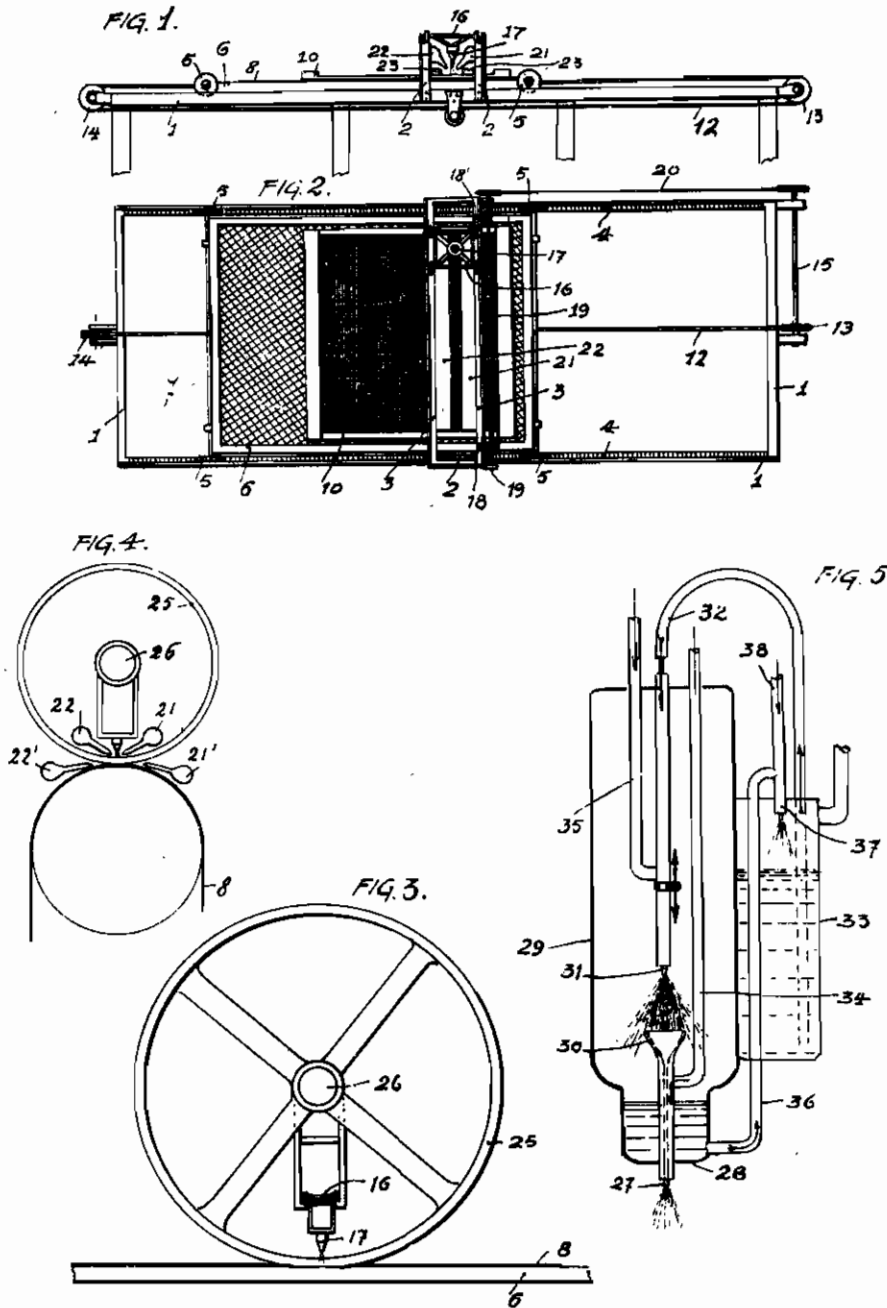


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# ALIEN PROPERTY CUSTODIAN

## PROCESS AND DEVICE FOR PRINTING FABRICS OF ALL KIND

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The method of printing fabrics by means of silk templates or masks, which are prepared by fotografic way, is well known. In carrying out this method, the colouring substance is used in the form of a paste, which is strongly rubbed on the template by hand, so as to allow it to come onto the fabric passing through the meshes of the silk template.

Besides of the irrational working, this method presents the inconvenient that the colouring substance may not become distributed and rubbed on the template in wholly uniform manner, so that even so positive print on the fabric does not appear uniform. Furthermore the fabrics printed by such a method are to be subjected to a particular washing operation in order to eliminate the thickening substances mixed to the colour substances.

The employ of liquid colour substances and the sprinkling of same by means of aerographs actuated by hand is not possible, as the silk templates prevent the sight of the fabric to be printed; it would thus be impossible to see where the colouring substances are sprinkled in a sufficient quantity and where not. Besides of this, an uniform sprinkling by hand is also impossible.

The printing of fabrics by means of liquid colours and using aerographs is already known, but in this case metal templates must be used, which allow the sight on the fabric to be printed.

The present invention relates to both a process and a device for printing fabrics of all kind and particularly also nap or fluffy or hair fabrics.

According to the new process, the known silk templates, which are prepared by fotografic way, are used, but printing is effected by sprinkling a liquid colour substance. The invention allows this method of printing and it assures obtaining of a printing which is unobjectionally under all respects. Practical trials have demonstrated that the printing of fabrics by the new process according to this invention better turns out than that effected by any whatever of the known methods; particularly good results have been obtained by printing nap or fluffy or hair fabrics with the new process.

According to the invention the sprinkling of the liquid colouring substances is accomplished by causing the spray nozzle or nozzles to mechanically effect a regular reciprocating movement with uniform velocity over the fabric covered with the silk template, said fabric together with said template being caused to effect at the end of each stroke of the nozzle a short longitudinal movement normal to the movement of the nozzle.

Thus the nozzle, little by little, uniformly coats and sprinkles the entire surface of the fabric.

The different movement of both the spray nozzle and the fabric together with the silk template, might, of course, take place otherwise. For instance, the fabric may be moved continuously, while the nozzle effects a more rapid reciprocating movement; or a row of nozzles may be disposed extending over the whole width of the fabric, which may be moved continuously in a direction normal to the row of nozzles; or a long nozzle having a knife opening may be used. Further it is possible to keep fixed the nozzle or nozzles and to move only the fabric together with the silk template or vice versa.

In every case, by such a mechanical relative movement between the fabric to be printed and the spray nozzle or nozzles an absolutely uniform sprinkling of the liquid colouring substance is obtained, both in regard of the quantity of colouring substance and the spraying pressure and period of same; this uniformity in all respects is of the greatest importance when liquid colouring substances are used.

A further important feature of the invention consists of the method and device for instantaneously drying the colouring substance sprayed on the fabric or on the template, where this is not permeable. Said drying is obtained by blowing and/or sucking hot air on the points where the colour have been sprayed.

The instantaneous drying of the colour is very important for obtaining an unobjectionable printing. Particularly the colour remaining on the template must be immediately dried in order to avoid overflowing of same on adjacent zones, otherwise the colour by leaking through the meshes of the template would alter the printing pattern and particularly the outlines of the decoration figures or patterns.

Furthermore the invention provides for a particular spray nozzle construction having the purpose of assuring an absolutely uniform sprinkling of the colour by said nozzle; this absolute uniformity has not been obtained by the usual spray nozzles.

The annexed drawings illustrate some examples of devices according to this invention.

Fig. 1 shows the complete device in elevation, for printing fabrics according to the method of the invention;

Fig. 2 is a plan view of same;

Fig. 3 shows another printing device, with the method according to this invention;

Fig. 4 represents a modification of the device shown in Fig. 3;

Fig. 5 shows the particular sprinkling device.

The device shown by Figs. 1 and 2 comprises a table 1 bearing a cross bridge 2 with guide rails 3—3 mounted upon the table 1. To the longitudinal sides of the table 1 are fixed two racks 4 upon each of which run two gearing wheels 5—5 fixed to a frame 6. In this frame is preferably stretched a metal net, upon which is placed the fabric 8 to be printed. Upon the fabric is placed a template of silk, which is stretched in the frame 10. The frame 6 is constructed as a carriage and is connected to the chain 12 running over two chain wheels 13, 14. The wheel 13 is mounted upon a shaft 15, which is connected to the shaft 19 by means of a chain 20. On the shaft 18 are mounted two bearings 18, 18', which together with a nose disposed on the car 16 carrying the spray nozzle 17 drive the shaft 15 by jerks. Said driving by jerks is effected at the end of each reciprocating stroke of the car 16. This car runs on the guide rails 3, 3. The spray nozzle 17 is fed with liquid colour from a vessel not shown.

The car 16 is regularly reciprocated by means of any whatever device driven by the motor, not shown in the drawing; for instance it may be provided of screw spindle with which engages a catch nut fixed to the car 16. The car 16 pushes at the end of each stroke a reversing lever which provokes the reversing of the direction of the spindle movement and at same time drives one of the bearings 18, 18' which effect the movement by jerks of the frame carriage 6.

The device according to the Figs. 1 and 2 works as follows: The car 16 runs on the rails 3, 3 in direction transversal to the frame 6 and the fabric 8 placed upon it, while liquid colour is continually sprayed from the nozzle 17. At the end of each stroke the car 16 dashes against the mentioned nose, whereby the direction of both the spindle and the car 16 is reversed. Said car actuates at the same time one of the bearings 18, 18' by provoking a displacement by jerks of the car frame 6 carrying the fabric and the template in a direction normal to moving direction of car 16.

In such a manner the fabric is little by little, regularly and uniformly sprinkled upon its whole surface.

As liquid colour remains on the template, particularly on the full points of same, it is necessary to immediately dry said colour in order to avoid that it leaks through the adjacent permeable meshes of the template and spot the decoration design. To this purpose blowing and/or sucking nozzles 21, 22 are foreseen, from which hot air is blown, on both sides of the spray nozzle 17 and fixed to the bridge 2, along the whole length of said bridge. By means of these nozzles 21, 22 sudden drying of the liquid remaining on the template is obtained.

The invention further provides means for assuring both a good adhering of the template on the fabric to be printed and a printing of decoration figures and pattern with clean and neat borders.

To this purpose serve two bars 23 which act as weights; said bars lying always on the template at both sides of the space to be sprayed and press-

ing said template against the fabric. Said bars must always maintain their position and not follow the car 6 by its movement; therefor they are disposed in guides on the table 1. They act either by their own weight or by means of springs.

In the example shown by Fig. 3 the template is fixed to two hoops 25 laid at a certain distance on a horizontal shaft 26, said template thus forming the surface of a cylinder. The shaft 26 is disposed at such a distance from the table 6, upon which lies the fabric to be printed, that the template touches said fabric 8. The car 16 accomplishing the reciprocating movement is disposed in the cylinder limited by the wheels 25 and runs on guides which are fixed in any whatever manner to the shaft 26. This device is actuated in the same manner as by Figs. 1 and 2; the only difference consists in the fact that in this case also the template receives a rotating movement in correspondence with the longitudinal displacing movement of the fabric. With such a device fabrics of any whatever length may be printed.

Fig. 4 shows a modification of the device shown in Fig. 3. The fabric to be printed rather than on a horizontal table is guides over a cylinder. By said example, besides of the blowing or sucking nozzles 21, 22, for drying purpose, additional drying nozzles 21' and 22' are foreseen which have the purpose to dry even under the template, on the fabric itself.

Since the sprinkling of liquid colours on silk templates must be effected in an absolutely uniform manner and since the known spraying nozzles are not able to assure said absolute uniformity, particularly as regards the quantity of colour, the invention provides for a special device adapted to produce a uniform jet of colour. Said device is shown in Fig. 5. The spray nozzle 27 is carried by a tube 30 which is disposed within a reservoir 28, 29 and enlarges itself as a funnel at the top. Over the funnel 30 is provided in the inside of the reservoir 29 a further nozzle 31 the pipe of which 32 is attached to the reservoir 33 containing the liquid colour. Both pipes 34, 35 convey the compressed air to the nozzles 27 and 31. A further pipe 36 goes from the bottom of the reservoir 28 to the main reservoir 33 of the colour, said pipe bringing back in this reservoir 33, through pipe 36 with compressed air pipe 36 and nozzle 37, the colour collecting in the reservoir 28.

By approaching the nozzle 31 to the funnel 30, or by moving it away from same, in the direction of the arrows shown in the figure, it is possible to exactly regulate to constant value the quantity of colour arriving to the funnel and issued by the nozzle 27.

Besides of the described and represented examples of the devices for carrying out this invention, other forms are, of course possible without departure from the spirit of the invention.

For instance the fabric might be guided together with the template in vertical direction, while the colour would be horizontally sprayed. Such a disposition is to be recommended when the fabric should be printed on both sides, because the printing may thus be effected on both sides uniformly and simultaneously.