No. 762,165. PATENTED JUNE 7, 1904.

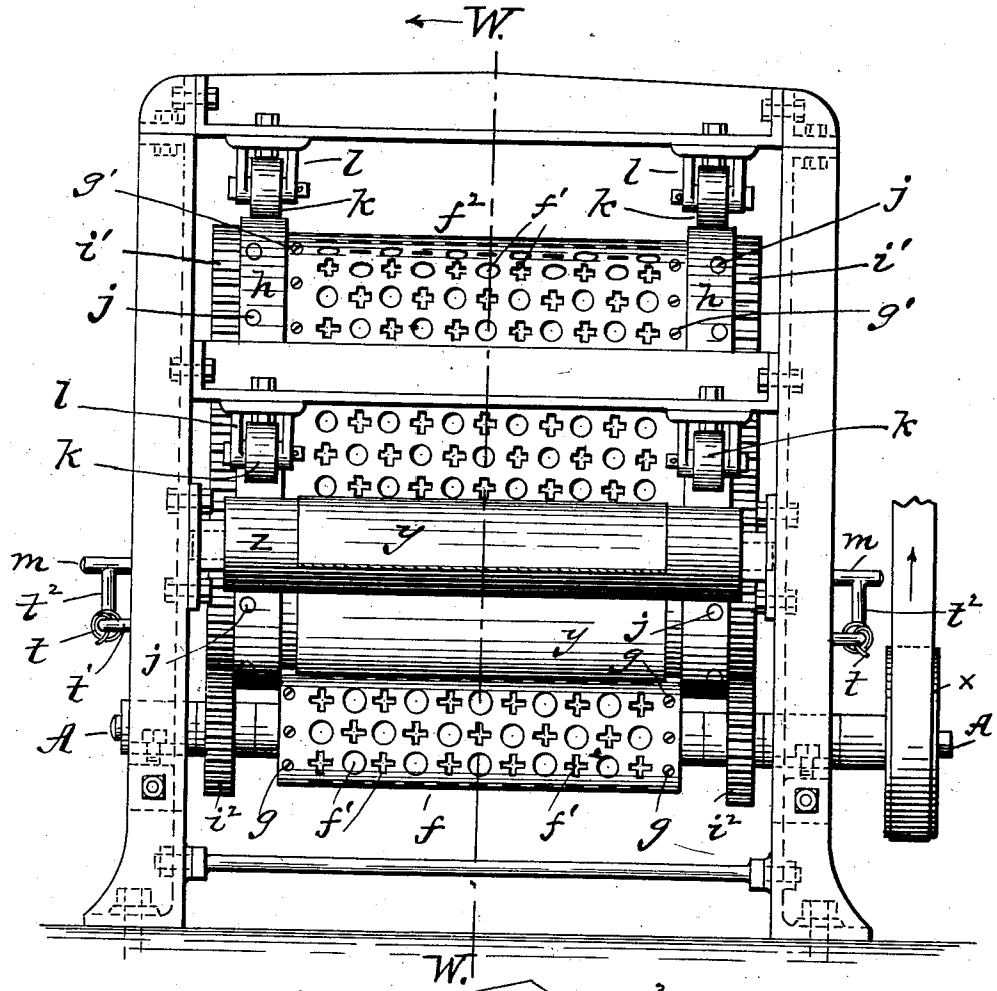
A. HAINEY.

CLOTH PRINTING MACHINE.

APPLICATION FILED SEPT. 28, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

FIG. 1.



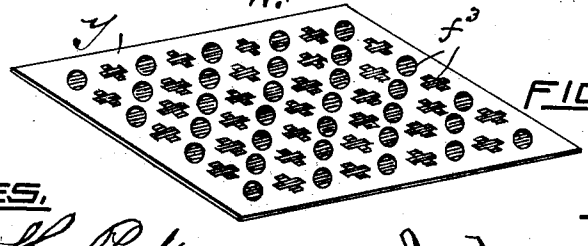


FIG. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

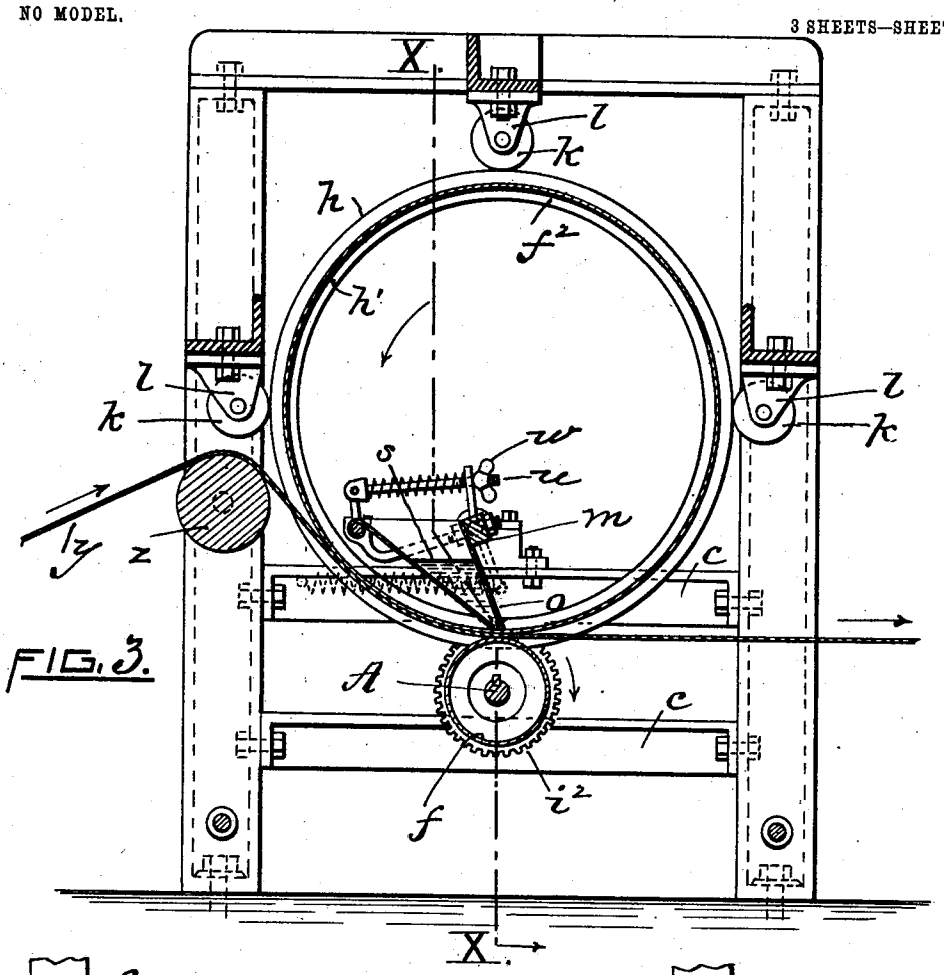

FIG. 3.

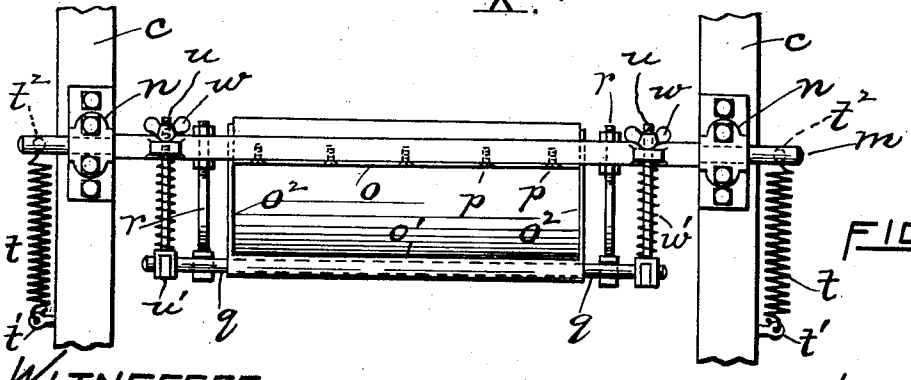

FIG. 4.

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APPLICATION FILED SEPT. 28, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

FIG. 5.

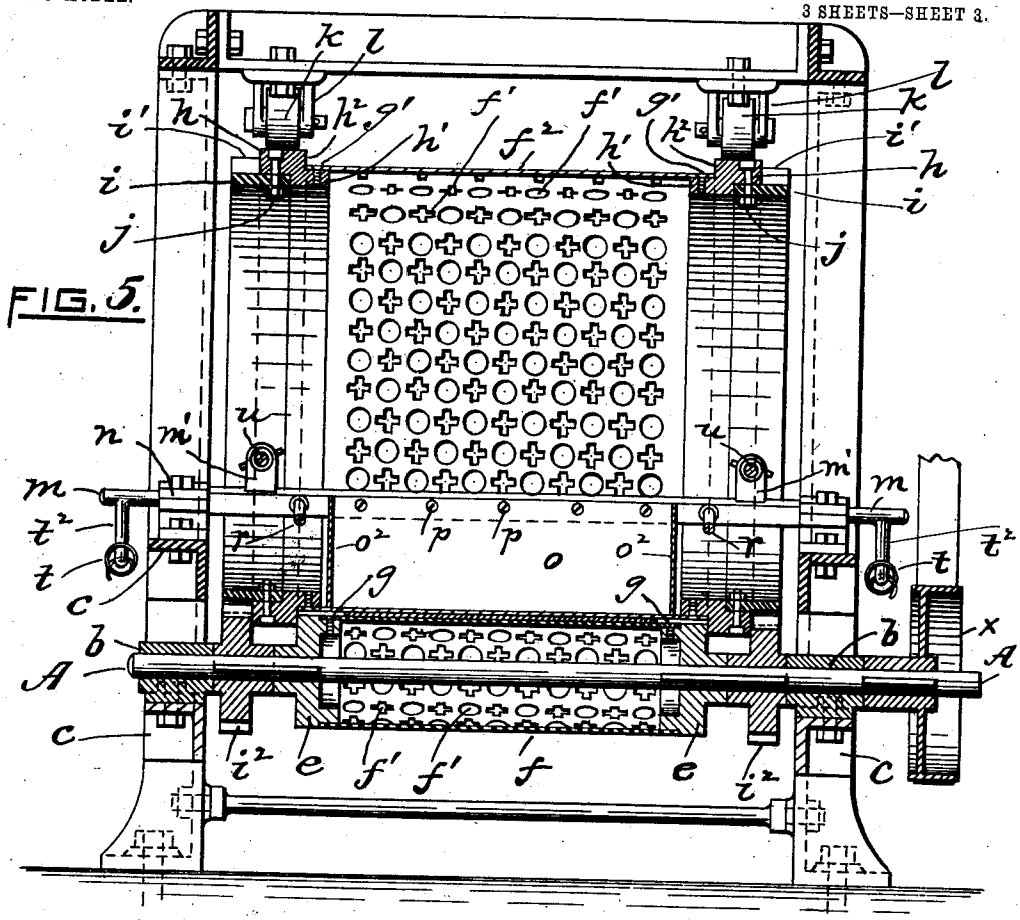
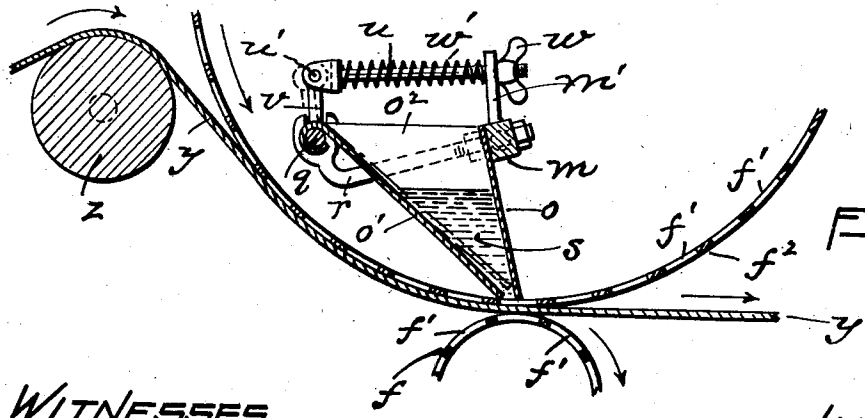


FIG. 6.



WITNESSES,

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UNITED STATES PATENT OFFICE.

ANDREW HAINEY, OF CENTRAL FALLS, RHODE ISLAND.

CLOTH-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 762,165, dated June 7, 1904.

Application filed September 28, 1903. Serial No. 174,991. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HAINEY, a citizen of the United States, residing at Central Falls, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Cloth-Printing Machines, of which the following is a specification.

This invention relates to an apparatus for printing colored figured patterns upon cloth. In this class of machinery having cylinders whose peripheral surfaces have to be engraved by hand to produce the desired pattern on the cloth involves considerable time and labor, whereby the said cylinders form an expensive factor in the cost of the machine.

The object of my invention is to provide cylinders of simple and inexpensive construction for the printing of cloth or fabric, such as calico, percale, muslin, and the like.

My invention consists, first, of two cylinders mounted longitudinally one above the other upon the machine-frame and driven by power thereon, each of said cylinders having thin circular shells provided with perforated or open work which conforms to the figured pattern desired upon the cloth or fabric, and, second, in a trough or receptacle adapted to contain the liquid coloring and mounted in proper supports upon the machine-frame, said trough extending longitudinally within the upper one of said cylinders and provided with means for regulating the proper discharge of the liquid coloring through the perforated or open work of the said upper cylinder upon the cloth or fabric, of the novel construction and combination of parts, as hereinafter fully described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 represents a front elevation view of my improved cloth-printing machine. Fig. 2 is a perspective view of a piece of cloth or fabric whose surface represents a figured pattern as printed by my improved cloth-printing machine. Fig. 3 is a vertical cross-sectional view of the machine, taken in line W W of Fig. 1. Fig. 4 is a top plan view of the trough or receptacle for containing the liquid coloring and also showing the means for regulating the proper discharge of the same upon the cloth which is to be printed. Fig. 5 is a longitudinal sectional elevation view of the machine, taken in line X X of Fig. 3. Fig. 6 is an enlarged cross-sectional detailed view of a portion of the cylinders and also illustrating the trough adjusted into two positions to suit the amount of discharge of coloring liquid desired upon the cloth.

Like letters indicate like parts.

A represents the driving-shaft, rotatably mounted in suitable bearings *b b*, which are bolted to each side frame *c c* of the machine.

e e are two disks keyed upon the driving-shaft A, and a thin metallic shell *f* has each of its opposite edges secured upon the peripheral surfaces of the said disks *e e* by screws *g g*, and this shell, which forms the lower printing-cylinder, is provided with perforated or open work *f' f'*, which conforms in outline to the figured pattern desired upon the cloth. *h h* represent two enlarged rings having inner reduced portions *h' h'*, so to provide shoulders h^2 h^2, which are arranged to contact with the outer faces of the disks *e e*, and a thin metallic shell f^2 has each of its opposite edges secured upon the inner portions *h' h'* by screws *g' g'*. *i i* are annular flanges fixedly secured upon the interior surfaces of the rings *h h* by bolts *j j*, and each of said flanges have outwardly-projecting gear-teeth i' i' adapted to engage with the teeth of two small spur-gears i^2 i^2, which are keyed to the driving-shaft A of the machine in the manner shown in Fig. 5. The shell f^2, which forms the upper printing-cylinder of the machine, is also provided with perforated or open work *f' f'*, conforming in outline with the perforated or open work of the lower cylinder-shell *f*. The upper cylinder f^2 is prevented from having a longitudinal movement on the machine by the shoulders h^2 h^2, which abut the outer faces of the disks *e e*, and said upper cylinder is held in a fixed position transverse of the machine by two sets of rollers *k k k*, which come in contact upon the peripheral surfaces of the rings *h h*, and said rollers are held equidistantly apart from each other and rotatably mounted

in brackets *l l l*, that are secured to the frame of the machine in the manner shown in Figs. 1, 3, and 5. This description of parts comprises the construction of the cylinders for my improved cloth-printing machine.

The means for discharging the liquid coloring upon the cloth is as follows: *m* represents a rock-shaft mounted in bearings *n n*, which are bolted to the side frames *c c* of the machine, as shown in Fig. 4, and said rock-shaft has its portion flattened or square-shaped between its bearings *n n*, and upon this portion of said rock-shaft is secured a blade or scraper *o* by screws *p p*, and said blade or scraper forms one wall of a rectangular-shaped trough or receptacle extending longitudinally within the upper cylinder f^2. The upper edge of the wall *o'* opposite of the blade or scraper is secured upon a rod *q*, whose ends are mounted in U-shaped extremities formed in arms *r r*, which are fixedly secured to the rock-shaft *m*, and said trough or receptacle has its side walls o^2 o^2 integral with the wall *o'* and extending beyond either end of the blade or scraper. The blade or scraper *o* extends downwardly at a slight angle, as shown in Fig. 3, and with its lower edge in contact at the lowest point upon the interior surface of the said cylinder f^2 and in vertical alinement to the axial center of the same, while that of the wall *o'* inclines downwardly at a greater angle than that of the blade or scraper and having its lower edge situated at a short distance from the lower edge of said blade or scraper, so to provide an exit or clearance for the passing therethrough of the liquid coloring, as designated by letter *s* in Figs. 3 and 6. The lower edge of the blade or scraper *o* is made to contact firmly upon the interior surface of the cylinder f^2 by pull-springs *t t*, which have one end secured to studs *t' t'* of the machine-frame *c c*, while the opposite end of said springs are connected to the lower end of downwardly-projecting studs t^2 t^2, integral at each end of the rock-shaft *m*, as seen in Figs. 1, 4, and 5. The remaining portion of the trough or receptacle having the walls *o'* and o^2 o^2 is provided with an oscillating movement by means of a rod connection *u*, which is bifurcated at one end thereof to receive a pin connection *u'* with a shank *v*, integral of the rod *q*, and said rod connection has its opposite end portion projecting through a shank *m'*, integral of the rock-shaft *m* and circumferentially screw-threaded to receive a thumb-nut *w*, and between the bifurcated end of the rod connection *u* and the shank *m'* of the rock-shaft is interposed a push-spring *w'*, so that turning of the thumb-nut *w* by the operator carries upwardly the lower edge of the wall *o'* to the dotted position, as indicated in Fig. 6. Thus a larger or smaller clearance is obtained in accordance with the desired discharge of liquid coloring upon the cloth to be printed.

The pattern-cylinders *f* and f^2 are each made from one sheet of thin metal and each sheet of a length to encircle the disks *e e* and rings *h h*, respectively, and these cylinders have their perforated or open work meet together at that point where the liquid is discharged upon the cloth.

This improved cloth-printing machine has a belt-driven pulley *x* keyed upon one end of the driving-shaft, as seen in Fig. 1, and said pulley drives the cylinders *f* and f^2 by means of the gearing in the arrow direction, as indicated in Fig. 3, and the cloth *y*, which is to receive the colored figured pattern, comes from a roll situated in the front of the machine and passes over a sand-roller *z* down and between the perforated surfaces of the cylinders *f* and f^2, at which point the cloth receives the colored figured pattern, as designated by f^3 in Fig. 2, after which the cloth passes in the arrow direction to the drying-room in the manner shown in Fig. 3. Each and all of the gears have their teeth cut without any backlash for the purpose of bringing the figured open-work patterns formed in the cylinders *f* and f^2 directly together at that point where the liquid coloring is discharged from the trough or receptacle.

The sheet metal which forms the pattern-shells for the cylinders is perforated by a suitable machine (not shown) to the proper outline of design required for the cloth, and said metal being thin allows the pattern-shells to be readily secured upon the disks and rings, as described, so that by having the figured design for the cloth perforated in the cylinder-shells great labor and expense is saved over the usual copper cylinders, which have their peripheral surfaces engraved by hand. The perforated or open work of the lower cylinder *f* has a somewhat larger area of opening than the perforated or open work of the upper cylinder f^2 for the purpose of allowing the cloth to sag down at the point where the liquid enters in order to color the entire area of surface within the pattern of the said cylinder f^2. In certain grades of cloth to be printed the shell of the lower cylinder may be plain.

By having the main or upper printing-cylinder open at each end allows the operator to recharge the trough or receptacle at any time during the running of the machine. Furthermore, having the trough provided with an oscillating movement the requisite discharge of coloring liquid may be readily obtained upon the cloth.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a cloth-printing machine, the combination, of a driving-shaft mounted in proper supports upon the machine-frame; two gears rigidly secured upon said shaft; two disks

rigidly secured upon said shaft; a thin metallic shell encircling said disks and having its opposite edges fixedly secured to the same; two rings mounted upon said disks, and having inner reduced diameters so to form shoulders abutting the outer faces of the same; a thin metallic shell encircling the reduced portions of said rings and having their opposite edges fixedly secured to the same and each of said shells provided with a perforated or open work pattern; a series of rollers properly mounted upon the machine-frame and divided equidistantly apart from each other and arranged to contact with the peripheral surfaces of the said rings; two annular flanges fixedly secured to said rings and having outwardly-projecting gear-teeth to engage with the gears of said driving-shaft; a trough or receptacle mounted upon the machine-frame adapted to contain a liquid coloring; and means mounted on said trough or receptacle for regulating the outward flow or discharge of the liquid coloring from said trough or receptacle to the perforated or open work patterns of the upper cylinder, substantially as set forth.

2. In a cloth-printing machine, the combination, of a shaft rotatably mounted in proper supports upon the machine-frame and driven by power; a gear rigidly secured upon said shaft; a cylinder rigidly secured upon said shaft; a second cylinder located above the first-named cylinder and having a gear fixedly secured thereon; each of said cylinders provided with perforated or open work patterns conforming to the outline with the design required upon the cloth; a series of rollers mounted upon the machine-frame and adapted to hold the second-named cylinder in position upon the first-named cylinder; a trough mounted upon the machine-frame, extending longitudinally within the second-named cylinder and adapted to contain a liquid coloring; said trough having a divided portion provided with means to permit of an oscillating movement and arranged to discharge more or less of the liquid coloring from the trough; substantially as set forth.

3. In a cloth-printing machine, the combination, of a shaft mounted in proper supports upon the machine-frame and driven by power; two disks keyed upon said shaft; a thin metallic shell having its opposite edges fixedly secured to said disks and provided with figured openings; a spur-gear keyed upon said shaft; two rings mounted on said disks; a thin metallic shell having its opposite edges fixedly secured to said rings; a spur-gear fixedly secured to one of said rings and adapted to engage with and be driven by the first-named gear; and means to hold said rings in a fixed position upon said disks; a rock-shaft mounted in supports upon the machine-frame and extending longitudinally within the upper pattern-shell; a trough adapted to contain a liquid coloring and consisting of a blade or scraper secured upon said rock-shaft; a pull-spring from the machine-frame to said rock-shaft adapted to hold the said blade or scraper in contact with the interior surface of the second-named pattern-shell; a wall inclined rearwardly from the lower portion of the said blade or scraper, and having opposite sides terminating with either end of the same; said inclined portion of the trough mounted on arms which are fixedly secured to said rock-shaft; and adjusting means mounted on said rock-shaft to permit the inclined wall to open or close upon the lower portion of said blade or scraper in accordance with the discharge of liquid coloring required upon the cloth, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW HAINEY.

Witnesses:
FRANK I. SHERMAN,
WILLIAM H. PECK.