Nov. 19, 1968 E. F. MUHLICH 3,411,442

DAMPENER FOR PRINTING PRESS

Filed Nov. 7, 1966 2 Sheets-Sheet 1

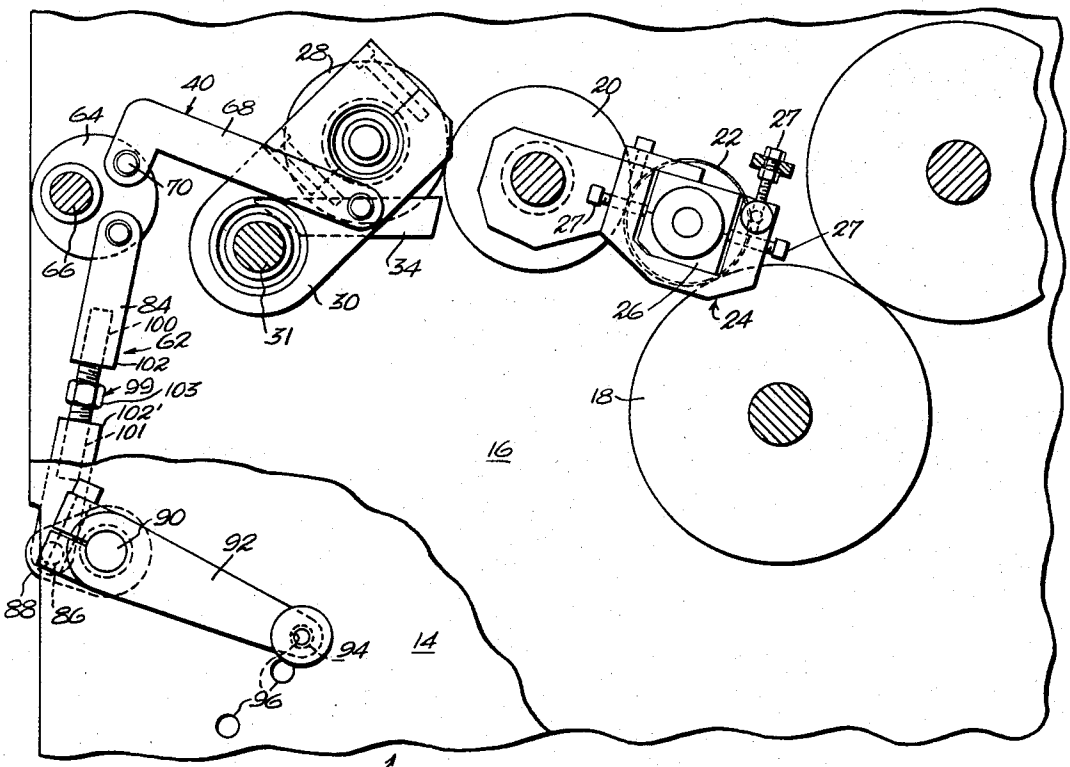


Fig. 1

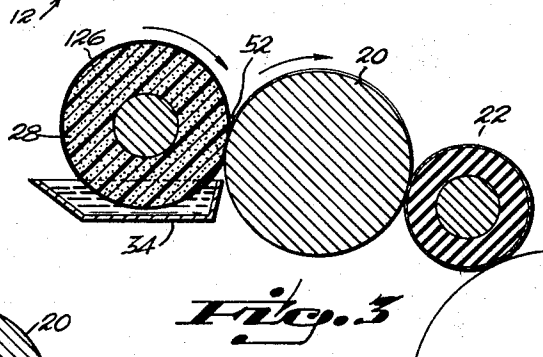


Fig. 3

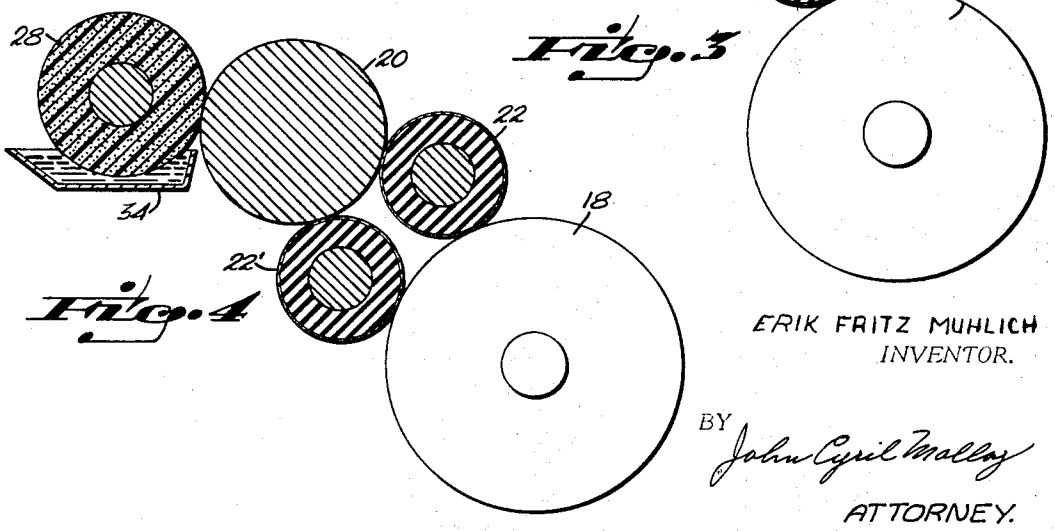


Fig. 4

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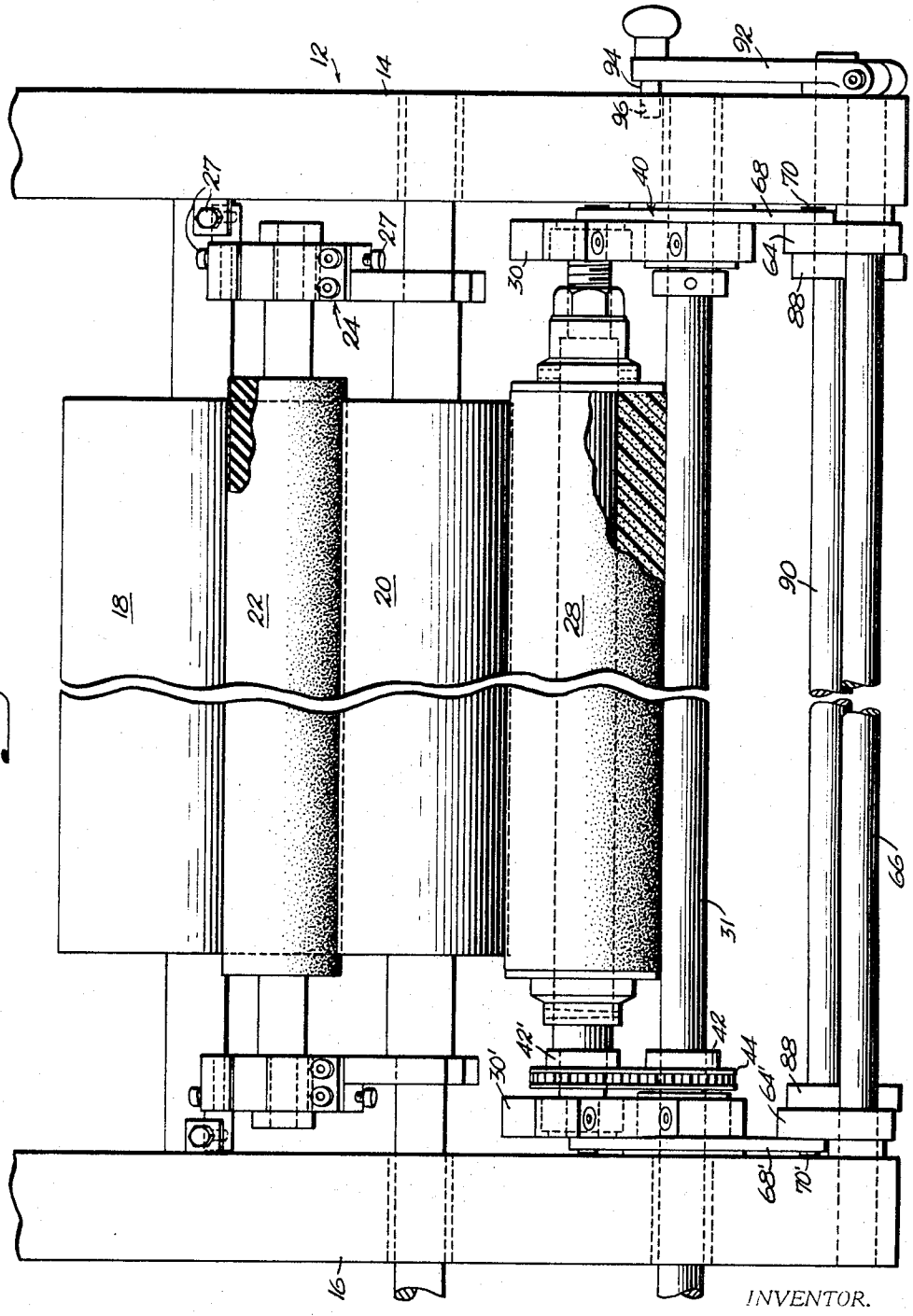


Fig. 2

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DAMPENER FOR PRINTING PRESS

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ABSTRACT OF THE DISCLOSURE

A dampener for dampening a drum including an adjustable transfer roll engaging the drum and a delivery roll which is supported in spaced relation from and rotates in a common direction as a fountain roller peripherally immersed in a supply tray, means for rotating the fountain roller independently of said delivery roll and means for adjustably positioning said fountain roller in different peripheral spacings from said delivery roll to control the amount of moisture directed to said drum.

This invention relates to a liquid delivery system especially useful as a dampening means for printing presses, principally for lithographic presses.

A primary object of the invention is to provide a dampener which will deliver a predetermined amount of liquid in a continuous stream of sheet form of uniform thickness which is required for wetting rollers in printing presses, for instance.

It is another object of this invention to provide a dampener means for presses which will quickly furnish a supply of water as required by the press upon starting of operation of the press without the usual period of wasteful adjustment operation.

It is also an object of this invention to provide a dampener means for presses which will not over-supply liquid fusnished to the press, and, thereby avoid waste.

It is a further object of the invention to provide a dampener having a characteristic manner of operation which is new and novel and is set forth more fully hereinafter.

It is a further object of the invention to provide a dampener which is easy to manufacture, simple to install on existing press units, and is long-lasting and easy to replace, and is generally economical in all aspects.

Other objects of this invention will become more apparent from the following description and the added drawings.

In the drawings:

FIGURE 1 is a side elevation view of a section of a press;

FIGURE 2 is a plan view of that section of the press indicated in FIGURE 1;

FIGURE 3 is a schematic diagrammatic view illustrating the operation of the instant delivery system; and

FIGURE 4 is a view similar to FIGURE 3 and including an additional transfer roller, as will be apparent hereinafter.

Referring to the drawings, wherein like reference characters designate like or corresponding parts throughout the different views, and referring particularly to FIGURE 1, there is shown a section of press which is designated by the numeral **12**. It includes spaced side walls **14** and **16** to carry a parallel roller system in spanning relation thereof. The system includes, as is conventional, a drum **18** to be wetted and a smooth surface metal delivery roller **20** with a transfer roller **22** adjustably wedged therebetween so that these rollers rotate at a common speed, referred to in the art as the machine speed. The transfer roller **22** is adjustable by reason of the fact that it is carried in the cradle means **24** which are journalled to the shaft of the roller **20** in which there are carried adjustable bearing blocks **26** journalled respectively to the ends of the shaft of the transfer roller. The bearing blocks are adjustable within the cradle to move the transfer roller into the wedged position shown in the drawings between the roller **20** and the drum **18** by the screw means **27** which bear upon the blocks. In the past, means have been provided to wet the smooth surfaced delivery roller, and the present invention provides an improved means of delivering a wetting agent to this roller which includes a metering means. To this end there is provided a fountain roller **28** journalled in arms **30**, **30'** which in turn are journalled to a drive shaft **31** which is driven independently of the machine, preferably by a variable speed motor. The arms **30** and **30'** are of a length such that the fountain roller is closely adjacent the smooth surfaced delivery roller, and at the same time the surface of the roller is at all times in operation partly immersed in a water supply tray **34**. An adjustable lock mechanism generally designated by the numeral **40** is provided to maintain the arms and, consequently, the carried fountain roller in close intimate relation with the smooth surfaced roller so that as the fountain roller rotates it will deliver water from the tray **34** in a continuous film of sheet form. The delivery will be best understood by reference to FIGURE 3, it being understood that the drive shaft **31** is connected by means of the sprockets **42** and **42'** and the chain **44** to rotate the fountain roller independently of the machine speed and in a direction of rotation which is the same as that of the smooth surface rollers; i.e., at the point of close intimate relation, the rollers are moving in opposite directions, as is indicated by the arrowed lines on FIGURE 3. It will be apparent that as the fountain roller in FIGURE 3 rotates through the water, it will pick up a supply of water and carry the same to the crotch between the fountain roller and the smooth surfaced roller or distributor roller as it is sometimes referred to. Because of the opposite relative movement of the surface of the distributor roller and because of the adhesivity forces, a thin film of the wetting agent will be deposited on the distributor roller surface and carried therearound as a thin film to be delivered to the transfer roller. Referring to the crotch between the fountain and distributor roller, which is generally indicated by the number **52**, the liquid, such as water, is carried into it to be picked up by reason of the natural attraction of the liquid to the surface of the metal distributor roller. It will be apparent that the amount which can be delivered by the distributor roller cannot exceed an upper limit by reason of the fact that the thin film carried thereon cannot exceed a certain radial thickness. This establishes the upper limit or maximum amount of liquid which may be delivered by the distributor roller to the transfer roller. Also, by reason of the independent drive means of the fountain roller, the speed of rotation of the fountain roller will determine the amount of liquid which is delivered to the crotch between it and the distributor roller. By visual inspection, one may determine the presence or absence of a supply of liquid in the crotch which, if more than the aforesaid maximum, will be turbulent in character as it seeks the film condition on the surface of the distributor roller before it reaches the crown or crest of travel on the distributor roller. The water or wetting agent which is traveled from the tray by the fountain roller to the distributor roller will at all times distribute itself evenly over the surface of the distributor roller in accordance with the well known characteristic phenomenon of adhesivity. Preferably, there is a slight space in the crotch between the surfaces of the fountain roller and the distributor roller which is just sufficient so that it is primarily the adhesivity forces and, secondarily, centrifugal forces which cause the pick-up by the smooth distributor roller of the amount of

liquid available by reason of the fountain roller rotation. In all events, the space between the parallel surfaces of the fountain and distributor rollers is not close enough to cause wear between the rollers by reason of relative opposite movement of the surfaces at the crotch. To adjust the space between the opposing surfaces in the crotch, adjusting means are provided to co-operate with the locking means. The adjustment means comprises a mechanism **62** which comprises cam means **64** and **64'** journalled on a back-up shaft **66** with the said locking means comprising links **68** and **68'** which are pivotally connected at their distal ends to the cam means by means of the pins **70** and **70'** so that on angular adjustment of the cam means the links will be pulled in unison to rotate the arms and, consequently, the fountain roller with respect to the drive shaft and the distributor roller. Adjustable means **62** are provided to rotate the cam through a small angular adjustment range and comprises a pair of extendible members **84**, each of which is connected at the lower ends thereof **86** to an eccentric **88** keyed for rotation about a shaft **90** on manipulation of a handle **92**. Detent means **94** are provided to connect the end of the handle into spaced recesses in the rail, such as those indicated by the numerals **96**. To extend the pair of extendible members of the unit **84**, a contra-threaded stem **99** is provided with the opposite ends of the stem being intermediate the length of the members in companionately threaded recesses **100** and **101** in the confronting ends **102** and **102'** of the member which may thereby be extended on threaded manipulation of the nut **103**. The fountain roller preferably is provided with a sleeve **126** snugly covering the body, which is preferably of neoprene, and may be of a water impervious treated paper so that liquid is carried on the surface thereof by the forces of adhesivity.

By reason of the structure disclosed herein including the provision of a delivery system including three rollers, a fountain roller, a delivery roller, and a transfer or blotter roller, arranged to rotate as set forth before and in the directions indicated, there is provided an improved delivery system for fluids to meter and control to a required degree the amount of water delivered to a press to obviate the prior art problems caused by too much water which will cause the print to be gray. The amount of liquid delivered may be regulated by controlling the revolutions per minute of the fountain roller with respect to the revolutions per minute of the distributor roller, thereby providing a degree of control below the maximum limit of capacity of the delivery system which is determined by the maximum film thickness on the smooth distributor roller. Thus, matched sets composed of a distributor roller, a drum to be wetted and a transfer roller may be provided and designed to deliver a maximum quantity of liquid to the drum and, below that maximum quantity, adjustment of the amount of liquid delivered may be obtained by control of the relative revolutions per minute of the distributor roller relative to the fountain roller and their relative portion with respect to one another. It has been found that the delivery system of the instant invention is particularly beneficial in the metering of a water supply to presses. In practice, it has been found that for a suitably matched set, of a distributor roller, of a drum, and of a transfer roller, a relatively slow angular velocity of the independently driven fountain roller is all that is required to deliver the amount of wetting agent to the distributor roller to cause the maximum thickness of delivered film of wetting agent. For instance, an angular velocity of the independently driven fountain roller such as to cause a surface speed of the fountain roller of approximately one-fourth of the machine speed has been found to be sufficient for certain printing operations. Irrespective of the differences in surface speed, the film delivered will be of uniform thickness because of the adhesivity phenomenon which causes the delivered wetting agent to spread uniformly over the surface of the distributor roller or, as it is sometimes called, the smooth surfaced roller. The spreading of the film takes place instantaneously and irrespective of the independent rotation of the distributor roller and the fountain roller and the fact that at the point of the closest intimate relation rollers are moving in opposite directions. The uniform thickness of the delivered film may be assisted by reason of relatively small centrifugal forces tending to thrust the water from the surface of the more slowly moving fountain roller to the smooth surfaced roller above the point of closest intimate relation and, by the fact that below the point of closest intimate relation of the fountatin roller and smooth surfaced roller, somewhat larger centrifugal forces tend to fling or throw any water remaining on the faster moving distributor roller back toward the fountain roller to be carried back to the tray **34**.

While the instant invention has been shown and described herein in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is therefore not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent apparatus and articles.

What is claimed is:

1. In combination a dampener for a press roll comprising:

an elongated drum mounted on a longitudinal axis of rotation;

an elongated, smooth-surfaced, delivery roll mounted on a longitudinal axis of rotation parallel to the axis of rotation of said drum;

an elongated transfer roll mounted on an axis of rotation parallel to those first-mentioned and disposed between said drum and delivery roll and in peripheral contact therewith, said transfer roll including terminal bearing assemblies having means for adjustably positioning said transfer roll relative to the outer peripheries of said drum and delivery roll for controlling the pressure therebetween whereby said delivery roll is driven by said drum through said transfer roll; and

means for delivering and metering a wetting agent delivered to said delivery roll comprising:

an elongated fountain roll disposed on an axis of rotation parallel to that of said delivery roll,

a supply tray of containing a supply of wetting agent and having a peripheral portion of said fountain roll disposed therein,

a drive shaft disposed below said tray and parallel to the axis of rotation of said fountain roll,

support arms journaled at one end adjacent respective opposite ends of said drive shaft for rotation about said drive shaft, said fountain roll being journaled at opposite ends at other ends of said support arms,

means operatively connected between said drive shaft and said fountain roll for rotating said fountain roll independently and in the same direction as the delivery roll, adjustment means operatively connected to said support arms for adjustably positioning said fountain roll in adjacent but peripherally spaced relation from said delivery roll for controlling the amount of wetting agent transferred therebetween,

said adjustment means comprising a back-up shaft in spaced parallel relation from said drive shaft,

cam means journaled on said back-up shaft, link means pivotally connected at opposite ends to an intermediate portion of said support arms and to said cam means eccentrically of said back-up shaft, said pivotal connections of said link means being parallel to said drive and back-up shafts,

a second shaft spaced from an parallel to said back-up shaft,

handle means connected to said control shaft for rotating the same,

detent means disposed in the path of movement of said handle means for locating various positions of adjustment thereof; and

connecting link means eccentrically and pivotally mounted at one end on said control shaft and eccentrically and pivotally connected to said cam means whereby peripheral spacing between said fountain roll and delivery roll can be readily adjusted and maintained.

2. The structure as claimed in claim 1 in which said connecting link means comprises extendible members including opposed, reversely threaded bore portions in opposed relation, and a reversely threaded bolt having an intermediate unit engaged in said opposed reversely threaded bore portions for obtaining finite adjustments of spacing between said fountain and delivery rolls.

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