

(No Model.)

8 Sheets—Sheet 1.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537.

Patented Nov. 26, 1895.

Fig. 1.

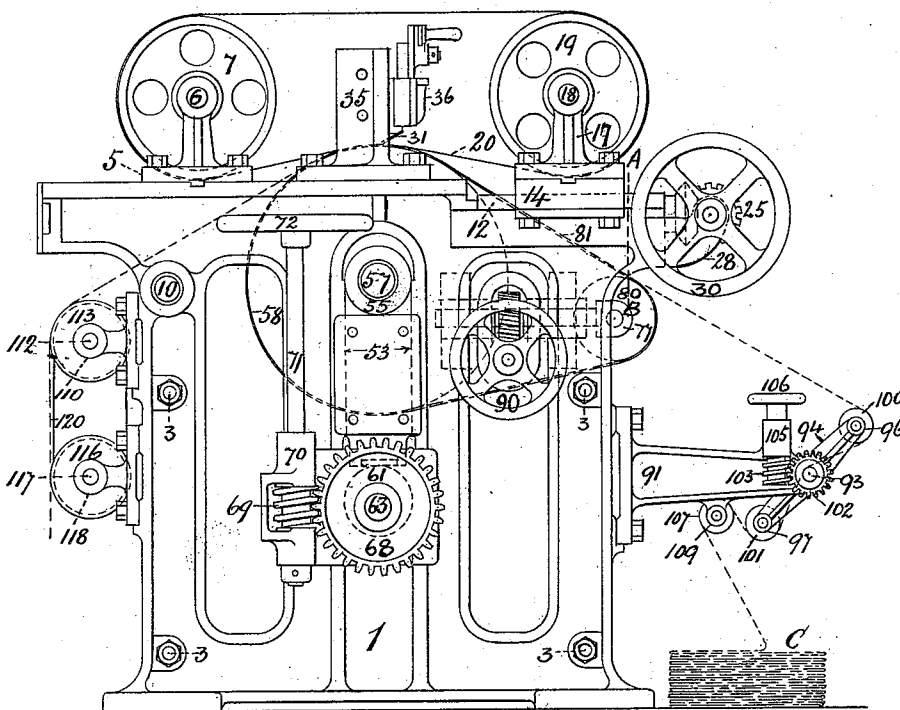


Fig. 10.

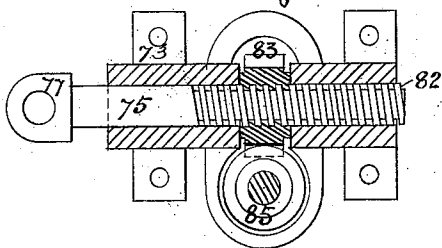
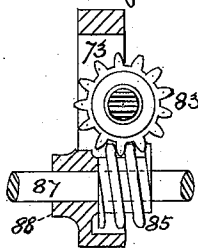


Fig. 11.



Witnesses
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(No Model.)

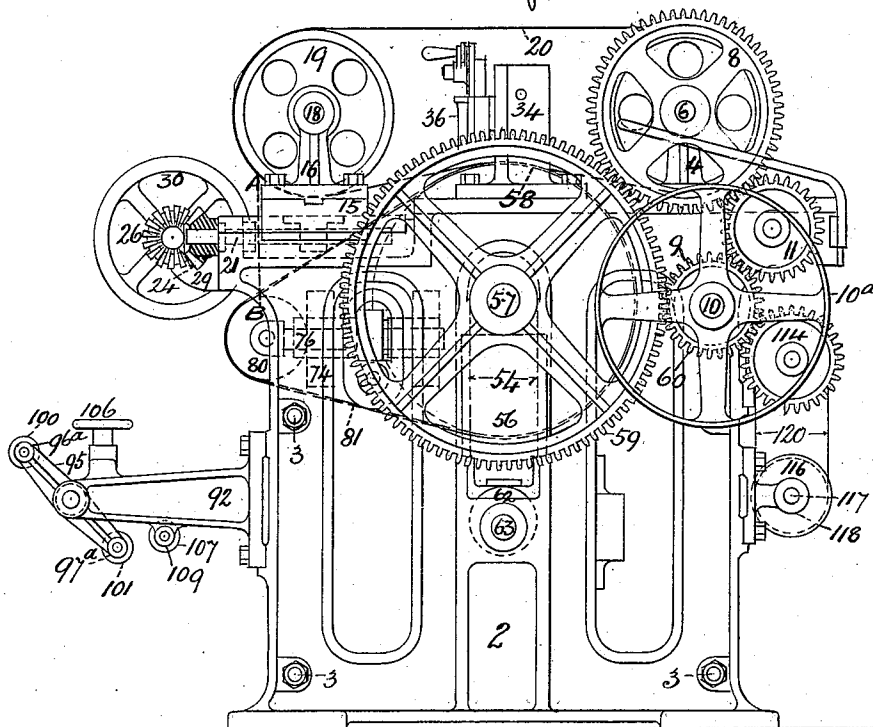
6 Sheets—Sheet 2.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537

Patented Nov. 26, 1895.

Fig. 2



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(No Model.)

6 Sheets—Sheet 3.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537.

Patented Nov. 26, 1895.

Fig. 3.

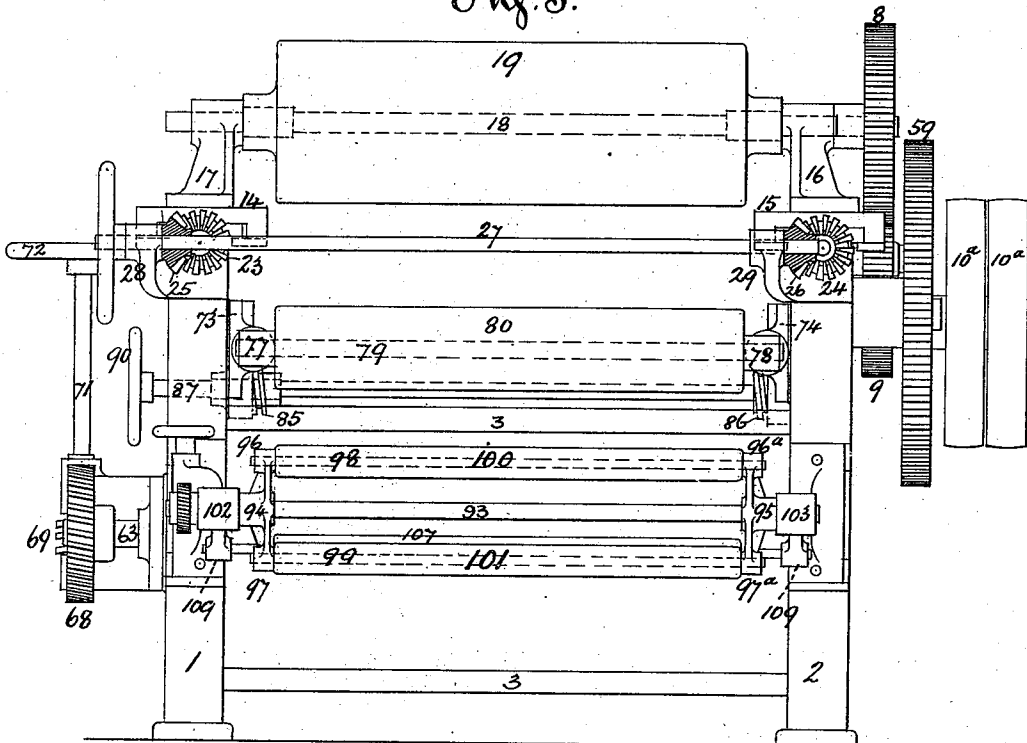
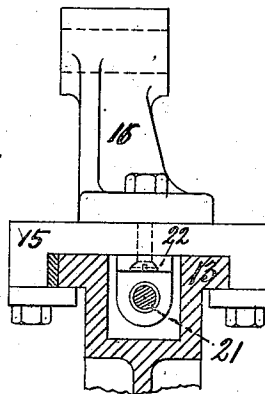


Fig. 9.



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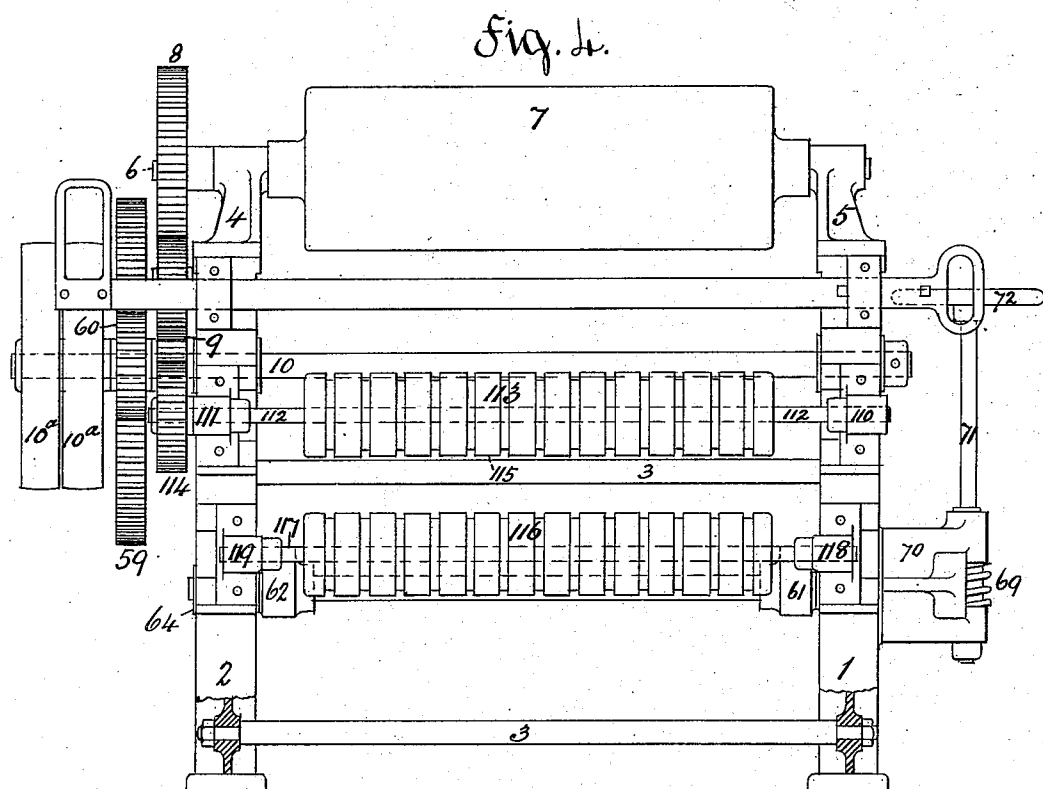
(No Model.)

6 Sheets—Sheet 4.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537.

Patented Nov. 26, 1895.



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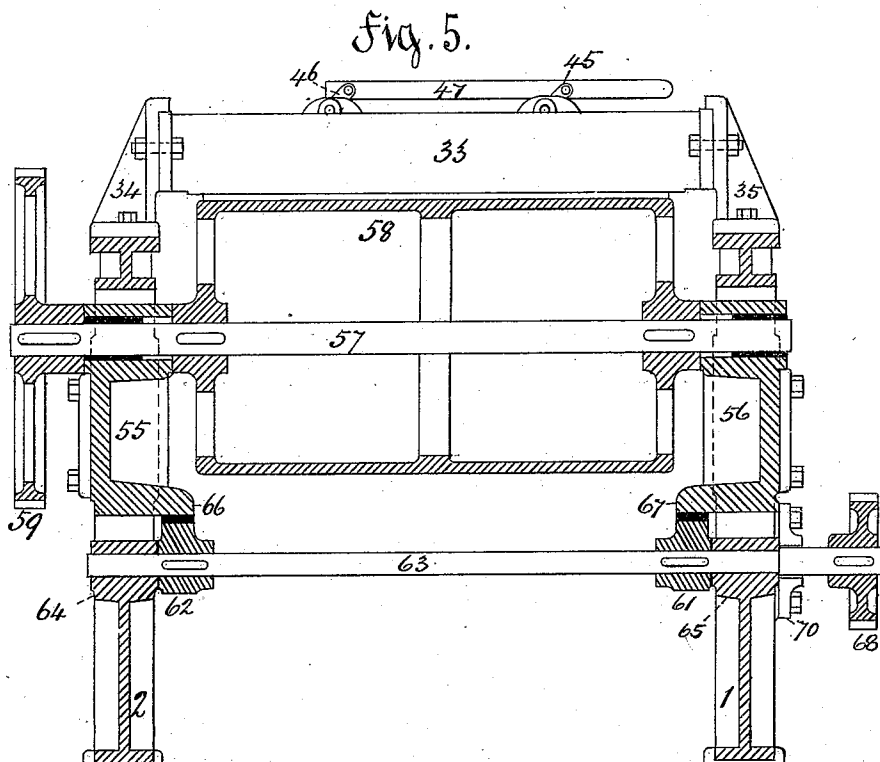
(No Model.)

6 Sheets—Sheet 5.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537.

Patented Nov. 26, 1895.



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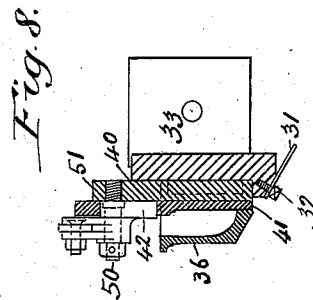
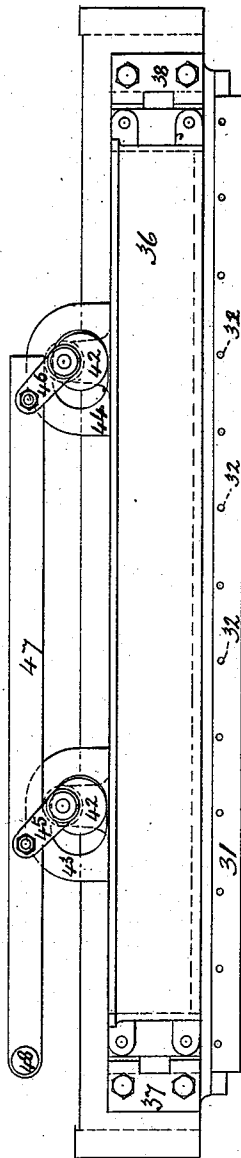
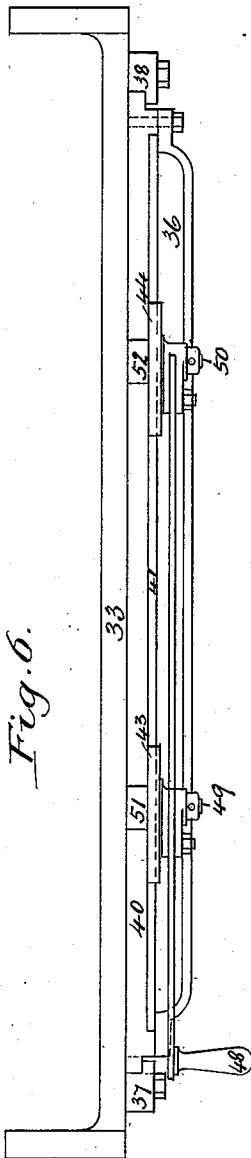
(No Model.)

6 Sheets—Sheet 6.

S. H. SHARP.
FABRIC PRINTING MACHINE.

No. 550,537.

Patented Nov. 26, 1895.



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UNITED STATES PATENT OFFICE.

SAMUEL HOLT SHARP, OF LEEDS, ENGLAND.

FABRIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 550,537, dated November 26, 1895.

Application filed February 16, 1895. Serial No. 538,655. (No model.) Patented in England December 6, 1894, No. 23,741; in France January 29, 1895, No. 244,700; in Belgium February 4, 1895, No. 113,952; in Austria May 23, 1895, No. 1,806, and in Hungary June 7, 1895, No. 2,901.

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 new and useful Fabric-Printing Machines, (for which Letters Patent have been obtained in England, No. 23,741, dated December 6, 1894; in France, No. 244,700, dated January 29, 1895; in Belgium, No. 113,952, dated February 4, 1895; in Austria, No. 1,806, dated May 23, 1895, and in Hungary, No. 2,901, dated June 7, 1895,) of which the following is a specification.

The object of my invention is to produce designs on textile and felted fabric or the like (hereinafter referred to as a "fabric") by means of an endless pattern-sheet by passing the said fabric, along with the said endless sheet on one side and an endless blanket on the other, between a pressing-cylinder and a fixed presser, the arrangement being such that the pressure of the cylinder against the presser forces the blanket and fabric partly into the orifices of the patterns in the endless pattern-sheet, while composition from the reservoir is supplied to the latter, which while passing under the fixed presser forces the composition into the fabric projecting in the orifices in the endless pattern-sheet, the superfluous composition being constantly kept on the pattern-sheet in front of the presser. I attain this object by machinery illustrated in the accompanying drawings, wherein—

Figures 1 and 2 are front and back elevations, respectively, of a printing-machine according to this invention. Figs. 3 and 4 are elevations of the feeding and delivery ends, respectively, of the said machine; and Fig. 5 is a central cross-section thereof. Figs. 6 to 11, inclusive, are detail views drawn to a larger scale and referred to more particularly hereinafter.

The machine comprises two frames 1 and 2, firmly secured together at a suitable distance apart by bolts 3. On these frames are secured bearings 4 and 5, in which is mounted a shaft 6, carrying a roller 7 and adapted to be rotated by means of a toothed wheel 8 in gear with a toothed wheel 9 on the driving-

shaft 10 through an intermediate wheel 11. At the feeding end of the machine the frames 1 and 2 are provided with parallel horizontal slides 12 and 13, Figs. 1, 2, and 3, and shown in part cross-section on line A B in Fig. 9, on which are mounted saddles 14 and 15, carrying bearings 16 and 17, in which is mounted a shaft 18, with a roller 19 fixed thereon. Around this roller and the roller 7 is carried an endless metallic pattern-sheet 20, which can be tightened or slackened at will by means of the saddles 14 and 15, which, with their rollers 19, can be caused to advance toward and recede from the roller 7 by means of screws 21, Figs. 2 and 9, which are arranged to be turned simultaneously in nuts 22, fixed to the saddles 14 and 15, miter-wheels 23 and 24, Figs. 1, 2, and 3, fixed on the outwardly-projecting ends of the screws 21 and gearing into miter-wheels 25 and 26, respectively, on a cross-shaft 27, which is carried by bearings 28 and 29 on the frames 1 and 2 and is provided with a hand-wheel 30.

31 is a presser, which is arranged between the upper and the lower portions of the endless pattern-sheet 20 and also between the rollers 7 and 19. This presser and its appurtenances are shown separately and to a larger scale in Figs. 6, 7, and 8, which are a plan, an elevation, and a cross-section, respectively, thereof. The presser 31, which is a sheet-metal strip (preferably a blade of spring-steel) having a blunt edge, is secured by screws 32 to a stock 33, which is carried by brackets 34 and 35. To the stock 33 at the feeding side thereof is attached the reservoir 36, containing the printing composition.

Arrangements are provided, such as clips 37 and 38, to enable the reservoir 36 to be readily removed from its position and again secured therein. Extending through the open end 39 of this reservoir and adjacent to the rear wall 40 thereof is arranged a vertically-movable slide 41, which is arranged to work in suitable guides, and is adapted in ascending to open an orifice in the bottom of the reservoir and in descending to force there-through a quantity of composition and to deliver the same upon the pattern-sheet 20 and the fabric under treatment, finally closing the

said orifice. The vertical motion of the slide 41 is produced by means of a pair of eccentrics 42, which work in slotted extensions 43 and 44 of the slide 41, and to which are fixed arms 45 and 46, connected to a bar 47, provided with a handle 48. The eccentrics 42, with their arms, are mounted on studs 49 and 50, secured in brackets 51 and 52, projecting from the rear wall 40 of the reservoir.

Immediately under the presser 31 there are arranged in the frames 1 and 2, Figs. 1, 2, and 5, parallel guides 53 and 54, in which are adapted to slide vertical bearings 55 and 56, carrying a shaft 57, on which is fixed the pressing-cylinder 58. This cylinder is arranged to be rotated by a toothed wheel 59, which is fixed on the shaft 57 and gears into a pinion 60 on the driving-shaft 10, Fig. 2. The pressing-cylinder 58 is adapted to be moved toward and away from the presser 31 by means of eccentrics 61 and 62, which are fixed on a cross-shaft 63, mounted in bearings 64 and 65 in the frames 1 and 2, and which bear simultaneously against projections 66 and 67 on the sliding bearings 55 and 56, respectively. On the cross-shaft 63 is secured a worm-wheel 68, adapted to be rotated by a worm 69, Figs. 1, 3, and 4, carried between bearings in a bracket 70 and fixed to a shaft 71, provided with a hand-wheel 72.

Instead of having the presser fixed and the pressing-cylinder movable, as above described, the presser may be made movable toward and away from the cylinder, which is then mounted in stationary bearings.

At the front end of the frames 1 and 2 there are fixed brackets 73 and 74, carrying in hollow cylindrical guides sliding rods 75 and 76, respectively, on the ends of which are bearings 77 and 78. Fig. 10 is a longitudinal vertical section and Fig. 11 a cross-section through one of these cylindrical guides. In the bearings 77 and 78 is mounted a shaft 79, on which is secured a roller 80. Around the peripheries of the cylinder 58 and the roller 80 is passed an endless band 81, (hereinafter referred to as a "blanket,") composed, preferably, of woven flexible material or of india-rubber. In order to enable the necessary tension to be produced in this blanket, the sliding rods 75 and 76, carrying the roller 80, are adapted to be moved simultaneously outward from the cylinder 58, for which purpose they are each formed with a screw-thread 82, (see Figs. 10 and 11,) on which is mounted, between the front and rear portions of the said parallel cylindrical guides, a worm-wheel nut 83 and 84, engaging in a worm 85 and 86 on a cross-shaft 87, which is mounted in bearings 88 and 89 in the brackets 73 and 74 and is provided with a hand-wheel 90.

At the feeding end of the machine there is also provided a tension arrangement to regulate the feeding of the fabric into the machine. For this purpose there are secured to the frames 1 and 2 brackets 91 and 92, provided with bearings at their outer ends, Figs. 1 and

2. On a shaft 93, mounted in these bearings, are fixed two double-armed levers 94 and 95, which are respectively furnished at their ends with bearings 96 and 96^a and 97 and 97^a, in which are mounted shafts 98 and 99, carrying rollers 100 and 101, respectively. The shafts 98 and 99, with their rollers, are adapted to be rotated about the axis of the shaft 93 by means of a worm-wheel 102, fixed on the shaft 93 and gearing with a worm 103 on a shaft 104, which is mounted in a vertical bearing 105 on the bracket 91 and is furnished with a hand-wheel 106. A roller 107, fixed on a shaft 108, mounted in bearings 109, carried by the brackets 91 and 92, serves, in conjunction with the rollers 100 and 101, as a brake for the fabric C, which is led around the rollers, as indicated by dotted lines in Fig. 1.

At the delivery end of the machine there are fixed to the frames 1 and 2 bearings 110 and 111, Figs. 1, 2, and 4, in which is mounted a shaft 112, which carries a drag-roller 113, and a toothed wheel 114, that gears in the wheel 9 on the driving-shaft 10. The drag-roller 113 is formed with a series of annular ribs 115, which are covered with glass, cloth, card-clothing, or other material adapted to drag or pull the material forward after leaving the pressing-cylinder 58. Below the roller 113 and some distance therefrom there is arranged a similarly-formed roller 116, with its shaft 117 mounted in bearings 118 and 119, fixed to the frames 1 and 2. In the annular grooves formed in the rollers 113 and 116, between the annular ribs, there are inserted a series of endless tapes 120, Figs. 1 and 2, which serve to rotate the roller 116 and also to strip the fabric from the drag-roller 113. Sometimes other grooves are formed in the ribs of the stripping-roller 116, and tapes placed in these grooves are passed around a plain cylindrical roller mounted on the floor some distance from the machine for the purpose of conveying away the printed material.

The driving-shaft 10 is provided with fast and loose pulleys 10^a to facilitate starting and stopping the machine.

The endless metallic pattern-sheet 20 used in this machine is constructed from a sheet of metal of any suitable width and thickness, and through the thickness of which is cut or engraved the pattern or design it is desired to produce on the fabric. This sheet is bent into the form of a cylinder, causing one end of it to overlap the other for a short distance, and the two ends are then soldered or brazed together, forming a lap-joint, the edges and surfaces being then reduced in thickness until the joint is of the same thickness as the remainder of the sheet.

With the arrangement already described a pattern-sheet can when required be readily removed from the rollers 7 and 19 in the following manner: First, the pressing-cylinder 58 is lowered as far as possible by means of the hand-wheel 72, and the roller 19 is then moved toward the roller 7 by means of the

hand-wheel 30 until the endless sheet 20 is sufficiently slack. On now removing the bearings 5 and 17 of the rollers 7 and 19, and also the bracket 35, supporting the presser 31 and reservoir 36, the pattern-sheet 20 can be easily withdrawn from the rollers.

The operation of my machine is as follows: The fabric C to be printed is first passed over the roller 107, under the roller 101, over the shaft 93, and under and over the other roller 100 of the tension arrangement and thence onto the blanket 81. It now passes under the pattern-sheet 20, the surface speed of which is equal to that of the blanket, and on approaching the presser 31 pressure begins to act thereon and increases in intensity until the fabric reaches and passes under the said presser. The effect of this pressure is to cause the fabric C to be forced partly into the pattern-holes in the endless sheet 20, so as to close them and prevent any of the printing composition from passing therethrough. The printing composition is fed from the reservoir 36 upon the upper side of the endless sheet 20, immediately in front of the fixed presser 31, and the portions of the fabric projecting into the orifices in the pattern-sheet 20 receive a certain amount of composition, which on passing under the fixed presser 31 is thereby forced into the fabric. By this means clear, distinct, and permanent designs or impressions are produced on the fabric. The fabric having passed the fixed presser 31 begins to leave the pattern-sheet 20, thus preventing the designs or impressions from becoming smeared, and finally passes over the drag-roller 113, which constantly draws it away from the pressing-cylinder.

The printing composition herein referred to is usually semiliquid in nature and comprises a metallic powder, as bronze-powder, aniline bronze-powder, or aluminum-powder, a quick drier, as gold-size, and litho-varnish.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a fabric printing machine, the combination of a traveling pattern sheet, a rotating presser coacting with the pattern, a pliable presser arranged on the opposite side of the pattern, and means for depositing printing composition on the pattern, as set forth.

2. In a fabric printing machine, the combination of an endless traveling pattern sheet, means, substantially as described for depositing ink thereon, a spring or yielding presser

thereon to force the ink into the orifices of the pattern sheet, a presser on the opposite side of the pattern to receive the fabric and force it into the orifices of the pattern, substantially as described.

3. In a fabric printing machine, the combination of a rotating pressing cylinder, an angularly arranged spring or yielding presser arranged opposite and coacting with said cylinder and presser arranged to be relatively adjusted toward and from each other, an endless pattern sheet arranged to travel between the presser and cylinder and means to feed the fabric between the cylinder and pattern sheet substantially as described.

4. In a fabric printing machine, the combination of an endless traveling pattern sheet with the yielding spring presser bar extending transversely across and bearing down on the upper face of the under length of the sheet to force the printing composition through the openings in the sheet substantially as described.

5. In a fabric printing machine, the combination of a traveling pattern sheet, a downwardly springing presser plate bearing down on the upper surface of the sheet transversely across the same, and the printing composition reservoir arranged just in advance of said presser plate and extending transversely across the sheet and arranged to deposit a printing composition across the sheet so that the presser plate can force the same into the openings in the sheet, substantially as described.

6. The combination in a fabric printing machine, of a traveling pattern sheet, a transverse support over the same, a printing composition receptacle and feeder carried by said support, and an inclined spring presser carried by said support and bearing down on the upper surface of the sheet behind the receptacle substantially as described.

7. In a fabric printing machine, the combination of an endless traveling blanket, rolls on which the blanket is mounted, an endless traveling pattern sheet coacting with the blanket, a presser thereon opposite one of said rolls, and means for depositing ink on the pattern sheet, substantially as described.

Leeds, January 30, 1895.

SAMUEL HOLT SHARP.

In presence of—

ROBERT EDWIN PEACOCK CRAVEN,
OSAR WESTON HODGSON.