Aug. 3, 1937. C. MASSON 2,088,801

MACHINE FOR PRINTING DESIGNS ON FABRICS BY MEANS OF STENCILS, PERFORATED PLATES, AND THE LIKE

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Fig. 1

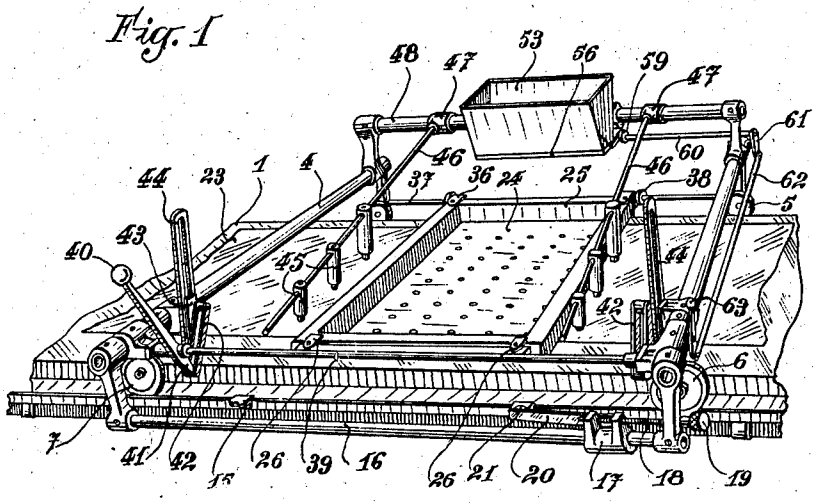


Fig. 2

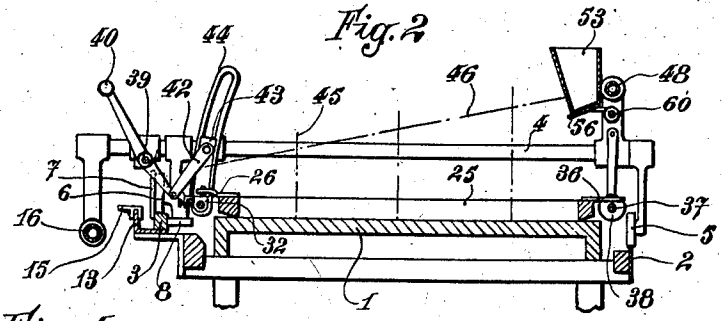


Fig. 4

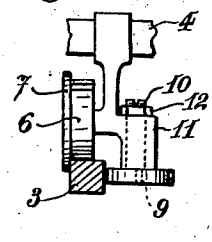


Fig. 3

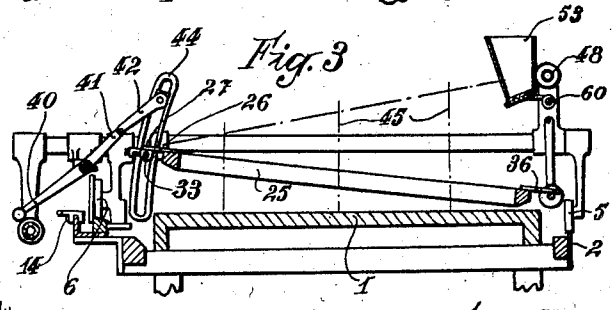


Fig. 5

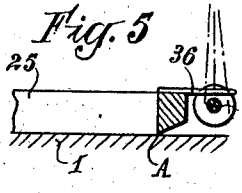


Fig. 6

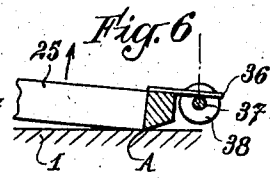
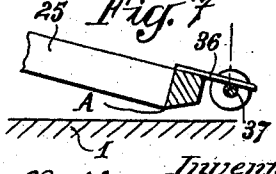


Fig. 7



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Fig. 8

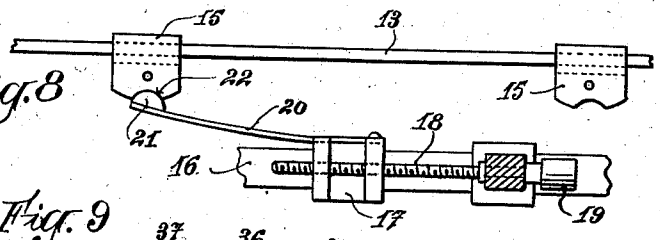
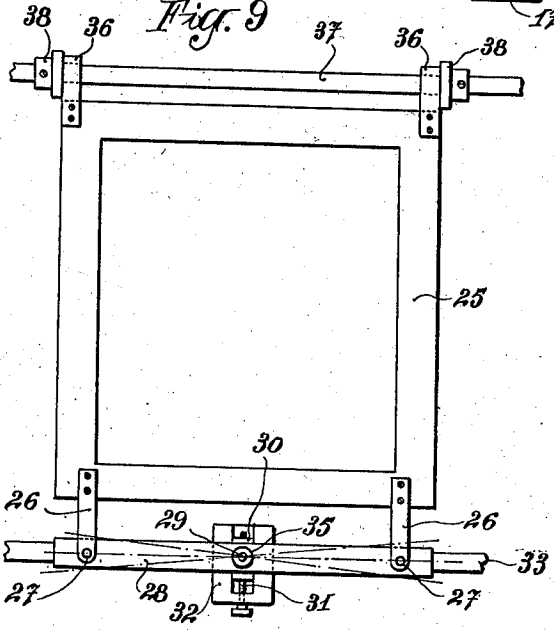


Fig. 9



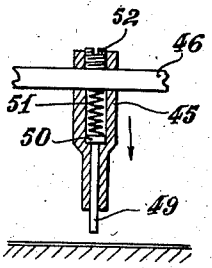


Fig. 11

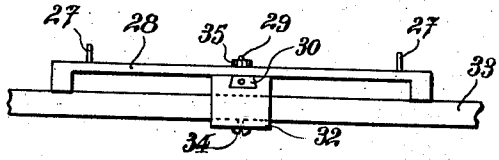


Fig. 10

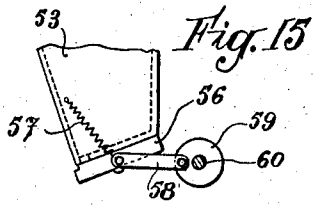


Fig. 15

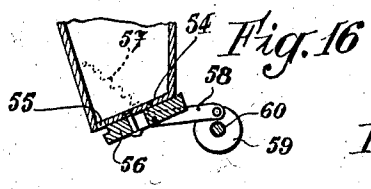


Fig. 16

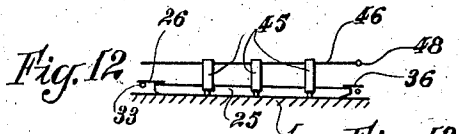


Fig. 12

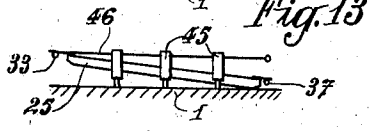


Fig. 13

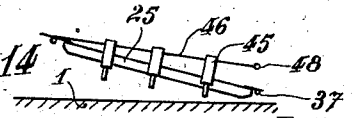


Fig. 14

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UNITED STATES PATENT OFFICE

2,088,801

MACHINE FOR PRINTING DESIGNS ON FABRICS BY MEANS OF STENCILS, PERFORATED PLATES, AND THE LIKE

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Application May 25, 1936, Serial No. 81,753
In France May 25, 1935

11 Claims. (Cl. 101—126)

This invention relates to a machine for printing designs on fabrics by means of a perforated surface which permits the passage of the dye, ink, etc.,—only at the desired places. The two most well-known examples of such surfaces are stencils and metal plates cut and perforated to the design.

The printing of fabrics by means of such surfaces is generally effected by pinning the fabric in a stretched condition on a printing table covered with felt or the like and printing successively throughout the length of the latter by means of a frame in which the perforated surface is stretched. The frame being applied to a part of the fabric, the operators spread the dye or ink by means of a scraper over the stencil or the like, then raise the frame and shift it further. As will be understood the various applications of the frame should be made at regular intervals carefully marked off in advance. In particular, when printing in several colours, several frames must be applied successively over the same parts of the fabric and they have to be minutely positioned in order that the colours will correspond to the design.

The present machine permits of avoiding any risk of careless workmanship which the work of displacing and positioning the frame by hand might involve. It ensures, moreover, a considerable saving of time and reduces the number of workmen required.

The machine according to this invention comprises a carriage rolling on rails disposed on the two sides of the table. A detent mechanism comprising a pawl carried by the carriage and pawl detents adjustable along one of the rails permits of stopping the carriage at a number of different positions over the length of the table. There is preferably provided a fine adjustment gear on the carriage to vary the position of the pawl and correct small errors in the longitudinal position of the carriage.

The latter comprises a stencil or like frame which an elevating mechanism permits first of raising by one of its sides causing at first the opposite edge to pivot on the material and then causing the whole frame to turn about an axis located beyond the material and thus to move away entirely from the printed fabric. A retaining mechanism associated with the lifting mechanism of the frame ensures that the fabric does not follow the stencil or the like when the frame is lifted, this retaining mechanism being in turn raised at the proper moment in order to release entirely the carriage. Finally, the carriage is preferably provided with a dye or ink reservoir which a distributor actuated by control operated by the operator permits of opening at the desired moment to spread the ink or dye within the frame.

In the annexed drawings:—

Fig. 1 is a general perspective view of a machine in accordance with the invention.

Fig. 2 is a transverse section thereof at the lowered position of the frame.

Fig. 3 is a section similar to Fig. 2, but at the raised position of the frame.

Fig. 4 is a detailed view of the guide rollers of the carriage.

Figs. 5 to 7 are diagrams illustrating the manner in which the frame is pivoted.

Fig. 8 is a detailed plan view of the detent mechanism with its fine adjustment gear.

Fig. 9 is a plan view of the stencil frame with the corresponding adjusting devices.

Fig. 10 is the corresponding end view.

Fig. 11 is an axial section of a fabric retaining piston.

Figs. 12 to 14 are diagrams illustrating the operation of the fabric retaining mechanism.

Fig. 15 is a side view of the ink distributing mechanism.

Fig. 16 is a transverse section thereof at the open position.

On both longitudinal sides of the table 1, Figs. 1 to 3, are disposed guide rails 2 and 3 on which runs a carriage 4. As shown in Figs. 2 to 4 rail 2 is a simple metal bar on which run plain cylindrical rollers 5 serving only as supports, while rail 3 is relatively thick and supports rollers 6 having but one lateral flange 7. Cylindrical rollers 8 with vertical axes complete the guiding ensured on one side by flange 7 as clearly shown in Fig. 4. The pivot 9 of rollers 8 is eccentrically carried by a spindle 10 screwed in a sleeve 11 forming part of carriage 4. It will be easily grasped that by turning more or less spindle 10, roller 8 may be moved nearer to rail 3 and consequently any play in the guiding may be taken up. A lock-nut 12 is provided for locking the final adjustment.

In front of rail 3 there is arranged an auxiliary rail 13, Fig. 2, made of thin metal and serving to carry detents 15 fixed by set screws 14. Fig. 8 shows the shape of detents 15. The carriage 4 has a longitudinal bar 16 (Figs. 1 and 8) on which slides a small auxiliary carriage 17 operable by a screw 18 the head 19 of which is axially retained in both directions by the main carriage. The auxiliary carriage 17 carries a blade spring 20, the

free end of which is provided with a stud 21 cooperating with recesses 22 in the pawl detents 15. It will be understood that if the detents are suitably disposed along rail 13, for instance by means of suitable gauges, the operator may, without need for special care, bring the carriage to all the positions previously marked off along the length of the table. It will be incidentally noted that no damage or misadjustment can result for the pawl mechanism from the carriage being roughly displaced, stud 21 merely travelling over the detent at which the careless operator intended to stop. Screw 19 permits, if necessary, of effecting any required correction without displacing detents 15, which is particularly desirable either when the colour is changed (the new stencil may not coincide with the previous one) or when the fabric 23 stretched over table 21 has moved.

In the example illustrated it is assumed, for the sake of clearness, that a stencil 24 is being used. No change is necessary when this stencil is replaced by a perforated plate.

Stencil 24 is held in a wooden frame 25. The latter (Figs. 1, 9 and 10) has two perforated lugs 26 on its side nearest to the operator, said lugs receiving pins 27 carried by a bar 28 pivotally connected at its middle 29 on a small carriage 30 transversely slidable under the action of a screw 31 in a second auxiliary carriage 32 movable over a bar 33 integral with the lifting mechanism described below. A set screw 34 permits of locking carriage 32 in position. The pivot 29 is locked by a milled nut 35. The opposite side of frame 25 is provided with two unperforated lugs 36 which, when the frame rests on the fabric 23, Fig. 3, are disposed slightly over a transverse bar 37 of the main carriage 4. Bar 37, Fig. 9, has two adjustable stops 38 permitting of preventing lateral displacement of lugs 36. It will be understood that these mechanisms permit of very exactly adjusting frame 25 in position on the main carriage 4.

The lifting mechanism disposed adjacent the operator comprises a longitudinal spindle 39 operated by a hand lever 40 provided with arms 41 connected by links 42 with carriages 43 movable in slides 44 forming part of the main carriage 4. The centre of curvature of slides 44 lies substantially along the lower edge of frame 25 opposite the operator. Carriages 43 carry the lifting bar 33 above referred to.

In normal operative position, Fig. 2, bar 33 is at such a height that bar 28 does not touch lugs 26. Frame 25 thus rests freely on the fabric as in hand working. When the operator moves lever 40 he raises carriages 43 and bar 33. Bar 28 therefore raises lugs 26 and thus causes frame 25 to pivot around the edge A, Fig. 5, opposite the operator. Lugs 36 (Fig. 5) are lowered and reach bar 37 (Fig. 6). From this moment frame 25 pivots around bar 37 (Fig. 7), edge A thus rising from the fabric and from table 1. Fig. 3 shows the position of the parts at the end of this lifting movement. The carriage is now freely movable to another position.

In order to retain the fabric on the table on the frame being lifted there are provided pegs 45, Figs. 1 and 11, mounted on transverse rods 46 fixed to sleeves 47 loose on a longitudinal bar 48 of the main carriage 4. Each peg 45 encloses a vertical rod 49 axially movable and having an enlarged head 50 pressed by a spring 51 in a vertical bore in the peg. It will be understood that spring 51 pushes head 50 towards the bottom of the bore thus causing the point of rod 49 to project downwards. When the pegs are lowered on the fabric their weight compresses springs 51 and ensures a regular pressure of rods 49 on the fabric. Pegs 45 are locked in position on rods 46 by means of set screws 52 and they are disposed so as to ensure a regular pressure.

Rods 46 terminate above the lifting bar 33. In operative position, Fig. 12, rods 49 bear on the table. When the operator operates the lifting lever 40 bar 33 moves over a considerable part of its stroke without touching rods 46, Fig. 13. This first movement corresponds to the separation of the stencil from the fabric. Then bar 33 raises rods 46 and pegs 45 thus clearing the fabric of rods 49.

Bar 48 also carries the dye or ink reservoir 53, Figs. 1, 15, 16. The latter has an inclined base 54 provided at its lowest portion with holes 55. These holes are normally closed by a slide 56 held against them by springs 57 which simultaneously force the slide 56 into its closing position. Links 58 connected at one end to slide 56 and at the other end to crank disks 59 keyed on an operating spindle 60 permit of opening slide 56 against the action of springs 57. Spindle 60, Fig. 1, terminates into an operating arm 61 connected to a connecting rod 62 which the operator can easily operate through the medium of an operating lever 63. It will be easily understood from Fig. 2 that as soon as holes 55 are uncovered the dye or ink falls into frame 25. The operator needs then only pass a scraper over the stencil to effect the printing.

As will be seen the machine according to the invention ensures an easy and rapid work and eliminates all risk of error or of incorrect positioning of the stencil. It permits the use of wide frames without requiring several operators to handle them while hitherto two men have been necessary to raise the frame due to the adhesion of the stencil to the fabric.

The main carriage 4 is preferably made of metal tubes as shown. These tubes are assembled together and with the other parts of the mechanism by bends, sleeves, etc. This construction permits with a limited stock of parts, of forming every size of carriage by cutting off the tubes to the proper lengths. The parts themselves are secured on the tubes either by locking collars or by set screws, which does not involve any particular machining of the tubes.

I claim:—

1. A machine for printing designs on fabrics comprising a table to stretch the fabric thereon; a carriage movable along said table; rails on both sides of said table to guide and support said carriage; means to stop the carriage at a number of adjustable positions along said table; a perforated printing surface carried by said carriage; and means on said carriage to raise said perforated printing surface.

2. A machine for printing designs on fabrics comprising a table to stretch the fabric thereon; a carriage movable along said table said carriage having on one side plain cylindrical supporting wheels and on the other side supporting wheels provided with a lateral flange; rails on both sides of said table to support said wheels; vertically pivoted wheels in the vicinity of said flanged wheels, said vertically pivoted wheels contacting the lateral face of the next rail opposed to the flange of said flanged wheels; means to stop the carriage at a number of adjustable positions along said table; a perforated printing surface carried by said carriage; and means on said carriage to raise said perforated printing surface.

3. A machine for printing designs on fabrics comprising a table to stretch the fabric thereon; a carriage movable along said table; means to guide and support said carriage; means to stop said carriage at a number of adjustable positions along said table; a frame mounted on said carriage; a perforated printing surface fixed to said frame; means on said carriage to raise one side of said frame; and means to pivot the opposite side of said carriage at first along the corresponding frame edge in contact with the fabric on said table, and afterwards along an axis situated beyond said frame edge.

4. In a machine as claimed in claim 3, said frame having lugs at its pivoting side, said lugs extending beyond said side and passing slightly over said carriage at the lowered position of said frame but forming pivoting means in contact with said carriage during the last period of the raising motion of said frame.

5. A machine for printing designs on fabrics, comprising a table to stretch the fabric thereon; a carriage movable along said table; rails on both sides of said table to guide and support said carriage; means to stop the carriage at a number of adjustable positions along said table; a frame mounted in said carriage; perforated lugs transversely projecting from one lateral side of said carriage; a longitudinal bar movably supported by said carriage; means to raise and lower said bar; pins adjustably carried by said longitudinal bar, said pins cooperating with the holes of said perforated lugs; unperforated lugs projecting from the opposite side of said frame; a longitudinal bar fixed to said carriage and passing slightly beneath said unperforated lugs at the lowered position of said frame but contacting said unperforated lugs during the last part of the raising motion of said frame; and a perforated printing surface mounted in said frame.

6. In a machine as claimed in claim 5, said means to raise and lower said movable longitudinal bar comprising auxiliary carriages fixed to both ends of said movable bar; slides fixed to the main carriage for co-operation with said auxiliary carriages; a hand-actuated longitudinal spindle; arms keyed on said spindle; and rods connecting said arms with said auxiliary carriages.

7. In a machine as claimed in claim 5, adjustable flanged collars on said second-named immovable longitudinal bar, said flanged collars forming lateral abutments to axially maintain said unperforated lugs.

8. In a machine as claimed in claim 1, said means to stop the carriage comprising an auxiliary rail along said table; detents adjustable along said auxiliary rail; a spring blade fixed to said carriage; and a stud at the free end of said spring blade, said stud being arranged for successive cooperation with said detents.

9. In a machine as claimed in claim 1, fabric retaining means adapted to press the fabric on the table along the front and rear edges of the perforated printing surface; and means to raise said fabric retaining means.

10. In a machine as claimed in claim 5, fabric retaining means adapted to press the fabric on the table along the front and rear edges of the frame; and transverse rods pivoted to the carriage and adapted to raise said fabric retaining means, said transverse rods being arranged to be actuated by the longitudinal frame-raising movable bar at the end of the frame raising motion.

11. In a machine of the character described a table for the fabric to be stretched thereon; a carriage movable along said table; means to support and guide said carriage; a perforated printing surface mounted in said carriage; means to raise said perforated printing surface; and fabric retaining members comprising rods pivoted to the carriage along a longitudinal axis; substantially vertical spring-pressed rods carried by said rods; and means to raise said pivoted rods and thereby said spring-pressed rods.

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