No. 636,071. Patented Oct. 31, 1899.

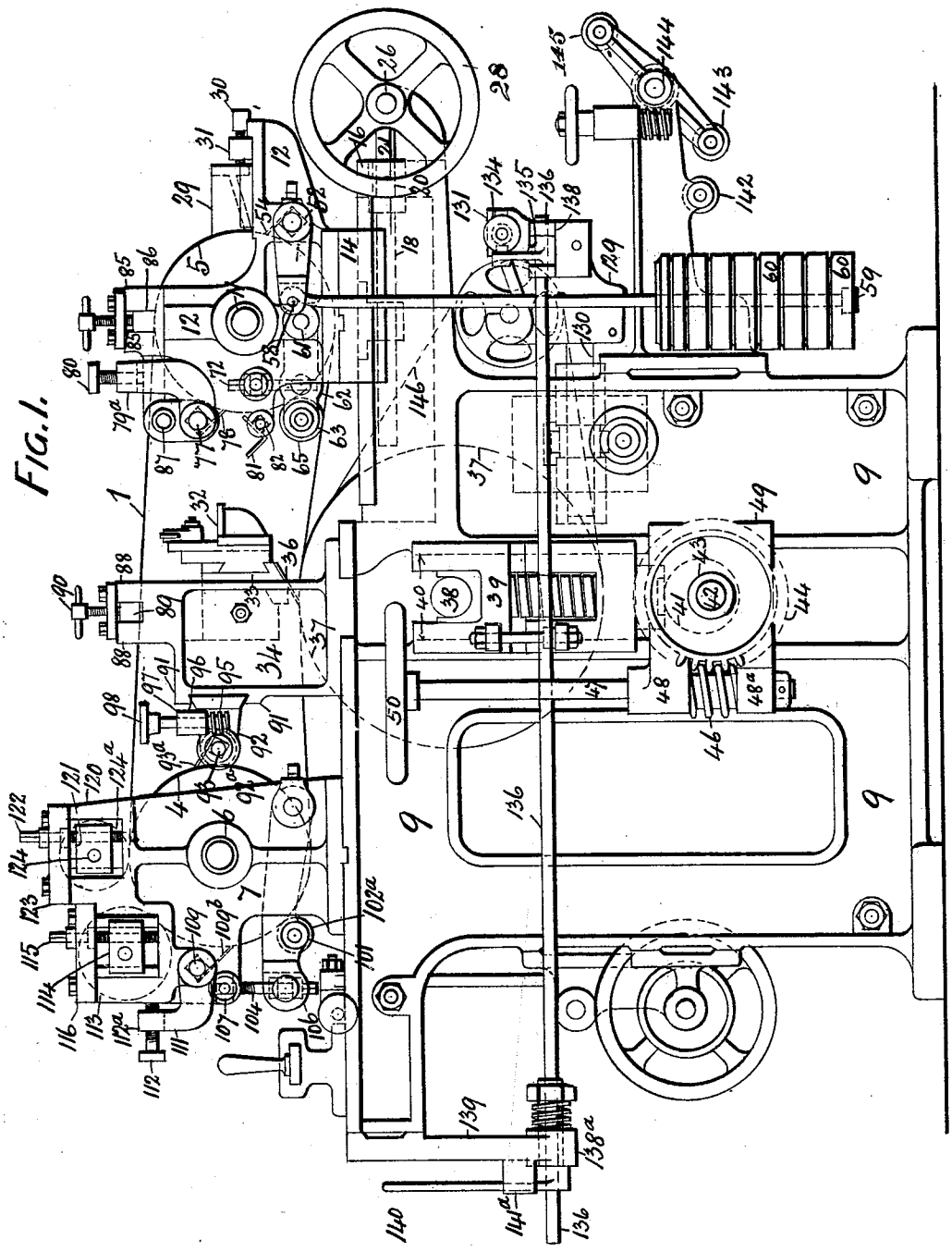
S. H. SHARP.

STENCIL PRINTING MACHINE.

(Application filed Apr. 1, 1899.)

(No Model.) 5 Sheets—Sheet 1.

FIG. 1.



Witnesses:
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Edwin Craven

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Samuel Holt Sharp
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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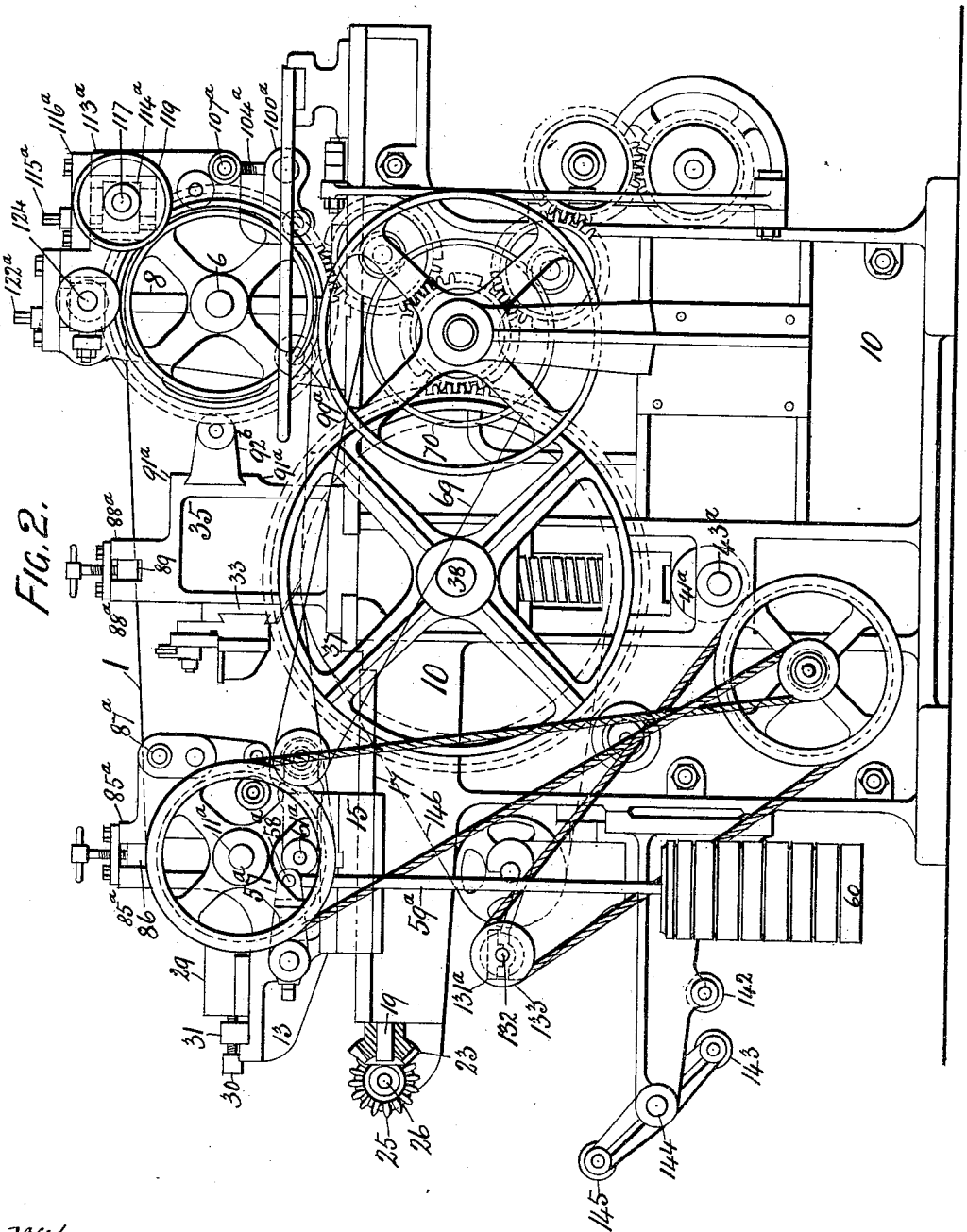
STENCIL PRINTING MACHINE.

(Application filed Apr. 1, 1899.)

(No Model.)

5 Sheets—Sheet 2.

FIG. 2.



Witnesses:
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(No Model.) 5 Sheets—Sheet 3.

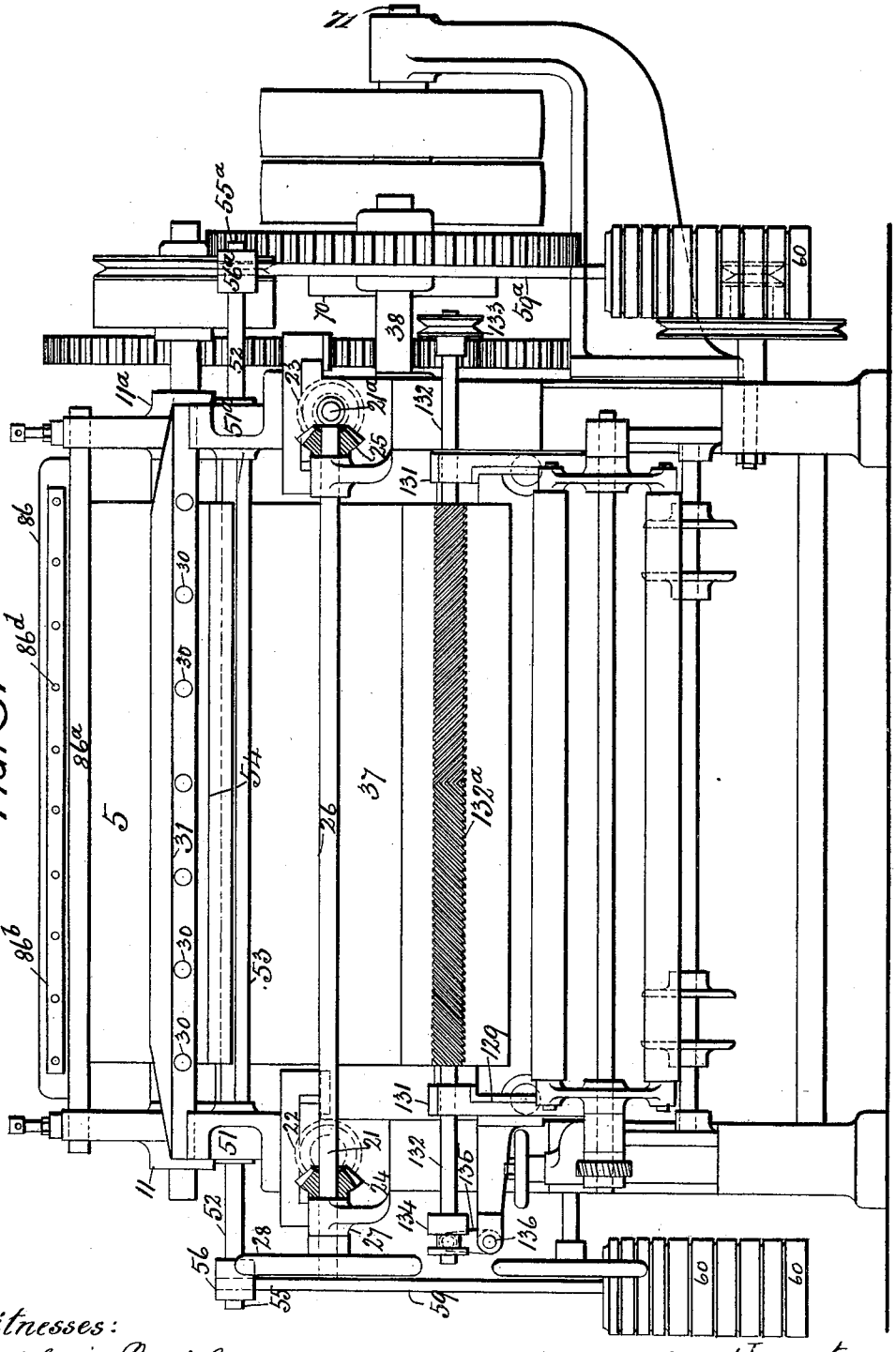


FIG. 3.

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S. H. SHARP.

STENCIL PRINTING MACHINE.

(Application filed Apr. 1, 1899.)

(No Model.) 5 Sheets—Sheet 4.

FIG. 4.

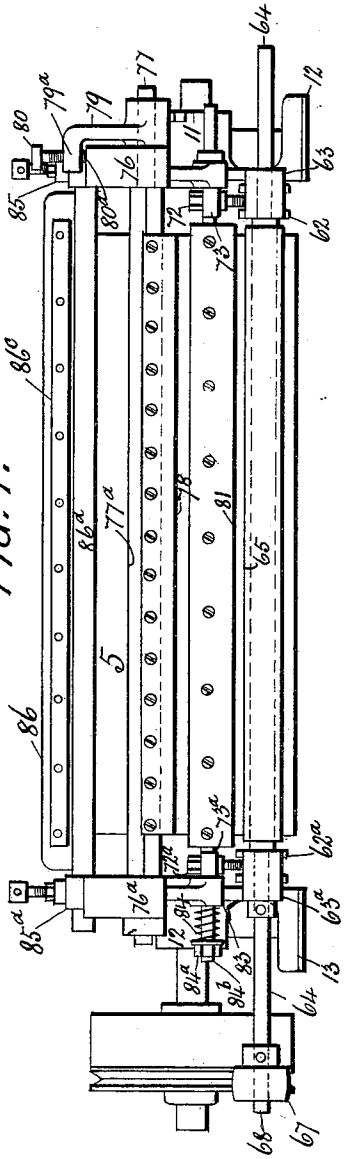


FIG. 6.

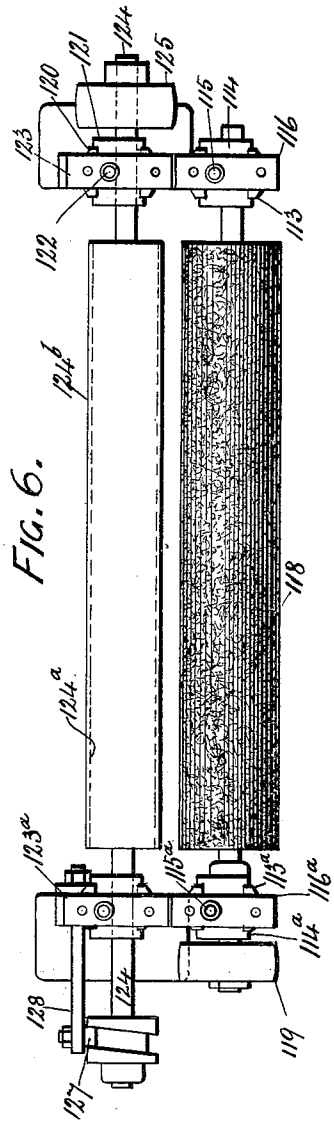


FIG. 7.

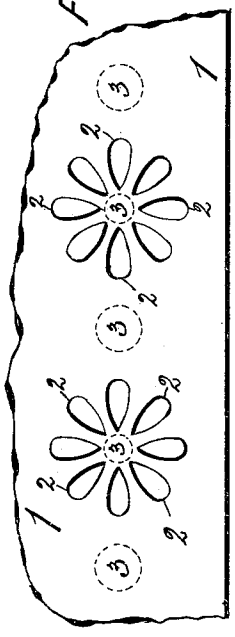
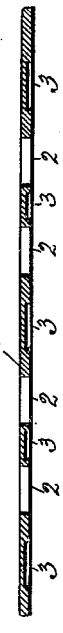


FIG. 8.



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No. 636,071. Patented Oct. 31, 1899.

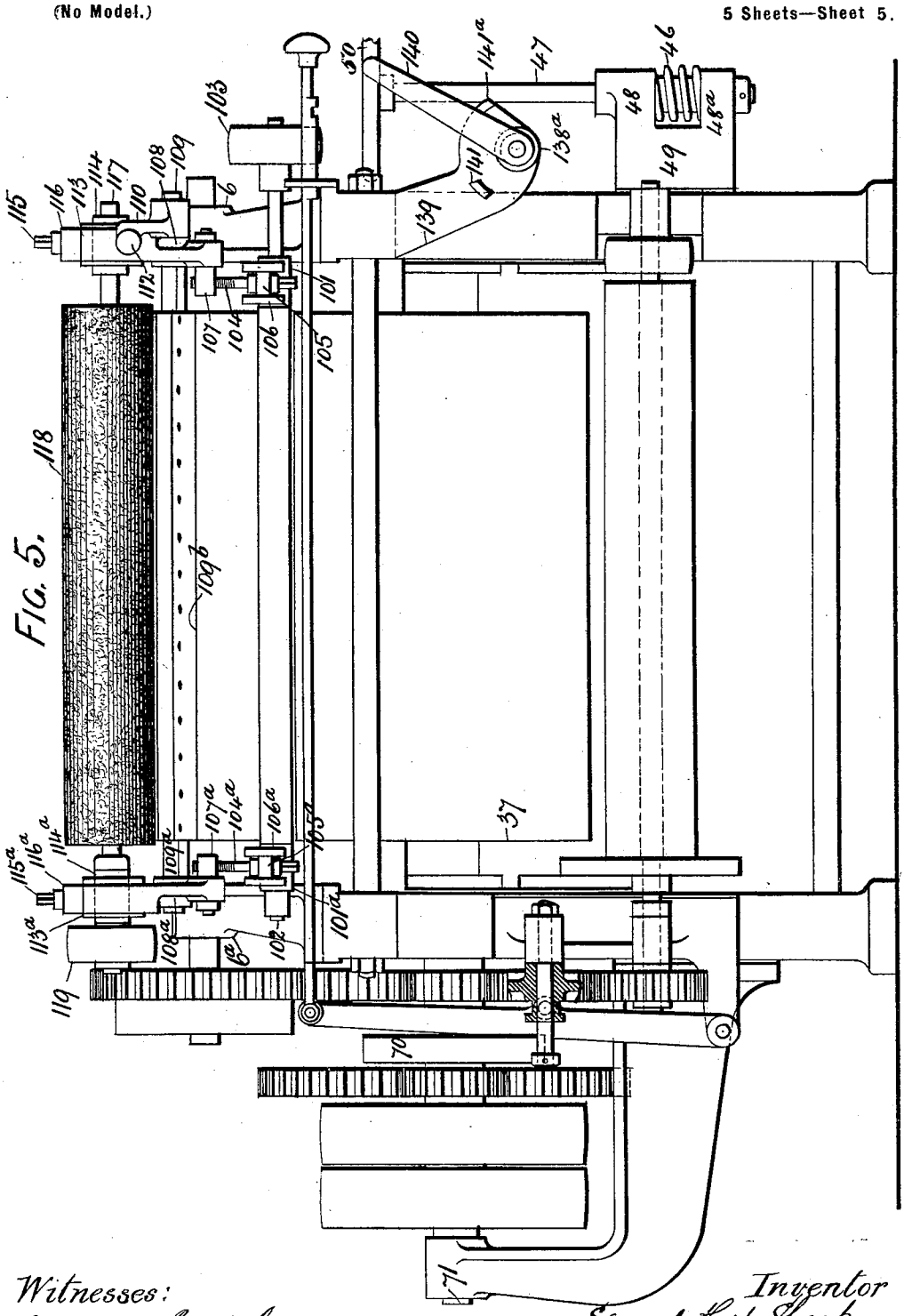
S. H. SHARP.

STENCIL PRINTING MACHINE.

(Application filed Apr. 1, 1899.)

(No Model.) 5 Sheets—Sheet 5.

FIG. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

SAMUEL HOLT SHARP, OF LEEDS, ENGLAND.

STENCIL-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 636,071, dated October 31, 1899.

Application filed April 1, 1899. Serial No. 711,443. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HOLT SHARP, a subject of the Queen of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented Improvements in Stencil-Printing Textile Fabrics in Colors, of which the following is a specification.

This invention relates to improvements in stencil-printing designs or patterns on textile or woven fabrics in two or more colors, and has for its object to insure accurate alinement or registering of the colors comprising such a design or pattern. For this purpose according thereto the complete pattern is printed in one printing operation by means of one or more endless stencil plates, strips, or bands that is formed or each formed with perforations that pass completely through it and correspond to one color of the design or pattern and at one side or surface with indentations or recesses that extend only partly through it and correspond to another color of the pattern or design. The endless stencil plate, strip, or band (hereinafter called a "stencil-plate") or each such plate thus formed is mounted upon suitable rollers and is supplied with color from suitable ducts or reservoirs provided upon a machine of suitable construction, such as that hereinafter described.

The accompanying illustrative drawings show a stencil-printing machine embodying this invention.

Figure 1 is a front elevation; Fig. 2, an elevation of the rear or driving side; Fig. 3, a view of the feeding-in end of the machine, and Fig. 4 a back view of a portion of the machine. Fig. 5 is a rear end view of the machine, and Fig. 6 a plan of a portion thereof hereinafter more particularly referred to. Figs. 7 and 8 show, respectively, in plan and longitudinal section a portion of a metallic stencil-printing plate according to this invention.

1 is an endless metallic stencil-plate that may be formed of a strip of metal of suitable length and breadth bent to shape and having its ends brazed or soldered together and the joint afterward reduced to the thickness of the remainder of the plate or be made by the electrodeposition of a suitable metal on a cylindrical mandrel or core. The stencil-plate has perforations 2 formed through its thickness, and indentations or recesses 3 are also formed therein at one side.

The stencil-plate 1 is mounted on metal rollers 4 and 5. The roller 4 is mounted in bearings 6 6^a in the brackets 7 8, secured to the main frames 9 10 of the machine, and the roller 5 is mounted in bearings 11 11^a in the brackets 12 13, secured to saddles 14 15, which can be simultaneously moved on slides 16 17 by means of screws 18 19, revolving in bearings 20 20^a in the ends of the slides 16 17. The screws 18 19 have secured on their ends 21 21^a bevel gear-wheels 22 23, which gear with other bevel gear-wheels 24 25, secured to a cross-shaft 26, mounted in bearings 27 27^a on the frames 9 10. The cross-shaft 26 is rotated when desired by the hand-wheel 28.

29 is an ink-duct mounted on brackets 12 13 and capable of adjustment thereon toward and away from the roller 5 by means of screws 30, rotating in the setting-up bar 31. 32 is another ink-duct attached to the beam 33, secured to the brackets 34 35. The beam 33 is provided with a flexible presser 36, which acts on the pressing-cylinder 37. This pressing-cylinder 37 is mounted on a shaft 38, which rotates in bearings 39 39^a, vertically adjustable in guides 40 40^a on the main frames 9 10. The bearings 39 39^a, with cylinder 37, are moved toward and away from the flexible presser 36 by means of eccentrics 41 41^a, secured on a shaft 42, mounted in bearings 43 43^a. A worm-wheel 44, secured on the outer projecting end 45 of the shaft 42, receives motion from a worm 46, secured to a vertical shaft 47, mounted in bearings 48 48^a on the bracket 49. 50 is a hand-wheel for rotating the shaft 47.

Below the ink-duct 29 there is mounted in bearings 51 51^a a shaft 52, having a square part 53, to which is secured a scraper 54. On the outer projecting ends 55 55^a of the shaft 52 there are secured levers 56 56^a, having forked ends 57 57^a, provided with pins 58 58^a, on which are hung rods 59 59^a. These rods 59 59^a suspend slip-weights 60, that furnish the required pressure to the scraper 54.

To the inner side of each bracket 12 13 there are secured studs 61 61^a, on which are mounted arms 62 62^a, the outer ends of which are furnished with bearings 63 63^a for the shaft 64 of a felt-covered roller 65.

67 is a pulley secured on the end 68 of the shaft 64 and driven by a strap 69 from a pulley 70 on the main driving-shaft 71 of the machine.

The felt-covered roller is moved toward and away from the stencil-sheet 1 by means of screws 72 72ª, which are mounted in oscillating bearings 73 73ª, turning in swiveling nuts 75 75ª, secured to the arms 62 63. A shaft 77 is mounted in bearings 76 76ª on the brackets 12 13, and on the square part 77ª thereof is secured, by means of screws, a scraper 78. To one end of the shaft 77 is secured a lever 79, one of its ends forming a nut 79ª, in which can turn a thumb-screw 80, the end 80ª of which bears against the side of the bracket 12 and so causes the scraper 78 to bear against the roller 5. Below the scraper 78 is a trough or spout 81, secured to the square part 82 of the shaft 82ª, which is carried in bearings 83 83ª and can be angularly adjusted and kept in position by means of the spring 84 and nut 84ª on one of its ends 84ᵇ.

85 85ª are guides in which is placed the cleaning-bar 86, covered at its lower part 86ª with felt, secured thereto by plates 86ᵇ 86ᶜ and screws 86ᵈ. The brackets 12 13 are also provided with bearings 87 87ª, in which may be mounted the shaft of a guide-roller when the machine is required to print strips.

88 88ª are guides formed in the brackets 34 35, in which is placed a cleaning-bar 89, similar to the one above described, and which is capable of being set up to the stencil-plate by means of set-screws 90 90ª. On the back of the brackets 34 35 are parallel V-shaped guides 91 91ª, in which the slide 92, having bearings 92ª 92ᵇ, can slide. The bearings carry the shaft 93 with its scraper 93ª, which is moved by means of a worm-wheel 94 on a shaft 93, gearing with a worm 95 on a shaft 96, which is carried in bearings 97, and is moved by means of a hand-wheel 98.

99 99ª are studs secured to the inner sides of the brackets 7 8 and on which are mounted arms 100 100ª, provided with bearings 101 101ª. 102 is a shaft mounted to rotate in the said bearings and having formed on it the damping-roller 102ª, covered with felt. The shaft 102 on one of its ends has secured to it a pulley 103, which receives motion from another pulley on a counter-shaft. The arms 100 100ª are capable of adjustment toward and away from the roller 4 by means of screws 104 104ª, mounted in swiveling bearings 105 105ª in the forked ends 106 106ª of the arms 100 100ª and screwing into oscillating nuts 107 107ª on the brackets 7 8.

108 108ª are bearings in the brackets 7 8, in which is mounted a shaft 109, having a square part 109ª, on which is secured a scraper 109ᵇ, which is pressed against the roller 4 by means of a lever 110, having at its end 111 a screw 112, turning in a nut 112ª, the said screw being arranged to push against the side of the bracket 7.

113 113ª are parallel guides formed in the brackets 7 8, in which sliding bushes 114 114ª, movable up and down by means of screws 115 115ª, are mounted and retained in position by the caps 116 116ª. 117 is a shaft which rotates in the bushes 114 114ª and on which is secured a brush 118. 119 is a pulley for driving the shaft 117. In similar parallel guides 120 120ª, formed in the same brackets, there are mounted similar sliding bushes 121 121ª, moved by screws 122 122ª and retained by caps 123 123ª.

124 is a shaft which is mounted and rotates in the bushes 121 121ª and to which is secured the wiping or cleaning roller 124ª, covered with felt 124ᵇ. On one end of the shaft 124 is secured a driving-pulley 125, and on the other end is secured a cam 126, formed on its periphery with a cam-groove, between the faces of which there works a fixed stud 127, carried by an arm 128, secured to the bracket 8.

On the brackets 139 139ª of the blanket-extending arms 130 130ª are provided bearings 131 131ª, in which is mounted a shaft 132 with a right and left handed screw-threaded spreading-roller 132ª.

133 is a driving-pulley on one end of the shaft 132, and on the other end thereof is secured a grooved boss 134 for moving the spreading-roller 132ª endwise by means of a lever 135, secured to a shaft 136 and provided with a stud 137, taking into the groove in the said boss.

The shaft 136 extends along the front of the machine and is mounted in a bearing 138ª, secured to the main frame of the machine, and in a forked bearing 138, secured to the bracket 139. A hand-lever 140 is secured to the shaft 136 by means of a sliding feather or key and is used to rock the shaft, its movement in either direction being limited by stop-pieces 141 and 141ª on the bracket 139. By moving the hand-lever 140 in either direction the spreading-roller 132ª, with its shaft 132, can be moved endwise in the bearings 131 131ª toward either side of the machine. The shaft 136, being secured in the forked bearing 138 by the lever 135, is caused on the bracket 139 being moved toward or away from the cylinder 37 to move endwise in the bearing 138ª.

The spreading-roller 132ª, which revolves in the opposite direction to the feed of the material into the machine, causes by its right and left handed screw-threads, which extend from the center to each end of the roller, any creases there may be in the material to be taken out before the same passes onto the blanket, and thus insures the material being printed evenly.

The endwise movement of the roller 132ª enables the material to be moved sidewise in the machine, so as to insure that it will be printed the required distance from the edges of the material.

The material to be printed is passed over the roller 142, under the tension-roller 143, over the shaft 144, and under and over the

tension-roller 145, then over the spreading-roller 132ª, which takes out any creases there may be in the material, the said roller being capable of movement to either side of the machine, so as to enable the material to be placed in the required position. The material then passes onto the blanket 146 and under the presser 36, the required pressure being then put on it by raising the cylinder 37. The traveling stencil-plate 1 on passing the ink-duct 29 has its perforations 2 and indentations or recesses 3, which form the pattern to be printed, filled with one color of ink or composition and on passing the scraper 54 is relieved of any surplus ink. The ink in the indentations or recesses 3 is carried forward by the stencil-plate; but that which entered the perforations 2 of the said stencil-plate is left on the roller 5, from which it is removed by the scraper 78, and as it accumulates it drops off into the trough or spout 81, thus leaving the perforations 2 empty. The inner or upper surface of the lower length of the stencil-plate is cleaned of any color thereon by the revolving roller 65, and the perforations are again filled with another-colored ink or composition supplied from the second ink-duct 32. On the stencil-plate and material passing together between the presser 36 and the cylinder 37 and blanket 146 the ink or composition in both the perforations 2 and indentations or recesses 3 is imprinted on the material. The material then leaves the stencil-plate and is carried away, as usual. The stencil-plate passes under and around the back roller 4, where it is first damped or wetted with turpentine or other fluid by the revolving felt-covered roller 102ª, then the color is removed off by the scraper 109ᵇ, the semi perforations or recesses are brushed out clean by the revolving brush 118 and finally wiped dry and perfectly clean by the revolving wiper 124ª and following cleaners, when it passes forward again to the first ink-duct 29.

It will be understood that each stencil plate or strip can be used for printing two colors, and by arranging a number of strips side by side a great variety of color effects can be produced, or the color-ducts may be so divided into compartments as to supply various colors to different widths of the stencil-plate; also, when several stencil-plates are arranged side by side they may be placed a short distance apart and colored ink or composition fed to the longitudinal space between adjacent bands.

What I claim is—

1. In a machine for printing fabrics in colors a stencil-plate having perforations therethrough corresponding in shape to parts of the pattern or design to be printed in one color, and recesses at one side thereof corresponding to other parts of the pattern or design to be printed in a different color, means for charging the said perforations and recesses with compositions of the respective colors and means for transferring the compositions to the fabric to be printed.

2. In apparatus for printing fabrics in colors, an endless stencil-plate having perforations therethrough corresponding to parts of the pattern or design to be printed in one color and with recesses at one surface thereof corresponding to other parts of the pattern or design to be printed in a different color, means for respectively supplying composition of one color to the recessed side of the stencil-plate, means for withdrawing such composition from the perforations therein, means for replacing it with composition of a different color, means for operating the plate, means for transferring the compositions from the plate to the fabric to be printed, and means for cleaning the said plate preparatory to receiving fresh composition, substantially as described.

3. In a fabric-color-printing machine, the combination of a traveling pattern-plate having perforations therethrough corresponding to the parts of the pattern to be printed in one color and with recesses at one side thereof corresponding to another part of the pattern to be printed in a different color, means for supplying color to the recesses in one side of said plate, a rotating presser coacting with the pattern-plate, a flexible presser arranged on the opposite side of said pattern-plate, and means for depositing composition on the opposite side of said pattern-plate in rear of said presser, as set forth.

4. In a fabric-color-printing machine, the combination of an endless traveling pattern-plate having perforations therethrough and recesses in one side thereof, means substantially as described for supplying color to the recesses in said plate, means substantially as described for depositing color in the perforated part of said plate, a presser acting to force the color into the said perforations, and a presser on the opposite side of the pattern-plate to receive the fabric and force it into the recesses and perforations of said plate, substantially as described.

5. In a fabric-color-printing machine, the combination of a rotating pressing-cylinder, a presser arranged opposite and coacting with said rotary pressing-cylinder, an endless pattern-plate arranged to travel between the cylinder and presser and formed with perforations therethrough and recesses in one side thereof, means for feeding compositions of different colors to the perforations and recesses respectively, and means for feeding the fabric between the cylinder and pattern-plate, substantially as described.

6. In a fabric-color-printing machine, the combination of a traveling pattern-plate having perforations therethrough and recesses in one side thereof, a transverse presser bearing on the upper surface of the plate, a printing-composition reservoir arranged to deliver color to one side of the plate so as to charge both the perforations and recesses therein

with printing composition of one color, means for afterward removing the color from the perforations, a second reservoir arranged just in rear of said presser and so as to deposit printing composition of another color across the plate so that the presser can force the same into the perforations in the plate and means for subsequently cleaning the said plate before again passing to the first reservoir, substantially as described.

7. In a fabric-color-printing machine, the combination of upper and lower coacting pressers, two parallel guide-rollers, an endless pattern-plate arranged to travel between said pressers and around said guide-rollers, and formed with perforations therethrough and recesses in one side thereof, a reservoir arranged adjacent to one of said guide-rollers and on the outer side of said pattern-plate and adapted to supply printing composition to the perforations and recesses in said plate, an adjustable scraper arranged below said reservoir and so as to scrape color off the outer surface of said plate but not from the recesses therein, an adjustable rotary cleaning-roller arranged to clean the inner surface of the pattern-plate after the same has passed from under the last-mentioned guide-roller, a second reservoir arranged to deposit printing composition upon and across the perforated lower part of the pattern-plate in rear of the upper presser, and means for cleaning the pattern-plate after leaving the pressers and before again receiving color, substantially as described.

8. In a fabric-color-printing machine, the combination of upper and lower coacting pressers, two parallel guide-rollers, an endless pattern-plate arranged to travel between said pressers and around said guide-rollers and formed with perforations therethrough and recesses in one side thereof, a reservoir arranged adjacent to one of said guide-rollers and on the outer side of said pattern-plate and adapted to supply printing composition to the perforations and recesses in said plate, a second reservoir arranged to deposit printing composition upon and across the perforated lower part of the pattern-plate in rear of the upper presser, a scraper and cleaning-roller arranged between the two reservoirs and adapted to clean the outer and inner surfaces respectively of said plate, a scraper adapted to remove color from the first guide-roller, a trough arranged below said last-mentioned scraper, a damping-roller whereby turpentine can be applied to the outer surface of that part of the pattern-plate that has been used for printing, a scraper arranged to subsequently act upon the wetted surface of the plate, a rotary brush adapted to brush the outer surface of the plate and the perforations and recesses therein while the plate is passing around the second guide-roller, a cleaning-roller and cleaning-bars adapted to subsequently wipe the brushed surface of the plate, and a scraper arranged to act upon the surface of the second roller after the pattern-plate has left it, substantially as described.

9. In a fabric-color-printing machine, the combination of an endless traveling blanket, rolls on which the blanket is mounted, an endless traveling pattern-plate coacting with the blanket, a presser thereon opposite one of said rolls, means for supplying printing composition to said plate, and an endwise-movable spreading-roller arranged transversely at the feeding end of said blanket and provided with right and left handed screw-threads, substantially as described for the purpose specified.

Signed in the city of Leeds, in the county of York, England, this 17th day of March, 1899.

SAMUEL HOLT SHARP.

Witnesses:

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