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LITHOGRAPHIC DAMPENING DEVICE AND METHOD

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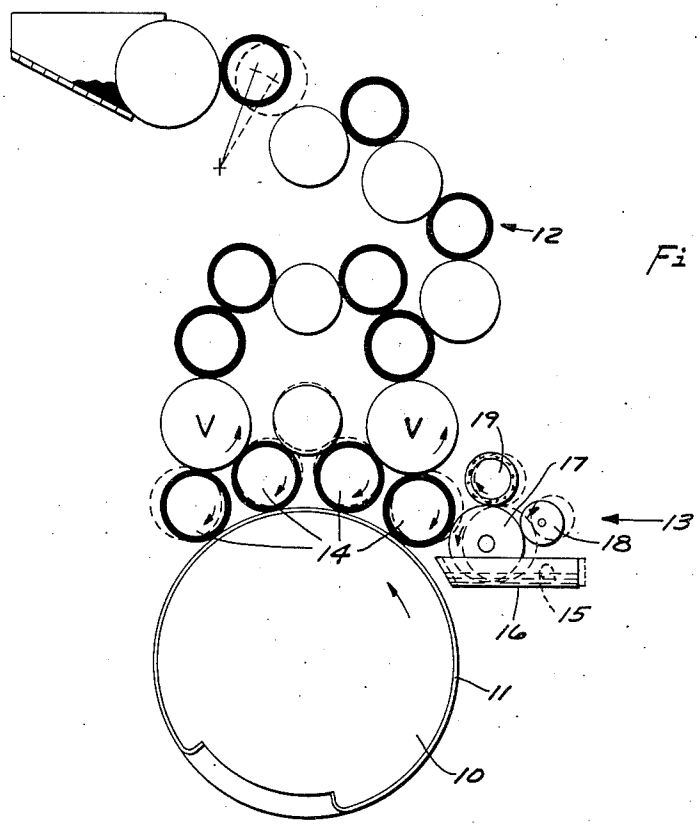


Fig. 1

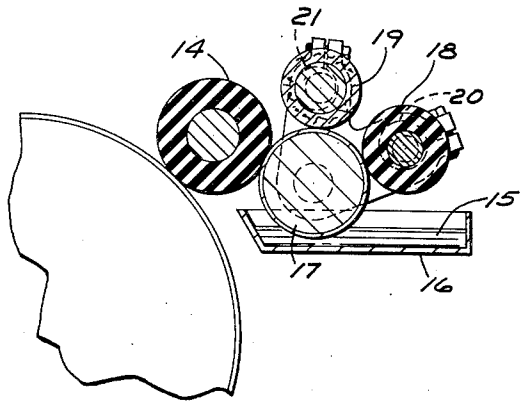


Fig. 2

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LITHOGRAPHIC DAMPENING DEVICE AND METHOD

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This invention relates generally to the lithographic printing process, and in particular to a novel type of dampening device and method for appliyng ink repellent water solution to a lithographic printing plate.

The principal object of this invention is to provide a fine, even distribution of lithographic ink repellent water solution by means of a relatively simple but highly efficient dampening device.

Another object of the invention is to obtain accurate lateral control of ink repellent water solution across the width of a lithographic dampening device without requiring the use of a plurality of individual water control means along the length of rollers of the device.

An object of a specific form of the invention is to produce a fine film of evenly distributed ink repellent water solution with a plurality of rollers of a contact system, all of which rollers run at the surface speed of a lithographic plate to which water is supplied.

Other objects of the invention will be apparent from the following description in which reference is made to the accompanying drawings.

According to the invention, a contact-type dampening system of a lithographic printing press comprises a first roller contacting a plate on a rotating cylinder, an ink-rejecting, water receptive roller contacting the first roller and carrying a film of water thereon, and a metering roller and an absorbent accumulator roller engaging the ink-rejecting roller to respectively meter the quantity of water on the roller and accumulatively absorb or pay out water applied by the ink-rejecting roller to the first roller in accordance with the demands or requirements of the surface of the printing plate.

In the drawings:

FIG. 1 is a simplified elevational view of a portion of a lithographic printing press illustrating an inker and one form of dampening device according to the invention.

FIG. 2 is an enlarged view of the dampening device in greater detail.

Referring now to FIG. 1, a plate cylinder 10 of any conventional lithographic printing press has mounted thereon by means of plate clamps (not shown) a lithographic printing plate 11. In conventional practice the plate 11 has image areas adapted to receive ink from an inker 12 and non-image areas adapted to receive ink repellent water solution from a dampening device 13. To obtain proper print quality, it is essential that a certain balance be obtained and maintained between the ink and water fed to the plate on all portions of the plate, regardless of variations in ink coverage from one portion of the plate to the next. The inker 12 may be of any particular type, the one shown in the drawings being illustrated merely for purposes of example. The inker 12 will normally include a plurality of form rollers 14 which contact a given line across the plate 11 in succession as the cylinder 10 rotates. The form rollers 14 are generally of resilient rubber or composition material. Since the remainder of the inker may be of any conventional type, its structure will not be described in detail, suffice it to say that the form rollers 14 may be adapted to be engaged with or removed from the plate 11 while being maintained in contact with vibrator rolls "V."

Ink repellent water solution 15 is placed in a shallow pan 16 which comprises a portion of the dampening device 13. Immersed in the solution 15 and contacting the first of the form rollers 14 is an ink-rejecting but water receptive pan roller 17 which is treated in the customary manner to have these two characteristics. Riding against the pan roller 17 is a metering roller 18 which is preferably made of non-absorbent resilient material, and an accumulator roller 19.

The function of the metering roller 18 is to squeeze off any excess liquid picked up by the pan roller 17 as it rotates in the solution 15, so as to control the quantity of water solution fed to the nip of the pan roller 17 and accumulator roller 19. The roller 19 has an absorbent covering which may be of conventional molleton material, so that the thin film of water metered by the roller 18 on the surface of the roller 17 may be distributed properly by the accumulator roller 19 in accordance with the requirements of the plate, particularly across its width. The function of the accumulator roller 19 is the same as described in the co-pending U.S. application of Wojciechowski and Brandt, Ser. No. 851,835, filed November 9, 1959.

The roller 17 and the rollers 18 and 19 may all be driven at the surface speed of the rollers 14 and the plate 11, or the rollers 17, 18 and 19 may be geared together but driven at a different speed from that of the form rollers 14. The difference in speed can function to control the quantity of water fed to the nip of the pan roller 17 and metering roller 18, this difference in speed being permissible due to the fact that lithographic ink has an oil base with which the water solution acts as a lubricant and permits slippage between rollers 17 and 14.

Referring now to FIG. 2, it will be seen that the rollers 18 and 19 may each be provided with eccentrics or other adjusting means 20 and 21 respectively to vary the pressure relationship of those two rollers with respect to the pan roller 17. The rollers 17, 18 and 19, and the pan 16 are preferably part of a single unit which is movable toward and away from the first ink form roller 14 so as to make or break contact between the roller 17 and the first form roller.

If desired, the roller 14 shown in FIG. 2 may be completely divorced from the ink roller 12 and be a part of the dampening unit. If this roller were part of a dampening unit which was never connected directly to the inker 12, it would preferably be covered with parchment paper so as to be substantially non-absorbent. By its being non-absorbent, the full advantage of the accumulator roller 19 as described in the co-pending application of Wojciechowski and Brandt would be taken advantage of, particularly the feature of rapidity of response in obtaining the proper ink-water balance.

In the form of our invention shown in FIG. 1, the operation would commence with the dampening device 13 and form rolls 14 in their dotted-line inoperative positions. At this time pan roller 17 is disconnected from the first form roller 14. Both the inker 12 and dampening device 13 would be run while in their inoperative positions to ink and dampen the rollers of the respective units. The device 13 would then be moved leftwardly to a first position until the pan roller 17 engaged the inked first form roller. After a few revolutions of the press, the dampening device 13 would be moved further leftwardly to urge the first form roller into contact with the plate to dampen the plate while feeding but a small amount of ink thereto. The remainder of the form rollers 14 would then be thrown "on" automatically when printing impression is thrown "on." During trip "off" of impression, the last three form rollers 14 would move to their

dotted line positions. At this time the press cylinders may run at slow speed and water would be fed from device 13 through the first form roller 14 to the plate to maintain it damp.

If desired, the roller 18 may be positioned below the roller 17 and be immersed in the ink repellent water solution 15. It would still rotate in the same direction, but would pick up the water from the pan 16 and meter a selected quantity by its pressure relationship with the water receptive roller 17. The metered film of water would then be worked upon additionally by the absorbent covering of the accumulator roller 19 to perform the desired functions as mentioned previously.

Various modifications and changes may be made without departing from the spirit and scope of the claims.

Having described our invention, we claim:

1. In a dampening device for supplying ink repellent water solution to the surface of a plate on a rotating cylinder of a lithographic printing press, a first roller rotating in contact with the plate and running at the surface speed thereof, ink-rejecting, water-receptive roller means running in contact with the first roller, means supplying the ink repellent water to the water-receptive roller, a pair of rollers running in contact with the water-receptive roller means at the surface speed thereof, said pair of rollers engaging the water-receptive roller at points in the path of travel of water from the supply to the point of contact of the water-receptive roller means with the first roller, one of said pair of rollers being a substantially non-absorbent resilient metering roller and the other being an absorbent accumulator roller positioned between the metering roller and the first roller, and means for adjusting the pressure relationship of the metering roller with the water receptive roller means.

2. In a dampening device for supplying ink repellent water solution to the surface of a plate on a rotating cylinder of a lithographic printing press, a form roller rotating in contact with the plate and running at the surface speed thereof, means supplying a film of ink to said form roller, ink-rejecting, water-receptive roller means running in contact with said form roll, means supplying the ink repellent water to the ink-rejecting roller means, a pair of rollers running in contact with the ink-rejecting roller means at the surface speed thereof, said pair of rollers engaging the ink-rejecting roller means at points in the path of travel of water from the supply to the point of contact of the ink-rejecting roller means with the form roller, one of said pair of rollers being a substantially non-absorbent, resilient metering roller and the other being an absorbent accumulator roller positioned between the metering roller and the ink form roller, and means for adjusting the pressure relationship of the metering roller with the ink-rejecting roller means.

3. A dampening device according to claim 2 wherein the ink-rejecting roller means comprises a single metal roller.

4. A dampening device according to claim 3 wherein said form roller and ink-rejecting roller means run at the same surface speed.

5. A dampening device according to claim 3 including a pan containing said ink repellent water, said pan being positioned closely below the ink-rejecting roller means whereby the latter roller is partially immersed in the water.

6. A dampening device according to claim 3 wherein there is a plurality of form rollers supplying ink to the plate, and wherein the form roller contacted by the ink-rejecting roller means is first in line to be contacted by a given line across the plate as the cylinder rotates.

7. The method of applying ink repellent water solution to the surface of a lithographic plate carried on a rotating cylinder of a lithographic printing press, comprising the steps of applying ink to an ink form roller, supplying a film of the ink repellent water solution to ink-rejecting, water-receptive roller means, metering the quantity of water on the ink-rejecting roller after it has been supplied thereto, thereafter accumulatively absorbing excess water from or applying additional water to the ink-rejecting roller means to provide a thin, substantially uniform layer of water of predetermined thickness on the surface thereof, engaging the ink-rejecting roller means with the ink form roller, and moving the ink from the form roller into contact with the surface of the plate while maintaining contact between the form roller and ink-rejecting roller means.

8. The method according to claim 7 wherein the ink-repellent solution is continuously supplied to the ink-rejecting roller means.

9. The method of applying ink to the image areas and ink repellent water solution to the non-image areas of a lithographic plate carried on a rotating cylinder of a lithographic printing press, comprising the steps of supplying ink to a form roller running in contact with the plate at the surface speed thereof, supplying a film of ink repellent water solution to ink-rejecting, water-receptive roller means running in contact with the form roller, metering the quantity of water on the ink-rejecting roller means after it has been supplied thereto and before it has been transferred to the form roller, continuously accumulatively absorbing excess water from or applying additional water to the ink-rejecting roller means as required by the printing plate after metering but before transfer to the form roller to provide a thin, substantially uniform layer of water of predetermined thickness on the surface of the ink-rejecting roller means, transferring the water from the ink-rejecting roller means to the inked-up form roller, and simultaneously transferring the ink and water from the form roller to image and non-image areas respectively of the lithographic plate.

10. The method of applying ink repellent water solution to the surface of a lithographic plate mounted on a rotating cylinder of a lithographic printing press, comprising the steps of contacting the plate with a first substantially non-absorbent roller running at the surface speed of the plate, engaging the first roller with an ink-rejecting, water-receptive roller running at the surface speed thereof, supplying water to the water-receptive roller in excess of that required by the plate, metering the quantity of water on the water receptive roller after it has been supplied thereto to remove all but a predetermined amount of water, thereafter accumulatively absorbing water from or applying additional water to the water-receptive roller to provide a thin, substantially uniform layer of water of predetermined thickness on the surface thereof, and transferring the water from the water-receptive roller to the first roller and then to the plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,364,257	Dobbertin	Jan. 4, 1921
2,102,641	Osborn	Dec. 21, 1937
2,183,568	Huck	Dec. 19, 1939
2,238,050	Goedike	Apr. 15, 1941
2,320,523	Jirousek	June 1, 1943
2,733,654	Rogers	Feb. 7, 1956
2,775,195	Martin	Dec. 25, 1956