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PRE-WETTER

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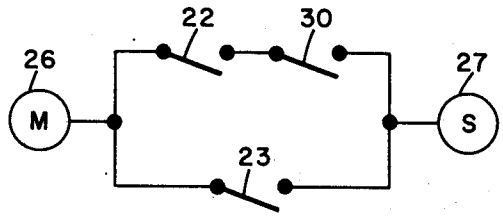


FIG. 3

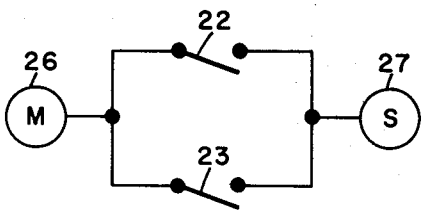


FIG. 2

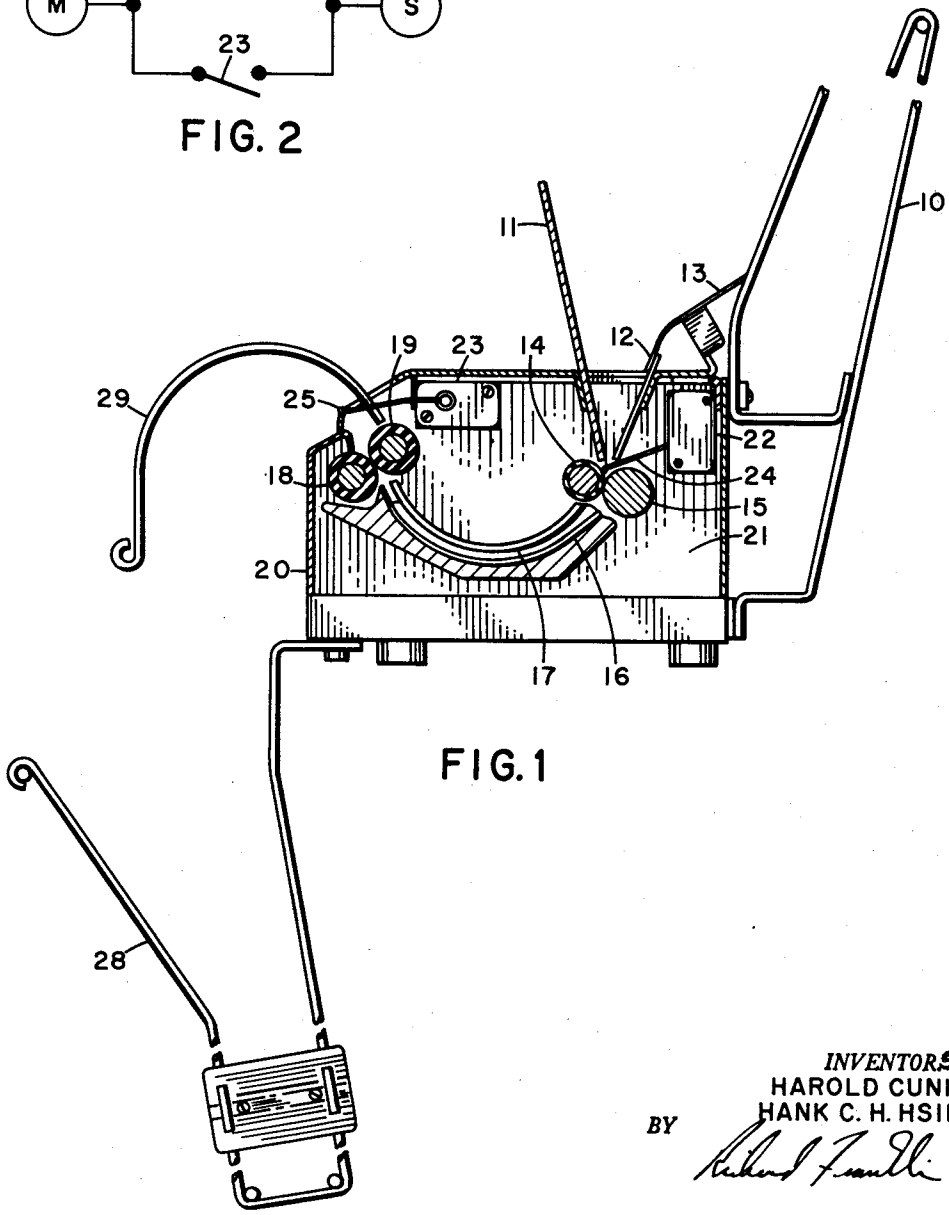


FIG. 1

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PRE-WETTER

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This invention relates generally to the field of offset printing. More particularly, it relates to a separate unit useful in conjunction with an offset printing press which provides for a uniform application of etchant to both surfaces of a master before the master is placed on the press.

In the field of offset presses and particularly in the field of short run presses, i.e., presses used to produce a limited number of reproductions requiring frequent changes of the master, it is vitally important that the time required in the process of changing from one master to another be held to a minimum. The word "master" as used throughout this description means the plate (paper, metal, etc.) which is inked and then either offset onto an intermediate drum and thence to the paper stock or else printed directly onto the stock.

Equally important in this field of short run printing is the desirability of minimizing the amount of operator skill required to produce acceptable printed material, since such presses are frequently used outside of a regular printshop. On a short run press of the type with which this invention is particularly adapted for use, the machine is frequently located in an office or establishment in which printing is an adjunct to the normal business of the concern. Such a press may be used for the preparation of company forms, notices, etc. The availability of highly trained and skilled press operators is usually very limited and, consequently, any improvement in existing equipment which will decrease reliance upon the aptitude of the skilled, non-skilled or semi-skilled help available is most useful.

With the paper or metallic masters of the type discussed above it is necessary that, prior to the application of ink from the ink rollers of the press, the plate be moistened with what is called an etchant. The term "etchant" is familiar to those skilled in this art and, in general, refers to a combination of water, glycerine, phosphoric acid, etc., which is relatively standard in the industry.

In one commonly used type of master the areas that are not to reproduce are quite water retentive and grease resistant, whereas the areas which are to reproduce are grease retentive and water resistant. To intensify and sharpen the reproduction it is desirable that each master be wet before it is inserted in the machine.

Hitherto, there has been no off-line method of etchant application known to the prior art other than use of a sponge by an operator directly on the plate. This, of course, is satisfactory only so long as the operator is satisfactorily skilled. If the operator is consistant in terms of the amount of moisture he or she applies to the plate, or if they are able to adjust the press to compensate for excessive or insufficient moisture application then there is no problem. But, for applications such as have been discussed above, where the skill of the available operators is normally quite limited and where the operator normally available may have to be replaced by a temporary substitute with even less familiarity with the equipment, the need for an automatic unit is clear.

There have been earlier on-line units, i.e., a part of the press itself, designed to accomplish a function similar to that of this invention. It is clear, however, that such solution is not as convenient as is that of the invention. Should the pre-wetter become disabled the entire press must be "down" to repair it. In addition, with the instant invention wetting of one master can take place while another master is on the press, whereas in an on-line unit wetting takes place at the start of a run, consuming valuable press time.

Accordingly, it is an object of this invention to provide an off-line automatic wetting machine for use with a printing press.

It is a further object of this invention to provide an automatic wetting machine which requires a minimum of operator skill.

Briefly stated, there is provided in accordance with the invention a pre-wetter having a reservoir of wetting fluid or etchant. Means are provided for guiding a plate to be wet through the etchant including input drive means for impelling the plate through a path defined by one or more guides, the guides being located so that the path they define is beneath the level of the etchant. Output means are provided for depositing the moistened plate in an output hopper including output drive means for receiving the plate as it leaves the path defined by the guide and a deflector structure for directing the moistened plate from the output drive means to the output hopper. Parallel switches are provided for controlling both the input and output drive means so that both drive means will be operative if either or both switches are closed. The switches in turn are controlled by associated sensing arms which are respectively located adjacent the input and output drive means so that the drive means will be operative only when a plate to be wet is inserted in the machine and will continue to be operative until the plate emerges from the output drive means.

For a better understanding of the invention together with other and further objects and advantages thereof reference is had to the following description to be read in conjunction with the accompanying drawings. The scope of the invention will be pointed out with particularity in the appended claims.

In the drawings:

FIGURE 1 is a side sectional view of a preferred embodiment of the machine.

FIGURE 2 is a schematic representation of the switch arrangement controlling the rollers shown in FIGURE 1.

FIGURE 3 is a modification of the switch arrangement shown in FIGURE 2.

Referring now to FIG. 1, there is provided an input hopper or rack **10** where a supply of plates or masters to be wetted are stacked to be readily available to the operator. An input slot is provided having a longitudinal dimension in excess of the largest sized paper it will have to accept. The input slot (not shown in the drawing) has appropriate input guides illustrated as being generally V shaped as defined by members **11** and **12**. A spring assembly indicated generally at **13** can be provided if desired to secure plates in the input hopper.

A pair of input rollers **14** and **15** are provided, arranged so that when the plate to be wetted is inserted in the input slot defined by guide members **11** and **12** the edge of the plate will fall between the two rollers which, when driven by a motor or other means (not shown) will take up the plate and impel it on its path through the machine. It has been found that rollers **14** and **15** can be constructed of aluminum to conserve weight and that one of the rollers can be fitted with O rings or similar friction imparting elements to feed the plate to be wetted through the rollers and the wetting solution.

As a plate passes through roller pair **14** and **15** it travels along a path defined by base member **16** and guide **17**, the path being generally U shaped and terminating at its other end in a pair of squeegee or output rollers **18** and **19**. A supply of etchant is provided within the reservoir **20** defined by housing **21**. Given a known speed of rotation of rollers **14**, **15**, **18** and **19**, each portion of the plate to be wetted will be in contact with the etchant for

a predetermined and what is more important, repeatable length of time thus controlling the degree of wetting with a precision that is obtainable manually only with highly skilled operators.

As the plate emerges from the path defined by members 16 and 17 its leading edge is grasped by output roller pair 18 and 19. Both roller pairs are controlled by a single motor or other drive means of any conventional type. This is not shown in the drawing.

The arrangement for controlling the drive motor and thus the roller pairs consists, in its simplest form of a pair of switches 22 and 23 operated by their respective sensing arms 24 and 25. Switch 22 is actuated by its sensing arm 24 when the plate to be wetted is dropped into the input slot defined by members 11 and 12, and switch 23 is actuated by its sensing arm 25 when the plate that has been wetted emerges from roller pair 18 and 19.

As shown in FIG. 2, switches 22 and 23 are arranged in parallel between a motor indicated at 26 and source of potential for the motor indicated at 27. If either or both of switches 22 and 23 are closed the motor will be operative to drive both of roller pairs 14 and 15 and 18 and 19. The location of sensing arm 25 along the longitudinal extent of roller pair 18 and 19 is not critical. However, it is a feature of this invention that in its simplest embodiment sensing arm 24 be located substantially at the center of the logitudinal input slot and hence substantially at the center of roller pair 14 and 15. By locating sensing arm 24 substantially at the center of roller pair 14 and 15 the operator need not take any appreciable care in inserting a plate to be wetted into the guide slot to prevent gross misalignment of the master which might damage the side of the plate as it passes through the machine. Since the rollers will not be driven by motor 26 so long as switches 22 and 23 are open no take-up of the plate occurs until the plate has reached a position wherein its leading edge is more nearly parallel to roller pair 14 and 15 and consequently gross skew is avoided without requiring operator attention to the input process. Switch arm 24 in addition to being located substantially centrally of roller 14 and 15 also has its operative portion, i.e., the part contacted by the leading edge of the plate, relatively close to the roller pair. The closer the operative portion of sensing arm 24 is to roller pair 14 and 15 the more precise will be the skew control.

Sensing arm 24 will remain depressed which, in the embodiment shown is the operative, or switch-closed position, until the plate clears that point. The distance between sensing arm 24 and sensing arm 25 along the path imposed by member 16 and guide member 17 is chosen so that the shortest plate employed will have its leading edge reach and raise sensing arm 25, which in this embodiment places switch 23 in the closed position, before the trailing edge of the plate clears sensing arm 24 opening switch 22. This insures that the drive to the roller pairs will continue until the plate has cleared the machine and is ready to drop into the take-up hopper or rack indicated at 28, being guided to that point by a deflecting member 29. Thus the machine will not be shut off until the plate being wetted has completely cleared the unit.

Where it is desired that a machine be suited for use with more than one plate at a time sensing arm 24 of input switch 22 can be located off the center of roller pair 14 and 15 so that the first plate inserted in the input slot will drop into position resting against the junction of rollers 14 and 15 without starting the machine, and sensing arm 24 will not be actuated closing switch 22 until the second plate is dropped in.

Where still more precise control of plate skew is desired a second switch and associated sensing arm can be employed. This construction is not shown in FIG. 1 but the switch arrangement for such a system is illustrated in FIG. 3 wherein a second switch 30 is placed in series with input switch 22, between motor 26 and source 27. It is clear that the motor will not start until the leading edge

of the plate to be wetted is in contact with each of the sensing arms associated with switches 22 and 30 hence, the leading edge must be in a line lying in the plane defined by those two sensing arms which, of course, can be chosen to be parallel to the input roller pair 14 and 15.

While what has been shown and described is believed to be the best mode and a preferred embodiment of the invention, modifications and variations can be made therein as will be clear to those skilled in the art, without departing from the spirit of the invention and consequently the scope of the invention is intended to be limited solely by the appended claims.

What is claimed is:

1. A unit for automatically wetting both surfaces of a plate comprising a housing having a reservoir therein, guide means mounted within said housing and defining a path having a portion within said reservoir, first and second roller pairs rotatably mounted within said housing, first and second switches, drive means adapted to rotate at least one roller of each of said roller pairs when either or both of said switches are closed, first and second sensing arms associated respectively with said first and second switches, said first and second sensing arms being respectively located proximate to said first and second roller pairs each adapted to close its associated switch when it is contacted by the leading edge of a plate keeping its switch closed until the trailing edge of the plate passes thereby, the distance between said first and said second sensing arms along the path defined by said guide means being chosen to be less than the distance between the leading and trailing edges of the shortest plate to be used with the unit, the location of said guide means relative to said first and second roller pairs being chosen so that when the leading edge of a plate contacts said sensing arm the plate will be driven by said first roller pair through the path within said reservoir defined by said guide means and thence out of the unit through said second roller pair said drive means ceasing to rotate said rollers when the trailing edge of the plate is removed from contact with both said first and second sensing arms.

2. A unit for automatically wetting both surfaces of a plate comprising a housing having a reservoir therein, first and second slots formed through a surface of said housing, first and second roller pairs rotatably mounted within said housing and respectively beneath said first and second slots, input guide means mounted on said housing for directing a plate dropped within said slot between the rollers of said first roller pair, an output hopper fixed to the exterior of housing, deflection means for directing a plate emerging from said second slot into said output hopper, first and second normally open switches, drive means adapted to rotate at least one roller of each of said roller pairs when either or both of said switches are closed, first and second sensing arms associated respectively with said first and second switches, said first and second sensing arms being respectively located proximate to said first and second roller pairs each adapted to close its associated switch when it is contacted by the leading edge of a plate keeping its switch closed until the trailing edge of the plate passes thereby, guide means mounted within said housing and defining a path from said first roller pair through said reservoir to said second roller pair, said guide means being constructed so that a fluid within said reservoir will contact all surfaces of a plate passing through the path defined thereby, the distance between said first and said second sensing arms along the path defined by said guide means being chosen to be less than the distance between the leading and trailing edges of the shortest plate to be used with the unit, the location of said guide means relative to said first and second sensing arms being chosen so that when the leading edge of a plate contacts said first sensing arm the plate will be driven by said first roller pair through the path within said reservoir defined by said guide means and thence out of the unit through said second roller pair said drive means ceasing to rotate said

rollers when the trailing edge of the plate is removed from contact with both said first and second sensing arms.

3. The unit defined in claim 2 wherein said first sensing arm is located substantially midway between the ends of said first roller pair.

4. The unit defined in claim 2 further including a third switch connected in series with said first switch, a third sensing arm associated with said third switch, said third sensing arm being located proximate to said first roller pair so that the leading edge of a plate in simultaneous contact with both said first and third sensing arms will be substantially parallel to said first roller pair, said drive means rotating at least one roller of said roller pairs only when at least both said first and third switches are closed, or said second switch is closed.

5. A unit for automatically wetting both surfaces of a plate comprising a housing having an input and an output slot formed therein, a reservoir within said housing adapted to contain a fluid, guide means within said housing defining a path through said reservoir from said input slot to said output slot, said guide means permitting fluid within said reservoir to enter said path, normally inoperative drive means within said housing for moving a plate dropped into said input slot through said path and out said output slot, and drive control means for actuating said drive means operative when a plate is dropped into said input slot and for thereafter halting said drive means when the plate emerges from said output slot.

6. The unit defined in claim 5 wherein said drive control means includes means for preventing the actuation of said drive means until the leading edge of a plate dropped into said input hopper is at an angle such that the edges of the plate will not be bent as it passes through said housing.

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