

Feb. 12, 1929.

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F. HÜBL

METHOD OF AND MEANS FOR SPATTER PRINTING BY MEANS OF A MECHANICALLY
OPERATED AND CONTROLLED SPATTER OR SPRAYING NOZZLE

Filed July 7, 1925

2 Sheets-Sheet 1

Fig. 1

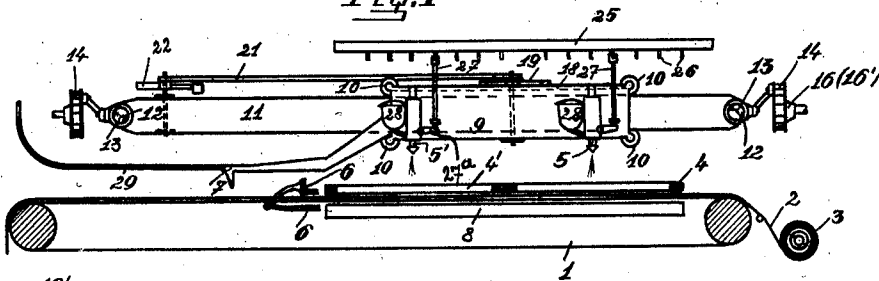


Fig. 2

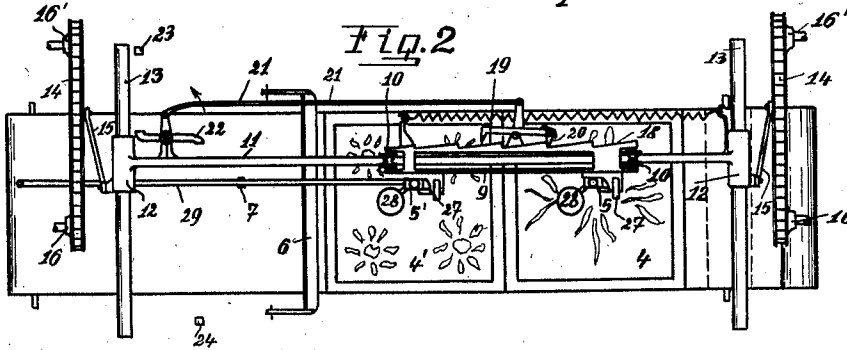


Fig. 3

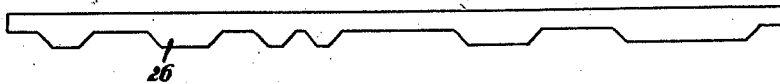
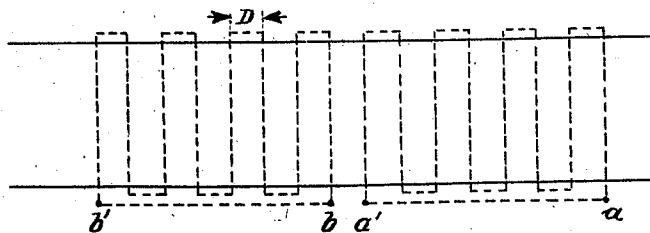


Fig. 4

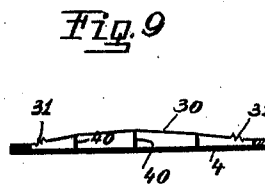
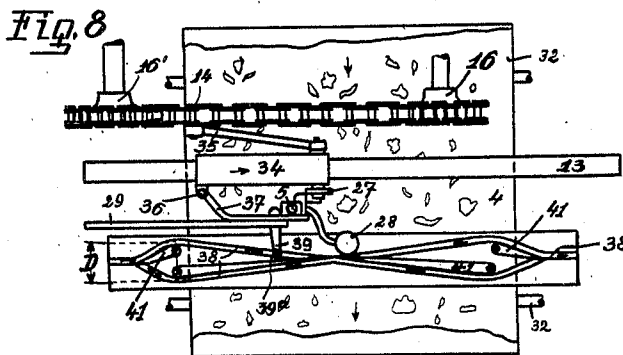
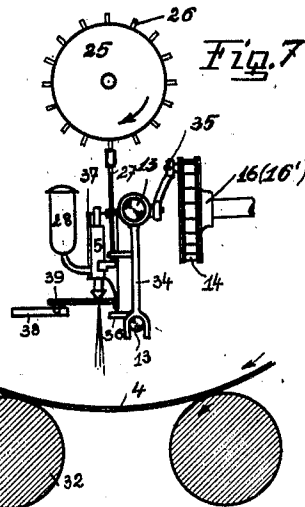
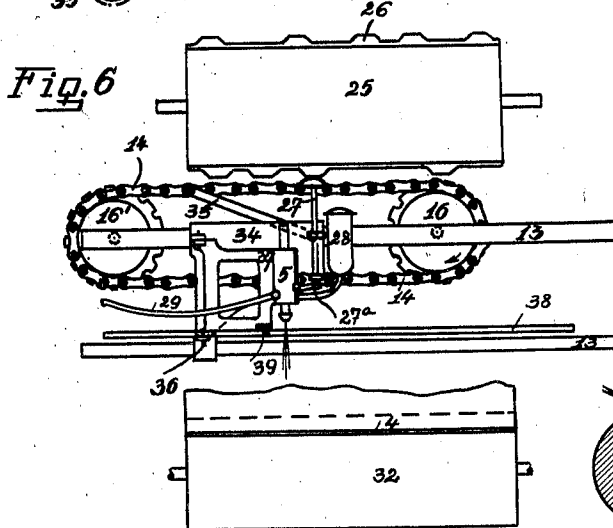
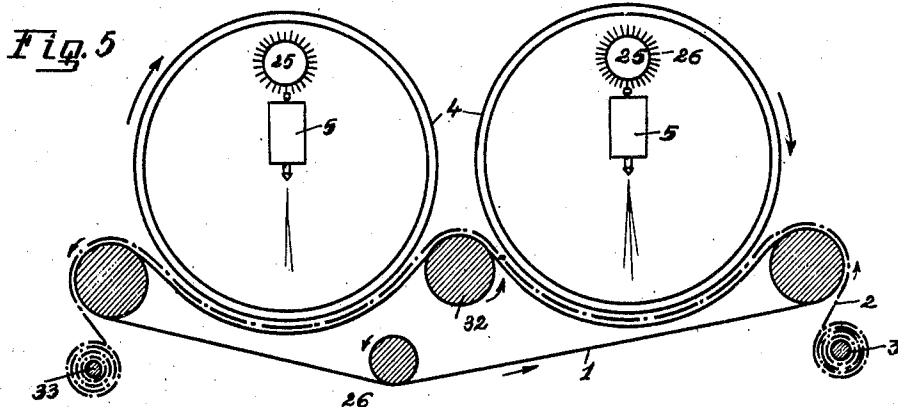


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METHOD OF AND MEANS FOR SPATTER PRINTING BY MEANS OF A MECHANICALLY OPERATED AND CONTROLLED SPATTER OR SPRAYING NOZZLE.

Application filed July 7, 1925, Serial No. 42,076, and in Austria June 12, 1924.

Devices for the production of multicoloured decorations by spraying colour through stencils are already known in which the nozzles are rotating in a closed guide the shape of which corresponds to the stencil openings. During their movement the nozzles were operated by cam members suitably arranged.

Further, devices are known in which the nozzles are arranged fixedly over the whole width of the articles to be decorated and are operated by cam members corresponding to the stencil-openings.

It has also been proposed to have the stencil take the form of a rotatable drum in the interior of which the nozzles are arranged, the nozzles being controlled by valves and being carried by arms which, by means of levers, are given a short reciprocatory motion axially to the drum.

The object of the invention is an apparatus for spraying colour through stencils in which the nozzles are moved to and fro over the width of the article to be decorated in tracks which are quite independent from the stencil openings.

Several modes of carrying out the present invention are illustrated by way of example on the accompanying sheets of drawings in which—

Fig. 1 shows in elevation, and Fig. 2 in a plan view a construction according to the invention.

Fig. 3 shows a nozzle-regulating card.

Fig. 4 illustrates diagrammatically the movement of the nozzle.

Fig. 5 shows diagrammatically a second arrangement.

Figs. 6, 7 and 8 show the mechanism for moving the nozzle in tracks.

Fig. 9 is a detail view.

In the apparatus for spraying colour as shown in Figs. 1 to 4, the character 1 designates an endless feed band and the numeral 2 designates a strip of material (fabrics, tissue, paper, impregnated materials or the like) which is wound off from a storage roll 3 and is fed forward for the length of a stencil underneath the stencils 4, adapted to be moved up and down.

Spraying nozzles 5 and 5' are mounted on a carriage 9, which is provided with rollers 10 and is laterally movable on a track or guide 11. By means of its slide-sleeves 12, the latter is moved to and fro transversely with respect

to the strip of material by the aid of chains 14 and pull-rods 15. The chains 14 always move in one direction over driving and guiding chain-wheels 16 and 16'. In order that the spraying nozzles pass through the track shown in Fig. 4 and uniformly spray the colour in stripes onto the stencil-faces, the arrangement is such, that, at every arrival of the nozzles at the forward or rear end of the track, the nozzle-carriage 9 jumps sideways for the width D of the spraying stripe, similar to the carriage of a typewriter. A spring has the tendency to continuously pull to the right the carriage 9. The rack 18, secured to the carriage 9, is fixed by pawls 20, which are arranged on a double armed lever 19. On cooperating with fixed stops 23, 24, a lever-arrangement effects the reversal of the pawls 20 with the lever 19 in such a manner, that at each reversal the carriage 9 is released for the distance D and by the action of the spring jumps to the right.

It would be wasteful to spray the entire stencil. The nozzles ought to spray only at those places where the stencil-openings are disposed. This is carried out by means of a control-stencil 25 (Fig. 1), which is arranged parallel with respect to the plane of the stencil and provided with nozzle-openers 26 (cards), which depress pins 27, operating directly upon resilient levers 27^a, which open the nozzles. Therefore the spraying-apparatus move along parallel tracks according to Fig. 4, which are independent from the pattern, but in accordance with the pattern they are operated at the desired places by means of the nozzle-openers (cards) 26. Thereby a nozzle is employed for each colour (two in the present case).

The colour flows from the moving colour-receptacle 28 into each nozzle. Compressed air is supplied by the swinging tube 29.

Means are provided, which tightly press from all sides the stencil 4 against the material to be printed on, in order to produce sharp contours or outlines. According to the present invention this is accomplished in that a netting of thin wires 30 is stretched across the entire stencil 4 (Fig. 9), whereby each wire terminates in a spring 31 in front of the place of attachment to the stencil-frame and yieldingly holds down the corresponding parts of the stencil by means of stays (depressors) 40.

According to the present invention the

same arrangement, however suitably constructed, is employed in the rotary spraying printing machine shown in Figs. 5, 6, 7 and 8, whereby the advantage of an uninterrupted operation is attained.

The cylindrically bent stencils 4 (Fig. 5) rest on the feed-band 1 above the rollers 32 and together with the same move in the direction indicated by the arrows, so that the material 2 to be printed on and coming from the roll 3 passes all the stencil-drums 4 (two being shown in Fig. 5 by way of example) necessary for the pattern, and the printed material is wound up at 33 at the end of the machine. All the transport rollers 32 rotate at the same speed and the stencil-drums 4 roll off upon the printing material by means of a suitable drive. The spraying devices 5, arranged on slides 34 (Figs. 6, 7 and 8) move to and fro parallel to the axis of the drum upon slide-bars 13 within the stencil-drums, the said movement being effected by means of the chain-drive 16, 16', 14 and the pull-rod 35. Thereby the nozzle is controlled according to the pattern (cut-outs) of the stencil, in that the resilient nozzle-lever 27^a operates by means of the pressure-bar 27 the nozzle-openers (cards) 26, arranged around the periphery of the drum 25. Each opener (card) 26 is of a certain shape according to the pattern or spraying strip. The opener-drum is fed forward the distance of an opener at the end of each nozzle-track.

In order to provide for a spraying in parallel stripes during the uninterrupted and uniform rotation of the stencil-drums, the slides 34 move parallel to the axis of the drum, while the nozzles 5 are arranged on a carrier 37 moving about a pivot 36 and swing out-

ward at both sides from a central position for the half width of the stripe (feed length) D (Fig. 8). The nozzle has to move the distance D, because the printing material and the stencil move forward the distance D during one movement of the nozzle 5. Therefore the nozzle passes through a track corresponding substantially to the shape of the figure 8, because it is forced to do so by the groove 38 in the shape of an 8. A pin 39^a of the nozzle-arm 39 engages the groove 38, whereby four shunting places 41, yielding to one side, enforce the passage through the groove in the direction indicated by the arrows. Thus towards the end of each movement the nozzle jumps back the distance D, and subsequently again passes obliquely during the transverse movement with the stencil-drum.

I claim—

In apparatus for producing designs upon paper, cloth or other surfaces in combination stencils in the shape of drums, continuously rolling off on the articles to be printed on, nozzles arranged in the inside of the drums running to and fro over the length of the drum and operated by cards according to the stencil openings and means by which during a forward movement of the nozzle over the length of the drum and in order to move in parallel lines over the article to be printed-on, the nozzle simultaneously is moved along for the distance of the forward feed of the said article and jumped back for this distance at the end of the track, in order to again move in an inclined path for the same distance during the return movement, so that the absolute nozzle-path is substantially in the shape of a figure 8.

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