E. BONTEMPS.

FABRIC PRINTING MACHINE.

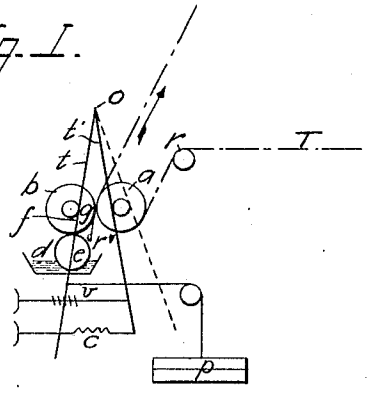
APPLICATION FILED SEPT. 3, 1909.

1,055,312.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 1.

Fig. I.



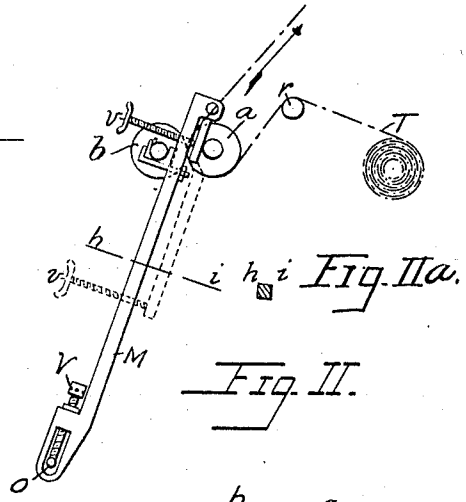
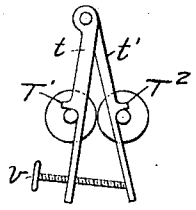


Fig. IIa.

Fig. II.

Fig. V



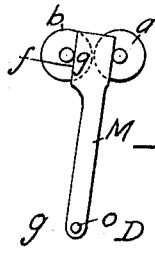


Fig. VI.

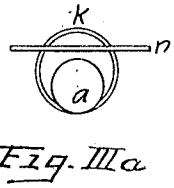


Fig. IIIa

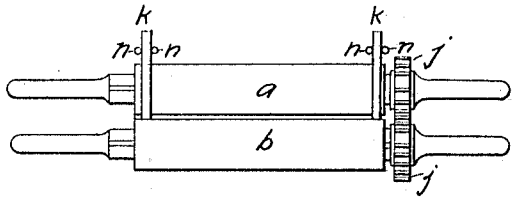


Fig. III.

Fig IIIb

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2 SHEETS—SHEET 2.

Fig. IV

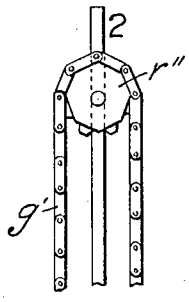

Fig. IVa

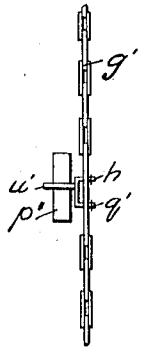

Fig. IVb

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ERNEST BONTEMPS, OF IVANOVO-VOSNESSENSK, RUSSIA.

FABRIC-PRINTING MACHINE.

1,055,312. Specification of Letters Patent. Patented Mar. 11, 1913.

Application filed September 3, 1909. Serial No. 516,086.

To all whom it may concern:

Be it known that I, ERNEST BONTEMPS, engineer-chemist, a citizen of the French Republic, residing at Ivanovo-Vosnessensk, Russia, have invented a new and useful Fabric-Printing Machine, of which the following is a specification.

My invention relates to machines or apparatus for printing fabrics and more especially to machines adapted to print only on the threads appearing on a fabric in relief. To this end, I so construct my machine, that one of the printing elements is movably arranged, and I provide adjusting means, whereby the movable printing element is held at a certain distance from the other printing element, which distance is determined in each case by the height to which the threads to be printed on project from the general plane of the fabric.

In order to make my invention better understood, I have illustrated the same in the accompanying drawings in a more or less diagrammatic manner, Figure 1 showing one way of movably arranging one of the printing elements, Fig. 2 showing another way, Fig. 2^a being a section along line *h*—*i* in Fig. 2. Figs. 3, 3^a and 3^b illustrate a further modification. Figs. 4, 4^a and 4^b illustrate an arrangement similar to Fig. 1, in combination with means to permit printing from a pattern. Figs. 5 and 6 are details illustrating further means for keeping the printing elements separated at a certain distance. Similar reference letters denote similar parts in all the different views.

Referring first to Fig. 1, the printing elements comprise the impression cylinder *a* and the printing cylinder *b*, adapted to rotate around their axes. The smoothly polished impression cylinder *a* rotates in a fixed position and is journaled in stationary standards *t'*. The engraved printing cylinder *b* is movable. To this end the cylinder *b* is journaled in a pair of lever arms, which can be adjusted about a pivot O so that the cylinder *b* can be moved toward or away from the impression cylinder *a*. By means of a screw spindle *v* the distance, at which the movable printing cylinder *b* is held away from the stationary impression cylinder, can be exactly determined. This distance corresponds to the height to which the threads to be printed on project from the general plane of the fabric T which is passed over a guide roll *r* and then around the impression cylinder *a* in the direction of the arrow shown in Fig. 1. In order to firmly hold the movable printing cylinder against the impression cylinder, a spring *c*, engaging the lever arms *t*, or a weight P may be provided, as clearly shown in Fig. 1. For practical purposes the printing cylinder *b* should be adjustably mounted on the lever arms *t* to permit the cylinder *b* to be raised or lowered so as to place it at exactly the same height as the impression cylinder *a*.

The screw spindle *v* prevents the cylinder *b* from approaching the impression cylinder *a* farther than to a certain extent, while permitting it to move away from the impression cylinder, in case the fabric passing between the two cylinders is thicker at places than the distance at which the two cylinders have been adjusted.

As indicated by the line *f*—*g* in Fig. 1, the journal bearings of the printing cylinder *b* may be freely mounted on an inclined plane, so that the cylinder *b* will be moved toward the impression cylinder *a* by its own weight. Instead of suspending the lever arms *t* and *t'* from a pivot, as shown in Fig. 1, they may be supported by the axes of the two cylinders by means of projections t^2, t^3, provided on the lever arms. This embodiment of my invention is shown in Fig. 5. It is obvious that, instead of the printing cylinder *b*, the impression cylinder *a* can be movably mounted, the effect being in both cases the same.

The guide roll *r* is preferably covered with felt, to thereby secure a better grip of the roll on the fabric, thus holding it under the desired tension and causing the threads to be printed on to better project from the fabric. Below the engraved printing cylinder, as usually, a scraper *r'* is provided, and in contact with the printing cylinder an inking roller *e* is mounted in such a way as to take up and transmit the color from an ink well *d* to the printing cylinder *b*.

In the embodiment shown in Fig. 2, the printing cylinder *b* is journaled in bearings, adjustably carried by a pair of rods M. These rods are pivoted with their lower ends at O, so that by their own weight they are moved toward the impression cylinder *a*. In this construction the distance, at which the two cylinders are held apart, is also determined by a screw spindle *v*, which bears against an abutment not shown. Means such as a spring or a weight to hold the printing cylinder *b* against the impression cylinder *a* can in this construction be dis-

pensed with. By means of a screw V provided at the lower ends of the rods M the printing cylinder *b* can be raised or lowered, as desired.

Fig. 3 shows the two cylinders *a* and *b* provided with gears *j*, which are in engagement with each other and whereby rotation may be imparted from the cylinder *a* to the printing cylinder *b*.

As shown more clearly in Fig. 3ª, at each end of the impression cylinder *a* a ring *k* is loosely mounted thereon, which rings are held in position by stops *n* and whereby the distance between the two cylinders is determined. The rings *k*, being loosely mounted on cylinder *a* may be easily exchanged to provide for different distances according to the thickness of the fabric to be printed on. This construction is especially adapted for cylinders which are not truly finished.

Fig. 4 shows an embodiment of my invention, in which the cylinders *a* and *b* are mounted similarly as shown in Fig. 1, but in combination with means, whereby a design can be produced from a pattern which is larger than the circumference of the cylinders. To this end a device is used which permits the fabric to be printed on intermittently only. To this end an endless chain *g'* which passes between the guide rollers r^2, r^2, is driven at suitable speed. According to the longer or shorter pattern, which is used, the chain may be shortened or lengthened between the points 2 and 2'. To any link of the chain may be attached a pin *u*, having pivoted to it a disk *i*, as shown in Fig. 4ᵇ. When the said disk *i* passes the plate P, it will depress the lever I, moving it to the position I'' shown by the broken lines in Fig. 4. In doing so, the disk *i* swings about its pivot pin *u*. The plate P can be adjusted nearer to or farther from the chain *g'*, as desired, by means of the screw spindles *v'*, v^2, whereby the required distance is obtained, and the printing cylinder *b* is then moved so far from the impression cylinder *a* that the relief portions of the fabric are not printed on. In this position, the printing cylinder rotates idly. The teeth of the intermeshing gears at the ends of the two cylinders (shown in Fig. 3) are made sufficiently long to prevent the gears from becoming disengaged. A screw *y* at the other end of the lever I permits the positioning of any other pair of cylinders *a*, *b* of another diameter. During this movement the lever I' of itself falls into the position I''', as indicated by the broken lines in Fig. 4, since the longer arm of the lever I' is heavier than its shorter arm *x*. Hence, the latter is moved to the position *x'*, where it is arrested by the stop *z*. The lever I is thus held in the lower position, until on the other side of the endless chain *g'* another pin *u'* see Fig. 4ª passes the plate P', which may also be adjusted in its position by means of screws *v'*, v^2. The pin *u'* lifts the lever I again to its original position, shown in full lines in Fig. 4. The chain *g'* is driven in the direction of the arrow. The printing cylinder *b* is returned to its original position in contact with the impression cylinder *a* by the spring *c*. The system of levers is equally provided on both sides of the endless chain *g'*, which is further guided by the large guiding wheels R, R. The pins *u* and *u'* are carried by forks *h*, *q'*, which are secured to the endless chain *g'*. A series of forks with pins can be provided, and the pins are arranged in such a manner that each pin divides the distance between the members *h* and *q'* of the fork into sections of different lengths, whereby the distances required for the printing in accordance with the pattern are very exactly obtained. Either one, or more pairs of printing elements can be used with the endless chain. Fig. 4 shows only one pair of printing elements, which, as has already been stated, are arranged as shown in Fig. 1. *a* is the smooth impression cylinder, *b* the engraved printing cylinder, carried by the arms *t*. By means of the screw V the pivot O can be raised or lowered. *c* is the spring which tends to move the cylinder *b* toward *a*. The screw spindle *v* determines the distance, at which the cylinder *b* shall be kept away from the cylinder *a*. The speed at which the cylinders are rotated depends, of course, on the kind of fabric to be printed on.

I claim:—

In a fabric printing machine, the combination of an impression cylinder adapted to rotate in a fixed position, a rotatable printing cylinder adapted to coöperate with said impression cylinder, bearings for said printing cylinder, a pair of rods adapted to adjustably support said bearings and pivoted at their lower ends so as to move by their own weight toward the said impression cylinder, an abutment, a screw spindle in cooperation with said rods and bearing against said abutment for determining the distance between the two said cylinders, and means, such as a screw, for raising and lowering the said rods thereby adjusting the relative coöperative position of the two cylinders.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST BONTEMPS.

Witnesses:

GUSTAV E. HARTWIG,

JOHN H. SNODGRASS.