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Applicant: **BANFI TRATTAMENTI TESSILI
S.P.A.**
Via Delle Brughiere, 9
I-20024 Garbagnate Milanese (Mi)(IT)

Inventor: **Savoldelli, Gianmaria**
Viale Vittorio Emanuele 49
Bergamo(IT)

Representative: **La Ciura, Salvatore**
Via Francesco Sforza 5
I-20122 Milano(IT)

Method of producing color spots in repetitive, non-regular patterns on a fabric layer and apparatus for carrying out the method.

A method of producing color spots in repetitive, non-regular patterns on a fabric layer (1), wherein the fabric is caused to move in one direction and a dyestuff is sprayed on to the moving fabric by means of one or more spray nozzles (10) to which a reciprocating motion is imparted along guide means (4) arranged to be orthogonal to the direction in which the fabric is moved.

The invention also relates to a machine for carrying out the method.

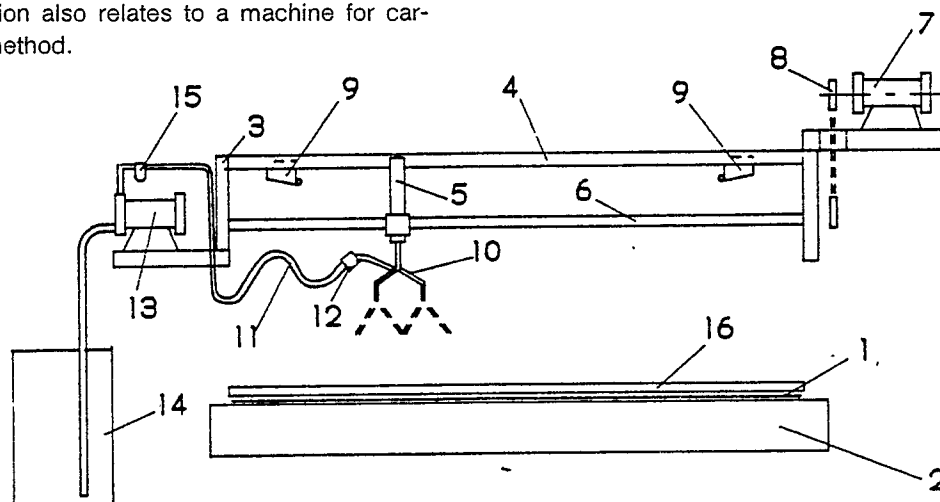


FIG. 1

METHOD OF PRODUCING COLOR SPOTS IN REPETITIVE, NON-REGULAR PATTERNS ON A FABRIC LAYER AND APPARATUS FOR CARRYING OUT THE METHOD.

This invention relates to a method of, and an apparatus for producing spots of color in repetitive non-regular patterns on a fabric layer.

More particularly, the method of the invention can be utilized for producing such spots of color on already dyed fabric with the purpose of giving it the appearance of an "antique" type fabric.

The apparatus for carrying out the method of the invention is arranged so that when used in an existing fabric treating plant, it permits the fabric to be processed continuously in a fully automatic manner.

Several processes are known at this state of the art which enable a fabric to be provided with decorative non-regularly shaped patterns but none of these known processes has permitted obtention of such a fabric like that according to the invention, i.e. one having spots of color produced on it whose appearance and size are such as to make the fabric appear antique.

According to one prior art process, a fabric band is caused to pass around a cylinder partially immersed in a dye-containing tank which is rotated about its own axis. The cylinder has an inclined axis with respect to the horizontal, whereby one end of the cylinder is immersed at a greater depth in the dyestuff than is the other end thereof.

As a result, the time the fabric will dwell in dyestuff is longer for one edge of the fabric than for the other, namely, the time gradually decreases as the other end is approached. Since dye absorption by the fabric is a function of the time the fabric remains immersed in the bath, there is obtained a fabric strip on which the color strength varies continuously from one edge of the strip to the other. However, this variation is one that is regular and which remains constant all along the length of that fabric.

Another prior art process comprises applying to a fabric a flowing printing paste which is intended to subsequently form a back-ground and which consists of only a thickening agent and an active dyestuff with no fixing agent added, then printing and fixing a counter-ground figuring, and finally subjecting the fabric piece to a spray dyeing-bath treatment using, at this stage, a fixing agent to fix the previously applied paste on the ground, after this paste having produced a spotting unevenness effect.

However, this is a rather difficult and complicated process and, in any case, one which does not permit the same effects to be obtained as those achieved by the method of this invention, which method comprises, on the contrary, producing by a

spray process, in repetitive cycles, spots of color that are non-uniform in shape and size, on a fabric while this is moved.

The invention will now be described in more detail by way of a non limiting example with reference to the accompanying drawing, wherein:

Figure 1 is a schematic view of an apparatus according to the invention, and

Figure 2 is a schematic view of the apparatus taken along an orthogonal plane to that in figure 1.

The apparatus according to the invention is intended for use on an existing fabric-processing plant wherein a fabric taken from a supply roll is laid on a conveyor belt by which the fabric is moved to a number of processing apparatus to be then wound on a take-up roll. In the above figures, 1 denotes a fabric as it is moved by means of a conveyor belt 2.

Placed at a proper location along the conveyor belt 2 is the apparatus according to this invention which comprises a frame (not shown in the drawing) having support means 3 fastened to it for supporting one or more guide members 4 on which a corresponding number of sliders 5 are slidably mounted. The sliders 5 are each engaged with a threaded shaft 6 which is in turn mounted on supports 3 in parallel relationship with said guide member 4.

The shafts 6 are driven in two directions of rotation from a motor 7 through a transmission means 8 of a known type.

The guide means 4 have limit switches 9 arranged therealong which are actuated by sliders 5 and which act in a manner known per se, to reverse the direction of rotation of motor 7.

Fitted to sliders 5 are nozzles 10 which are connected through a flexible pipe 11 provided with a shut-off solenoid valve 12, to a pump 13. The pump 13 plunges in a dyestuff-containing reservoir 14 to supply dyestuff to nozzles 10 through a filter 16 and said flexible pipe 11.

Beneath the above described devices there is arranged, in such a position as to contact the advancing fabric, a tube 16 or the like, which tube has a slit running all along the length of tube 16 and placed so as to be adjacent to the fabric-contacting region of the tube.

The tube 16 is connected to suction means of a type known per se.

Operation is as follows :

A fabric coming from a supply roll is laid on a conveyor belt 2 to be moved thereby, at uniform speed, under the spray apparatus. The apparatus

has previously been set for properly positioning the limit microswitches 9 and 10 according to the width of the fabric.

When the apparatus is actuated, dyestuff sucked from reservoir 14 by pump 13 is supplied by this latter through filter 15 - which removes any clots and/or other impurities from dyestuff - to flexible pipe 11 and into nozzles 10.

At the same time, the motor 7 causes the threaded rods 6 to rotate about their axis, so that the rotating rods 6 engage the nozzle-supporting sliders 5 to cause them to translate in an orthogonal direction to the direction in which the fabric is moved. The direction of rotation of rods 6 is such that the sliders 5 are moved in opposite directions to one another while dyestuff is being sprayed onto fabric through spray nozzles 10.

At the end of their stroke, the sliders 5 will engage with the associated limit microswitches thereby to cause the motor, and thus the rods 6, to reverse their direction of rotation. The sliders 5 then commence to translate in an opposite direction to the preceding one, while dyestuff continues to be sprayed onto the advancing fabric.

If necessary, the valve 12 may be operated to shut off dyestuff flow to nozzles 10, owing for example to a stopping of the conveyor belt.

In this way, color spots or blots can be produced on a fabric which are non-regular in size and shape but repetitive, and which can be varied as a function of a number of parameters, such as the number and setting of the nozzles, the quantity of sprayed dyestuff, the rate at which the fabric is moved and the sliders 5 are translated.

These spots of color are repeated cyclically with the shapes thereof being always different from, though roughly similar to each other.

Any excess dyestuff sprayed onto the fabric can be removed by suction through the elongated slit in pipe 16 and returned back to dyestuff reservoir 14.

The fabric is then moved to a drying station and to any subsequent processing steps, such for example as a further printing step, to be finally wound on a take-up roll.

By the above-described method, a fabric showing changeable or "shot" effects of color and able to be subsequently printed, if desired, can be obtained in a simple and fully automatic manner.

The effect to be obtained may be varied, for example, by using more sets of spray nozzles arranged to spray different dyestuffs, or by changing the spray nozzle angulation or the quantity of sprayed dyestuff, or even the speed of translation of the nozzle-supporting means and the rate at which the fabric is moved.

Many other changes and modifications are conceivable, and may be easily made to the

above-described embodiment of the invention, by those skilled in the art, without departing from the spirit and scope of this invention.

Claims

1. A method of producing color spots in repetitive non-regular patterns on a fabric layer, characterized in that the method comprises spraying a dyestuff on to a moving fabric by means of sprayer means that are performing a reciprocating motion in an orthogonal direction to the direction in which the fabric is moved.

2. The method according to claim 1, wherein the dyestuff is sprayed by spray nozzles which are caused to reciprocatingly move in parallel relationship with, and in opposite direction to each other.

3. A machine for producing spots of color in non-regular but repetitive patterns on a fabric layer, characterized in that the machine comprises :
means for causing a fabric band to advance;
means for spraying a dyestuff on to said fabric while advancing, said sprayer means being imparted a reciprocating motion in an orthogonal direction to the direction of the advancing fabric.

4. The machine according to claim 3, wherein said spraying means are spray nozzles fitted to associated slider means which are movable on corresponding guide means arranged in an orthogonal direction to the direction in which the fabric is moved, said slider means each engaging with a threaded shaft which is rotated about its own axis.

5. The machine according to claim 4, wherein limit-microswitches are provided along said slider guiding means and act to control the means driving in rotation said threaded shafts so as to reverse motion thereof.

6. The machine according to claims 3 to 5, wherein at least two sliders are provided and each of them carries one or more spray nozzles, said spray nozzles being caused to reciprocatingly move in an opposite direction to one another.

7. The machine according to claims 3 to 6, wherein the machine includes means arranged to be in contact with the moving fabric and acting to remove excess dyestuff therefrom.

8. The machine according to claim 7, wherein said removing means is a tubular member placed in contact with the fabric and connected to vacuum means, said tubular member having an elongated slit formed therein-said slit being parallel to the axis of the tubular member and being arranged to be adjacent to the moving fabric.

9. A fabric obtained by the method according to claims 1 and 2 using the machine according to claims 3 to 8.

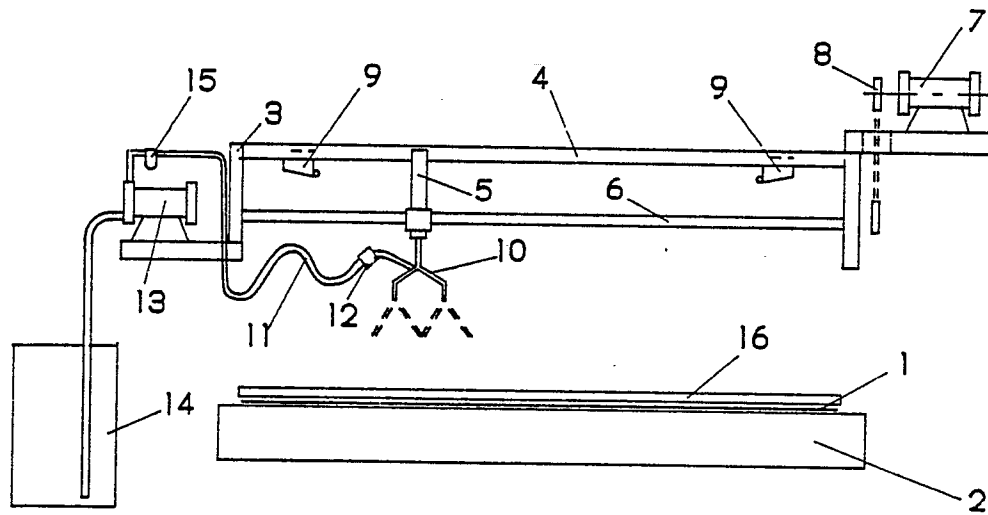


FIG. 1

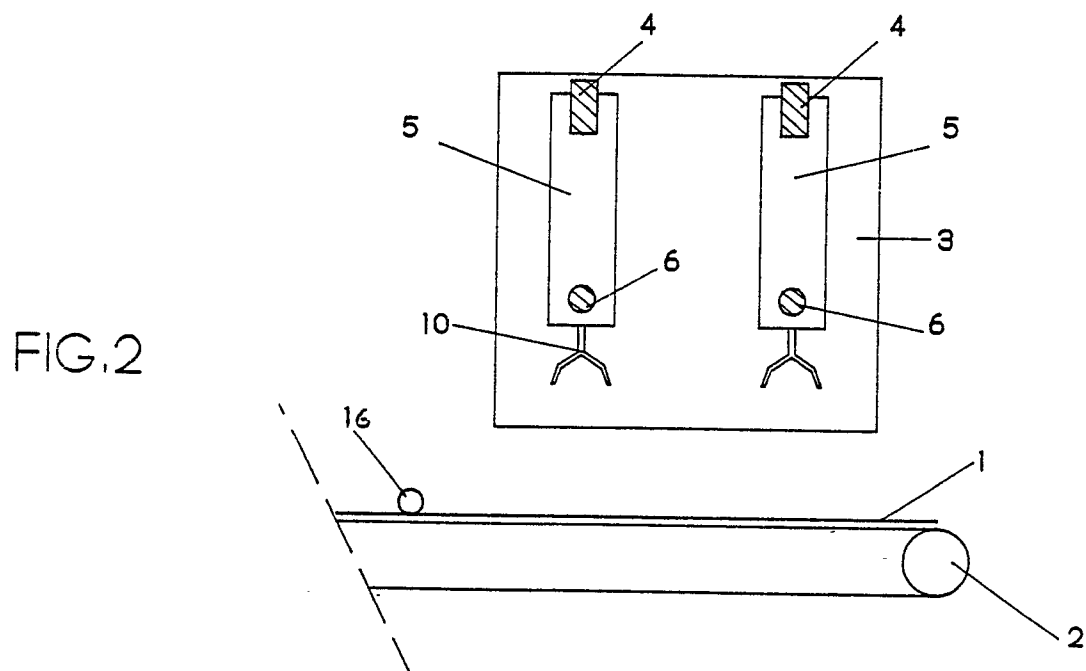


FIG. 2



EP 90 10 4239

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	FR-A-2319433 (SCHABLONENTEchnik KUFSTEIN) * the whole document *	1-9	D06B11/00
X	FR-A-2156702 (NORTH AMERICAN MILLS) * the whole document *	1-6, 9	
A	US-A-3717722 (MESSNER)		
A	GB-A-1077204 (J.P. STEVENS)		
A	US-A-4610151 (B & D DESIGNS)		
A	US-A-4578965 (ARMSTRONG WORLD INDUSTRIES)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 SEPTEMBER 1990	Examiner PETIT J. P.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document			