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POWDER APPLICATOR FOR PRINTING MACHINES

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This invention relates to printing machines, and more particularly to an applicator adapted to spray powder across the face of the endless blanket used in a textile printing machine or other similar printing machines.

In the modern textile printing machine, powder is applied to the endless printing blanket at the powder dryer assembly after it leaves the washing station and before it passes to the printing station. The use of powder in this way serves two useful purposes. The powder dries the face of the blanket by absorbing any water particles remaining thereon after it has been washed, thus preventing running of the colors due to the presence of excess moisture in the subsequent printing operation. Also, the powder absorbs excess colors during the printing operation, thereby minimizing the discoloration of the blanket and facilitating the removal of excess colors therefrom during the washing operation.

The applicator customarily used in the powder dryer assembly of these machines consists of a gravity feed hopper containing a supply of powder, such as talc, and a series of brushes for spreading the talc across the face of the blanket and for removing any excess talc therefrom. One of the problems encountered in applying talc in this manner is that it is not distributed uniformly over the face of the blanket. Also, in the type of applicator heretofore used, it is very difficult to control effectively the amount of talc which is applied.

In accordance with this invention, a simple applicator is provided for using air under pressure to spray powder, such as talc, across the face of the printing blanket. The arrangement of the applicator in this manner obviates the difficulties heretofore encountered by affording an excellent uniformity of distribution of powder over the face of the blanket and an effective control of the amount of powder applied. Thus, the use of an excessive quantity of powder is eliminated, with resulting economy, and an adequate quantity of powder is constantly sprayed on the blanket to absorb the excess moisture and colors thereon, with increased efficiency of operation.

Briefly described, this device comprises a hopper containing a supply of powder such as talc, conduit means connected to the hopper and arranged with a perforated portion of the conduit means adjacent to the printing blanket, and means positioned in the hopper for delivering air under pressure so that the talc is forced by the air pressure from the hopper into the conduit means and sprayed through the perforated portion of the conduit means across the face of the blanket.

The invention is described more in detail below in connection with the accompanying drawing, in which:

Fig. 1 is a side elevation view of the powder dryer assembly of a textile printing machine;

Fig. 2 is a corresponding sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view of the powder applicator taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged sectional view of the regulating valve portion of the hopper on the line 4—4 of Fig. 3;

Fig. 5 is a corresponding sectional view on line 5—5 of Fig. 4; and

Fig. 6 is an enlarged fragmentary side elevation of the conduit means in the form of a tubular pipe illustrating the arrangement of the perforations in that portion of its structure adjacent to the printing blanket.

Referring at first to Figs. 1 and 2 of the drawing, the disposition and arrangement of a powder applicator 18 arranged in accordance with the present invention are shown in relation to the powder dryer assembly 11 of a textile printing machine.

The powder dryer assembly 11 comprises the assembly frame 12, rolls 13, 14, and 15 which are mounted on the assembly frame 12, rotary brush 16, suitably mounted on the assembly frame 12 for rotation by a pulley arrangement with roll 14 and for lateral adjustment by set screw 17, and the powder applicator 18.

In the operation of the powder dryer assembly 11, the printing blanket 19, after leaving the washing station (not shown), passes through the powder dryer assembly 11 on rolls 13, 14, and 15. In the passage of the printing blanket 19 from roll 14 to roll 15, the face 19 of the printing blanket 19 is cleaned by rotary brush 16, then, the face 19 of the printing blanket 19 has powder 20 sprayed thereon by the powder applicator 18. After being sprayed with the powder 20, the printing blanket 19 passes over the roll 15 to the printing station (not shown) of the textile printing machine.

The form and arrangement of the powder applicator 18 are illustrated more in detail in Figs. 3, 4, 5, and 6 of the drawing. As shown, the powder applicator 18 comprises a hopper 21, conduit means 22, and means for delivering air under pressure to the conduit means 22.

The hopper 21, as shown, is cylindrically shaped, tapers toward the bottom, and contains agitating
arms 23, feed propellers 26, and a powder regulating valve 25. The regulating valve 25 comprises an annular stationary web 28 formed with sector shaped openings 27, an annular movable web 23 formed with sector shaped blades 23 and connected to the stationary web 28 at a central pivot point 29, a bolt 31 attached to the end of one of the blades 23 and extending through a slot 32 in the side of the hopper 21, and a locking nut 33 mounted on the exterior end of the bolt 31. As shown in Fig. 4, the movement of the bolt 31 in the slot 32 rotates the movable web 23 so that the annular position of the sector shaped blades 23 determine the clearance afforded by the sector shaped openings 27. As soon as the desired amount of powder 28 is passing through the openings 27, the locking nut 33 is turned until it engages the side of the hopper 21 thereby locking the movable web 25 in fixed relation to the stationary web 28. The agitating arms 23 and feed propellers 26 are rotated in the hopper 21 by the motor 34, mounted on the assembly frame 12, with a pulley arrangement of the wheel 35 on the motor shaft 36 and the wheel 37 on the shaft 38, mounted on the hopper 21, transmitting the necessary power through the gear box 39.

The conveying means 22 may take any convenient form for receiving the powder 28 forced by air pressure from the hopper 21 and for spraying the powder 28 uniformly over the face 18 of the printing blanket 16; as shown, the conduit means 22 comprises a tubular pipe arrangement having perforations 40 in that portion of its structure adjacent to the printing blanket 16. This tubular pipe arrangement is connected to the hopper 21 at the end 41 which is formed with a Venturi shaped throat 42 for receiving air under pressure from the nozzle 43 of the air compressor pipe 44, and is closed at the other extending end 45.

The means for delivering air under pressure to the conduit means 22 comprises a pipe 44 from an air compressor (not shown), a magnetic cut-on and cut-off valve 45 for controlling the delivery of the compressed air, and a nozzle 43 positioned in the base of the hopper 21 so that air under pressure is delivered directly into the center of the Venturi shaped throat 42 of the conduit means 22.

The cooperating action of the agitating arms 23 and feed propellers 26 with the proper setting of the regulating valve 28 provides a measured quantity of powder 28 to the base of the hopper 21. During the operation of the textile printing machine a constant stream of compressed air is forced through the pipe 44 and out of the nozzle 43 positioned in the base of the hopper 21 so that the powder 28 is forced by the air pressure from the base of the hopper 21 through the Venturi shaped throat 42 and out of the conduit means 22 through the perforations 40.

Since the conduit means 22 is disposed across the face 18 of the printing blanket 16 with that portion of its structure containing the perforations 40 adjacent to the printing blanket 18, the face 18 of the printing blanket 16 is sprayed constantly by a measured quantity of powder 28.

We claim:

1. A powder applicator for applying talc to a printing blanket in a textile printing machine comprising a perforated, elongated conduit having an open Venturi shaped throat at one end, means for supplying talc to said Venturi shaped throat, a tubular nozzle connected to a source of compressed air and disposed in the center of said Venturi shaped throat whereby compressed air is delivered into said Venturi shaped throat and said talc is forced into said conduit and through the perforations onto said blanket.

2. In a textile printing machine having a printing blanket, a powder applicator comprising powder supply means, a perforated, elongated conduit disposed in space relation transversely of the blanket of said machine, said conduit having an open Venturi shaped throat in one end, said Venturi shaped end being connected to said supply means, said conduit being closed at the other extending end and having a plurality of perforations spaced in that portion of its structure adjacent to said blanket, and a tubular nozzle connected to a source of compressed air and positioned in said supply means with the end of said nozzle being disposed in the center of said Venturi shaped throat whereby compressed air is delivered into said Venturi shaped throat forcing said powder into said conduit and through said perforations across the face of said blanket.

3. In a textile printing machine having a printing blanket, a powder applicator comprising a hopper formed for storing a supply of powder, said hopper having agitating means and regulating means for controlling the flow of powder to the base of said hopper, a perforated, elongated conduit disposed in space relation transversely of the blanket of said machine and formed with a plurality of perforations in that portion of its structure adjacent to said blanket, said conduit having an open Venturi shaped throat in one end, said open end being connected to the base of said hopper, said conduit being closed at the other extending end, and a tubular nozzle connected to a source of compressed air and positioned in the base of said hopper in space relation to said Venturi shaped throat for delivering air under pressure to said Venturi shaped throat whereby compressed air is delivered into said Venturi shaped throat forcing said powder into said conduit and through said perforations across the face of said blanket.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

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<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
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<tbody>
<tr>
<td>2,353,965</td>
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<td></td>
</tr>
<tr>
<td>2,535,965</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,581,341</td>
<td>Coleman</td>
<td>July 10, 1950</td>
</tr>
<tr>
<td>1,353,979</td>
<td>Kaufmann</td>
<td>May 9, 1920</td>
</tr>
<tr>
<td>2,006,757</td>
<td>Botzler et al.</td>
<td>July 7, 1935</td>
</tr>
<tr>
<td>2,281,213</td>
<td>Bergh</td>
<td>Nov. 4, 1941</td>
</tr>
<tr>
<td>2,266,849</td>
<td>Cole</td>
<td>Dec. 23, 1941</td>
</tr>
<tr>
<td>2,375,766</td>
<td>Britcher</td>
<td>May 15, 1941</td>
</tr>
</tbody>
</table>