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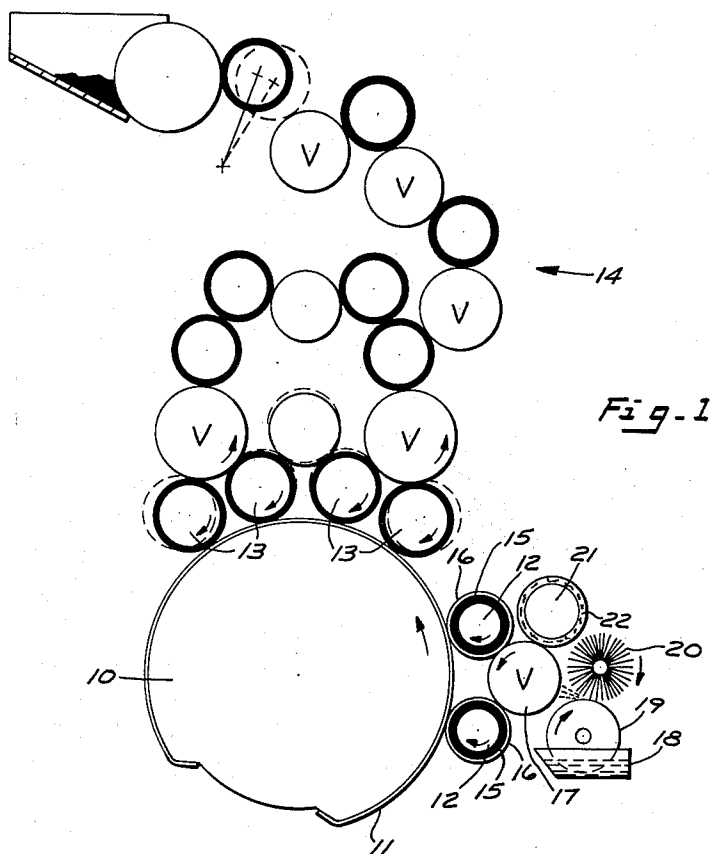


Fig. 1

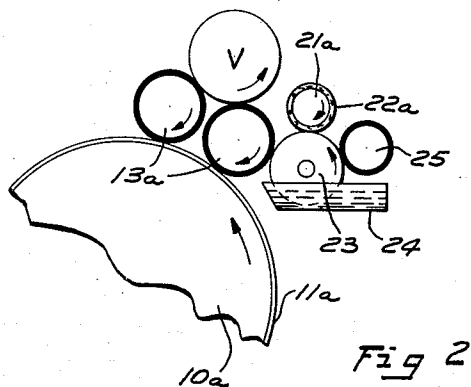


Fig. 2

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DAMPENING DEVICE FOR LITHOGRAPHIC PRINTING PRESS

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2 Claims. (Cl. 101-148)

This invention relates generally to a method and means for dampening a lithographic plate with ink repellent water solution prior to or simultaneous with its being inked by inking means.

For several decades, it has been conventional in the lithographic printing art to dampen a plate with one or more dampening form rolls having an absorbent molleton covering. While such dampening devices have performed quite satisfactorily for high quality printing in the hands of highly skilled lithographers, their slowness in responding to adjustments in the quantity of water fed, the difficulty of obtaining and maintaining the ink-water balance, and the inability to obtain ease of control of the water feed laterally of the dampener have left something to be desired.

Within recent years, the molleton coverings on the dampener form rolls contacting the plate have been replaced in many instances with parchment paper which is usually wrapped spirally around the rolls. Since such parchment paper is substantially non-absorbent, the necessity of pre-dampening as with the conventional molleton coverings is no longer required, except for a molleton covering on the conventional ductor roller. Accordingly, the ink-water balance could be obtained more readily with less wasted sheets at the start of the printing job, and any adjustment in the ink-water balance would be more rapidly transmitted through the dampener. In addition, the conventional water stops, which are used as squeegees against the pan roll to wipe clean selected areas of the dampener across its width in order to obtain lateral water feed control, were needed with the paper dampener system to a lesser extent and for fewer printing jobs than that previously required in the molleton type dampener.

Although the parchment paper dampener form rolls are considered an improvement over the molleton system in some respects, there is still apparent room for improvement in the rapidity of response of the dampener to an adjustment of the ink-water balance, and also in lateral control of the quantity of water across the dampener. These latter problems are the primary ones with which the present invention is concerned.

Accordingly, the primary object of the invention is to eliminate or materially reduce the disadvantages of the previous known systems.

It is another object of this invention to provide a dampening device capable of satisfactorily handling a greater variety and complexity of lithographic printing jobs than previous known systems, with a minimum of operator attention or adjustment.

Another object of the invention is to provide a lithographic dampening device capable of responding rapidly to changes made by the operator in the quantity of dampening fluid fed thereby.

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A further object of the invention is to provide a lithographic dampening device for feeding the proper, minute quantity of dampening to a lithographic plate in but a few revolutions of the printing press with which it is associated when the press is initially started.

Another object is to provide a dampening device for use in high quality lithographic printing, which device includes compensating means for automatically adjusting itself in accordance with different water quantity requirements across the width of a lithographic plate.

Still another object of the invention is to provide a lithographic dampening device which uses less ink and dampening water solution than known devices of the sort while maintaining the same or obtaining better printing quality.

Another object of the invention is to provide a dampening device which requires little adjustment to vary the quantity of water fed thereby from one printing job to the next.

Still another object is to provide a lithographic dampening device which enables the use of lower quality printing paper than heretofore without a loss of print quality.

Other objects and advantages will become apparent from the following description in which reference is made to the accompanying drawings.

According to the invention, a lithographic dampening device comprising one or more substantially non-absorbent rollers transfers ink repellent water from the surface of the rollers directly to the surface of the printing plate. Intermediate a point where the water is applied to the non-absorbent rollers and the point where it is taken off by contact with the surface of the lithographic plate, an overriding absorbent roller engages the non-absorbent rollers. This absorbent roller acts as an accumulator to not only smooth out the water on the non-absorbent rollers in an extremely fine, thin film, but acts also to either absorb excess water or pay out water stored by the absorbent roller according to plate requirements at a particular instant.

In the drawings:

FIG. 1 is a simplified elevational view of a portion of a lithographic printing unit illustrating one form of dampening device embodying the invention, and,

FIG. 2 illustrates a fragmentary portion of a lithographic printing unit having another form of dampening device embodying the invention.

Referring now to FIG. 1, a plate cylinder 10 has mounted thereon by means of conventional plate clamps (not shown), a lithographic plate 11. As shown, the cylinder 10 rotates counterclockwise. A pair of dampener rolls 12 running in contact with the rotating plate deposits ink repellent water solution thereon, and further rotation of the cylinder 10 presents the dampened portions of the plate 11 to a plurality of ink form rollers 13 of any conventional inker arrangement. For operation of the particular inker illustrated, one may refer to Harold et al. U.S. Patent 2,448,975.

The dampener rolls 12 are preferably each a steel roller having a relatively thick resilient cover of rubber or suitable composition material 15. A parchment paper covering 16 may be applied over the rubber 15 as described in Rowe U.S. Patent 2,891,470. Such parchment paper is substantially non-absorbent and has been utilized with a fair degree of success in recent years in the litho-

graphic industry. The parchment paper 16 may be wound spirally onto the rolls 12 while the rolls are removed from the press.

A water-receptive, ink-rejecting vibrator roller 17 is positioned intermediate the two dampener rolls 12 and engages both of the rolls. The ink repellent water solution is supplied from a water pan 18 to the surface of a pan roller 19 and then is flicked toward and onto the surface of the vibrator roller 17 by means of a rotating brush 20. This type of device creates a very fine mist of droplets of ink repellent water and provides the impelling force necessary to drive them onto the vibrator roller 17. A mist generating device of this type is shown in Dahlgren U.S. Patent 2,868,118. It can be seen from the direction of rotation of the rollers 17 and 12, that the water received by the vibrator roller 17 from the mist generating brush and pan roller travels over the surface of the roller 17 in a counterclockwise direction after which a portion of it is transferred to the parchment 16 on the upper dampener roll 12 and a further portion transferred to the parchment 16 on the lower dampener roll 12. Since the dampener rolls 12 run in contact with the plate 11 on the cylinder 10, they of course transfer water to the plate. The rollers of the dampening system thus far described are all substantially non-absorbent, the vibrator roller 17 preferably being of chrome plated steel or aluminum which has been properly treated to provide the aforementioned characteristics.

The plate 11 of a lithographic offset printing press runs in contact with a blanket on a blanket cylinder (not shown) from which the image is transferred to sheet or web material to be printed. Since the non-image portions of the printing plate must reject ink until all of the ink form rollers 13 have contacted a given line across the plate and the form rollers have deposited the ink on the image portions thereof, it is necessary that sufficient ink repellent solution be applied to the plate by the dampening rolls 12 to keep it wet until it has been contacted by all of the ink form rollers. Therefore, any given area across the plate 11 will still be carrying dampening solution after it passes the last one of the ink form rollers 13 and will thus transfer some of the water to the blanket on the blanket cylinder and to the printed material. In addition, some water will be lost from both the plate and blanket by evaporation. It has been found that the device as thus far described will work satisfactorily for printing a small number of sheets, but that its adjustment is so critical that it eventually carries too little or too much water and consequently requires either an increase or decrease in the supply of water or ink. When such adjustment is made, the color density of the print may vary from what was previously achieved.

In order to provide a system for storing water in excess of immediate plate needs, and to further provide for a minimum of adjustment by the operator to maintain the proper ink-water balance, an accumulator roll 21 is arranged to engage the vibrator roller 17 at a point intermediate the application of the mist of ink repellent solution by the mist-creating device and the point at which the solution is transferred to the upper dampener roller 12. It has been found that the mist-creating device, although capable of providing a very fine control of solution, nevertheless deposits the solution in very minute droplet form onto the vibrator roller 17. In order to smoothen this droplet pattern into a thin, even film of liquid, an absorbent covering 22 is provided on the roller 21 to iron out the tiny droplets on the vibrator roller 17. The absorbent covering may be of any particular type. A molleton covering has been found very satisfactory, and in some instances a lint-free sock may be slipped over the covering 22 to minimize or eliminate the possibility of lint from the molleton getting into the inker or onto the print. Since not all of the water applied to the dampener rolls 12 is actually dissipated, i.e., since some water subsequently returns through the dampening rolls

to the vibrator roll 17, the accumulator roll acts to either absorb any excess water on the vibrator roll 17, or pay out additional water carried by the covering 22 if so required by the plate.

We have found that there can be a wide variation of printing coverage on the plate 11 but that one speed setting of the pan roller 19 and brush 20 can accomplish most dampening jobs without requiring any lateral control by means of conventional water stops. The quantity of liquid supplied by this mist-creating device is so small as to be practically unnoticeable in operation insofar as a wet appearance of the vibrator roller 17 is concerned. We have further found that the absorbent covering 22 of accumulator roller 21 need initially receive only a slight amount of water on its outer surface before the entire dampening system becomes effective for proper dampening. Absorbent rollers of the type illustrated are conventionally found in the train of water from the source to the plate rather than riding over the train. Because of this, the absorbent rollers in the train have required full dampening before they were able to pay out liquid at the proper rate. We have found that the accumulator roller 21 properly handles any printing job without requiring any additional lateral control of the quantity of water applied by the mist creating device to the vibrator roller 17.

Referring now to FIG. 2, a pan roller 23 dips in a pan 24 carrying ink repellent water solution. A metering roller 25 of non-absorbent, resilient construction contacts the pan roller 23 to squeeze off excess water and simultaneously break it down into a thin film on the pan roller 23. The roller 23 is treated to be ink-rejecting and water-receptive. An accumulator roller 21a having a covering 22a of substantially the same type as accumulator roller 21, in FIG. 1, contacts the pan roller 23 and serves the same function as in FIG. 1. The pan roller 23 may be driven at the same speed as the speed of the form rollers 13a, or at a slightly lower speed which may be varied to adjust the quantity of liquid transferred from the roller 23 to the first form roller 13a of the inker. In practice, the rollers 23, 25 and 21a would be mounted as a unit and movable from right to left and reverse. The first form roller 13a would be normally spring-urged outwardly away from the plate 11a while the remaining form rollers would be automatically operable to be thrown on or off in the usual manner.

When initially starting operation of the press, the inker would of course be inked up with all of the rollers 13a out of contact with the plate and with the dampener unit moved to the right out of contact with the form roller 13a. The dampened dampener unit would then be moved leftwardly as shown in FIG. 2 until the roller 23 would engage the inked first form roller 13a and after a few revolutions of the press, would then be moved further in a leftward direction to urge the first form roller 13a into contact with the plate against the spring pressure which biases it outwardly. At this time ink and water would be transferred simultaneously to a given line across the surface of the plate 11a. After a few revolutions of the cylinder 10a, the remainder of the rollers 13a could be automatically thrown on and printing could commence in the usual fashion.

While we have described and shown but two systems using an accumulator roller in a dampening device, we wish it to be understood that other forms of the invention may be made without departing from the spirit and scope of the claims. For example, but one dampener form roll may be needed, and also, the water may be applied to the vibrator roller by any type of ducting means. Still other modifications are possible without departing from the essence of the invention.

Having described our invention, we claim:

1. A device for dampening a lithographic printing plate on a rotating cylinder with ink repellent water solution, comprising water-carrying roller means having at

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least a portion thereof adapted to run in surface contact with the plate, said roller means having a substantially non-absorptive surface at least a portion of which is ink-rejecting, relatively non-absorptive means for supplying ink repellent water from a water supply to the ink-rejecting portion of the roller means at a point remote from the plate, the primary path of water from the supply to the plate around said roller means defining a train of water, and an absorptive accumulator roller running in surface contact with the ink-rejecting portion of the roller means over the train of water and between the supplying means and the plate.

2. A device as set forth in claim 1 wherein the means supplying ink repellent water comprises means for creating a continuous, substantially uniform mist of finely

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divided particles of said water and for directing the mist toward and onto the roller means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,103,254	Goedike	Dec. 28, 1937
2,622,521	Larsen	Dec. 23, 1952
2,690,119	Black	Sept. 28, 1954
2,708,874	Schultz	May 24, 1955
2,868,118	Dahlgren	Jan. 13, 1959
2,891,470	Rowe et al.	June 23, 1959

FOREIGN PATENTS

387,694	Germany	Jan. 2, 1924
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