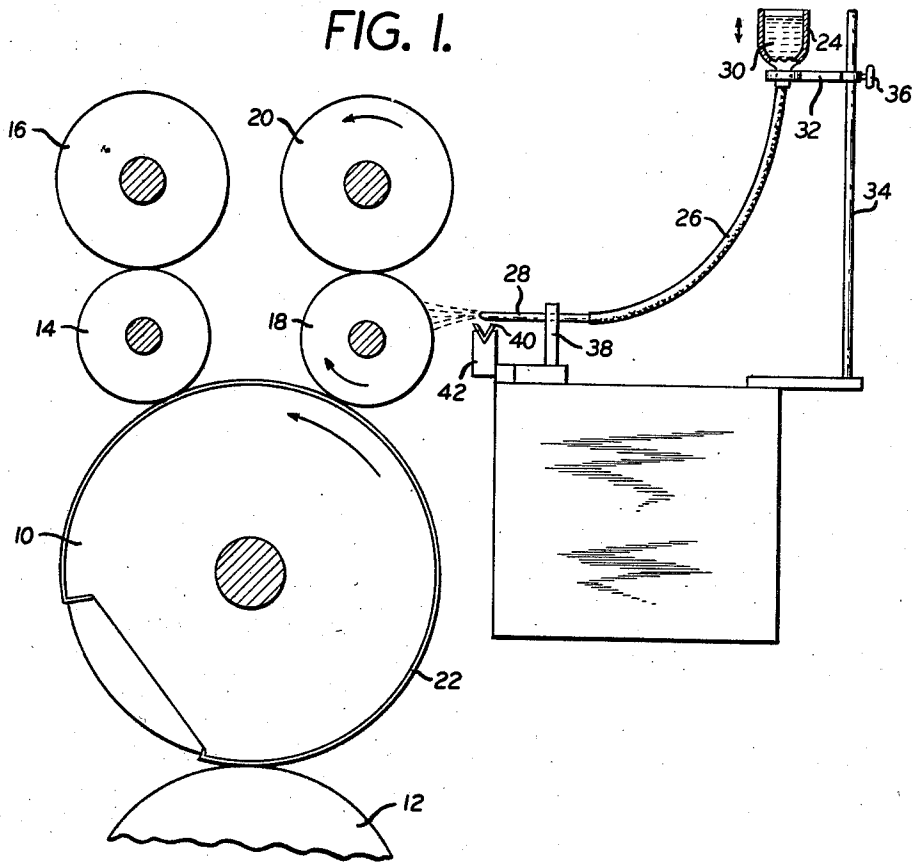
Aug. 4, 1959 L. G. ERZINGER 2,897,753

DAMPENING APPARATUS FOR OFFSET PROCESS PRINTING PRESSES

Filed Jan. 17, 1958 2 Sheets-Sheet 1

FIG. 1.



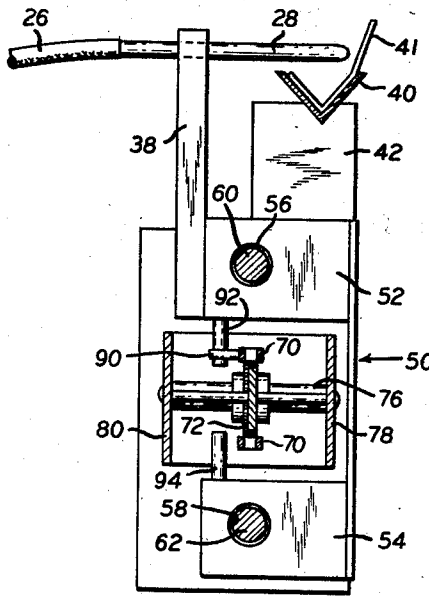


FIG. 4.

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2 Sheets-Sheet 2

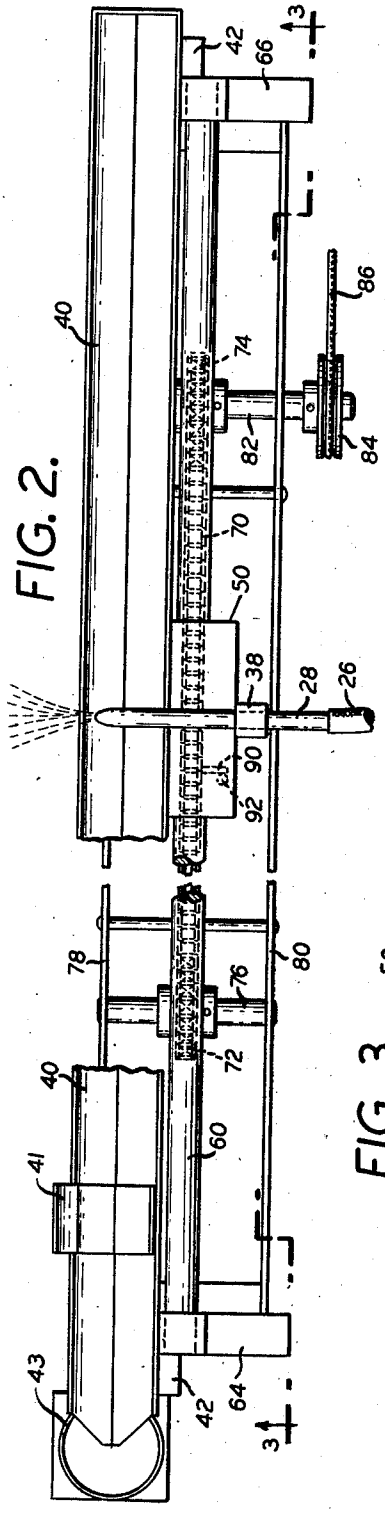


FIG. 2.

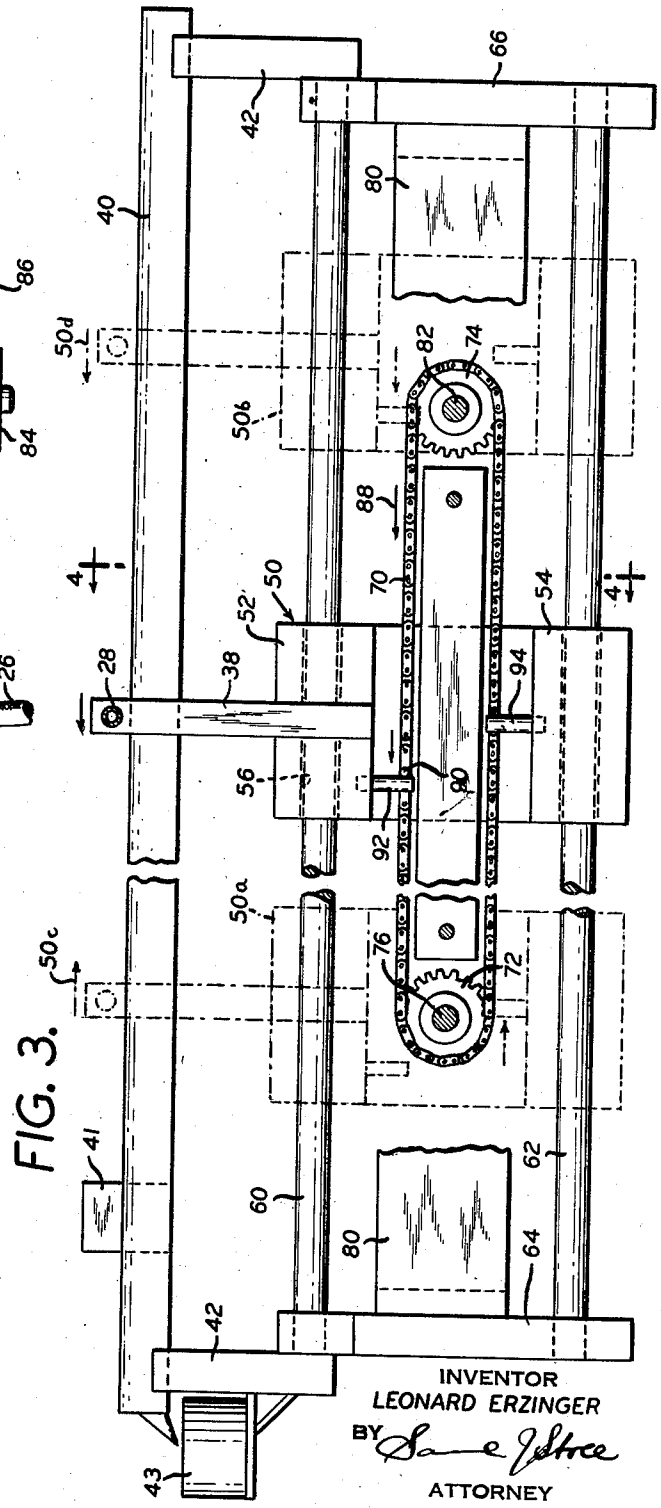


FIG. 3.

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DAMPENING APPARATUS FOR OFFSET PROCESS PRINTING PRESSES

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Application January 17, 1958, Serial No. 709,703

1 Claim. (Cl. 101—148)

This invention relates to dampening apparatus for offset process printing presses.

The modern offset lithographic printing press is provided with a plate cylinder, a rubber-covered cylinder, and a metal cylinder. Secured to the plate cylinder is a thin metal sheet which has a photographic image imposed upon it and adapted to attract grease and oil, which are the main constituents of printing inks. The area surrounding the photographic image is the non-printing area which is chemically treated to be water receptive and to repel grease and oil. The rubber-covered cylinder receives its inked design from contact with the thin metal sheet on the plate cylinder and this design is then transferred to a sheet of paper which is supported by the metal cylinder.

During the printing cycle the plate cylinder is kept wet by an assembly of cloth-covered rollers which themselves are maintained in a wet state by a reservoir of acidulated water. A second assembly of rollers supplies ink to the plate cylinder in the same manner as the first assembly of cloth-covered rollers applies acidulated water thereto, but the two roller assemblies are separate systems which perform independently of each other, although they are of course synchronized in the operation of the press.

One object of the present invention is the provision of a single system of rollers which simultaneously applies both ink and water to the plate cylinder. More specifically, the present invention utilizes the conventional assembly of ink rollers to apply both the ink and the water to the plate cylinder. The underlying principle of this system is based upon the high surface speed of the ink rollers and the difference in specific gravity between printing ink and acidulated water. The heavier printing ink will tend to cling to the surface of the ink rollers, while the lighter acidulated water will tend to remain on the outer circumference, that is, upon the outer surface of the ink coating rather than upon the surfaces of the rollers themselves. Stated differently, in the system herein described and claimed the inking rollers are coated with two layers of fluid, the inner layer consisting of ink and the outer layer superimposed upon the inner layer consisting of water.

Another object of this invention is the provision of a very simple yet efficient apparatus for applying the foregoing system to an offset printing press. The apparatus embodies several components which are individually operable and which may be synchronized to perform a common function. The first component is a gravity feed water flow and in its simplest form it is merely an inverted bottle which constitutes an elevated reservoir, a line leading from the mouth of said bottle, and a nozzle at the discharge end of said line. Water flows by gravity from the bottle through the line and nozzle and upon one of the inking rollers. The water flow is controllable by a second component which is merely a vertically adjustable support for said water bottle. The water flow is controlled by the simple expedient of raising or lowering

the water bottle. The flow is also controlled by using nozzles or jets of various orificial sizes. The flow may be cut off by a conventional valve or the bottle may be lowered to a level below the nozzle.

Another component of this apparatus is a reciprocating carriage which carries the nozzle, the bottle, and the adjustable bottle support. This carriage moves longitudinally of the inking roller to which the water flow is applied, and its speed of movement first in one direction and then in the opposite direction is coordinated with the speed of rotation of said inking roller. The object is to supply the desired quantity of water to the inking system and through said system to the plate cylinder. In an alternate arrangement, the bottle and bottle support may be mounted on the stationary frame of the press and connected by a flexible line to the nozzle.

An important feature of the carriage is the nature of its reciprocating drive mechanism. The carriage and the drive mechanism are connected in such manner that they may readily be disconnected and again connected at any time and without interruption of the operation of the drive mechanism.

Among the important features of the present invention is the elimination of the entire dampening system which conventional offset printing presses embody. Another important advantage of this system is the fact that it is capable of confining the acidulated water to the water supply system and the rollers and cylinders of the machine. In other systems of the prior art attempts were made to spray the acidulated water upon various components of the printing press. This practice constitutes a health hazard, since the spray contaminates the air with chromic acid, which is a violent poison, affecting the health of those who operate the presses.

The invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary, partly schematic, vertical section through an offset printing press embodying the dampening apparatus herein claimed.

Fig. 2 is a fragmentary top view of the dampening apparatus.

Fig. 3 is a side view, partly in vertical section, on the line 3—3 of Fig. 2.

Fig. 4 is a vertical section through the dampening apparatus taken on the line 4—4 of Fig. 3.

The offset printing press shown in the drawing is provided with the following conventional components: a plate cylinder **10**, a rubber-covered cylinder **12**, and a plurality of inking rollers **14**, **16**, **18** and **20**. A thin metal sheet or offset printing plate **22** bearing a photographic image is attached to the plate cylinder **10** during the operation of the machine and ink is applied thereto by means of inking rollers **14** to **20**, inclusive. The ink adheres only to the photographic image, and the area surrounding said image is chemically treated to repel ink and to receive water. Acidulated water is applied to said sheet, and it adheres only to the area surrounding the photographic image. The ink which adheres to the image is then transferred by contact to the rubber-covered cylinder **12** and also by contact from said rubber-covered cylinder to a sheet of paper. This procedure is entire conventional.

The apparatus for wetting the metal sheet **22** bearing the photographic image will now be described. It comprises an elevated inverted bottle **24** which serves as a reservoir, a hose **26** leading from the mouth of said inverted bottle, and a nozzle or jet **28** connected to the discharge end of said hose. Contained within the bottle is a quantity of acidulated water **30**, for example, a quart of such water which is sufficient for three hours of printing on a 14"x20" press. The nozzle **28** is situated

adjacent inking roller 18, and the flow of acidulated water from said bottle 24 through hose 26 and nozzle 28 will be directed upon said roller 18.

The flow of water through nozzle 28 may be controlled by raising or lowering bottle 24 relative to said nozzle 28. This is accomplished by mounting the bottle on an adjustable bracket 32 which is supported on a vertical stand 34. A manually operable set screw 36 adjustably secures said bracket 32 to said stand 34, and the bracket may be raised or lowered as desired to raise or lower bottle 24.

Nozzle 28 is supported by a suitable bracket 38 in operative position relative to roller 18. A trough 40, paralleling roller 18 and below nozzle 28, is mounted on brackets 42. This trough performs an important function in conjunction with deflector plates 41. These deflector plates are slidably mounted on trough 40, and there may be as many such deflector plates, and they may be of such dimensions as may be desired. These deflector plates may be interposed between nozzle 28 and inking roller 18 to prevent the flow of water from striking the roller. For example, there may be two such deflector plates, one at each end of the roller, and when the nozzle is brought to an inoperative position at either end of roller 18 (as will shortly be described) the deflector at that end will deflect the flow of water into the trough. The trough will carry it into a receptacle 43, shown in Figs. 2 and 3.

Stand 34, bracket 38 and brackets 42 are all supported on a carriage 50. This carriage includes frame members 52 and 54 in which bearings 56 and 58 are fitted. These bearings ride on a pair of horizontal rails 60 and 62 which are supported at their ends in frames 64 and 66 of the printing press. It will be observed from the foregoing that carriage 50 is adapted to slide on rails 60 and 62 longitudinally of roller 18 and either leftwardly or rightwardly, as dotted lines 50*a* and 50*b* and arrows 50*c* and 50*d* in Fig. 3 indicate.

A reciprocating drive mechanism is provided to drive the carriage first in one direction and then in the other, longitudinally of roller 18. This drive mechanism is shown in Figs. 2, 3 and 4, and it will there be seen that it includes an endless chain 70 mounted on a pair of gear wheels or sprockets 72 and 74 respectively. Sprocket 72 is an idler, and it is mounted on a shaft 76 supported by frame members 78 and 80 of the machine. Sprocket 74 is the drive sprocket, and it is mounted on a driven shaft 82, which is also supported on frame members 78 and 80. A pulley 84 is secured to shaft 82, and a belt 86 is connected to said pulley 84 and to a rotary drive element such as a pulley on an electric motor. It is evident from the foregoing that chain 70 is adapted to move continuous in a given direction as indicated by arrow 88 in Fig. 3.

A single pin 90 projects laterally and horizontally from one of the links in chain 70. A pair of vertically disposed pins 92 and 94 are secured to carriage 50, pin 92 projecting downwardly from an elevated position of said carriage, and pin 94 projecting upwardly from a lower position of said carriage.

It will be noted in Figs. 3 and 4 that pins 92 and 94 are disposed to intercept drive pin 90. In Fig. 3, drive pin 90 is shown in engagement with vertical pin 92, and this causes the carriage to move leftwardly as viewed in said figure. When drive pin 90 reaches sprocket 72 and commences to move around the sprocket in counterclockwise direction, it will disengage vertical pin 92 and the carriage will come to a stop. Drive pin 90 will continue to move with chain 70 until it passes around sprocket 72 and commences to move rightwardly on the lower run of said chain. It will now engage vertical pin 94 and cause the carriage to move rightwardly as viewed in Fig. 3. When drive pin 90 commences to move around drive sprocket 94 it will disengage vertical pin 94 and eventually, when it reaches the upper run of chain 70, it will reengage vertical pin 92 and cause the carriage to move leftwardly.

This intermittent reciprocating movement of the carriage continues as long as the chain moves. It is possible, however, to stop the movement of the carriage without interrupting the continued movement of the chain. This is done by manually moving the carriage off to the side a sufficient distance beyond the chain to prevent engagement of the drive pin 90 with either of the vertical pins 92 and 94. When it is desired to have the carriage resume its intermittent reciprocating movement above described, it is normally moved into any operable position, where its vertical pins 92 and 94 will be engaged by the drive pin 90 of the chain.

It will now be understood that the reciprocating movement of the carriage enables the water feed mechanism to distribute the water flow uniformly along the entire effective length of roller 18. In the normal rotation of rollers 18 and 20, uniform distribution of the water will be effected and metal sheet 22 will be uniformly dampened.

I claim:

In an offset printing press, a plate cylinder, an offset printing plate removably mounted thereon, an inking roller mounted for inking engagement with said offset printing plate, and water feeding means situated adjacent the inking roller and adapted to feed water thereto, said water feeding means comprising a nozzle directed at the inking roller and an elevated water reservoir feeding into said nozzle, whereby the water contents of said reservoir are fed by gravity through said nozzle and against said inking roller, a carriage being provided to support said nozzle, and reciprocating drive means being operably connected to said carriage to cause it and the nozzle to move longitudinally of the inking roller in reciprocating fashion, whereby the water flow from said nozzle is directed against the entire effective length of the inking roller, said reciprocating drive means comprising an endless chain mounted on a pair of sprockets, one adjacent each end of the inking roller, said chain having upper and lower runs extending longitudinally of said inking roller, one of said sprockets being connected to rotary drive means to cause continuous movement of the endless chain, a first pin projecting laterally from said chain, a second pin projecting from the carriage for engagement with the first pin when the first pin is situated in the upper run of the endless chain, and a third pin projecting from the carriage for engagement with the first pin when the first pin is in the lower run of the endless chain, whereby engagement of the first pin with the second pin causes the carriage to move in one direction longitudinally of the inking roller and whereby engagement of the first pin with the third pin causes the carriage to move in the opposite direction longitudinally of the inking roller.

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