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MOISTENING DEVICE FOR WEB MATERIALS

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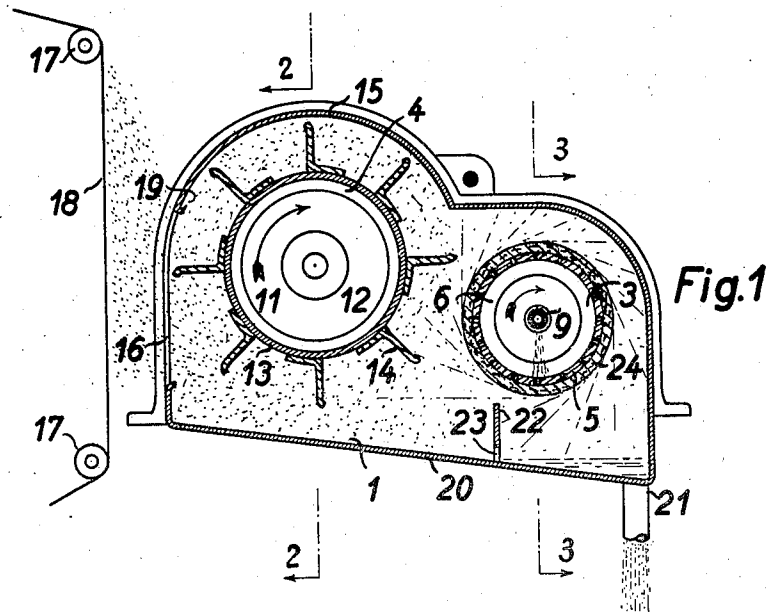


Fig. 2.

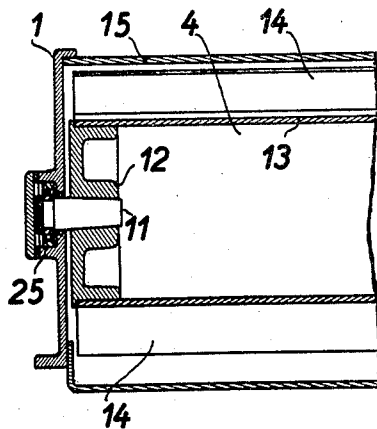
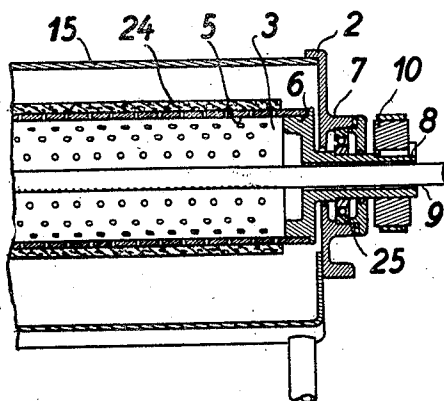


Fig. 3.



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MOISTENING DEVICE FOR WEB MATERIALS

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5 Claims. (Cl. 91-44)

The present invention relates to devices for moistening fabric and paper webs of all kinds, and in particular to the type where the liquid to be applied to the fabric or paper web issues from the jacket of a sprinkler cylinder. The object of the invention is to provide a new constructional form of devices working with sprinkler cylinders, by means of which a finer atomization of the liquid is obtained and a uniform distribution upon the web is ensured.

According to the invention there is arranged, in addition to the sprinkler cylinder, the axis of which is adapted to act in the manner of a feed nozzle pipe and the perforated jacket of which is provided with a lining pervious to liquids, a fan cylinder which atomizes the liquid particles centrifuged from the sprinkler cylinder and conveys them to the fabric web. The fan cylinder is mounted parallel to and has the same length as the sprinkler cylinder, and carries radially disposed blades or vanes along its entire length. It is driven in the same direction of rotation as the sprinkler cylinder. The two cylinders are housed in one common casing which but for an outlet slot is totally enclosed, care being taken that only the atomized liquid coming from the fan cylinder is allowed to reach the fabric web through the slot, as the former is passed by the latter.

The fan cylinder is preferably disposed beside the sprinkler cylinder and the outlet slot is arranged in the wall of the casing adjacent the fan cylinder, the upper edge of the slot being designed in the manner of a gutter. The bottom of the casing is preferably designed in the manner of a trough, baffle plates being arranged for preventing a centrifuging of the liquid particles direct on to the fabric web from the sprinkler cylinder.

The invention is hereinafter explained in more detail with the aid of the constructional forms illustrated in the drawing by way of example. In these

Figure 1 is a cross-section, and

Fig. 2 a partial longitudinal section on the line 2-2 in Figure 1, and

Fig. 3 a partial longitudinal section on the line 3-3 in Figure 1.

The lateral bearing housings 1, 2 carry a sprinkler cylinder 3 and a fan cylinder 4 disposed side by side and rotatably mounted. The sprinkler cylinder 3 consists of a perforated sheet metal jacket 5, which is rotatable in bearings 7 in the bearing housings 1, 2 by means of end members 6. The sheet metal jacket 5 is covered upon the outside with a layer 24 of felt or similar absorbent material. A nozzle pipe 9 is passed through a

shaft bore 8 of the end members 6 and connected to a supply pipe. The sprinkler cylinder is driven by means of a belt pulley 10 keyed to one of the end members 6 and in turn driven from a power drive not illustrated on the drawing.

The fan cylinder 4 consists of the end covers 12 arranged upon axle journals 11, the said covers carrying a sheet metal jacket 13. The sheet metal jacket 13 has the same length as the sprinkler cylinder 3 and carries upon the outside, radially extending vanes or blades 14. The said blades may alternatively be arranged in the manner of a helical screw thread upon the sheet metal jacket, so long as the said thread extends over the entire length of the jacket 13.

Both cylinders are mounted in water-tight ball bearings 25. The fan cylinder 4 is driven in the same direction of rotation as the sprinkler cylinder and preferably also from the same source of power. The rotational speed of the fan cylinder 4 depends upon the degree of atomization desired.

The two cylinders 3, 4 are enclosed by means of a sheet metal casing 15 carried upon the bearing housing 1, 2. Adjacent the fan cylinder 4 the sheet metal casing 15 is provided with an outlet slot 16, through which the atomized liquid is ejected by the fan cylinder 4 on to the fabric or paper web 18 as the latter passes over the rollers 17. The upper edge of the slot 16 is designed in the manner of a gutter 19 for collecting and draining the liquid condensing upon the sheet metal jacket 15.

The bottom 20 of the casing 15 is inclined downwardly in the direction of the sprinkler cylinder and acts as a collecting trough. The liquid collected here is drained away through a pipe 21. The bottom is further provided with baffle plates 22 having drain openings 23.

The device works as follows:

The liquid issuing from the nozzle pipe 9 passes through the perforated sheet metal jacket 5 onto the layer 24 around the cylinder and owing to the rotation of the cylinder 3 it is tangentially centrifuged in the form of drops. The liquid particles centrifuged in the direction of the fan cylinder 4 are then atomized by the latter and reach the fabric web 18 through the slot 16.

The liquid particles which do not reach the fan cylinder and the condensate forming upon the casing wall are collected in the gutter 19 and in the bottom trough 20 respectively.

What I claim and desire to secure by Letters Patent of the United States is:

1. A material moistening device comprising a rotatable sprinkler cylinder operable, when ro-

tated, to effect a sprinkled projection therefrom of liquid supplied thereto, and a rotatable liquid atomizing cylinder interposed between said sprinkler cylinder and the material to be moistened so as to intercept liquid projected from said sprinkler cylinder toward the material to be moistened and thereby prevent direct sprinkling of the material by liquid projected by said sprinkler cylinder, said atomizing cylinder being effective, when rotated, to atomize liquid delivered thereto in sprinkled form by said sprinkling cylinder and to project the atomized liquid onto the material to be moistened.

2. A material moistening device comprising a hollow, perforated, rotatable sprinkler cylinder, means for supplying liquid to the interior of said cylinder, a layer of material, pervious to liquid, around said cylinder whereby said cylinder is operable, when rotated, to effect a sprinkled projection of liquid therefrom, and a bladed, rotatable liquid atomizing cylinder effective, when rotated, to atomize liquid sprinkled thereagainst and to project the atomized liquid therefrom, said atomizing cylinder being disposed in receiving relationship to liquid projected in sprinkled form from said sprinkler cylinder and to prevent direct sprinkling of the material to be moistened by liquid projected from said sprinkler cylinder, said atomizing cylinder also being disposed to effect spraying of the material to be moistened by the atomized liquid projected therefrom.

3. A material moistening device comprising a casing having an aperture for the issuance from

said casing of atomized liquid upon a piece of material disposed exteriorly of said casing adjacent to said aperture, a bladed, rotatable liquid atomizing cylinder effective, when rotated, to effect atomization of liquid sprinkled thereagainst and to project the atomized liquid therefrom, said atomizing cylinder being disposed within said casing in a position to effect projection of atomized liquid through said casing aperture upon the material to be moistened, a rotatable sprinkler cylinder within said casing spaced from said atomizing cylinder and operable, when rotated, to effect a sprinkled projection of liquid supplied thereto upon said atomizing cylinder, and means for supplying liquid to said sprinkler cylinder, said atomizing cylinder being interposed between said casing aperture and said sprinkler cylinder to prevent direct sprinkling of the material to be moistened by liquid projected from said sprinkler cylinder.

4. A material moistening device as set forth in claim 3 including a baffle plate within the casing interposed between the casing opening and the sprinkler cylinder and cooperating with the atomizing cylinder to prevent direct sprinkling of the material to be moistened by liquid projected from the sprinkler cylinder.

5. A material moistening device as set forth in claim 2 in which the blades of the atomizing cylinder are substantially radially disposed at angularly spaced points and extend longitudinally along said cylinder.

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