending bracket 67 forming part of the support 58. The utilization of the pivot mounting 66 together with the adjusting screws 66' affords adequate latitude in the adjustment of the blade angle relative to the roller 18. After the blade is in the adjusted position it can be secured by the tightening and locking screw 68 which clamps the ends of the bracket 67 firmly about the pivot member 66.

A still further embodiment of the invention is shown in Fig. 8. As in the case of the previous embodiments of the invention, the frame members 10 are each provided with sockets 69 and slots 70 for installation and removal of the cleaning apparatus. In this instance, however, the blade supporting element is denoted by the numeral 71' which engages and extends upwardly from the pivot 71 and carries the blade assembly 72 on the upper end thereof. This blade assembly is substantially identical to the blade assembly as shown and described in connection with Figure 7. Angular adjustment of the blade 22 is effected by a pair of adjusting screws 73 and 74 threadably engaging a bracket member 75 which is fixedly secured to and carried by an actuating arm 76. The arm 76 corresponds generally to the arm 67, for instance, of Figure 7. With this arrangement the angle of the blade 22 can be readily adjusted by the operation of the screws 73 and 74 which bear against the underside of the blade supporting member 71', and may be locked in position by locking screws 77. It will be observed in this embodiment of the invention that the end plates 71' are pivoted about the pivot pins 71 and the angular displacement is controlled by the arm 76. Thus the arm 76 is a control member rather than a support member as in the previous embodiments of the invention.

While only certain embodiments of the invention have been illustrated and described, it is understood that modifications, alterations and changes may be made without departing from the true scope and spirit as defined by the appended claims.

What is claimed is:

1. Roller cleaning apparatus comprising an elongated flexible blade and means supporting each end of said blade for movement of said blade into and out of engagement with said roller with the plane of said blade when in engagement with the roller being substantially tangential to a curve described about the axis of the roller and at a distance therefrom approximately equal to one half the radius of the roller, at least the edge portion of said blade when out of engagement with said roller being curved inwardly from each end toward said roller.

2. Roller cleaning apparatus according to claim 1 wherein said blade is formed of nylon.

3. Roller cleaning apparatus according to claim 1 wherein said blade is carried by at least two spaced blade supporting means and said blade is gently bowed between the supporting means so that the portions of the blade between the supports are closer to the roller than the end portions of the blade when the latter is out of roller engagement and thereby provide substantially uniform roller contacting pressure throughout the length of the blade when the blade is in engagement with the roller.

4. In printing apparatus, at least two side frames, at least one roller supported between said frames, each of said frames including at least one pin-receiving socket, a flexible transverse blade having a lengthwise bow, and means for supporting each end of said bowed blade between said side frames, said supporting means including reciprocable pins removably engaging said sockets and means for angularly displacing said blade about the pins to move said blade into and out of a roller engaging position.

5. In printing apparatus according to claim 4 wherein said frames each include a slot extending from each socket outwardly from the roller for slidably receiving said pins to facilitate installation and removal of said blade and supporting assembly.

6. In printing apparatus according to claim 4 wherein angularly displacing means comprises rotatable cam means carried by at least one side frame and cam actuating means on said blade support whereby angular movement of the cam means in one direction moves the blade into the roller engaging position and angular movement in the other direction releases the blade from the roller engaging position.

7. In printing apparatus, at least two side frames, at least one roller supported between said frames, each of said frames including at least one pin-receiving socket, a transverse blade and means for supporting said blade between said side frames, said supporting means including a pair of side members, a transverse blade carrying member extending between and carried by said side members, reciprocable pins carried by said side members for movement into and out of said sockets, a transverse shaft between said side frames, at least two cams carried by said shaft, and adjustable cam cooperating means on each side member and responsive to angular displacement of the cams to move the blade and blade supporting means into and out of a roller engaging position.

8. In printing apparatus according to claim 7 wherein said side frames each include a groove of a depth less than that of the associated socket and extending from the socket outwardly away from the roller.

9. In printing apparatus according to claim 7 wherein the central portion of said blade is bowed inwardly toward the roller.

10. In printing apparatus according to claim 7 wherein said blade is formed of a non-metallic material with the central portion bowed inwardly toward the roller.

11. In printing apparatus according to claim 7 wherein said reciprocable pins are spring loaded and each of said side members includes spring means for movement of the blade out of the roller engaging position upon angular displacement of the cams to release the blade from the roller engaging position.

12. In printing apparatus, at least two side frames, at least one roller supported between said frames, each of said frames including at least one pin-receiving socket, a transverse blade and means for supporting said blade between said side frames, said supporting means including a pair of side members, a transverse blade carrying member extending between and carried by said side members, reciprocable pins carried by said side members, for movement into and out of said sockets, a transverse shaft between said side frames, at least two cams carried by said shaft, and adjustable cam cooperating means on each side member and responsive to angular displacement of the cams to move the blade and blade supporting means into and out of a roller engaging position, said blade supporting means including means for adjusting

the angular position of the blade relative to the blade support.

13. In printing apparatus, a pair of side frames, a roller supported between said frames, upper and lower transverse shafts spaced from said roller, each of said side frames including a socket between said shafts and a groove of shallower depth than the socket and extending from the socket outwardly away from the roller, a pair of side members, a transverse trough extending between and secured to said side members, spring actuated reciprocable pins carried by said side members for engaging said sockets, an elongated bowed blade carried by said trough, spring actuated means between the lower of said transverse shafts and said side members for movement of the blade away from the roller, at least two eccentric cams carried by said upper transverse shaft and adjustable means on said side member slidably engaging said cams, whereby angular movement of said upper shaft will operate the cams to move the blade into the roller engaging position against the action of said spring actuated means.

14. In printing apparatus according to claim 13 wherein said blade is formed of nylon and contacts the roller at an angle wherein the plane of the blade is substantially tangential to a curved surface described about the roller

axis and having a radius equal to one half the radius of the roller.

15. In printing apparatus, a roller, side members including pins pivotally engaging said apparatus, a transverse trough carried between said side members, said trough including a relatively rigid L-shaped member having one leg extending obliquely upwardly toward the roller and the other leg extending obliquely downwardly and means secured to and extending obliquely upwardly from the lower end of the lower leg to form an elongated V-shaped receptacle, a blade carried in the under side of the upper leg and means adjustably positioning the angular position of the trough and a blade about said pins and relative to said roller.

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