April 1, 1941. A. G. GROMM 2,237,179

MEANS FOR DECORATING TEXTILES

Filed Sept. 28, 1939 2 Sheets-Sheet 1

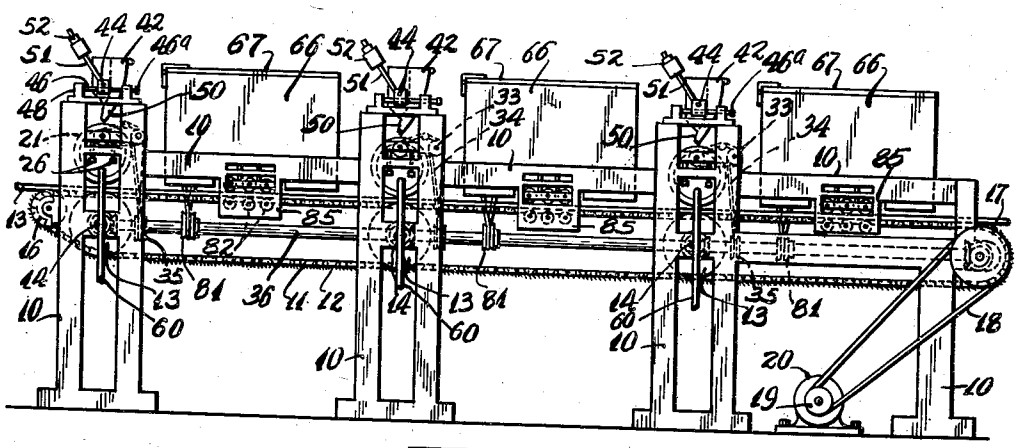


Fig. 1.

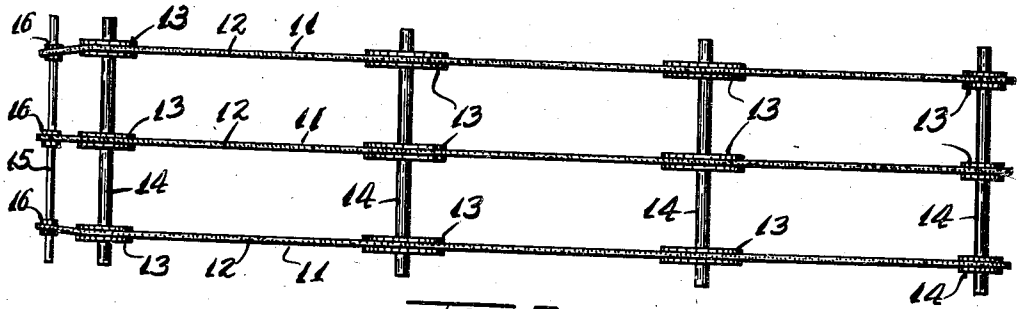


Fig. 6.

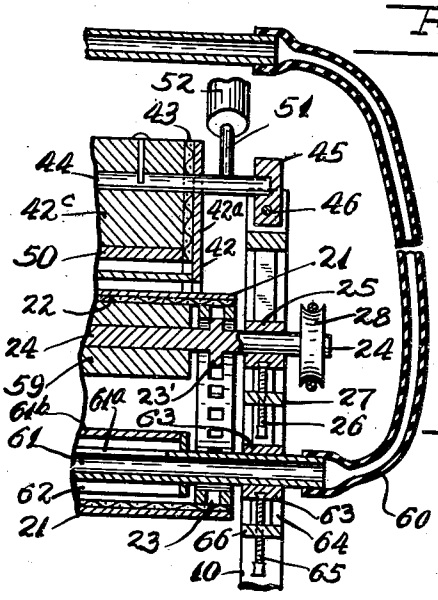


Fig. 5.

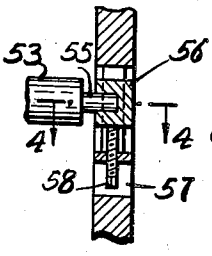


Fig. 3.

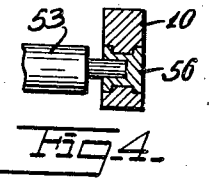


Fig. 4.

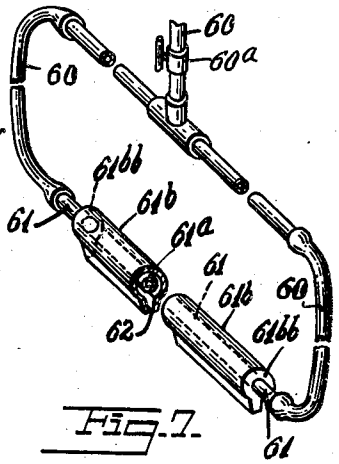


Fig. 7.

INVENTOR
Alexander G. Gromm
BY Zoltan Polachek
ATTORNEY

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MEANS FOR DECORATING TEXTILES

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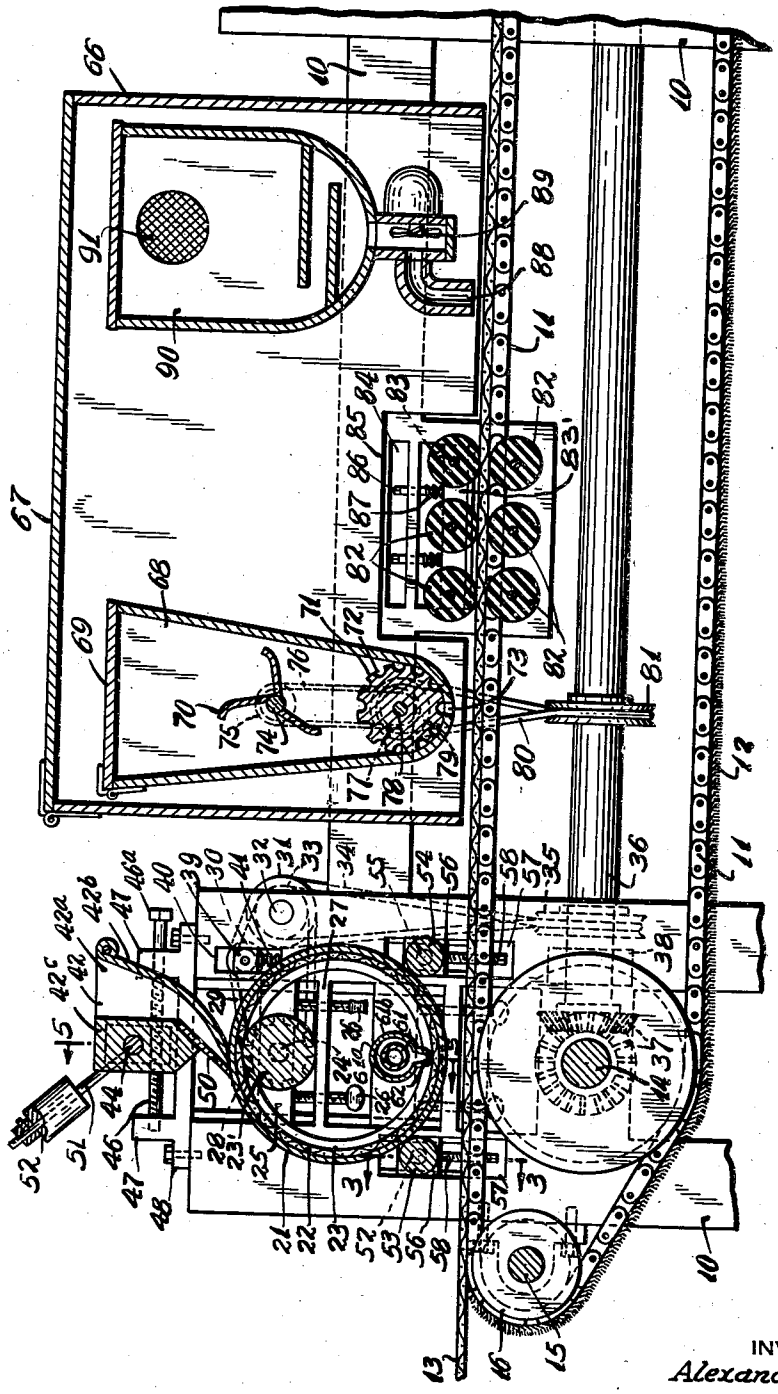


FIG. 2.

INVENTOR
Alexander G. Gromm
BY Golden & Golden
ATTORNEY

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UNITED STATES PATENT OFFICE

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MEANS FOR DECORATING TEXTILES

Alexander G. Gromm, New York, N. Y.

Application September 28, 1939, Serial No. 296,889

10 Claims. (Cl. 101—116)

This invention relates to new and useful improvements in a means for decorating textiles and other materials.

The invention has for an object the construction of a mechanism for decorating textiles and other materials operating in accordance with a certain predetermined method and adapted to apply ink, or the like upon textile material controlled with a stencil, or to apply adhesive material on the textile so that subsequently powdered or flaked material may be deposited thereon and pressed into position.

Still further the invention proposes the construction of a device as mentioned which is characterized by several units, each of which is substantially identical to each other and each of which is adapted to create a different color or a different design upon the textile.

Still further the invention proposes to characterize the device by an endless conveyer arranged to selectively carry the textile material from one unit to the other.

Another object of this invention is a novel arrangement of a stencil and inking or liquid applying means, associated with an air supply in a certain way so that the air may blow ink or liquid from the stencil upon the textile material to produce the decorating referred to.

Still further the invention proposes the construction of a device as mentioned which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a side elevational view of a mechanism for decorating textiles in accordance with this invention.

Fig. 2 is a fragmentary enlarged longitudinal sectional view of the left hand portion of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary horizontal sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary vertical sectional view taken on the line 5—5 of Fig. 2.

Fig. 6 is a fragmentary plan view of the endless conveyer.

Fig. 7 is a schematic perspective view of one of the air distributors used in the device.

The device for decorating fabrics or other materials in accordance with this invention includes a frame 10 supporting an endless conveyer 11 having fabric or other holding elements 12 thereon, and adapted to slightly stretch if practical and hold fabric or other material moved by the conveyer. More specifically the endless conveyer 11 comprises several endless bands which are mounted upon wheels 13 mounted on shafts 14 supported upon the frame 10. At the front end of the device there is a shaft 15 which supports wheels 16 spaced closer together than the wheels 13.

The endless bands engage over the wheels as illustrated in Figs. 1, 2, and 6 in a way so that when the textile material 13 is engaged upon the endless conveyer at a point near the wheels 16, the gripping elements 12 of the endless conveyer, which comprises a plurality of fine outwardly projecting wires or pins, will grip the textile material and stretch the textile material as it is advanced by the conveyer. This is particularly so since the textile material when placed upon the endless conveyer at a point near the wheels 16, moves towards the wheels 13 and there is a separating of the endless bands of the endless conveyer due to the fact that the wheels 13 are spaced further apart than the wheels 16. As illustrated in Figs. 1 and 6 there are several groups of wheels 13 mounted upon the frame 10. The last group of wheels 13 is arranged at the rear end of the frame 10.

A means is provided for driving the endless conveyer, and this means includes a wheel 17 mounted upon one of the shafts 14 and engaged by a belt 18 which engages over a pulley 19 of an electric motor 20. Each of the wheels 13 and 16 preferably have teeth engaging suitable openings in the endless elements 11 which may be a chain so that all of the wheels 13 will rotate during the operation of the conveyer and assist in properly supporting the conveyer.

The decorating device has a plurality of substantially identical units for applying more than one color or substance upon the textile material. In Fig. 1 three units have been illustrated. Each of these units is constructed as follows:

A hollow cylindrical perforated or porous stencil 21 is rotatively supported transversely of the endless conveyer 11 preferably by being mounted upon a hollow cylindrical porous drum 22 preferably made of fine wire mesh material. A means is provided for rotating the stencil 21 and this means is synchronized with the operation of the endless conveyer. This means includes toothed

annular members 23 mounted upon end portions of the cylindrical screen 22 and meshing with sprocket wheels 23' mounted upon a shaft 24 which is rotatively supported at its ends in blocks 25.

The blocks 25 are vertically adjustably mounted on the frame 10. This is accomplished by several adjustable screws 23 rotatively connected with the blocks 25 and threadedly engaging stationary members 27 mounted upon the frame 10. A wheel 28, see Fig. 5, is mounted upon one end of the shaft 24. A belt 29 engages over this wheel 28 and over another wheel 30 resiliently supported on the frame 10. The belt 29 engages over a wheel 31 on a shaft 32 rotatively supported on the frame 10. The shaft 32 is provided with another wheel engaged by the belt 34 extending downwards and engaging over a pulley 35 which is mounted on a shaft 36 connected by beveled gears 37 with one of the shafts 14. The shaft 36 is suitably rotatively supported on standards 38. The wheel 30 is mounted upon a block 39 which is slidably mounted in an opening 40 in the body 10. A spring 41 acts to resiliently urge the block 39 in one direction so as to keep the belt 29 tight.

A tray 42 is provided for ink or other liquid material which is to be deposited upon the stencil, and then thereafter transferred to the textile material, in accordance with the marking or design on the stencil. The tray 42 comprises a hollow body having end walls 42^a and a back wall 42^b. A member 42^c extends across the front open side of the tray 42. This member 42^c has felt or other packing material 43 mounted upon its ends and engaging the end walls 42^a, for preventing the ink or liquid material from running out of the tray.

The member 42^c is fixedly mounted on a shaft 44 which is turnably mounted in block 45 longitudinally adjustably mounted on the frame 10. More particularly each block 45 is vertically engaged by a screw 46 extending longitudinally on the frame and rotatively supported in arms 47 of a bracket 48 which are mounted on the frame 10. The screw 46 has a head 46^a by which it may be conveniently turned to move the shaft 44 forwards and rearwards, and consequently the parts connected with the shaft. It is pointed out that the shaft 44 engages through the end walls 42^a of the tray so that the tray will be moved along with the shaft.

A doctor blade 50 is provided for keeping the surface of the stencil 21 clean and is mounted upon the bottom portion of the member 42^c and engages against a longitudinal line of the stencil 21. A radial arm 51 is connected with the shaft 44 and supports a weight 52 which is adjustably mounted along the radial arm so that the pressure of the doctor blade 50 against the stencil 21 may be controlled.

The stencil 21 is rotatively supported by the fact that it rests upon rollers 53 and 54 which are mounted on opposite sides along the bottom portion of the stencil, and these rollers 53 and 54 are supported by shafts 55 which rotatively engage in bearing blocks 56 vertically slidably mounted in openings 57 formed in the body 10. Adjustment screws 58 are rotatively connected with the blocks 56 and threadedly engage stationary portions of the body 10 so that it is possible to adjust the vertical position of the rollers 53 and 54. A counter-pressure roller 59 is mounted upon the shaft 24 and acts against the inner face of the stencil immediately adjacent the edge of the doctor blade 50. This counter-pressure roller 59 also assists in rotatively supporting the stencil 21.

An air supply 60 is connected with each end of a pipe 61 having an air discharge slot 61^a in its top and extending through an outer pipe 61^b which extends through the bottom portion of the stencil 21 and has an elongated discharge nozzle 62 capable of discharging a stream of air completely across the longitudinal line of the stencil 21. This pipe 61 is supported in blocks 63 which are adapted to be moved. More specifically the blocks 63 engage in openings 64 in the body 10. Screws 65 threadedly engage through portions 66 of the body 10 and rotatively connect with each block 63. This arrangement permits the pipe 61 to be adjusted upwards and downwards to control the distance between the discharge end of the nozzle 62 and the stencil 21. The air supply 60 is controlled with a valve 60^a. The pipe 61^b has closed ends 61^{bb} fixedly mounted on the pipe 61.

A housing 66 is located immediately to the rear of the stencil 21 and this housing is fixedly mounted on the body 10. The housing 66 has a hinged cover 67 which permits access to the interior. Within the housing there is a container 68 which also has a hinged cover 69. Within this container there is a mixer 70 and at the bottom of the container there is a distributor drum 71 having a plurality of peripheral grooves 72. The lower end of the container 68 has a transverse opening 73 along its entire width.

The container 68 is adapted to hold powdered or flaked decorating materials or flaky materials. The mixer 70 is mounted upon a shaft 74 provided with a pulley 75 which is driven by a belt 76 engaging over a pulley 77 mounted on a shaft 78 which supports the distributor 71. The shaft 78 is provided with another pulley 79 engaged by the belt 80 engaging over a wheel 81 mounted on the shaft 36. The arrangement is such that during the operation of the decorating device rotations from the shaft 36 will be transmitted to rotate the distributor 71 and the mixer 70. This will cause discharging of quantities of the materials from the container transversely across the top face of the textile material 13.

There are a plurality of pressure rollers 82 arranged in two groups. One group is disposed beneath the textile material 13 and the other group upon the textile material. One of these groups of rollers 83 has each roller rotatively mounted in a block 83' which is adjustably supported in an opening 84 of a bracket 85. Adjustment screws 86 and compression springs 87 are arranged to tension the top group of rollers 82 upon the bottom group. In this way a suitable pressure may be obtained to press the material discharged from the container 68 upon the textile material 13.

Immediately to the rear of the pressure rollers 82 there is a vacuum device capable of lifting up loose particles from the textile material. This vacuum device has an inlet 88 extending completely across the width of the textile material 13. The inlet 88 connects with a suction fan which is capable of discharging into a container 90. This container 90 has an opening 91 through which the air may escape. The container 90 is adapted to accumulate the picked up particles.

The operation of the device is as follows:

The stencil 21 is cut with a predetermined design or marks. Textile material 13 to be decorated is engaged upon the endless conveyer at a point near the wheels 16. The endless conveyer

stretches the textile material laterally so that when it reaches a point immediately below the stencil 21 of the first decorating unit it is completely stretched. The endless conveyer 13 is driven by the electric motor 20. This motor indirectly causes rotations of the shaft 36.

Rotations from the shaft 30 are transmitted to rotate each of the shafts 24. As the shafts 24 turn the wheels 23 thereof, will cause the stencils 21 to revolve. The stencils 21 will be inked from ink or other liquid materials from the trays 42 discharging upon the tops of the stencils. The doctor blades 5 will wipe off the stencils permitting the right quantity of ink to remain thereon. Compressed air will discharge from the nozzles 62 to blow the ink from the bottom portions of the stencils through the stencils and upon the textile material 13.

As these inked portions of the textile material reach the containers 68, they will be powdered with the powder or other material from the containers. The distributors 71 control the discharge of the powdered or flaked material upon the textile material. This powdered or flaked material will be pressed tight upon the inked or liquid wetted material on the textile, by the pressure rollers 82. The loose powdered material will be lifted up from the textile material by the suction device 88, 89, etc.

Each decorating unit of the device operates in substantially the same way except when the first unit applies one decoration, the second adds to the decoration, and the third adds still further. In this way when the textile material leaves the decorating machine it is decorated with several colors or several kinds of decorative materials.

Each tray 42 and doctor blade 50 may be adjusted forwards or rearwards relative to the stencils 21 to better control the distribution of ink or liquid material upon the stencils.

Each pressure roller 59 may be vertically adjusted so that there is proper pressure in conjunction with the doctor blade for the correct applying of ink or liquid material. Each of the rollers 53 and 54 may be vertically adjusted for raising or lowering the stencil 21 in relation to the doctor blade 50. Each of the air discharge pipes 61 may also be adjusted vertically for controlling the distances between the nozzles 62 and the bottom portions of the stencils.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric.

2. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric, said hollow cylindrical stencil being supported by a hollow cylindrical porous supporting element.

3. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric, said means for rotating said stencil, comprising a toothed annular member mounted on one end of said stencil, a gear having its teeth engaging the teeth of said annular member, and a transmission system connected to said conveyor and said gear for driving said annular member when said conveyor moves.

4. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric, and means for holding said pipe in various vertical adjusted positions to change the space between said stencil and said nozzle to vary the operative force of the discharging air.

5. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended

through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric, and means for holding said pipe in various vertical adjusted positions to change the space between said stencil and said nozzle to vary the operative force of the discharging air, comprising a vertical frame extending along the ends of said pipe, blocks supporting the ends of said pipe and slidably supported on said frame, and screws having their intermediate portions threadedly engaged through a stationary portion of said frame and having their free ends bearing against said blocks.

6. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor and spaced from the top face of said fabric material, means for rotating said stencil synchronized with said conveyor, means for supplying ink or other fluid material to fill the porous openings of said stencil, an air supply, a pipe extended through said stencil and connected with said air supply, and an elongated discharge nozzle formed on said pipe and directed downwards for blowing the fluid material from the porous openings located above said fabric onto said fabric for transferring the design of said stencil to said fabric, said pipe, comprising an inner pipe section directly connected to said air supply and having an upwardly directed air discharge slot, and an outer pipe section engaged on said inner pipe section and encasing said air discharge slot, said outer pipe section being formed with said discharge nozzle.

7. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor, means within said stencil for blowing ink or other fluid material from said stencil onto said fabric, a tray for ink or other fluid material mounted longitudinally of said stencil, a counter pressure roller located within said stencil urging said stencil against said tray, and a doctor blade engaging a longitudinal line of said stencil and controlling the flow of liquid from said tray to fill the porous openings of said stencil.

8. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor, means within said stencil for blowing ink or other fluid material from said stencil onto said fabric, a tray for ink or other fluid material mounted longitudinally of said stencil, a counter pressure roller located within said stencil urging said stencil against said tray, and a doctor blade engaging a longitudinal line of said stencil and controlling the flow of liquid from said tray to fill the porous openings of said stencil, said tray, comprising a hollow tray having end walls and a back wall, and a member extending between the front edges of said end walls.

9. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor, means within said stencil for blowing ink or other fluid material from said stencil onto said fabric, a tray for ink or other fluid material mounted longitudinally of said stencil, a counter pressure roller located within said stencil urging said stencil against said tray, and a doctor blade engaging a longitudinal line of said stencil and controlling the flow of liquid from said tray to fill the porous openings of said stencil, said tray, comprising a hollow tray having end walls and a back wall, and a member extended between the front edges of said end walls, said doctor blade being mounted on the bottom of said member.

10. In a means for decorating textiles, an endless conveyor, fabric holding elements on said conveyor for holding and stretching fabric material placed thereon, a hollow cylindrical porous stencil rotatively supported transversely of said conveyor, means within said stencil for blowing ink or other fluid material from said stencil onto said fabric, a tray for ink or other fluid material mounted longitudinally of said stencil, a counter pressure roller located within said stencil urging said stencil against said tray, and a doctor blade engaging a longitudinal line of said stencil and controlling the flow of liquid from said tray to fill the porous openings of said stencil, and means for vertically adjustably supporting said counter pressure roller to vary the pressure with which said stencil will be engaged against said tray.

ALEXANDER G. GROMM.