Dec. 19, 1939. W. F. HUCK 2,183,568

MOISTURE DISTRIBUTING MECHANISM FOR PRINTING MACHINES

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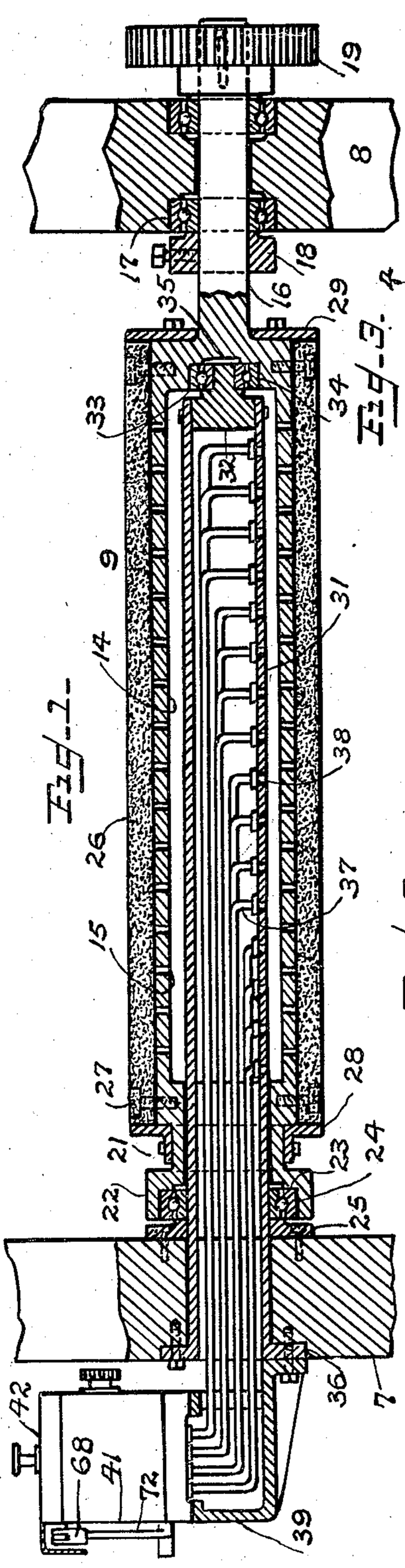

Fig. 1.

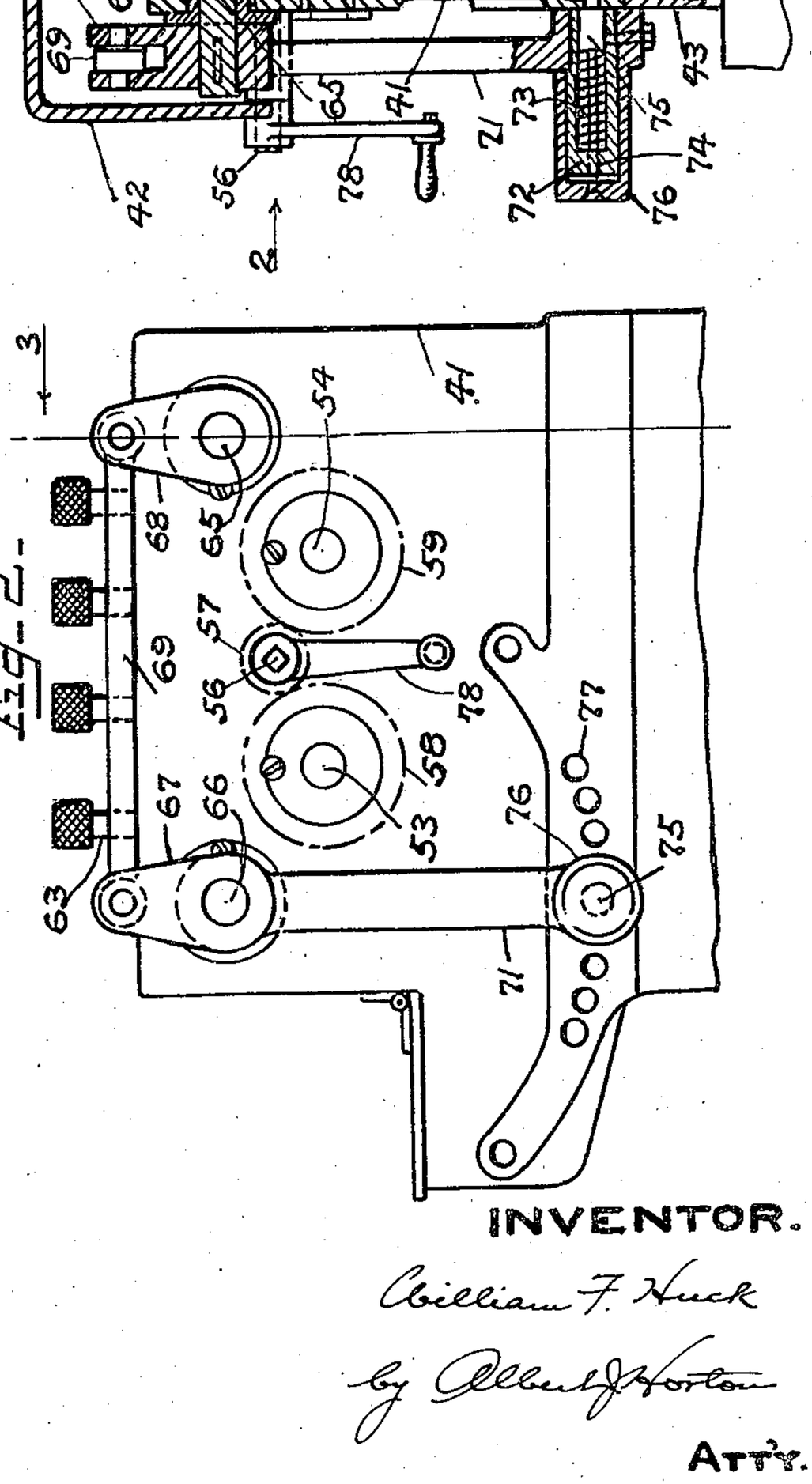

Fig. 2.

Fig. 3.

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Fig. 4.

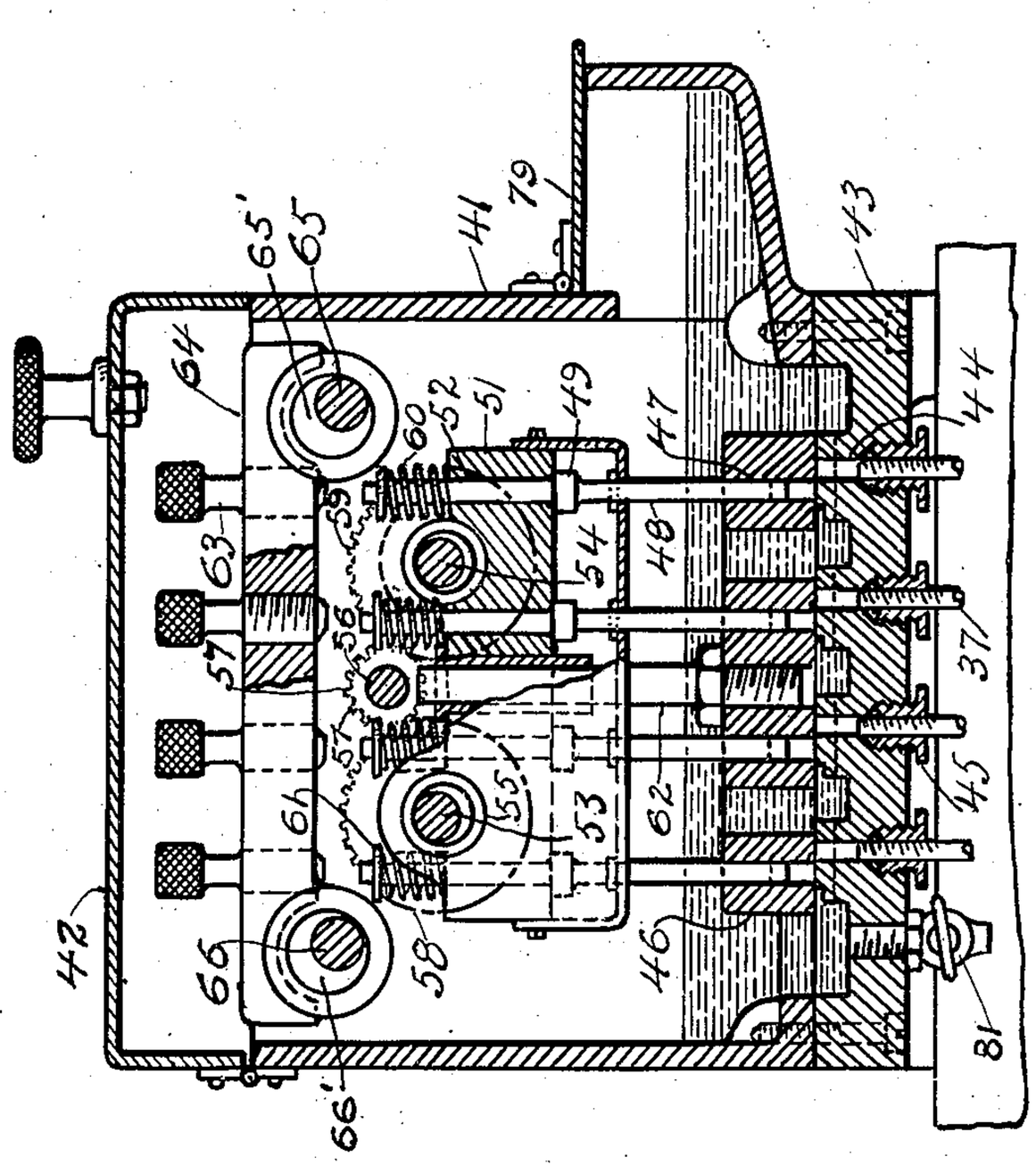
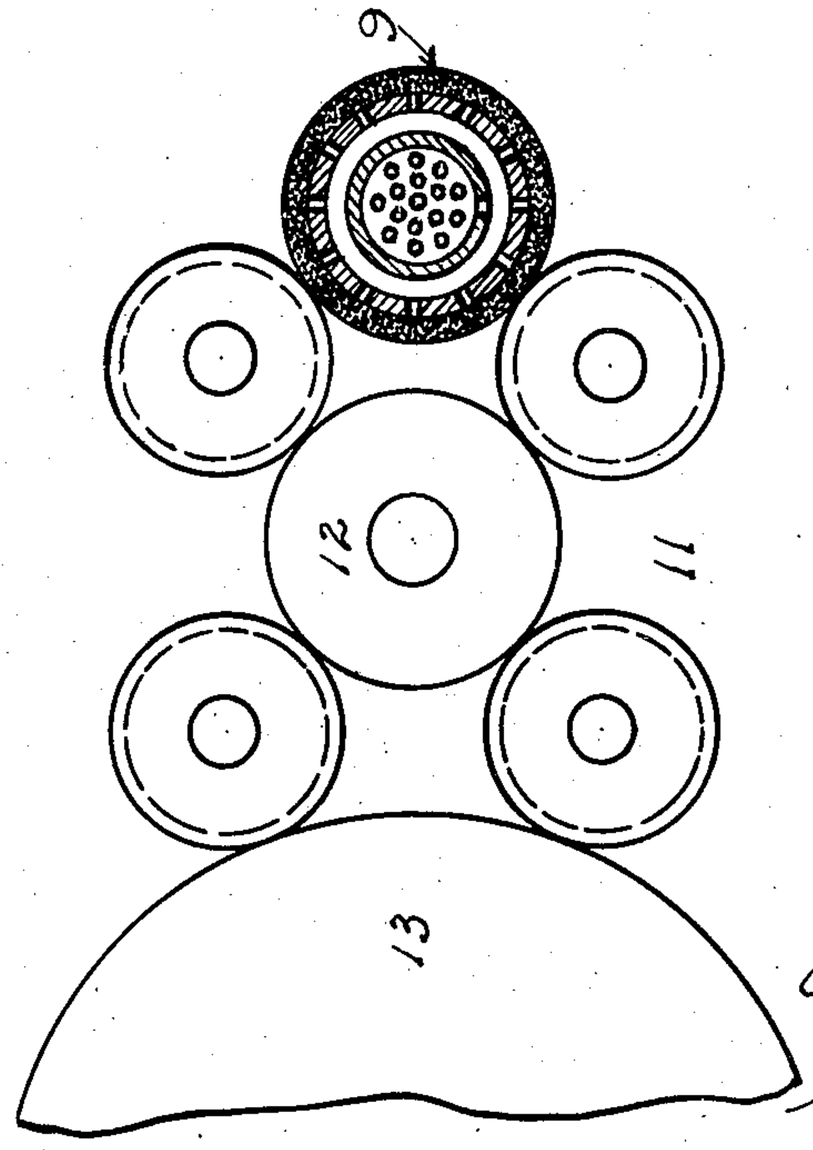


Fig. 5.



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MOISTURE DISTRIBUTING MECHANISM FOR PRINTING MACHINES

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11 Claims. (Cl. 101—147)

This invention relates in general to moisture distributing mechanism for printing machines, and more particularly to a novel moisture distributing or transfer roller designed and adapted to afford a complete control of the liquid to be supplied to a lithographic press.

The object of the invention is to provide a moistening roller for a lithographic press with means for measuring and delivering a variable supply of moisture to preselected portions or sections of the said moistening roller, and consequently, to the adjacent coacting rollers and predetermined portions of the form to be inked and moistened.

A further object is to provide an improved method for and means of dampening the moisture distributing members of a lithographic printing machine by manually controlled means permitting the accurate measurement and application of variable quantities of moisture to preselected portions of the peripheries of the adjacent rollers and of the form to be inked and moistened.

It is also an object to provide a moisture distributing apparatus of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With these and other objects not specifically referred to, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter pointed out and will be best understood by reference to the drawings, wherein:

Figure 1 is a longitudinal sectional view, partly in elevation, of a moisture distributing roller and coacting control mechanism therefor in accordance with the invention;

Figure 2 is a fragmentary side elevational view of the reservoir and pump assembly employed for directing regulated quantities to preselected portions of the moisture supplying roller, as seen in the direction of the arrow 2 of Figure 3, with certain parts omitted;

Figure 3 is a transverse sectional view of the pump assembly and reservoir taken on line 3—3 of Figure 2, as viewed in the direction of the arrow;

Figure 4 is a view similar to Figure 3 of the pump assembly and reservoir taken on line 4—4 of Figure 3 showing additional elements of the means provided for regulating and controlling the pressure feed mechanism for the selective and variable disposition of liquid at the points desired; and

Figure 5 is a fragmentary diagrammatic view of certain parts of a lithographic press as equipped with a moisture distributing roll, in accordance with the present invention.

Referring now to the drawings wherein similar characters of reference indicate corresponding parts in the several views of the preferred form of the invention, 7 and 8 designate standards or frame members of a lithograph press, wherein a moistening roll 9 is turnably supported and coactingly engaged with a chain of distributing rollers 11 including a drum 12, the said distributing roller being adapted to transmit moisture to the form cylinder 13.

The roller 9 comprises a rotatable cylinder 14 having a plurality of radially positioned ducts 15 communicating with both its interior and outer peripheries for a purpose which will appear hereinafter. The cylinder 14 is provided at one closed end with an integrally formed shaft 16 rotatably supported on bearings 17 arranged in the frame member 8, the said shaft 16 being confined against axial movement relatively to the said frame member by a collar 18 and the hub of a gear 19 keyed on the shaft. The other end of the cylinder 14 is formed with an exterior annular groove 21 and a widened portion 22 having an inner annular shoulder 23 against which a bearing 24 is juxtaposed. A thrust plate or abutment 25 fastened to the frame member 7 retains the bearing 24 within the flared opening at the widened adjacent end of the tube. On the periphery of the cylinder 14, a layer of felt or other suitable material 26 is fastened in any suitable manner as by the screws 27 and prevented from longitudinal displacement on the said cylinder by the flanged collar 28 and washer 29 respectively.

Within the bore of the rotatable cylinder 14, a tube 31 is positioned, the said tube being closed at one end by a cap or plug 32 shouldered as at 33 to provide a seat for a bearing 34 arranged within a recess 35 in the closed end of the cylinder 14. The other end of the tube 32 has an outwardly projecting annular flange 36 which is fastened within a countersunk portion of the frame member 7. The outer cylinder 14 in this manner is rotatably supported partly on the inner periphery of fixed inner tube 31 and partly on the frame member 8.

The hollow inner tube 31 accommodates a plurality of pipes or conduits 37 each of the latter having a nozzle 38 protruded through a hole in an adjacent portion of the said inner tube 31 and adapted to periodically discharge liquid adjacent the ducts 15 formed in the outer cylinder 14, as the

latter rotates, for the distribution of moisture as will appear hereinafter. The pipes 37 are extended out of the inner tube 31 and thence through a casing 39 attached to the frame member 7 in any suitable manner. The pipes 37 from the casing are led into a reservoir 41 containing the moistening liquid and the power operated mechanism for forcing liquid under pressure through the conduits to the moistening roller 9.

The liquid measuring and feeding apparatus employed for the purpose of this invention and now to be described, may be, in some respects, of the general form disclosed in Patent No. 1,427,853 to Roesen, dated September 5, 1922. The said apparatus is enclosed in the reservoir 41 which has a hinged top 42 and a bottom 43 suitably secured to the body portion of the reservoir and apertured as at 44 to receive the pipes or conduits 37, which pass through packing nuts 45 threadedly received in enlarged openings communicating with the apertures 44 in the bottom 43 mentioned above. Sufficient conduits are provided so that there is a conduit for each portion or section of the form or forms to be moistened. For the purpose of illustration, 16 conduits are shown, but it is to be understood that as many conduits as may be desired or necessary will be provided. The conduits which form a part of the liquid measuring and feeding system are adapted to deliver liquid through the holes in the inner tube 31, whence the liquid passes through the ducts 15 of the cylinder 14 to its felt covering 26 whereby the moisture can be controlled and applied to predetermined portions or sections of the form or forms, as will be more fully described hereinafter.

The pumping mechanism within the reservoir as best shown in Figures 2 and 4, by means of which the liquid in regulated quantities is forced through the apertures 44 by a series of individual pumps, one for each aperture, includes a frame 46 arranged to have a sidewise sliding movement and provided with suction and discharge ports 47, adapted to coact with the said apertures. Working in the frame and in each of these ports is a valveless plunger pump having a plunger in the form of a rod 48, which intermediate its ends, is provided with an operating collar 49 fast thereon. These pumps are operated in any desired manner, being given a vertical motion for suction and discharge while the frame 46 is given a sidewise sliding movement alternately to bring the ports 47 into communication with the liquid reservoir 41 for suction and with the conduits 37 for discharge. This is effected by providing a second frame 51 with apertures or holes 52 within which the upper ends of the plungers move. The frame 51 is grooved at two points to receive eccentric shafts 53, 54 on the ends of which are mounted eccentric heads 55 fastened to the said frame 51. The shafts 53, 54 are driven in any suitable manner which, or example, may be by means of a shaft of the printing machine connected as through an over-running clutch (not shown) to an intermediate shaft 56 having a gear 57 meshing with a pair of gears 58, 59 fastened to the ends of the shafts 53, 54, mentioned above. The over-running clutch permits the shaft 56 and parts connected thereto to be manually operated when desired for appropriate adjustments, preliminary moistening of the moistening roller and form, etc., as will appear hereinafter.

Each of the plunger rods 48 is provided with a spring 60 confined between a stop collar 61 fast on the rod and the top of the frame 51. The frames 46 and 51 are preferably interconnected with each other by a supporting rod or bar 62 by means of which a sliding movement is given to the frame 46. As the eccentric shafts rotate, the frame 46 is given a sidewise movement to bring the ports 47 into communication with the bottom of the reservoir. As the movement of the shafts continues, the frame 51 is lifted and this movement raises the plungers through the spring 60, the extent of the movement depending upon the position of certain stops hereinafter referred to. Further movements of the eccentrics are permitted by the springs 60. As the shafts continue their further movement and the frame 51 starts downward they contact the collars 49 hereinbefore referred to, and as at this time the frame 46 has slid sidewise thereby bringing the discharge ports in line with the conduits 37, further movement of the eccentrics causes the plungers to start to move down and force the measured quantity of fluid into the said conduits.

Means are provided whereby the upward or suction producing movement of the plungers may be varied so that the ports 47 will receive on the suction stroke and accurately measure, a variable quantity of fluid. As shown in Patent No. 1,427,853 alluded to above, this regulation of the plunger movement may be controlled both at the pumps or at any desired point remote from the machine.

To control the extent of the upward movement of the plungers in any and all positions during the operation of the machine, a plurality of manually regulable stops 63, hereinbefore mentioned, are provided. These stops are each threadedly engaged in a frame 64 mounted on eccentric shafts 65, 66 operatively connected together by the arms 67, 68 and connecting bar 69 and adapted to be positioned in coacting relationship with the frame 46, 51 above mentioned, by an operating member or handle 71 secured at its upper portion to an outer end of the shaft 66.

The lower end of the operating handle 71 is formed with an opening wherein a socket member 72 is fastened in any suitable manner. A spring 73, arranged in the said socket, encircles the stem of a plunger rod 74 and is confined between an enlarged portion or head 75 thereon and the bottom of the socket. The outer end of the plunger rod 74 is fastened to a sleeve 76, slidably mounted on the exterior periphery of the socket member. The plunger head 75 has a reduced portion or tip which is received in a series of holes 77 provided in a portion of the frame of the pump assembly.

By drawing back the sleeve 76 and consequently the tip of the plunger from one of the adjacent holes, the handle 71 and shaft 66 fastened thereto may be swung to the right or left, as viewed in Figure 2, and the tip of the said plunger inserted in a different hole, thereby effecting a general adjustment of the stop-carrying frame 64 and consequently of the stops 63, with a view to simultaneously regulating the scope of the stroke of the entire series of plungers 48, in order to dispense a greater or less amount of liquid, as desired. In addition to the general adjustment, the stops may be individually controlled by turning same in their respective threaded sockets in the frame 64, as hereinbefore mentioned, so that a variable quantity of liquid may be directed to any preselected portion or portions on the periphery of the moistening roller while the machine is in operation, or prior thereto.

Provision is made for manually operating the measuring or pumping devices when desired or

necessary as, for example, when the form and coacting parts require a preliminary moistening prior to the normal power actuation of the press. In accordance therewith, a removable handle 78 shown in operable position secured to shaft 56 is provided. Prior to normal operating periods of the machine, the handle is removed from the machine, but when, for example, a preliminary moistening of the form before actual use is desired, the handle 78 is placed on the squared outer end of the shaft 56 and the latter rotated manually, thereby turning the shaft 56 and consequently the shafts 53, 54 and cams 55, whereby the frame 51 and the plungers carried thereon may be reciprocated in order to measure and dispense the desired amount of liquid through the intermediary of the parts mentioned above.

A lid 79 hingedly connected to a wall of the reservoir permits the latter to be conveniently replenished with liquid while an outlet pipe and valve 81 serve to drain the reservoir of its contents.

The function and mode of operation of the device has been in large measure indicated above, but may be summarized as follows:

In accordance with the usual practice in lithographic printing, greasy ink is applied to the form on the cylinder 13 by suitable mechanism (not shown) while the application of water or other moistening liquid is made by the apparatus herein disclosed, as follows:

Moistening fluid is placed in the reservoir 41 and the stops 63 individually preadjusted to positions known to yield a predetermined supply of liquid at a given speed. The stops accomplish this function by limiting the upward throw of the plunger 48 and the consequent capacity of the suction and exhaust ports 47, thereby measuring a predetermined quantity of liquid, as the frames 46 and 51 oscillate in the well known manner. The said stops are preferably adjusted while the press is running to vary the amount of liquid to be fed to the preselected portion or portions on the form, where the effect desired can be best obtained under actual operating conditions.

The liquid on the down stroke of the plungers 48 is forced into the adjacent ends of the conduits as these latter align with the ports 47, the liquid thence traveling to the nozzles 38 from which it falls upon and enters the adjacent ducts 15 arranged in the rotatable cylinder 14. The ducts then transfer the liquid to the felt 26, which in turn applies it to the distributing rollers 11.

From the above description, it will be seen that a complete control of the supply of moisture is provided by the instant apparatus so that a regulated premeasured supply of liquid can be directed to any predetermined portion of the form on the cylinder 13 in order to regulate the flow of liquid to those sections of the form which are thought to require either a greater or less amount of liquid.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, and it will be further understood that each and every novel feature and combination present in or possessed by the mechanism herein disclosed forms a part of the invention included in this application.

What I claim is:

1. The combination with the moistening apparatus of a lithographic printing machine, said apparatus having a plurality of manually-adjustable pumps and a conduit for each of said pumps; of a moisture distributing roller, and means connecting said plurality of conduits with ducts in the roller, whereby liquid in regulated amounts and from any preselected conduit may be applied to various predetermined peripheral portions of the roller.

2. The combination with the moistening apparatus of a lithographic printing machine, said apparatus having a plurality of conduits and a corresponding plurality of manually-regulable pumps for delivering liquid in regulated quantities through said conduits; of a moisture distributing roller, said roller having ducts communicating with the conduits and adapted to receive and convey liquid therefrom to the periphery of the roller while rotating.

3. The combination with a lithographic press having a liquid-containing reservoir, a liquid measuring and feeding system within said reservoir for conveying liquid therefrom to points without said reservoir, a moisture distributing roller, and means operatively connecting the roller to the said reservoir and said measuring and feeding system whereby liquid may be applied in regulated and measured amounts to various preselected portions of the roller while rotating.

4. In a moisture distributing apparatus for a lithographic press, a reservoir for liquid, a plurality of pumping means connected to the reservoir for ejecting the liquid therefrom, a tubular member, a plurality of conduits fixed to the reservoir and to the member and communicating individually with the plurality of pumping means, and a cylinder rotatably mounted on the member and adapted to receive liquid therefrom, while rotating, said pumping means being individually regulable while the press is in operation.

5. In a moisture distributing apparatus for a lithographic press, the combination with the form cylinder, reservoir for liquid and pumps in said reservoir for ejecting liquid in measured quantities from the reservoir; of a moisture distributing roller, said roller including an inner stationary tube, conduits secured to the tube and to the reservoir for transferring liquid from the said reservoir to the outer periphery of the said tube, and a cylindrical member mounted on the tube and having ducts adapted to receive liquid from the said conduits, whereby liquid in measured amounts may be applied to preselected portions of the form cylinder while rotating.

6. In a device of the character described, a moisture distributing roller, comprising an inner stationary tube, conduits in said tube adapted to convey liquid to the exterior thereof, bearings arranged adjacent tne ends of the said tube and adapted to rotatably maintain same and a cylinder in concentric relation, ducts in said cylinder adapted to receive liquid from said conduits, and a moisture-absorbing covering secured to the periphery of the cylinder and adapted to receive liquid from the cylinder.

7. In a moisture distributing device for a lithographic printing machine, a hollow roller having passages between its inner and outer surfaces, a reservoir for containing fluid, a plurality of measuring devices operably connected to the reservoir and conduits leading from each measuring device and having orifices within the roller spaced longitudinally thereof, whereby regulation

of the flow of each device will correspondingly regulate the amount of moisture delivered to a section of the roller.

8. In a moisture distributing mechanism for a lithographic printing machine, a dampening roller, a reservoir for containing moistening liquid, a plurality of measuring devices operably connected to the reservoir and driven when the machine is running, each of said devices being adjustable to measure and deliver a variable quantity of liquid and a conduit leading from each measuring device to an orifice located within and adjacent the internal peripheral surface of the roller, each orifice being disposed to supply moisture to a portion of the roller.

9. In a moisture distributing device for a lithographic printing machine, a dampening roller, a reservoir for containing moistening liquid, a plurality of measuring devices operably connected to the reservoir and driven when the machine is running, a conduit leading from each measuring device to an orifice located adjacent the peripheral surface of the roller and disposed to supply moisture to a portion of the roller, and means for operating the measuring devices manually to dispense a variable quantity of liquid when the machine is not running.

10. In a moisture distributing apparatus for a lithographic press, a reservoir, a dampening roller, liquid measuring devices connected to the reservoir, power operated means for actuating said measuring devices, conduits connected to the measuring devices and to the roller and adapted to convey liquid to said roller, and manually operable means for actuating the measuring devices to dispense a predetermined variable quantity of liquid independently of the power operated means.

11. In a moisture distributing apparatus for a lithographic press, a reservoir, a dampening roller, liquid measuring devices connected to the reservoir, power operated means for actuating said measuring devices, conduits connected to the measuring devices and to the roller and adapted to convey moisture to said roller, instrumentalities to selectively and simultaneously regulate the amount of liquid conveyed by the moistening devices, as desired, and other means for operably actuating the measuring devices to dispense a predetermined variable quantity of liquid independently of the power operated means.

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