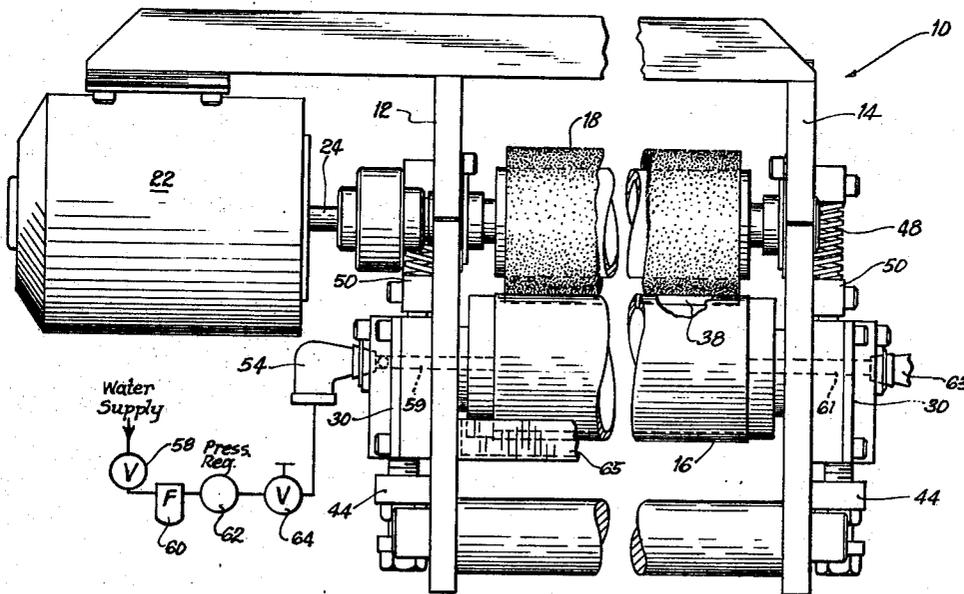


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[45] Patented **Mar. 23, 1971**  
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[56] **References Cited**  
**UNITED STATES PATENTS**  
620,385 2/1899 Voelker..... 118/325X  
2,648,088 8/1953 Bailey..... 68/200X  
3,198,199 8/1965 Schultz..... 68/200X  
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[54] **MOISTURIZER MEANS FOR WEBS**  
7 Claims, 3 Drawing Figs.  
[52] U.S. Cl..... **68/200,**  
118/316, 118/325, 134/122  
[51] Int. Cl..... **B05c 5/00**  
[50] Field of Search..... **68/200,**  
205, 202; 118/316, 325; 134/64, 122

**ABSTRACT:** An apparatus for applying moisture to web surfaces wherein water or other fluid is introduced into tubular supply means located adjacent the path of movement of the web. An opening is provided in the top surface of the tubular elements and the water is maintained under pressure so that a continuous supply of water is forced outwardly through the opening and exposed on the outer surface of the tubular elements. An applicator means such as a brush operates to continuously pick up the water and to throw the water onto the web surfaces.



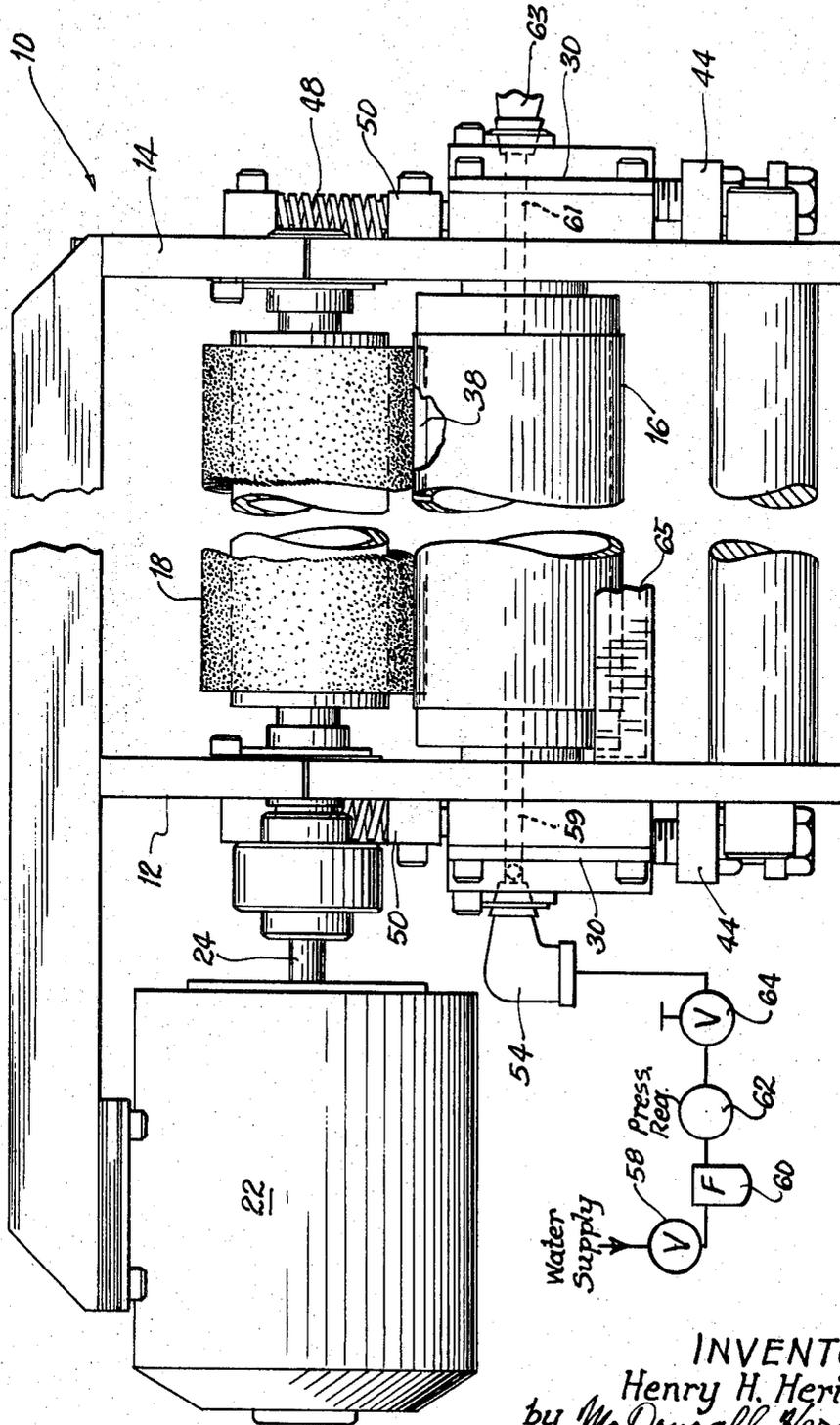


FIG. 1

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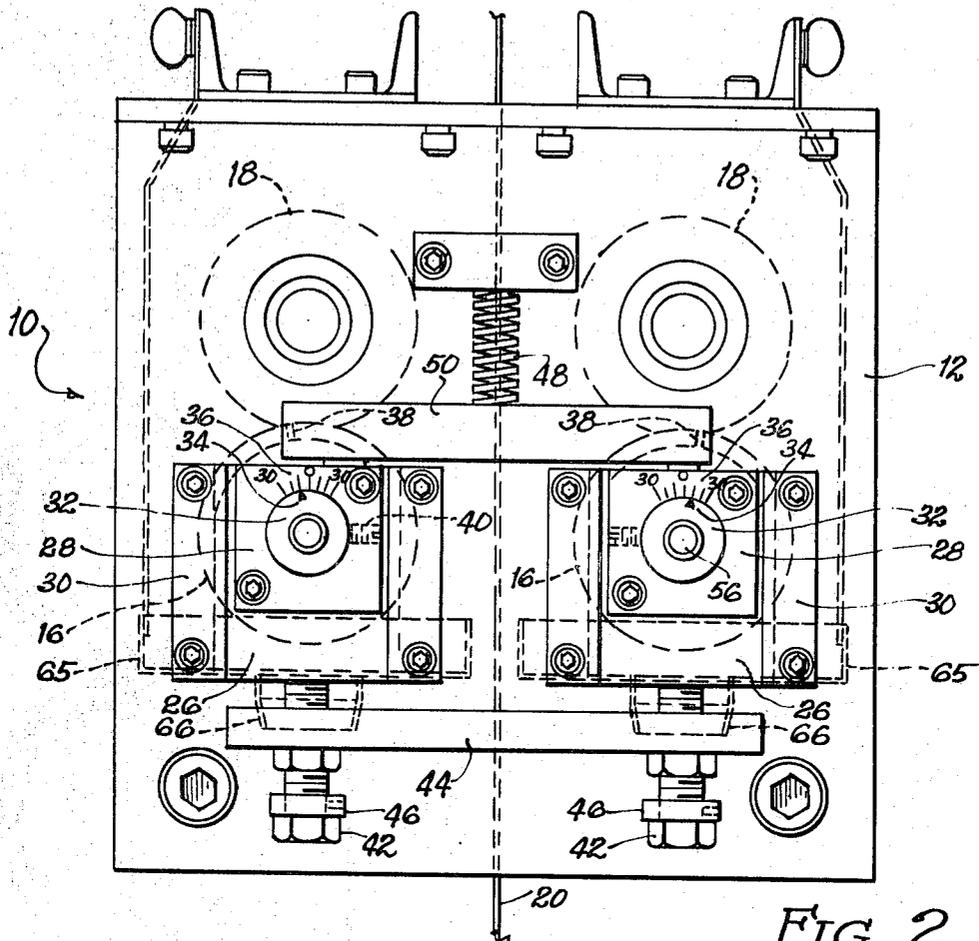


FIG. 2

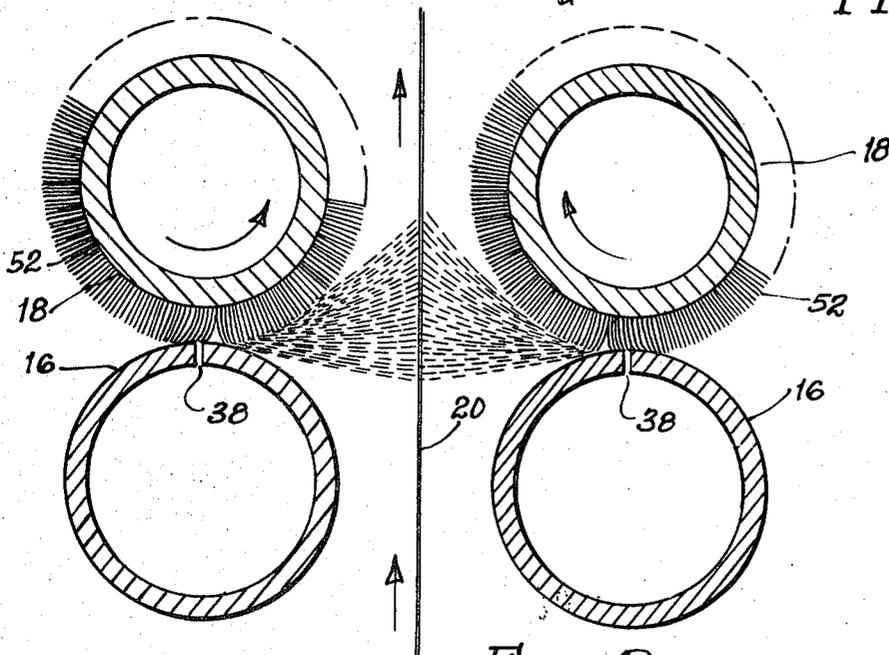


FIG. 3

## MOISTURIZER MEANS FOR WEBS

This invention relates to an apparatus for dampening webs, particularly printed webs. The invention is specifically directed to structures of the type described in Schultz; U.S. Pat. No. 3,198,199.

It is a general object of this invention to provide a web moisturizing or dampening means which can be very economically manufactured and which is characterized by a high degree of reliability in operation.

It is a more specific object of this invention to provide a web dampening means which can be manufactured from readily available stock so that a minimum of expensive material and assembly costs are encountered.

It is still further object of this invention to provide a web dampening means which can be regulated in a highly reliable fashion whereby the amount of moisture applied to web surfaces can be controlled to the extent that highly satisfactory uniformity is achieved.

These and other objects of this invention will appear hereinafter, and for purposes of illustration, but not of limitation, a specific embodiment of the invention is shown in the accompanying drawings in which:

FIG. 1 is an elevational view of the dampening apparatus;

FIG. 2 is an end elevational view of the apparatus shown in FIG. 1; and,

FIG. 3 is a schematic illustration of the moisture applying action achieved in the construction.

The web dampening apparatus of the invention generally comprises elongated fluid supply means which are located adjacent the path of movement of a web. Fluid such as water is introduced under pressure into the supply means, and the water is continuously forced out of openings defined at the top of the supply means. A continuous supply of water is, therefore, available for transfer to the web surface.

The application of the fluid to the web surface is achieved by means of applicators which are disposed above the supply means and which continuously engage the fluid which is exposed on the top surface of the supply means. In the preferred form of the invention, the applicator means comprise brushes which wipe against the surface of the supply means, and which then flick the fluid outwardly for contact with the web surfaces.

The invention contemplates adjustability of the various elements utilized so that the application of moisture can be accurately controlled. One adjustable feature involves the mounting of the tubular supply means whereby these supply means can be raised and lowered relative to the applicator brushes. With this arrangement, the pressure of the brushes on the fluid can be varied so that the flicking action can be controlled.

The tubular supply means are also rotatably mounted so that the position of the openings at the top of the supply means can be adjusted relative to a vertical plane passing through the access of the supply means. This provides for variations in the point of contact of the applicator brushes with the fluid which also provides a means for regulating the moisture application.

FIGS. 1 and 2 illustrate the web dampening apparatus 10 which includes a pair of upright end plates 12 and 14. These end plates serve as supporting means for tubular fluid supply elements 16 and applicator brushes 18. As shown in FIG. 2, a pair of tubular elements 16 and 18 is located on each side of the line of travel for the web 20. With this arrangement, fluid can be applied to both surfaces of the web as would be the case where a printed web is being handled. It is contemplated, however, that the principles of the invention may be employed for fluid application on one side only of a web.

A constant speed AC drive motor 22 is provided with a drive shaft 24 for imparting rotary movement to a brush 18. Suitable linkage, for example meshing spur gears, can be utilized for connecting the directly driven brush 18 to the other brush 18, or each brush can be driven directly from a separate motor.

The tubular elements 16 are attached at their ends to a plate assembly comprising plates 26, 28 and 30. The tubular ele-

ments define a reduced diameter end portion 32 which is rotatably received in circular openings defined by the plates 26 and 28. An aligning mark 34 is formed on the end portion 32, and this mark moves when the associated tubular element 16 is rotated relative to the plates 26 and 28. A scale 36 is formed on the plate 28 to provide a means for determining an angular displacement of the tubular element.

The tubular elements each define elongated slots 38 which extend substantially completely along the length of the tubular elements. The slot may be one continuous opening; however, intermediate reinforcement may divide the slot at one or more points along its length. The invention also contemplates the use of a plurality of small openings which will discharge sufficient fluid for achieving the results of the invention.

Once the angular position of the tubular elements is chosen, setscrews 40 are provided for securing the tubular elements in the desired position. It has been found that displacement of the tubular elements to an angle of about 5—10° with the vertical will provide the most desirable action from the standpoint of reducing waste of water which issues from the tubular elements. Thus, the brushes 18 tend to pick up water which might otherwise run down the sides of the tubular elements. When waste is controlled, a greater degree of uniformity and accuracy can be achieved when applying the fluid to a web.

Adjusting screws 42 are provided for engagement with the bottom surface of the plate 26. The adjusting screws are received in threaded bores defined by the bars 44 which are secured to the plate 12. Stop members 46 are also secured to the plate for limiting the upward extent of the adjustment. When the screws 44 are backed away relative to the bar 44, the assembly of plates and the associated tubular elements will be lowered. The reduced diameter end portions 32 of the tubular elements are received in slots defined by the plates 12 (not shown) to permit adjustability of the tubular elements. A pair of springs 48 bear down on upper bars 50 which in turn bear against the assembly of plates to thereby firmly hold the tubular elements irrespective of the position of these elements.

As best shown in FIG. 3, the brushes 18 are provided with relatively long bristles 52 so that a "flicking" action will occur when the bristles are bent upon contact with the elements 16 and are thereafter released at a point beyond the opening 38. It has been found that the system of this invention provides constant exposure of fluid for contact between bristles whereby highly uniform moistening action can be accomplished.

The fluid, preferably water, which is delivered to the tubular elements, enters through the pipe connection 54 which is threaded into the central opening 56 defined by each end portion 32 of the tubular elements. The water supply may be a standard supply which is delivered through valve 58 and filter 60. A pressure regulating valve 62 should be included in the delivery line to insure uniform pressure. A metering valve 64 is located upstream of the pressure regulating valve.

In a typical operation, a web 3 feet wide may be passed between the moisture applying brushes. Accordingly, the brush 18 and tubular element 16 illustrated in FIG. 1 will be substantially wider than they are long. Typically, the tubular elements may comprise standard 3½ inch diameter pipe (4 inch OD) 39 inches long. A 1/16-inch slot 38 may be milled along the length of the pipe. The reduced diameter end portions referred to may simply comprise 3½ inch or smaller OD pipe threaded into the ends of the elements 16.

A manifold is preferably connected to the inlet members 54 for the respective tubular elements so that both elements will be fed from the same water supply. The water entering the tubular elements will fill these elements, and this condition is preferably maintained throughout the operation of the construction. Thus, the constant application of pressure will result in continuous flow of water through the openings 38 and onto the top surfaces of the tubular elements. As shown, a passage 59 extends from the openings 56 of the tubular elements to the interior of these elements. A similar passage 61 may be pro-

vided at the opposite end of the construction with an outlet pipe 63 being provided so that circulation through the pipe can be achieved. This arrangement may be particularly suitable for achieving greater uniformity in pressure; however, suitable operation is possible by simply plugging this end of the tubular elements.

Excess water which is not passed onto the web surfaces by the brushes will be collected in the pans 65 provided beneath each of the tubular elements. Drains 66 may either deliver the excess water for recirculation or to means for disposal.

Where adjustments in the angle of the opening 38 are desired, the adjusting bolts 42 may be employed for lowering the elements 16 to facilitate rotation of these elements. The adjustment achieved by means of the bolts 42 may also be useful for varying the distance between the opening 38 and the access of the brushes 18 to thereby achieve a more desirable discharge onto the web surfaces.

The apparatus of the instant invention is particularly characterized by a substantially linear relationship between the amount of moisture applied to the web and the setting of the pressure regulating valve 62. Thus, an increase or decrease in pressure will bring about a substantially corresponding increase or decrease in the amount of moisture applied. This provides for greatly simplified operation since difficult calculations need not be made for purposes of determining a proper pressure setting for a particular job. Prior systems have been found to display a nonlinear relationship and, therefore, the results that would be obtained under certain operating conditions are more difficult to predict.

It will be understood that various changes and modifications may be made in the above-described construction which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

I claim:

1. In an apparatus for handling continuous webs, the improvement in means for applying moisture to the web surfaces, said moisture applying means comprising an elongated fluid supply means extending transversely adjacent the path of movement of said web, said fluid supply means comprising an elongated tubular element, discharge openings defined on the upper side of said supply means, said openings comprising at least one elongated slot defined in the wall of the tubular element and extending axially of the tubular element, said fluid comprising water which is forced under pressure into one end of said tubular element and then outwardly through said slot, means for supplying fluid under pressure to said supply means whereby amounts of said fluid are continuously forced outwardly at the top of the supply means for exposure on the

outer surface of the supply means, an applicator means disposed above said supply means, said applicator means continuously engaging the fluid exposed on the outer surface of said supply means, said applicator means operating to pick up at least a portion of said fluid and then throw the fluid onto the web surfaces, and means for moving the tubular element about its axis for adjusting the position of said slot relative to a vertical plane extending through the axis of the tubular element.

2. In an apparatus for handling continuous webs, the improvement in means for applying moisture to the web surfaces, said moisture applying means comprising an elongated fluid supply means extending transversely adjacent the path of movement of said web, discharge openings defined by said supply means, means for supplying fluid under pressure to said supply means whereby amounts of said fluid are continuously forced outwardly through said openings for exposure on the outer surface of the supply means, and including an applicator means disposed adjacent said supply means, said applicator means comprising a rotatably mounted brush continuously wiping against the surface of said supply means at a point immediately adjacent the position of the discharge openings for engaging the fluid exposed on the surface, the spacing between said surface and the axis of the brush being less than the radius of the brush whereby the bristles of the brush are bent during wiping movement over said surface and then operate to flick the fluid onto the surfaces of said web, and including means for moving the supply means about its axis for adjusting the position of said openings relative to a vertical plane extending through the axis of the supply means.

3. An apparatus in accordance with claim 2 wherein a fluid supply means and associated applicator means are mounted on both sides of the web.

4. An apparatus in accordance with claim 2 wherein said fluid supply means comprises an elongated tubular element, and wherein said fluid comprises water which is forced under pressure into one end of said tubular element and then outwardly through said openings.

5. An apparatus in accordance with claim 4 wherein said openings comprise at least one elongated slot defined in the wall of the tubular element and extending axially of the tubular element.

6. An apparatus in accordance with claim 2 including adjustable mounting means for said supply means whereby the position of the supply means can be varied relative to said brush.

7. An apparatus in accordance with claim 2 wherein said slot is positioned between 5 and 10° away from said vertical plane.

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