Jan. 8, 1924. 1,480,348

E. CADGENE ET AL

FABRIC PRINTING MACHINE

Filed Dec. 5, 1922 2 Sheets-Sheet 1

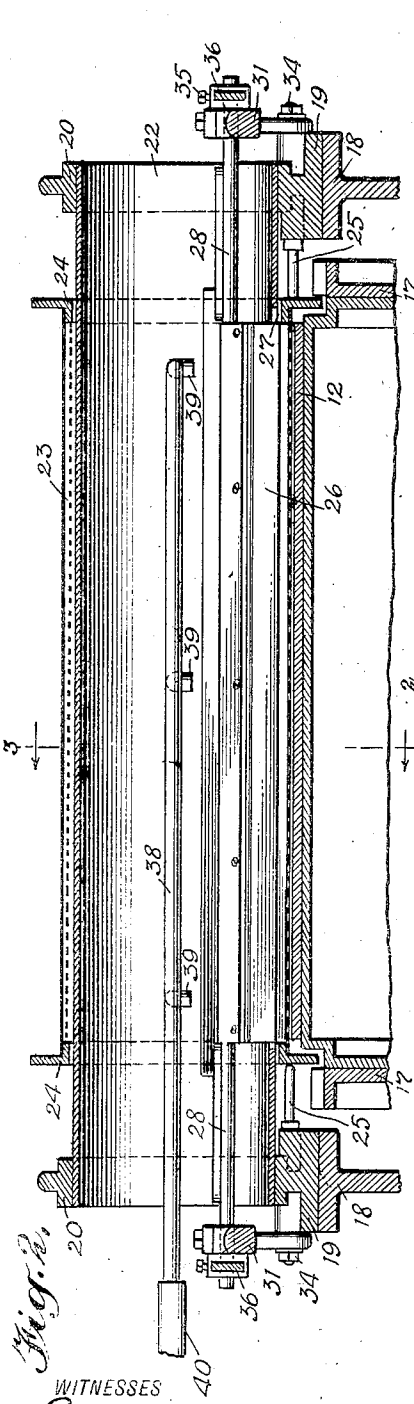


Fig. 2.

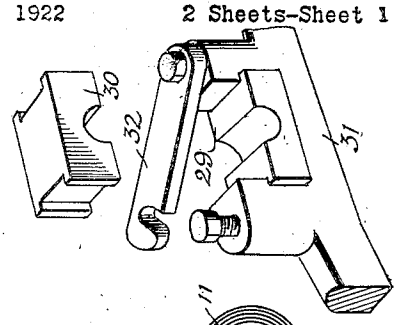


Fig. 5.

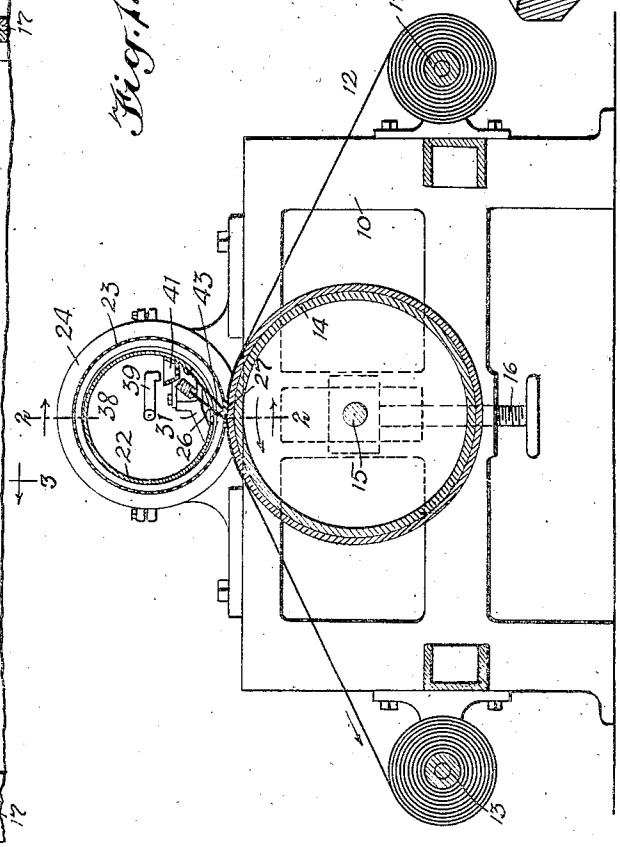


Fig. 1.

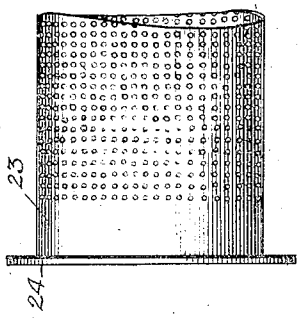


Fig. 6.

WITNESSES

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Fig. 3.

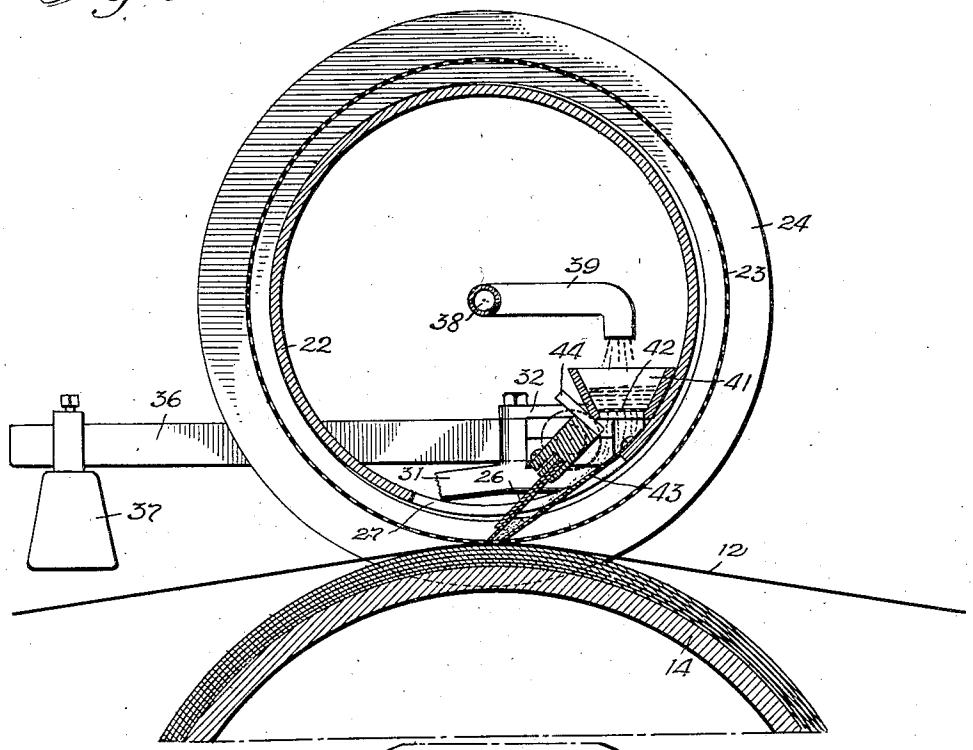
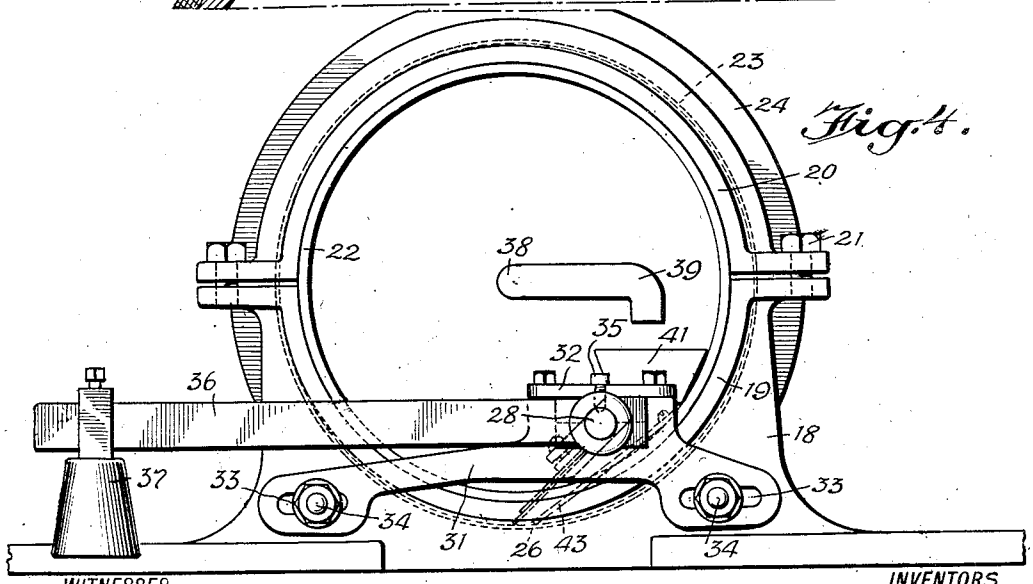


Fig. 4.



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UNITED STATES PATENT OFFICE.

ERNEST CADGENE, OF ENGLEWOOD CLIFFS, AND GEORGE DUPONT, OF PATERSON, NEW JERSEY.

FABRIC-PRINTING MACHINE.

Application filed December 5, 1922. Serial No. 605,034.

To all whom it may concern:

Be it known that we, ERNEST CADGENE and GEORGE DUPONT, both citizens of the United States, and residents, respectively, of Englewood Cliffs, in the county of Bergen and State of New Jersey, and of Paterson, in the county of Passaic and State of New Jersey, have invented a new and Improved Fabric-Printing Machine, of which the following is a full, clear, and exact description.

This invention relates to improvements in printing machines, and has particular reference to a machine for printing textile fabrics.

It has heretofore been customary, in machines of this character, to employ an endless stencil made of an elongated strip of light flexible material which is passed around two tension rollers, one of which may be made adjustable with respect to the other to vary the tension of said stencil. The fabric to be printed is passed between said stencil and a pressure roller and contacted with the stencil at a point intermediate said tension rollers. Due to the flexibility of the stencil and its elongated formation, with a consequent sagging thereof when in operation incident to its being passed around widely separated rollers, it has not only been found difficult to impart and maintain the proper contact of the stencil with the fabric in order to insure a regular even printing of all parts of the fabric, but due to the tension and consequent strain upon the light stencil, the stencils are soon destroyed.

The principal object of this invention is to overcome the difficulties in the prior art constructions as heretofore set forth by providing a new and improved construction of the stencil and in the manner of mounting the same, whereby the stencil is permitted to have a limited free floating movement by means of which an even line contact with the fabrics is maintained so as to insure a regular even printing of all parts of the fabric.

Another object is to provide a construction in which only that portion of the stencil at the printing zone is subjected to a pressure between a pair of aligned pressure elements, one of which is rotary, so that no distortion of the stencil will occur, while the remainder of the stencil is entirely free from any and all strains, the travel of the stencil being accomplished entirely by the rolling frictional effect produced by the rotary pressure element.

Another object is to feed the composition employed to print the fabric in such manner that the same will be evenly distributed over and through the stencil at the point where the same is engaged by the fabric to be printed.

A further object is to so construct the machine that the stencil and associated parts may be readily removed and replaced by stencils of different designs or sizes.

The above and other objects will appear more clearly from the following detail description, when taken in connection with the accompanying drawings, which illustrate a preferred embodiment of the inventive idea.

In the drawings—

Figure 1 is a transverse sectional view of the machine constructed in accordance with the invention;

Figure 2 is an enlarged sectional view on the line 2—2 of Figure 1;

Figure 3 is a transverse sectional view on the line 3—3 of Figure 2;

Figure 4 is a fragmentary end elevation of the machine;

Figure 5 is a fragmentary perspective view of a supporting member and bearing utilized for detachably supporting a pressure element employed in connection with the invention; and

Figure 6 is a fragmentary elevation of the stencil employed.

Referring more particularly to the accompanying drawings the numeral 10 indicates generally the frame of the machine, on one side of which is mounted a longitudinally extending shaft 11 upon which is wound the fabric 12 to be printed, the opposite side of the frame supporting a similar shaft 13 for receiving the fabric after being printed. The shafts may be removably supported in any desired manner in order to permit of the bolts of fabric being applied to the machine and removed therefrom after the printing operation. The machine further includes a large pressure roller 14 mounted upon the shaft 15 which is rotat-

ably mounted in suitable bearings which are preferably vertically adjustable by means of the screws 16 to apply the proper printing pressure to the fabric. The roller 14 may be provided with suitable gears 17 (see Figure 2) at the ends thereof for the purpose of driving the same.

At each end of the frame 10 the same is provided with a vertically disposed supporting member or bracket 18 carrying the lower half of an annular clamping member 19, the upper half 20 of which is detachably secured to the lower half by means of the bolts or other fastening devices 21 for the purpose of removably supporting and clamping a stationary support shown as a cylindrical drum 22 transversely of the frame 10 in alignment with and above the pressure roller 14.

Before the drum 22 is placed in position and clamped between the clamping members 19 and 20, a stencil 23, which is preferably constructed of thin sheet metal, is placed about the drum so as to freely encircle the same. This stencil is shown in the drawings as formed into a tubular cylindrical member of greater diameter than the drum 22 so as to permit free movement of the stencil relatively to the drum to enable the stencil to have a free floating movement during the operation of the machine.

The purpose of the drum 22 is to serve as a limiting means for this free floating movement of the stencil and it also furnishes a convenient supporting means for the distributing trough 41 to be hereinafter described, and while this drum has been shown as a substantially continuous cylindrical member, it could readily be replaced by a single transversely extending bar, by a series of bars, by a short segmental member, or by anyone of a number of equivalent structures which bear either against the outside or the inside of the stencil and serve to limit the movement of the stencil beyond a certain predetermined point. Likewise while the stencil has been shown as a cylindrical tubular member, the shape of the stencil is immaterial as long as it is formed into a member having a continuous or endless surface whether cylindrical, elliptical or otherwise.

The drum 22 as shown is cut away along its bottom portion to form an elongated slot 27 through which is adapted to project a combined pressure element and distributing blade 26 which extends longitudinally of the drum substantially the full length of said stencil with which the lower edge of said element 26 is adapted to contact.

Means are provided for removably supporting the element 26 in operative position and said means comprise the trunnions 28 which are secured to the upper side portions of the element 26, the outer ends of said trunnions being rotatably mounted in bearings consisting of the upper and lower bearings 29 and 30, mounted in the brackets 31, which are adjustably secured to the lower clamping member 19, by means of the bolts 34 passing through the elongated slots 33, provided in bracket 31.

Any suitable means such as the pivoted latch 32 may be provided for securing the bearings 30 and 31 within bracket 31.

Each of the trunnions 28 extends beyond the bearings 30 and 31 and has secured thereto, as by set screw 35, an arm 36, which extends longitudinally of the machine, and has adjustably mounted thereon a weight 36, by means of which the pressure of the pressure element 26 upon the stencil may be regulated as desired, it being noted that the pressure of the element produced by the provision of arm 36 and weight 37 will be constant but will permit the element 26 to yield upwardly without changing the value of the pressure.

The stencil 23 is provided with a plurality of apertures of any desirable shape or size arranged to form any suitable design and the pressure element 26 is so adjusted by means of the elongated slots 33 that the lower edge of the pressure element which contacts with the stencil will lie in substantially the same vertical plane as the axis of pressure roller 14. Assuming that the roller 14 is rotated in the direction of the arrow in Fig. 1 and that the fabric 12 is threaded between the pressure roller 14 and the stencil, the pressure between these pressure members 14 and 26, will cause the stencil 23 to be rotated and the fabric 12 to be drawn from the feed roller 11. The weight 37 is so proportioned as to produce a comparatively light pressure sufficient to secure enough frictional contact to insure the rotation of the stencil and the even distribution of the printing composition to and through the apertures of the stencil into the fabric but without producing a retarding action upon the stencil. The fabric and stencil therefore travel at the same linear speed with a rolling contact. As the stencil is rotated, because of its freedom of movement upon the drum, it will adjust itself to a perfect line contact with the lower edge of the pressure element 26, thereby insuring an even feeding of the printing composition and in so doing it will move to the position clearly shown in Fig. 3 of the drawings, so that its left hand portion will tend to approach and drag upon the drum. In order to avoid the undue retarding or braking effect which would be caused if the entire length of the stencil were to contact with and drag upon the drum, suitable means such as the flanged collars 24 may be secured in the ends of the stencil which collars it will be noted by referring to Fig. 2 project in-

wardly beyond the inner surface of the stencil, to provide only a small bearing surface.

These collars when secured to the stencil also serve as a bracketing means for the stencil and while they have been shown as secured only at the ends of the stencils, any number of collars could be placed at any suitable points along the stencil, or the drum; or the drum or its equivalent structure could be furnished with one or more projecting ribs to furnish a reduced bearing for the stencil.

Means are provided for feeding a suitable printing composition, such as paste, to the stencil whereby the same may be applied through the openings in said stencil to the fabric as the latter is passed between the stencil and the roller 14. This means may include a feed pipe 38 which projects into the drum 22 from one end thereof and which is provided at intervals with the outlets 39. The outer end of the feed pipe 38 is detachably connected to a coupling 40, which in turn extends to a suitable source of supply from which the composition is fed by hydraulic pressure or otherwise to the pipe 38. As the composition passes from the outlets 39 the same falls into a troughlike receptacle 41 having a perforated bottom 42 through which the composition flows onto a deflector plate 43, one longitudinal edge of which is secured to the drum 22 along one edge of the opening 27 therein, said plate being designed to feed the composition to the stencil forwardly of the pressure element 26 which, as the stencil is rotated, not only acts to evenly distribute the composition over the inner surface of the stencil but also acts to press an equal amount of the composition through the openings of the stencil. The receptacle 41 is detachably supported within the drum 22 and may simply rest on the drum and a strip 44, preferably carried by the upper longitudinal edge of the pressure element 26.

From the foregoing description it will be apparent that a stencil may be removed and replaced by detaching the pipe 38 from the coupling 40, removing the receptacle 41 from the drum, disconnecting the trunnions 28 from their respective bearings, after which the pressure element 26 may be removed from the drum and then detaching the upper clamping members 20, following which the drum and stencil may be lifted from the lower bearing members 19 and the stencil then removed from the drum.

What is claimed is:

1. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation thereabout, means exerting a pressure against said stencil for rotating the same, and other means exerting a pressure against said stencil in opposition to the first named pressure for insuring a uniform rotation of said stencil about said stationary support, and for evenly distributing a composition to a fabric to be printed which is passed between said stencil and the first named means.

2. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation thereabout, means for rotating said stencil and for passing a fabric to be printed between the same and said stencil, a pressure element projecting through said drum and engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to the fabric, and means cooperating with said pressure element for feeding said composition to said stencil.

3. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation thereabout, means for rotating said stencil and for passing a fabric to be printed between the same and said stencil, a pressure element engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to the fabric, and a deflector plate adjacent to and cooperating with said pressure element for feeding said composition to said stencil adjacent the point of contact thereof with said fabric.

4. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation thereabout, means for rotating said stencil and for passing a fabric to be printed between the same and said stencil, a pressure element engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to the fabric, means cooperating with said pressure element for feeding said composition to said stencil, and a composition receptacle positioned upon said support and from which the composition flows to the last named means.

5. In a fabric printing machine, a stationary drum, a cylindrical stencil mounted for rotation thereabout, means for rotating said stencil and for passing a fabric to be printed between the same and said stencil, a pressure element projecting through said drum and engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to the fabric, a deflector plate also projecting through said drum and cooperating with said pressure element for feeding said composition to said stencil adjacent the point of contact thereof with said fabric, and a receptacle for containing said composition supported within said drum by said pressure element and from which the composition flows to said deflector plate.

6. In a fabric printing machine, a stationary support, a cylindrical stencil freely mounted for rotation thereabout, rotary means exerting a pressure against said stencil for rotating the same relative to said sup-

port, other pressure means engageable with said stencil to cooperate therewith in distributing a composition to a fabric to be printed, supporting members for properly positioning said other pressure means in fixed relation with respect to said rotary means and means permitting of an adjustment of said supporting members transversely with respect to the axis of rotation of said rotary means.

7. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation about said support, a pressure element engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to a fabric to be printed through the medium of said stencil, a supporting member arranged at one end of said pressure element, and bearings carried by said supporting member and in which said pressure element is removably mounted.

8. In a fabric printing machine, a stationary support, a stencil freely mounted for rotation about said support, a pressure element engageable with said stencil to exert a pressure thereon and to evenly distribute a composition to a fabric to be printed through the medium of said stencil, a supporting member arranged at one end of said pressure element, bearings carried by said supporting member and in which said pressure element is removably mounted, and means permitting of an adjustment of said supporting member to properly position said pressure element with respect to said stencil.

9. In a fabric printing machine, a stationary support, sectionalized clamps in which said support is removably mounted, a stencil rotatable about said support, and means for feeding a printing composition to said stencil and evenly distributing the same to a surface to be printed.

10. In a fabric printing machine, a stationary support, sectionalized clamps in which said support is removably mounted, a cylindrical stencil rotatable about said support, and means detachably supported on said support for feeding a printing composition to said stencil and evenly distributing the same to a surface to be printed.

11. In a fabric printing machine, a pressure roller, a freely floating stencil, and means to hold said stencil under pressure in substantially a line contact with a fabric passing between said pressure roller and stencil.

12. In a fabric printing machine, a pressure roller and a stencil between which the fabric is adapted to pass, a pressure element in longitudinal alignment with said pressure roller adapted to hold said stencil under pressure against said roller and said stencil being held between said roller and element for free lateral movement.

13. In a fabric printing machine, a pressure roller and a stencil between which the fabric is adapted to pass, a pressure element having a knife like edge in longitudinal alignment with said pressure roller adapted to force said stencil under pressure towards said roller, said stencil being held between said roller and element for free lateral movement to permit said stencil to automatically adjust itself and thereby maintain a continuous line contact with said knife like edge.

14. In a fabric printing machine as set forth in claim 13, a stationary support with which said stencil is adapted to contact to limit the lateral movement thereof.

15. In a fabric printing machine as set forth in claim 13, a normally stationary support with which said stencil is adapted to contact to limit the lateral movement thereof and means interposed between said support and stencil to reduce the frictional contact area between said support and stencil.

16. In a fabric printing machine as set forth in claim 13, a normally stationary support with which said stencil is adapted to contact to limit the lateral movement of said stencil and means secured to said stencil to reduce the frictional contact area between said stencil and support and to serve as a bracing and strengthening means for said stencil.

17. In a fabric printing machine as set forth in claim 13, means for forcing said pressure element and roller towards each other with a yielding constant pressure.

18. In a fabric printing machine as set forth in claim 17, means for adjusting said last mentioned means.

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