SYSTEM FOR CLEANING ROLLERS OF A DUPLICATING MACHINE, SUCH AS INK ROLLERS

Inventors: John P. Gallagher, Park Ridge; Kenneth J. Tonkin, Glenview; Lawrence A. Borneman, Lombard, all of Ill.

Assignee: A. B. Dick Company, Chicago, Ill.

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Abstract

The invention relates to a system for cleaning rollers in an offset duplicating machine, for example the ink rollers, which includes a lever having a normal operating mode and a clean-up mode, while in the latter mode the lever being effective: (1) to operate an eccentric support and a bearing mount to bring an ink fountain roller and an ink ductor roller into continuous contact with the remaining rollers in the system; (2) to dispense cleaning fluid to the ink system rollers; (3) to remove contaminants from the ink system rollers by engaging a scraper assembly; and (4) to turn off the repellent supply and empty the repellent fountain.

9 Claims, 6 Drawing Figures
FIG. 3

FIG. 4
SYSTEM FOR CLEANING ROLLERS OF A DUPLICATING MACHINE, SUCH AS INK ROLLERS

BACKGROUND OF THE INVENTION

Cleaning up of the ink feeding systems in duplicating machines, for example offset duplicating machines, has always involved substantial manual effort in which operators are exposed in dirtying their hands and spray from spinning rollers. Even in cleaning systems such as those exemplified by Curtis U.S. Pat. Nos. 2,302,490 and 2,341,020 and Cope et al. U.S. Pat. No. 2,969,735, the ink fountain roller must be manually cleaned. Furthermore, those structures fail to provide a cleaning fluid storage and dispensing system as an integral component of the machine so that chemical cleaning can be coordinated and balanced with mechanical cleaning by the operation of a scraper thereby obtaining fast and thorough cleaning of the ink system rollers.

OBJECTS AND SUMMARY OF THE INVENTION

Accordingly, it is an overall object of the present invention to provide a system to clean up all rollers in a train comprising operative structure in a duplicating machine, such as the ink rollers of an ink jet system, at least some of which rollers contact only intermittently during normal operation, by bringing the rollers into continuous contact during cleaning.

It is a further object of the present invention in accordance with the above to provide a system to clean up ink rollers in a duplicating machine for example, which includes structure for storage and dispensing of cleaning fluid that is an integral component of the duplicating machine.

It is one of the more detailed objects of the present invention in accordance with the above to provide a system to clean up ink rollers in a duplicating machine for example, which incorporates a control that is selectively actuable into normal or clean up modes, and which in the latter mode is actuable to dispense cleaning fluid or to scrape rollers.

It is another detailed object of the present invention in accordance with the above to provide for fool-proof operation of the cleaning system whereby the clean-up mode cannot be entered until the ink fountain has been removed to assure that ink in the fountain does not contaminate the system during cleaning.

It is an overall object of the present invention in accordance with the above to provide a cleaning system of the type particularly usable in a duplicating machine for cleaning the ink system that is economical to manufacture and simple to operate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation emphasizing the ink and repellent system of an offset duplicating machine embodying the present invention;

FIG. 2 is a side elevation of the offset duplicating machine system of FIG. 1 depicting the position of ink fountain and ductor rollers, repellent fountain tray and scraper assembly as a control lever is operated in a cleaning mode;

FIG. 3 is a front elevation of the offset duplicating machine system of FIG. 1 with a section removed;

FIG. 4 is a plan view of a lower portion of the offset duplicating machine system of FIG. 1;

FIG. 5 is an elevation of a portion of the offset duplicating machine system of FIG. 1 to show a cleaning liquid supply and a repellent solution supply; and

FIG. 6 is a plan view depicting operation of a safety latch and the control lever to dispense cleaning liquid.

Turning to the drawings and a preferred embodiment of the present invention, shown in FIG. 1 is an exemplary ink feeding system 10 usable in offset duplicating machines of the type sold by A. B. Dick Company, assignee of the present invention. The exemplary ink feeding system is of the type that mixes repellent solution with the ink, that arrangement being known in the art as an aquamatic system. However, the present invention is usable in other systems that do not mix the ink and repellent solution in the ink system, the latter sometimes referred to as a molleton system.

Describing the system 10 generally, ink is supplied from an ink fountain 11 and repellent solution is supplied from a water or aquamatic fountain 12, each supported on offset duplicating machine side frames 13a, 13b (see FIG. 3). The repellent is supplied to the fountain by a repellent supply 12a including a control valve 12b (see FIG. 5). In the exemplary system ink is carried by an ink fountain roller 14 and an ink ductor roller 15 to a third or intermediate roller 16, often times referred to in a lithographic system as herein shown as a distributor roller, and repellent is carried by a distributor roller 18 and repellent ductor roller 19 to the same distributor roller 16. The latter carries ink and repellent to an oscillating roller 20 that is in contact with a form roller 21 that applies the ink and repellent to a master cylinder (not shown). As will be described, the form roller 21 would ordinarily be separated from the master cylinder during the cleaning operation.

The ink fountain roller 14 may be driven by a suitable ratchet mechanism (not shown) well known in the art. The repellent fountain roller 18 is driven, in the exemplary embodiment, by a gear train 24 (see FIG. 3) including a drive gear 25 engaging a driven gear 26 carried by a repellent fountain roller shaft 28. The same drive gear 25 engages a spur gear 29 affixed to one end of a distributor roller shaft 30 for driving the latter. During normal printing operation each of the rollers turns in a direction as shown by the arrows in FIG. 1. It should be noted that the peripheral surface of ink fountain roller 14 is driven in a direction opposite to that in which the adjacent peripheral surface of ductor roller 15 is moving due to being in driving contact with the distributor roller 16.

The ink ductor roller is suitably carried for self-aligning operation in a cradle assembly 31 including a pivot shaft 32 for pivotally carrying arms 34, 35, respectively, that themselves rotatably receive opposite ends of the roller 15. The cradle assembly includes a deflection or cross bar 37 which extends parallel to the ductor roller 15 and is connected at its opposite ends to the arms 34, 35. A driving arm 32a is mounted on the pivot shaft 32 and connected to the cross bar 37 to pivot with the shaft 32 and thereby swing the ducting roller 15 back and forth.

For effecting ducting operation of the roller, a driving drive assembly 36 is provided at one end of the pivot shaft 32 (see FIG. 1). The latter includes a driver cam wheel 38 having a cam undersurface 39 for drivingly engaging a cam follower 40 connected by an arm 41 to torsion shaft 37. The latter is suitably journaled in frame members 13a, 13b to permit pivotal move-
The cam follower 40 is biased toward the cam surface 39 (counter clockwise as viewed in FIG. 1) by a spring 42 having one end suitably anchored to frame 13b (see FIGS. 1 and 3). Accordingly, as the cam wheel 38 is driven, an undulating action is transmitted to the follower thereby pivoting the pivot shaft 32 which carries the ducer roller 15 back and forth between the inking roller 14 and the distributor roller 16 thereby bringing a controlled quantity of ink to the latter.

The repelled ducer roller 19, is carried for swinging movement on a pair of pivotally supported arms 44, 45. In the exemplary embodiment the arms are pivotally supported on the fountain roller shaft 28. Arm 45 (see FIG. 1) is in the shape of a bell crank having an extending follower finger 46 that is actuated by a crank arm 48 pivotally carried by a stub shaft 49 suitably supported in frame 13b. The arm 48 carries a driven follower wheel 50 at one end and a driving follower wheel 51 at the opposite end, and the latter engages the under side of the follower finger 46. A driving cam 52 is provided at one end of distributor roller 20. As the latter is driven a rocking motion is transmitted to the ducer roller 19 moving it toward and away from the distributor roller 16 while maintaining the ducer roller 19 in continuous contact with the fountain roller 18, thereby introducing a controlled quantity of repelled solution into the system. The length of time that the repelled fountain roller 19 is maintained in contact with the distributor 16 is adjustable by rotating the support shaft 49. As best shown in FIG. 1 a higher support of the crank arm 48 corresponds to more contact between the distributor roller 19 and the distributor roller 16.

In accordance with the present invention the inking system 10 can be cleaned by an operator without having to soil his hands by manual operation of a single control 60 which brings the ink fountain roller 14 and the ink distributor roller 15 into continuous rotational contact with the remaining inking system rollers, and which also permits selective application of a cleaning solution to the ink soiled rollers, and also permits inscrapping of contaminants whereby all the rollers in the inking system are cleaned by the simple manipulation of the lever. As herein exemplarily shown, the lever 60 is fixed to an extending end 61a (left side as viewed in FIG. 3) to a pivotably supported ink fountain carrying shaft 61 which includes a manually graspable end 60a. The shaft 61 also includes an extending end 61b at the opposite end. Shaft ends 61a, 61b are pivotably supported in respective frames 13a, 13b.

For permitting the lever 60 to bring the fountain roller 14 into continuous contact with the ducer roller 15 while pressing the latter into continuous contact with the distributor roller 16, respective eccentric support assemblies 62, 64 are provided at each end of shaft 61, and respective biased bearing mounts 65, 66 are provided at each end of a fountain roller shaft 68. First describing the eccentric support assembly 62 it being the same as the eccentric assembly 64 at the opposite end, the shaft end 61a is offset with respect to the ink fountain support shaft 61. Shaft end 61b is also offset with respect to shaft 61. As a matter of assembly 62, a pair of bearing plates 69, 70 are mounted on the side of an ink fountain base 71 through which the supporting shaft 61 protrudes. Inner plate 69 is fixed to the base 71 while outer plate 70 is adjustable relative to its orientation with respect to plate 69 for reasons to be explained subsequently. Outer plate 70 has an integral tab 72 that supports the ink fountain bearing mount 65.

Describing the latter a bearing block 74 for rotatably supporting one end of shaft 68 is slidably retained in frame 13a (see FIG. 3). The bearing block is biased by a spring 75 toward the tab 72, the spring being enclosed within a retaining 76 suitably fastened to the frame 13a, for example by a screw 78.

Accordingly, because of the relative eccentric relationship between the supported shaft ends 61a, 61b and the shaft body 61, when the shaft end 61a is pivoted counter-clockwise by operating the lever 60, as viewed in FIG. 2, the shaft 61 is lowered and carries with it the plate tab 72. Thus, the bearing block 65 is forced downward by spring 75 thereby bringing the roller 14 down against ducer roller 15 until the rollers 14, 15 and 16 are pressed into intimate contact by the spring 75. At that time the rotation of the ink fountain roller 14 is reversed and the rollers rotate in the direction shown by the arrows in FIG. 2. Though the exemplary eccentric support assembly 64 and the biased bearing mount 66 at the opposite side of the machine are not described in detail, the structure and operation corresponds to that of assembly 62 and mount 65 described herein. For permitting precise adjustment of the height and alignment of the fountain roller 14, as mentioned above, the exemplary embodiment permits plate 70 to be pivoted with respect to plate 69 before the plate 70 is tightened into fixed relationship with respect to plate 69.

Turning now to the structure for applying cleaning solvent to the inking rollers, in the exemplary embodiment a solvent supply 80 is carried by frame 13a. The supply 80 is connected by a suitable conduit 81 including a valve assembly 82 to a cleaning liquid dispensing pipe 84 spanning between frame members 13a, 13b above distributor roller 16 (see FIGS. 2, 5 and 6). In the present instance the pipe 84 includes a plurality of spaced openings 85 for permitting liquid to be directed toward the inking rollers. Of course other types of liquid application systems such as spray nozzles or slits and which include a control in the flow line to permit selective application of cleaning liquid may be used.

The lever 60 is mounted on shaft 61a so that a transverse motion of the lever is permitted, that is a rocking motion from left to right as viewed in FIG. 6. To that end a lever hub 66b has a generally noncircular opening 60c for receiving shaft 61a thereby providing recessed portions on opposite sides of a pin 86. Thus, when the lever 60 is moved down into a fluid dispensing portion of a cleaning mode (shown in phantom in FIG. 2) rocking of the lever 60 will engage a lever end tang 88 with a valving arm 89 pivotally supported at 89a. In the present instance the valving arm 89 is normally biased by a spring 90 to squeeze the conduit 81, which in one practical instance was a rubber tube, against a bracket 89b so as to prevent liquid flow. However, when the tang 88 is actuated by rocking lever 60, it acts on arm 89 against bias of spring 90 to open the conduit 81 so that cleaning liquid can flow through to the dispensing pipe 84.

For scraping or removing contaminants in the inking system, the present invention includes a scraper assembly 91 selectively operable by the lever 60 while the latter is in a scraper portion of the clean up mode (shown in solid in FIG. 2). To that end, the exemplary embodiment of lever 60 includes a depending link 92 (see...
FIGS. 2, 3 and 4) pivotably attached by a pin 94 to a portion 60d of lever 60. The other end of link 92 is provided with an aperture 92a for receiving a pin 95 carried by a crank 96 affixed to one end of a scraper actuating shaft 98. The latter is pivotally supported by side frames 13a, 13b and in the present instance includes a pair of screwed tongues 99, 100 for engaging operative structure of the scraper assembly.

Describing that structure, the exemplary scraper assembly includes a pair of rocker arms 101, 102 carried for pivotable movement on respective stub shafts 104, 105 mounted in the sides of a collecting tray to be described. To permit actuation of the rocker arms, by the scraper actuating tongues 99, 100, one end of arm 101 has an ear 106 and a complementary end of arm 102 on the opposite side of the machine has an ear 108. For permitting adjustment of the angular movement of the rocker arms in response to a predetermined angular movement of the actuating tongues, ear 106 includes a threaded bolt 106a and ear 108 includes a threaded bolt 108b. The opposite ends of the arms carry a scraper blade assembly 109. The latter includes a beam 110 spanning between the arms 101, 102, for example, distributed extruded metal and being set into rocker arm recesses, only recess 111 in arm 101 being shown.

As herein disclosed the scraper portion of the scraper blade assembly takes the form of a longitudinally extending member 112 having a generally triangular cross section (see FIGS. 1 and 4) carried by the beam 110. The member 112 includes a scraper ledge 114 including a scraping edge 114a and a contaminant diverting face 114b. The ledge 114 is supported by a front leg 115 and a rear leg 116, both of which are molded as a unit with the ledge. In one practical instance, the member 112 was formed of molded rubber. The front leg 115 includes an integral base portion 118 that extends transversely to form a pedestal which is grasped by a retaining slot 119 proximate to one longitudinal edge of the beam. The rear leg 116 also includes an integral base portion 120 that extends transversely to form another pedestal which is grasped by another retaining slot 121 proximate an opposite longitudinal edge of the beam. It is one of the features of the present invention that the threaded bolts 106a, 108a are adjusted so that when the control 60 is actuated into the scraping position the scraping edge 114a is just contacting the surface of oscillating roller 20 with slight pressure. It is assumed in the latter instance that the surface either has no liquid on it, or a liquid having a viscosity in the range of solvent cut lubricating ink.

As herein illustrated the aquatic fountain 12 is dumped during ink clean up (shown in solid in FIG. 2). To that end, the aquatic fountain includes a fountain tray 125 (see FIGS. 1, 2 and 3) carried by a rack assembly 126. The latter includes a pair of opposite side members 127, 128 joined by a bar 129 and pivotably carried on respective pintles 130, 131; pintle 130 pivotably supporting rack side 127 on machine side frame 13a and pintle 131 pivotably supporting the other rack side 128 on the other machine side frame 13b. A spring 132 is connected between side member 127 and frame 13a to normally bias the rack assembly 126 so that the tray is held upright. Accordingly, when the lever 60 is in a normal running mode, shown in phantom in FIG. 5, the depending link 92 presses against a pivotably supported pedestal 12c, the latter is biased by a spring 12d to act against the force applied by the link. The biasing action is such that when the link 92 moves laterally to a position as shown in solid lines in FIG. 5, the pedestal 12c with its struck-up finger is pivoted thereby squeezing a tube 12e against an anvil 12f. Repellent is introduced into the tray when the lever 60 is in the normal running mode (phantom lines) through an outlet 134 to the fountain tray (see FIG. 1). The repellent solution is maintained at a desired level to permit the fountain roller 18 to carry the repellent to the system by a self controlling system, for example, by directing the fresh repellent solution in an otherwise air tight storage tank 12a through an air tube 135, thereby releasing solution through tube 12e. The mouth of tube 135 is positioned in the tray 125 at a height corresponding to the desired liquid level in the tray. As the solution level drops the tube mouth permits air to feed into the tank 12a thereby releasing solution, however, there is no liquid flow through tube 135 back to the supply tank 12a. Accordingly, the mixing of air exposed contaminant from the tray 125 with the fresh fluid in the supply tank 12a is nearly eliminated.

Responsive to movement of the lever 60 through a first portion of its clean up mode of operation the link 92 raises pin 95 and pivots the shaft 98 about a foot 138 and engage the rack bar 129 with a roller 139 carried by the foot upper end. As viewed in FIG. 2, pulling down on lever 60 pivots shaft 98 clockwise, and with it foot 138, thereby pivoting rack bar 129 counterclockwise about pintles 130, 131. As a result the tray 125 is tipped so that repellent solution is spilled over a tray lip 125a into a contaminated fluid collecting tray or sump 140. For easy cleaning, the latter may include a disposable liner 141 which may be formed of polyethylene and shaped to follow the contours of the tray 140. The collecting tray substantially spans the distance between the machine opposite side frames 13a, 13b and extends underneat the repellent solution tray 125 and the scraper assembly 91. Accordingly, all of the scrapings and flushed liquids can be collected in the one tray. The tray 140 is suitably carried on the side frames 13a, 13b for easy withdrawal and installation by an operator from the left hand side of the machine as viewed in FIG. 1.

It will be appreciated by those skilled in the art that the present clean-up system can be used with different well known repellent systems other than the one disclosed. Furthermore, the structure for bringing the ink ductor roller into continuous contact with the ink fountain roller may be different while still following the teachings of the present invention. For example, the fountain roller 14 and distributor roller 16 may be so positioned that the ductor roller may be swung into position where it bridges the space between the two rollers and is in continuous contact with both of them.

It is another feature of the present invention that the lever 60 can not be swung into the clean-up mode unless an ink fountain liner 145 is removed. The exemplary ink fountain includes the base 71 on which is carried removable liner 145 (see FIGS. 1, 3 and 6). The liner maintains a pool of ink in contact with the ink fountain roller 14. When the liner is removed the pool of ink is taken out of the machine and the ink fountain is emptied so that ink cannot feed into the system and cause contamination during clean-up. As exemplified herein, a bracket 146 is slideably supported on pins 148, 149 carried by ink fountain base 71. The bracket, when at its left hand position as shown in phantom in
FIG. 6, prevents the lever 60 from moving into the clean-up mode. The bracket, when at its right hand position as shown in solid lines in FIG. 6, allows the lever 60 to swing into the clean-up mode. However, bracket 146 is blocked against slideable movement by a lip 150 on the liner 145. Thus, until the liner 145 is removed the bracket cannot be slid sidewise to permit actuation of the lever 60 into the clean-up mode. Accordingly, accidental initiation of the clean-up system is prevented until the ink fountain liner and ink pool are taken out of the machine.

Turning now to the operation of the cleaning system, when the lever 60 is in a normal operating mode as shown in FIGS. 1, 3 and in phantom in FIG. 5, the inking roller 14 is in its raised position. It is supported by eccentric assemblies 62 and 64 and the ratchet drive for the inking roller is engaged. The link 92 pivots the pedestal 12c so as to permit repellent solution to flow through the tube 12e. Accordingly, the offset duplicating machine is operative to feed out in a controlled manner ink from fountain 11 and repellent solution from fountain 12.

As the lever 60 is pulled downward or counterclockwise as viewed in FIG. 2, the shaft 61 is pivoted so as to lower the fountain roller 14 by lowering the bearing mounts 65, 66. The ratchet drive for the ink fountain 14 is disconnected. The link 92 moves laterally to the left as viewed in FIG. 5, thereby allowing the spring 12d to pivot the pedestal 12c so as to squeeze tube 12e against anvil 12f. Accordingly, the supply of repellent solution to the repellent tray 125 is cut off. Also, the shaft 98 is pivoted bringing roller 139 into engagement with rack bar 129 to tip tray 126 so as to spill repellent solution out of the tray. The spills repellent solution is caught in a collecting tray 140.

The lever 60 is pivotable further to an angular position as shown in phantom in FIG. 2, described as the fluid dispensing portion of the clean-up mode, where the lever is permitted to move laterally or sidewise and pivot valving arm 89 thereby opening the tube 81 so that cleaning fluid flows through the dispensing pipe 84 and through apertures 85 on to the distributor roller 16. The operator observes the application of the cleaning liquid to the rollers and the extent to which the ink contaminant is dissolved, then decides whether a scraping action should be effected to remove the contaminant.

The final pull down position of the lever 60, as shown in bold outline in FIG. 2, described as the scraping portion of the clean-up mode, pivots shaft 98 so as to bring fingers 99 and 100 into engagement with structure on scraper blade rocker arms 101, 102 to thereby swing the scraper 112 agains the oscillator roller 20.

The contaminant on the surface of roller 20 are normally dissolved or cut with solvent sufficiently to facilitate scraping of the liquid from the surface to be cleaned onto the diverting face 114b for deflection into the contaminant collecting tray 140.

Thus, it is clear from the foregoing that an improved clean-up system is provided allowing an operator to thoroughly clean contaminated surfaces, such as the ink rollers of an offset duplicating machine, by a simple manual operation. However, it will also be appreciated by those skilled in the art following the teachings of the present invention that the system is adaptable to automation, for example a pushbutton may be used to initiate clean-up operation and a programmer responsive thereto operative to sequence the clean-up through the ink fountain roller lowering, the liquid dispensing and scraping modes by actuating suitable electromechanical devices. The clean-up system is fool proof so that an operator cannot accidentally initiate the cleaning operation while ink is still in the fountain. Though an exemplary embodiment of the invention has been described, it is understood that this is by way of illustration and the scope of our invention is defined solely by the appended claims which should be construed as broadly as the prior art will permit.

We claim as our invention:

1. In an offset duplicating machine having a set of rollers in an ink system including a fountain roller adapted to transmit ink from a fountain and a doctor roller making intermittent contact with the fountain roller to carry ink to a third intermediate roller in a train of ink system rollers, a system for cleaning said rollers comprising combination a frame; a control carried by said frame having a normal operating mode and an ink system clean-up mode; means responsive to operation of said control in said clean-up mode for bringing the fountain, the doctor and the intermediate rollers into continuous rotative contact; a supply of cleaning liquid supported by said frame; means responsive to actuation of said control to a clean-up mode liquid dispensing position for directing cleaning liquid from said supply to said rollers, said liquid being carried through the set of rollers in the ink system; a scraper supported by said frame; and means responsive to actuation of said control to a clean-up mode scraping position for actuating said scraper into engagement with one of the rollers to remove contaminant therefrom and thereby remove contaminant from all of the rollers.

2. The combination of claim 1 including means carried by the frame and movable relative thereto for rotatably supporting the fountain roller, and wherein said means responsive to operation of said control for bringing the fountain and doctor rollers into continuous rotative contact is also operative to maintain the latter rollers in continuous engagement with the remaining rollers of the ink system.

3. The combination of claim 1 wherein said control is manually movable between a first liquid releasing position and a second scraping position, so that in the first position the control is operable to apply said cleaning liquid to the rollers and must be moved to said second position to be operable to engage said scraper.

4. The combination of claim 1 wherein said means for rotatably supporting the fountain roller is a bearing block movable relative to said frame, a movable arm for supporting said bearing block, and means responsive to operation of said control for actuating said arm between a first position wherein said fountain roller is maintained in a normal operating position and a second position wherein said fountain roller is in continuous engagement with said doctor roller in a cleaning position.

5. The combination of claim 1 including a safety latch releasable to allow actuation of said control to said clean-up mode thereby preventing clean-up operation in the ink system while ink is still in the fountain.

6. The combination of claim 1 including means for adjusting the pressure with which said scraper engages
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the roller that is scraped when said control is actuated to said scraping position.

7. In an offset duplicating machine having a first set of rollers in an inking system including an ink fountain roller adapted to transmit ink from an ink fountain to an ink ductor roller making intermittent contact with the ink fountain roller so as to carry ink to the remaining rollers in the inking system, and a second set of rollers in a repellent system including a repellent fountain roller adapted to transmit repellent from a repellent fountain to a repellent ductor so as to carry repellent to the remaining rollers, a system for cleaning said inking system rollers comprising in combination a frame; a control carried by said frame having a normal operating mode and an inking system clean-up mode; repellent fountain carrying means on said frame for movably carrying the repellent fountain, the repellent fountain being movable between a first position maintaining a supply of repellent for the repellent fountain roller and a second position releasing said supply of repellent; means responsive to operation of said control in said clean-up mode to move the repellent fountain to said second position releasing said supply of repellent; means responsive to operation of said control in said clean-up mode to bring said ink fountain and ink ductor rollers into continuous rotative contact; a supply of cleaning liquid supported by said frame; means responsive to operation of said control in a liquid dispensing portion of said clean-up mode for directing said cleaning liquid from said supply to said rollers, said liquid being carried throughout the roller system, a scraper, and means responsive to operation of said control in said clean-up mode for actuating said scraper into engagement with one of the rollers to remove contaminants therefrom and thereby remove contaminants from all of the rollers in continuous contact.

8. The combination of claim 7 including a contaminant receiving tray disposed below the repellent fountain and said scraper to collect said released repellent and said scraped contaminants.

9. The combination of claim 8 wherein said scraper is movably carried by said tray and includes an arm responsive to operation of said control for actuating said scraper into engagement with one of the rollers so that contaminants are scraped into said collecting tray.

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