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H. GRAMLICH.

MOISTENING DEVICE FOR PRINTING MACHINES.

APPLICATION FILED MAY 3, 1904. RENEWED MAR. 28, 1906.

Fig. 1.

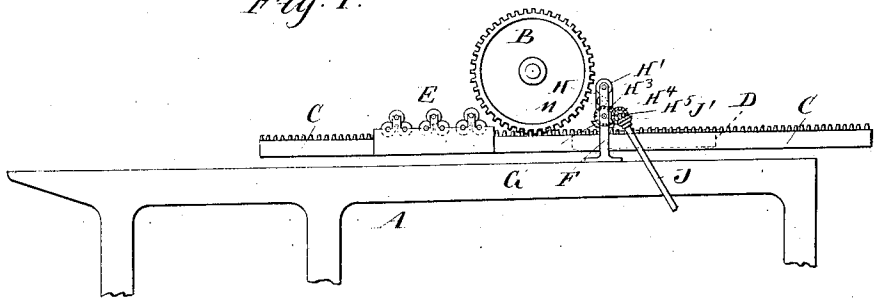
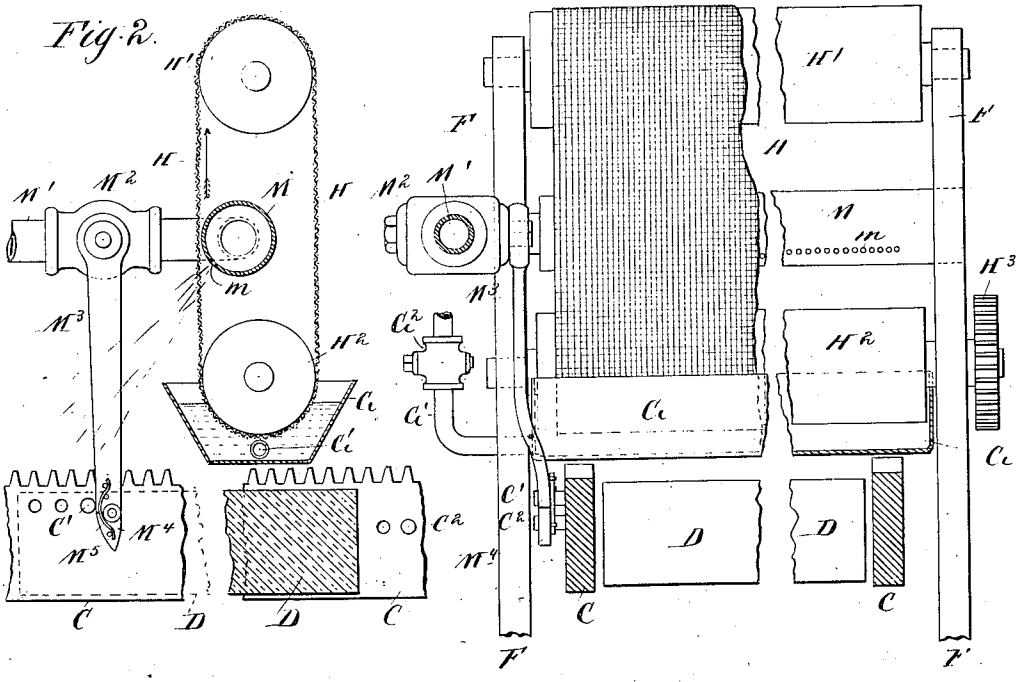


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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MOISTENING DEVICE FOR PRINTING-MACHINES.

No. 841,142. Specification of Letters Patent. Patented Jan. 15, 1907.

Application filed May 3, 1904. Renewed March 28, 1906. Serial No. 308,414.

To all whom it may concern:

Be it known that I, HENRY GRAMLICH, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Moistening Devices for Printing-Machines, of which the following is a specification.

The invention relates to means for supplying moisture to the printing-surfaces in lithographic and analogous printing operations; and the object of the invention is to provide means for moistening such surfaces by spraying the water thereon, thus avoiding the injury to the work due to the direct contact of water-rollers and like devices with the printing-surfaces, and for insuring uniform distribution of the moisture upon such surfaces.

The invention consists in certain novel features and details of construction by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show a preferred means of carrying out the invention.

Figure 1 is a side view of a lithographic press equipped with the invention, certain portions of the printing mechanism being omitted. Fig. 2 is an end view of the spraying device and a portion of the machine, partly in vertical section. Fig. 3 is a corresponding face view, partly in transverse vertical section.

Similar letters of reference indicate the same parts in all the figures.

A is the frame of a lithographic press of any ordinary or approved type, B is the cylinder, C the reciprocating bed, D a stone mounted thereon, and E the inking-rollers, all incompletely shown, but sufficiently for the purposes of this descripton, and all, with the driving mechanism and other omitted parts and equipments, may be understood to be as usual in printing-machines of this character.

In lithographic and kindred methods of reproduction it is necessary to moisten the printing-surface after each impression prior to reinking. This operation is usually performed by a system of water-rollers similar in action to an inking device, in which the stone travels beneath a roller in contact with the printing-surface and is supplied with water. In practice the roller takes up more or less of the ink or color and again transfers it to the stone, the result being imperfect work, notwithstanding all the precautions taken to insure against such offsetting.

My invention is intended to obviate this difficulty by avoiding the direct contact of rollers and analogous devices with the printing-surface and supplying the water in the form of fine spray directed upon the surface by an air-blast.

F F are standards mounted on the frame, one on each side in rear of the impression-cylinder, supporting between them above the path of the stone a trough or shallow reservoir G, to which water is supplied through a pipe G′, controlled by a cock G^2, and H′ H^2 are rollers mounted in the standards parallel with each other and one above the other. The lowermost roller H^2 is partly submerged in the trough and on the overhung end of its shaft is equipped with a spur gear-wheel H^3, meshing with a spur gear-wheel H^4, having a bevel gear-wheel H^5 on its outer face, in which meshes a bevel gear-wheel J′ on an inclined shaft J, which may be that commonly employed to impart motion to the usual water-rolls.

H is an endless belt or apron, of wire-gauze, running on both rollers and moved in the direction indicated by the arrow in Fig. 2 at a uniform speed through the water in the trough to fill its interstices and carry up the water thus held by capillary attraction on the side next the cylinder B.

M is a pipe extending parallel with and between the rollers inclosed by the belt and provided with a series of small perforations *m*, directed forward and downward against the inner face of the water-filled portion of the belt. Air under pressure is supplied to the pipe M through a branch M′ from an air compressor or reservoir (not shown) and in escaping through the perforations *m* drives the water at an angle upon the printing-surface beneath in finely-comminuted particles or spray.

The spray may be blown continuously; but I prefer to intermit the flow by an automatically-operated cock M^2 in the branch M′, arranged to deliver the spray after each impression and during the travel of the stone toward the inking-rollers. The cock has an arm or

lever M^3 extending downward into the path of two pins C' C^2 on the reciprocating bed C and terminates in a hinged dog M^4, arranged to turn freely in one direction against the force of a light spring M^5 and to form a practically rigid extension of the lever in the opposite direction. The pins are set at different levels, the pin C' being higher than the pin C^2, and are adjustably separated longitudinally of the bed, as determined by the length of the stone. As the latter passes beneath the cylinder to make an impression the pin C^2 passes idly below the dog or, if it contact therewith, merely deflects it sufficiently to permit the passage, and the cock M^2 remains closed until the extreme of the reciprocation in that direction is reached, at which time the pin C' has struck the lever above the dog and thrown it to the position shown in Fig. 2 and admits air to the pipe M. This condition is maintained and the stone sprayed during its return movement until the lower pin C^2 strikes the rear face of the dog and moves the lever to shut off the air-supply and then escapes beneath the dog, thus moistening the printing-surfaces during the travel of the stone toward the inking-rollers. The duration of the spray may be varied to suit various sizes of stones by placing the pins in suitably-spaced holes or otherwise adjustably separating them longitudinally of the bed, and any preferred means may be employed to control the supply of water to the reservoir or trough or to maintain the water-level therein.

Although I have described the invention as applied to a lithographic press, it will be understood that it may be applied to printing-machines using metal plates or other printing-surfaces either flat or mounted on a cylinder.

Other means for imparting motion to the belt may be employed, and other means for inducing the spray may be substituted, the essential feature of the invention being the application of moisture to the printing-surface in the form of spray instead of by direct contact of moistened pads or rollers.

I prefer the apparatus shown for the reason that the quantity of water held in the meshes of the gauze is practically uniform, and the delivery may be governed very exactly by the speed of the belt travel and the volume and pressure of the air. It will be also understood that the apparatus described will serve successfully in other situations in which a spray is desired. Other open-work material—as loosely-woven fabric, cheese-cloth, or lace—may be substituted for the wire-gauze.

I claim—

1. In a printing-machine of the character set forth, an atomizing device embodying a fixed sprayer and a movable moisture-absorbing medium interposed between the same and the surface to be sprayed and constructed to supply moisture to the printing-surface in the form of spray.

2. In a printing-machine of the character set forth, an atomizing device embodying a fixed sprayer and a movable moisture-absorbing medium interposed between the same and the surface to be sprayed and constructed to supply moisture to the printing-surface in the form of spray, and means automatically governing the action of said atomizing device to automatically control the duration of the spraying operation.

3. In a printing-machine of the character set forth, means for supplying air under pressure, and an endless moisture-conveying means interposed between the same and the surface to be moistened, whereby the compressed air forces said moisture in the form of spray upon said surface.

4. The spraying device described, consisting of a water-reservoir, a movably-mounted sheet of open-work material arranged to traverse said reservoir and carry water therefrom in its interstices, and a relatively fixed air-blast arranged to drive the water from such interstices said movably-mounted sheet being interposed between said air-blast and the surface to be moistened.

5. The spraying device described consisting of a reservoir, a pair of rollers one of which is in said reservoir, a belt of open-work material as wire-gauze running on said rollers, means for moving said belt, and an air-pipe having a series of openings arranged to direct an air-blast through said belt.

6. The spraying device described, consisting of a water-reservoir, a pair of rollers one of which is in said reservoir, a belt of open-work material as wire-gauze running on said rollers, means for moving said belt, an air-pipe having a series of openings arranged to direct a current of air upon said belt, and means for automatically admitting and stopping a supply of air under pressure to said pipe.

7. The spraying device described, consisting of a reservoir, a pair of rollers one of which is in said reservoir, a belt of open-work material as wire-gauze running on said rollers, means for revolving one of said rollers and moving said belt, an air-pipe inclosed within said belt between said rollers, and having a series of openings arranged to direct a current of air through the interstices of said belt, and means for automatically admitting and stopping a supply of air under pressure to said pipe.

8. In a printing-machine, a reciprocating bed adapted to carry a printing-surface, a spraying device located above such surface and embodying a moisture-absorbing medium and a relatively fixed air-pipe inclosed within the same and adapted to direct a spray upon such surface, and means automatically

operated by the movement of said bed for controlling said spraying device.

9. The spraying device described, consisting of a water-reservoir, a pair of rollers, one of which is in said reservoir, a belt of open-work material as wire-gauze running on said rollers, means for moving said belt, an air-pipe inclosed in said belt between said rollers and having a series of openings arranged to direct a current of air against the inner face of said belt, and a cock controlling the admission of air to said pipe, in combination with the reciprocating bed of a printing-machine, and with means carried by said bed for automatically operating said cock.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

HENRY GRAMLICH.

Witnesses:
G. V. BATES,
CHARLES R. SEARLE.