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2,905,085

TEXTILE PRINTING

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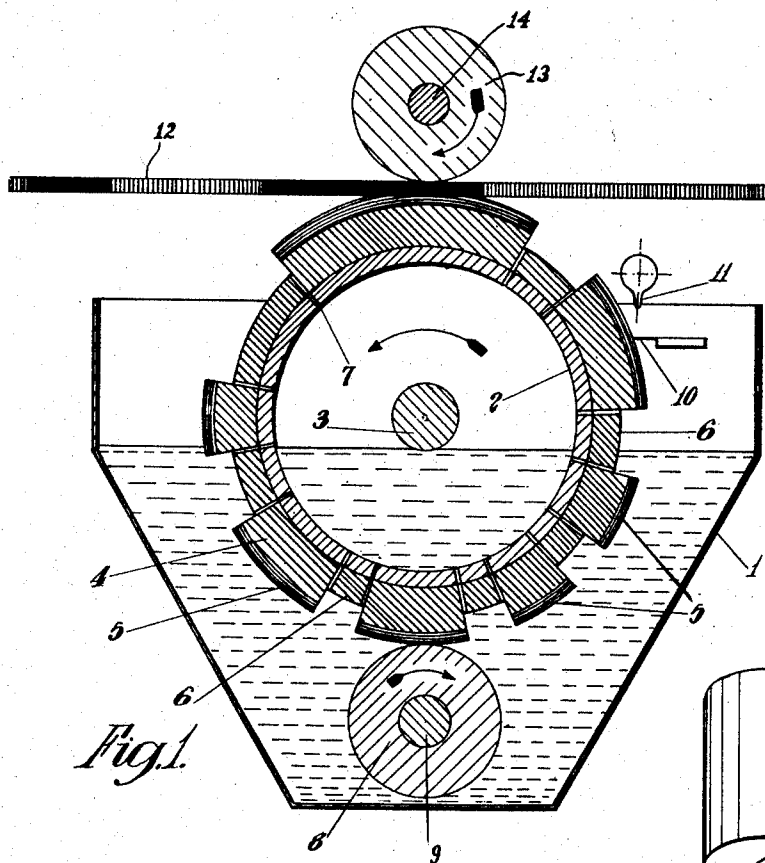


Fig. 1.

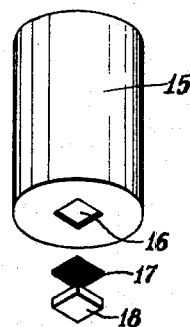


Fig. 2.

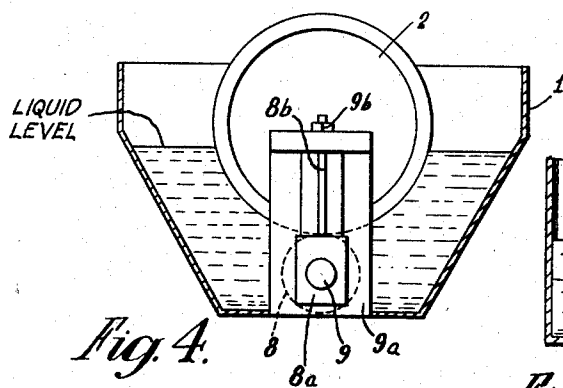


Fig. 4.

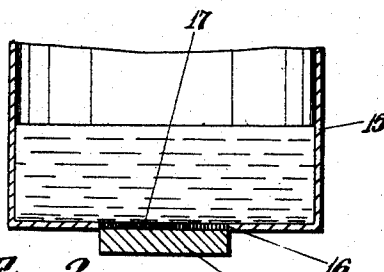


Fig. 3.

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2,905,085

TEXTILE PRINTING

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Claims priority, application Great Britain November 15, 1956

5 Claims. (Cl. 101—219)

The present invention relates to a method and equipment for printing on pile fabrics, blankets, felts, towels and raised fabrics and for warp printing, and has for its object to provide means whereby such fabrics can be effectively printed down to the bottom of the material without the printing spreading beyond the contours of the desired pattern elements.

According to the invention, a printing solution or dye is applied to the textile material by means of elements formed of resilient cellular material, which is initially caused to soak up the solution or dye and is subjected to pressure while in contact with the material to transfer solution or the dye to the material.

The printing may be effected by a roller or rollers, having a pattern in relief formed by elements each comprising a base of solid or resilient material such as rubber, and a pad of cellular material of a suitable thickness to meter the correct amount of solution in relation to the depth of the pile. The pads may be of any foamed or sponge plastic or rubber material having interconnected pores. The roller may rotate partly immersed in dye solution, with an auxiliary roller to squeeze the pads while immersed in the dye to remove air and allow them to soak up the solution. The auxiliary roller may be adjustable to vary the pressure on the printing roller. It may be of any accurately turned and polished material, and its speed may be synchronised with that of the printing roller.

The pads on leaving the solution are fully saturated but carry excess surface colour. This may be removed by various methods such as a scraper knife, a sponge roller in light contact, an air jet or a soft bristle brush. Any combination of the above may be used depending on the type of design to be produced.

The fabric to be printed is pressed against the revolving printing roller either by means of a roller adjustable for pressure or by means of a vibrating pad.

For multicolour printing several synchronised rollers running in separate dye baths may be used.

The colour may be thickened by the use of conventional thickening agents but the thickening must be adjusted to allow penetration of the pile without undue spreading of the pattern.

It is understood that the pile fabric will be under the necessary control both warpways and weftways to ensure proper registration when being printed.

In another method of carrying out the invention, the dye solution is contained in a trough, the bottom of which has openings covered with gauze or the like, with pattern elements of cellular material underneath. The fabric may travel intermittently, pile upwards beneath the trough, which is lowered on to the fabric while the latter is stationary and is vibrated if necessary. The dye is drawn into the pads from the trough and is ejected from the bottom of the pads into the pile of the fabric.

Alternatively the pattern elements may be mounted on flat blocks of wood or other suitable material and used

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as in hand printing, the solution being soaked up from a shallow tray at the side of the printing table.

After printing the fabric may be passed through a suitable drying machine.

Pile fabrics may be printed with a water soluble substance such as glue size which flattens the pile where it has been printed. The pile which remains standing is then dropped off and after washing a relief effect remains.

The thickness and cellular formation of the sponge layer may be selected in accordance with the thickness of the pile, so that the required volume of liquid can be picked up, wastage and flooding being avoided. The sponge layer serves as a reservoir and a metering device for the liquid.

On account of the pumping action which can be obtained, sufficient dye can be applied to print the whole of the pile, even of a deep pile fabric, without using an excess which would cause a spreading of the dye.

Referring to the accompanying drawings:

Figure 1 shows diagrammatically one form of apparatus for textile printing in accordance with the invention.

Figures 2 and 3 are respectively a perspective view and a sectional view of another form of apparatus and,

Figure 4 is a diagrammatic view along the lines of Figure 1, illustrating the mode of adjustment of the auxiliary roller.

Referring to Figure 1, there is a tank 1 containing a dye solution. A roller 2 mounted on a shaft 3 is partly immersed in the solution. The roller 2 carries a relief pattern formed by elements each having a base 4 of material such as rubber and a pad 5 of cellular material. There are spacers 6 between the elements, and drain holes 7 passing through the shell of the roller 2. At the bottom of the tank 1 there is an auxiliary roller 8 on a shaft 9, the roller 8 pressing against the pads 5 as the roller 2 rotates, to remove air and allow them to soak up the solution. As shown in Figure 4, the auxiliary roller 8 is adjustable relative to the periphery of roller 2, so that pressure on the printing roller components can be varied to suit the particular conditions encountered. More particularly, the ends of the shaft 9 are mounted in bearing blocks 8a, which blocks are movable in vertical slide-ways 9a suitably supported at each end of the tank 1. The desired movement to each block 8a can be effected by means of a spindle 8b secured to the block, and a nut 9b threaded onto the free or upper end of the spindle 8b. A scraper blade 10 and an air jet 11 are provided above the surface of the liquid to remove excess liquid from the surfaces of the pads 5. The fabric 12 to be printed is led, pile downwards, above the roller 2 in contact with the pads 5, and a pressure roller 13 on a shaft 14 above the fabric 12 presses the latter against the pads 5 so that liquid is squeezed out of the pads 5 and absorbed by the pile of the fabric.

Referring to Figures 2 and 3, the dye solution is placed in a container 15, the base of which has a hole 16 shaped to the pattern to be printed, the hole being filled with fine wire gauze 17, under which a pad 18 of cellular material corresponding in shape to the pattern to be printed projects below the base of the container 15. The solution flows through the gauze 17 and saturates the pad 18. The container is then lowered on to the fabric to be printed and pressed down to compress the pad 18 and eject the liquid. The gauze 17 prevents a quick return flow of the liquid into the container 15 by its throttling action, and the liquid squeezed out of the pad 18 is absorbed by the fabric. The container is then raised and the pad 18 takes up more liquid while the fabric is being moved on.

What we claim is:

1. An apparatus for printing textile materials comprising a reservoir for containing a printing solution to be applied to the material, at least one printing roller

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mounted for rotation in the reservoir and being partly immersible in the printing solution, the printing roller having a pattern in relief on its periphery, the relief pattern being composed of a plurality of elements, each element thereof including a base carried by the printing roller periphery and a pad of cellular material on the base, and a pressure applying means within the reservoir below the level of the solution and in peripheral contact with the printing roller to squeeze the pads to remove air therefrom and allow the pads to absorb the solution. 10

2. An apparatus for printing textile materials as claimed in claim 1, further including means cooperable with the pressure applying means to adjust the position of the pressure applying means relative to the printing roller to vary the pressure on the printing roller. 15

3. An apparatus for printing textile materials as claimed in claim 2, in which said pressure applying means is an auxiliary roller mounted in the reservoir for rotary movement.

4. An apparatus for printing textile materials as claimed 20

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in claim 3, in which said base is a resilient component and a further roller is located above the printing roller to cooperate with the printing roller to press the textile material against the printing roller.

5. An apparatus for printing textile materials as claimed in claim 4, further including means above the level of the solution in the reservoir and cooperable with the printing roller to remove excess solution from the pads.

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