Feb. 10, 1925. 1,526,266

L. L. DE SMET

MULTIPLE COLOR DOT PRINTING MACHINE

Filed May 31, 1924 4 Sheets-Sheet 1

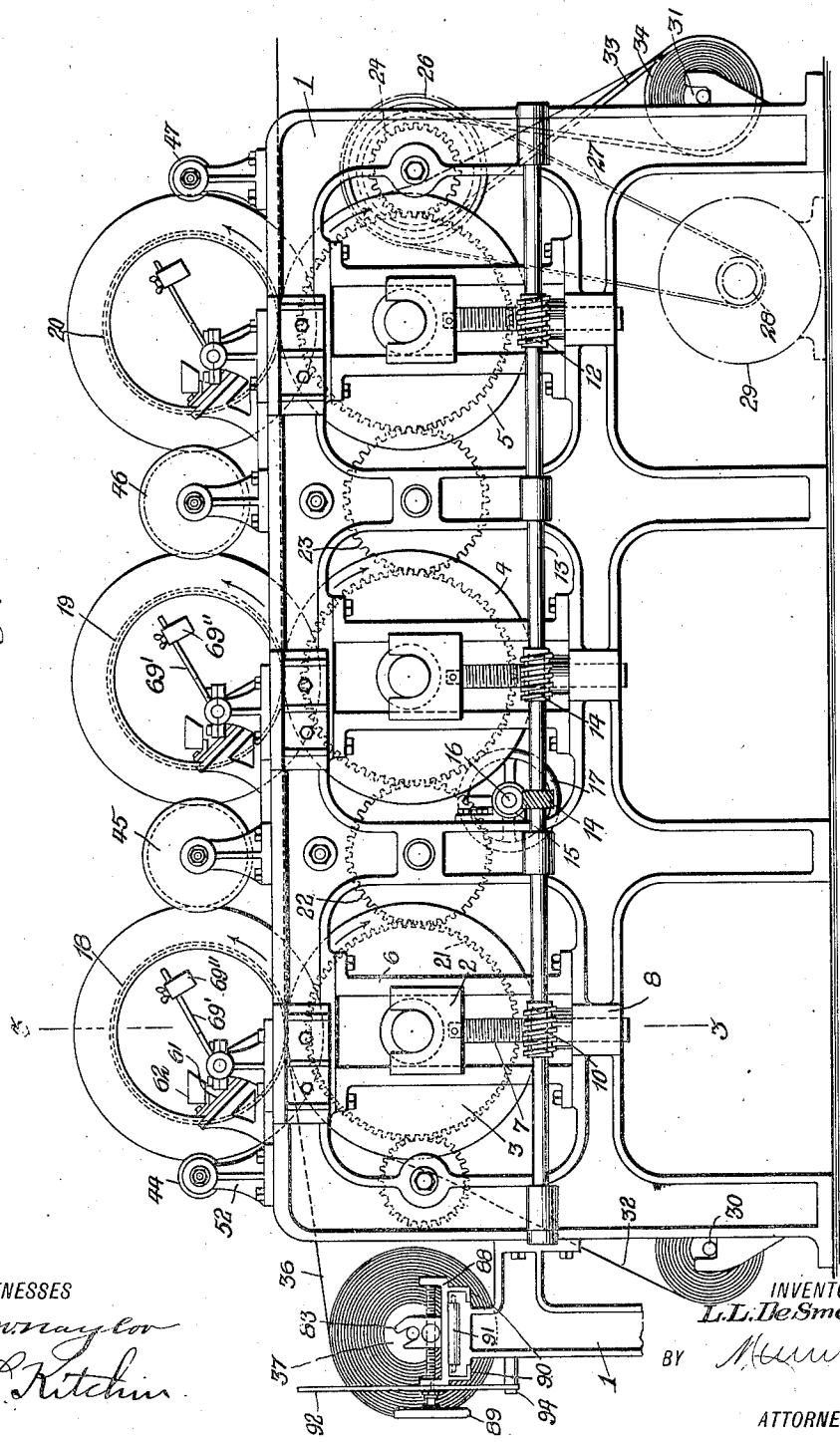


Fig. 1.

WITNESSES

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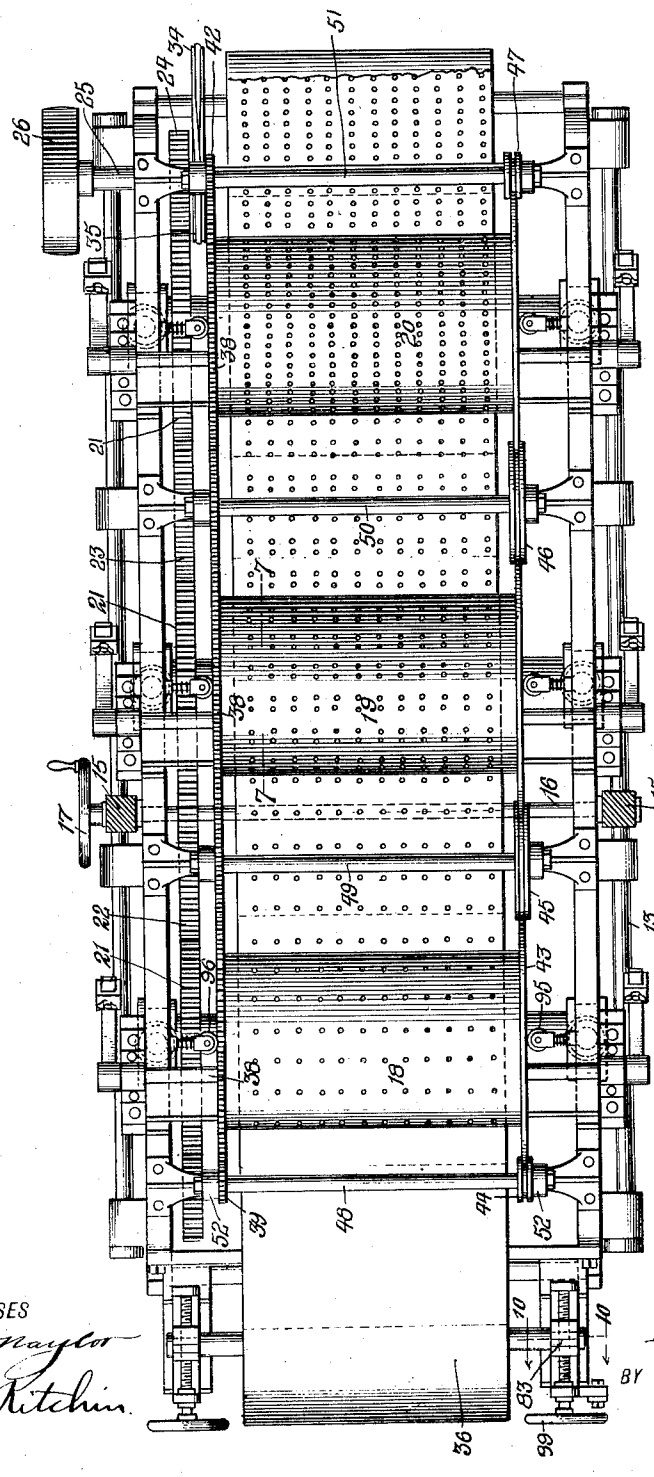


Fig. 2.

WITNESSES

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Fig. 3.

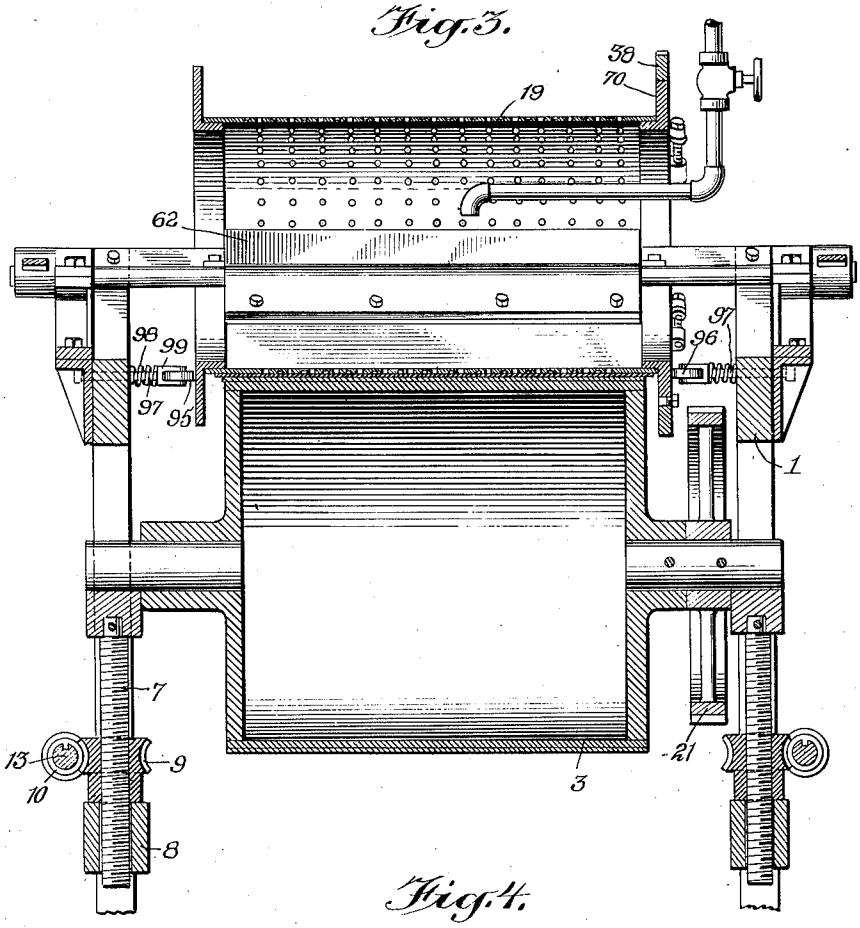


Fig. 4.

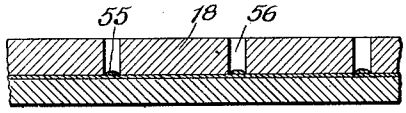


Fig. 5.

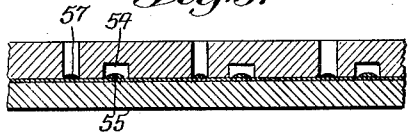
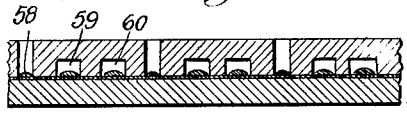


Fig. 6.



WITNESSES

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MULTIPLE COLOR DOT PRINTING MACHINE

Filed May 31, 1924 4 Sheets-Sheet 4

Fig. 7.

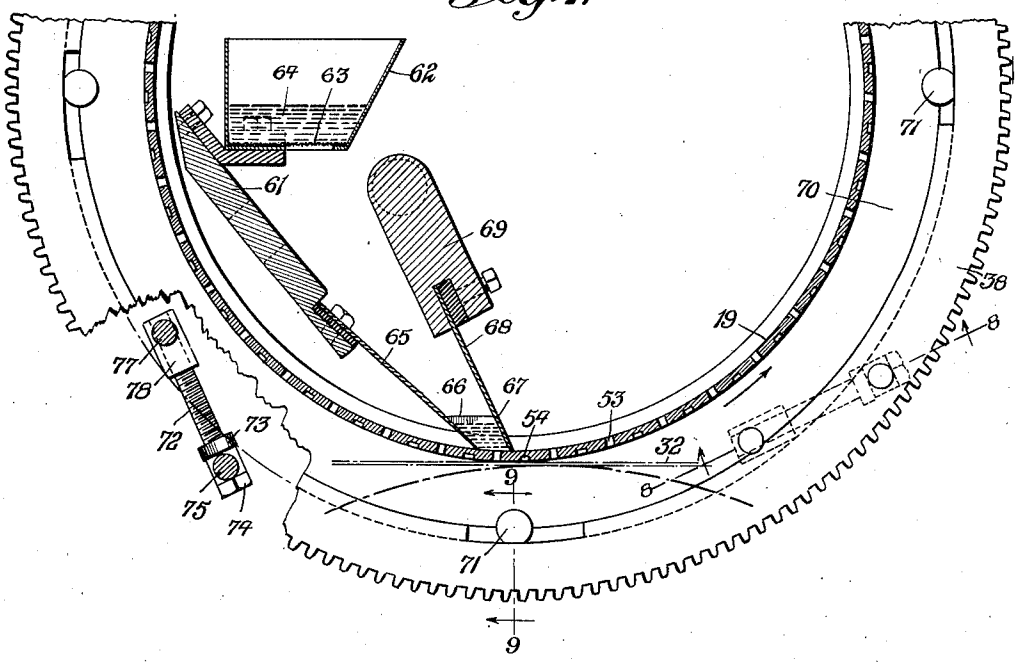


Fig. 9.

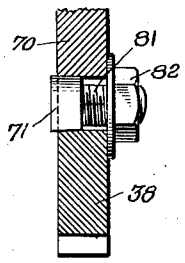


Fig. 8.

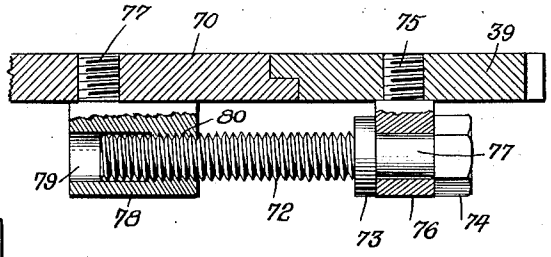
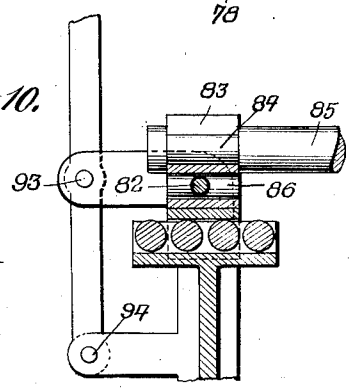


Fig. 10.



WITNESSES

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Patented Feb. 10, 1925. 1,526,266

UNITED STATES PATENT OFFICE.

LIEVEN LOUIS DE SMET, OF FAIR LAWN BOROUGH, NEW JERSEY.

MULTIPLE-COLOR DOT-PRINTING MACHINE.

Application filed May 31, 1924. Serial No. 717,048.

To all whom it may concern:

Be it known that I, LIEVEN LOUIS DE SMET, a subject of the King of Belgium (having taken out his first United States citizenship papers), and a resident of borough of Fair Lawn, in the county of Bergen and State of New Jersey, have invented a new and Improved Multiple-Color Dot-Printing Machine, of which the following is a full, clear, and exact description.

This invention relates to machines for printing on a cloth, and particularly to that type of machine known sometimes as flocking machines, and has for an object to provide an improved construction, wherein a plurality of colors may be printed on a strip of cloth as it is passed once through the machine.

Another object of the invention is to provide a fabric printing machine wherein a plurality of rollers is provided associated together in such a manner that the same color or different colors may be deposited therefrom on a strip of cloth passing through the machine.

A still further object more specifically is to provide in a printing machine a plurality of printing drums adapted to print different colors, the arrangement being such that recesses are provided in certain of the drums for preventing smearing of the paint deposited on the cloth.

A still further object of the invention is to provide a printing machine for printing dots on fabric, wherein dots of different colors may be provided, having means designed to retain the fabric and other parts in alignment to produce a proper registry throughout.

In the accompanying drawings—

Figure 1 is a side view of a dot printing machine disclosing an embodiment of the invention.

Figure 2 is a top plan view of the structure shown in Figure 1.

Figure 3 is a sectional view through Figure 1 approximately on the line 3—3.

Figure 4 is an enlarged fragmentary sectional view of part of the printing drum shown in Figure 3, the same illustrating how small quantities of paint are applied to the fabric in the form of dots.

Figure 5 is a view similar to Figure 4, but showing a section of the second roller illustrated in Figure 1, the same illustrating how a new series of dots is applied and how the dots of the previous row are protected.

Figure 6 is a view similar to Figure 5, but showing a section through the third roller illustrated in Figure 1.

Figure 7 is an enlarged fragmentary sectional view through Figure 2 approximately on the line 7—7.

Figure 8 is an enlarged fragmentary sectional view illustrating a gear adjusting member embodying certain features of the invention, the same being taken on the line 8—8 of Figure 7.

Figure 9 is a fragmentary sectional view through Figure 7 approximately on the line 9—9.

Figure 10 is an enlarged fragmentary sectional view through one of the bearings, the same being taken approximately on the line 10—10 of Figure 2.

By the construction of printing machines, particularly those known as flocking machines, a colored liquid is deposited in dots on the fabric and arranged in certain designs. This liquid is known as paint and produces raised dots simulating, to a certain extent, embroidery. Heretofore, machines of this character applied only a single colored paint arranged to produce different designs. Where more than one color was desired to improve the design, it was necessary to pass the cloth through a second machine and this was very difficult as it usually was impossible to produce a proper registry of the different dots.

In the present invention means have been provided for printing or depositing three different colored paints in a strip of fabric as it passes once through the machine. It is, of course, evident that a greater number of colors or less number could be used without departing from the spirit of the invention, the only requirement being to increase or decrease the number of printing rollers used.

Referring to the accompanying drawings by numerals, 1 indicates a frame of any desired kind which is provided with vertically adjustable bearings 2 adapted to support the shafts of the various drums 3, 4, and 5. These drums may be of any desired kind and are preferably hollow, as shown in Figure 3, for the sake of lightness. The outer surface of these drums are smooth in order to provide a proper surface for supporting the cloth as it passes thereover. Each of the adjustable bearings or boxes 2 is guided in its respective guiding mem-

bers 6 carried by the frame 1 and associated with each of the drums 3, 4 and 5. A threaded member 7 is rigidly secured by a pin or otherwise to each of the bearing boxes 2 and extends downwardly through a guiding sleeve 8 carried by the frame 1. A worm wheel 9 is threaded on to each of the screws 7 and the respective worm wheels are continually maintained in mesh with the respective worms 10, 11 and 12 rigidly secured to a shaft 13. A worm wheel 14 is also connected with the shaft 13 and meshes with a worm 15 mounted on the shaft 16, which shaft carries a hand wheel 17 whereby the parts may be manually adjusted and the various bearing boxes 2 raised and lowered simultaneously. As illustrated in Figures 2 and 3, the arrangement just described is positioned on both sides of the machine, so that there is only one hand wheel 17. This arrangement permits the various drums, 3, 4 and 5 to be bodily adjusted toward and from the printing drums 18, 19 and 20. The drums, 3, 4, and 5 are positively driven, while the printing drums 18, 19 and 20 are driven by friction. In order to positively drive the lower drums, each drum has a large gear wheel 21 secured thereto and these gear wheels are connected by the respective idlers 22 and 23, while a pinion 24 meshes with one of the gears 21. This pinion is rigidly secured to shaft 25, which shaft carries a pulley 26. A belt 27 passes over the pulley 26 and over a small pulley 28 driven by the motor 29. Arranged near the bottom of frame 1 and at each end are rollers 30 and 31, roller 30 being free to rotate when the cloth 32 is pulled. Roller 31 is driven by a belt 33 passing over a pulley 34 connected with the roller 31 and over a pulley 35 connected to the shaft 25. The cloth 32 is a heavy cloth of some kind known as a foundation cloth, said cloth passing upwardly over drum 3 and from thence in a horizontal line over drums 4 and 5, and then down to the roller 31 on which it is wound. The pull of roller 31 maintains this foundation cloth tight, whereby a proper foundation or movable horizontal base is provided for the fabric 36, which is to be printed. This fabric is wound on a roller 37 and is pulled through the machine by the friction of the various parts including the drums 3 and 4 and the printing rollers 18 to 20.

Each of the printing drums is provided with a large gear 38 meshing with the various idlers 39, 40, 41 and 42, which idlers act to hold the rollers in alignment and also to cause them to rotate in unison, whereby a proper registry may be maintained. In order to assist this alignment and proper registry, each of the printing drums is provided with a guiding disk 43 and coacting with the respective disks guiding wheels or pulleys 44, 45, 46 and 47. These guiding pulleys are connected to the respective idler gears 39 to 42 by the respective shafts 48, 49, 50 and 51. These shafts are rotatably mounted in suitable bearings 52 connected to the frame 1. By this method the printing drums are permitted a free rotation produced by friction and also permitted to yield upwardly or away from the drums 3, 4 and 5. Though this yielding motion is permitted, the drums will all remain in alignment and in registry by reason of the gears and guiding disks just described.

The various printing drums 18, 19 and 20 are of identical construction except for the position of the apertures of the outside surface illustrated particularly in Figs. 4, 5 and 6. Figure 7 illustrates in section part of the printing drum 19 and associated parts. From this figure it will be observed that the drum 19 is formed with a plurality of apertures 53, which may be arranged in any desired order, as, for instance, as shown in Figure 3, whereby straight rows of dots will be produced. Arranged between the apertures 53 are depressions 54 for accommodating the dots 55 caused by the paint flowing through the apertures 56 of the drum 18 (Figs. 4 and 5). As the cloth passes beneath the drum 18, a single series of dots will be provided, as indicated in Figure 4, and when the cloth reaches the drum 19, the depressions or notches 54 will accommodate the dots 55 provided by drum 18 and in turn will provide additional dots or printed matter 57, which may be of the same color or of different color. When the cloth reaches the third drum; namely, drum 20, a third dot 58 will be provided which may be of the same color or of a different color than those before provided. In addition the printing drum 20 is provided with a pair of recesses or depressions 59 and 60 to accommodate the dots provided by printing drums 18 and 19. It will, of course, be understood that the various apertures in the various drums may be arranged to produce any desired configuration and that the notches and depressions, 54, 59 and 60 must be arranged to agree with this arrangement of apertures.

Referring again to Figure 7, it will be noted that there is provided a bracket or member 61 which is secured to the frame 1 by any suitable fixture and which carries a trough 62 extending for substantially the full length of the drum 19. This trough is provided with a foraminous bottom 63 whereby the paint 64 may be strained as it falls therethrough on to the bracket 61 and on to the feeding knife 65, which is of comparatively thin metal and which is preferably also resilient. The feeding knife 65 is preferably provided with forwardly extending flanges 66 on each side to hold the

small quantity of paint 67 in proper place when associated with the spring scraping blade 68 rigidly secured in any desired manner to the bar 69. This bar is provided with a journal at each end rotatably mounted in suitable bearings, as shown in Figure 1. To the bar 69 is also secured an arm 69′ having an adjustable weight 69″, whereby the blade 68 may be brought under any desired tension. The bar 69 extends beyond the drum and is mounted in any suitable manner on the frame. In this way substantially all of the paint released from the trough 62 will be maintained between the blades 65 and 68, or until the paint has been deposited on the fabric 36 through the apertures 53. By this construction and arrangement of parts, the fabric 36 may be printed as rapidly as the paint can flow through any of the apertures 63.

In order to adjust the various printing drums, special means have been provided to produce an accurate adjustment to cause a proper alignment. Each of the drums is provided with a flange 70, on which the respective gear rings or gears 38, 39 and 40 are loosely mounted. A plurality of wedges 71 is carried by each of the flanges 70, and after the gear rings or gears have been properly adjusted, these wedges are forced in until they tightly clamp the parts together. In order to adjust the position of the gear ring 39, for instance, in respect to the drum 19, a threaded member 72 is provided. This threaded member, as shown in Figure 8, is provided with a stop 73 and a head 74. A screw member 75 is screwed into the gear wheel or ring 39 and is provided with an enlarged head 76, through which the shank 77 of the screw member 72 extends, whereby the screw member 72 may be freely rotated, but cannot move longitudinally in respect to the head 76. A second threaded member 77 is screwed into the flange 70, said threaded member 77 having a head 78 provided with a smooth guiding bore 79 in a threaded section 80 coacting with the threaded section of the screw member 72. By this construction and arrangement whenever the head 74 is rotated, the flange 70 and the gear ring 39 will move in respect to each other. This will cause adjustment to align the various apertures 53 so as to coact with the apertures of the other drums. After all of the drums have been adjusted in like manner, the various wedges 71 are driven in or forced in until the parts are tight. These wedges are preferably comparatively short, as shown in Fig. 9, each wedge having a threaded extension 81 for receiving a nut 82, whereby they may be held against accidental loosening.

As illustrated in Figures 1, 2 and 10, means have been provided for aligning the roller 37. This means includes a bracket 83 adjacent each end of the roller. This bracket accommodates a restricted part 84 of the shaft 85 of roller 37 (Fig. 10). A pin 86 is loosely mounted in the bracket 83 and is provided with a threaded aperture for accommodating the threaded screw member 87. This screw member is rotatably mounted in a bracket 88 and carries a hand wheel 89 whereby the screw member may be freely rotated at any time. The bracket 88 is provided with a pair of underhanging guiding clips 90 for holding the bracket on the lower bearings 91. A hand operated lever 92 is connected at 93 to a bracket 88 and at 94 to a projection from the frame 1, whereby as the lever 92 is shifted back and forth, the shaft 85, roller 37 and associated parts are also shifted. A bracket 88 and associated parts is provided on opposite sides of the machine, as shown in Figure 2, and as these are identical, no additional description will be necessary. The lever 92 is arranged only on one side as a duplication of this lever would not be necessary. Whenever desired, either of the hand wheels 89 may be rotated for properly aligning the roller 37, while the lever 92 is loose, for bodily shifting the roller in either direction. In regard to the aligning of the various parts, it will be noted in Figure 3 that anti-friction rollers 95 and 96 are provided, said rollers being carried by screw bolt reciprocating and guiding pins 97 and each pin surrounded with a spring 98 bearing against the fork 99 of the respective pins and against certain parts of the frame 1, whereby a proper pressure will be maintained to hold the drum in a desired position. The springs 98 are comparatively stiff so as to firmly hold the drums in a given position, but in case of excessive strain, the drums yield, though the same will quickly return to their former position.

In operation, after the parts have been properly aligned and the foundation cloth 32 arranged, as shown in Figure 1, the fabric 36 is threaded into the machine until it assumes substantially the position shown in Figure 1. The machine is then started and as it operates, the printing drum 18 prints dots of a certain color, while the printing rollers or drums 19 and 20 will print additional dots either of the same color or different color and positioned in a desired relationship to the other dots. As the fabric leaves the machine, the various dots are, of course, still wet and, consequently, the fabric is passed through a drying apparatus of any approved kind capable of drying the paint before the fabric is rolled or folded.

I claim:

1. A multiple color dot printing machine, including a plurality of printing rolls, and means for moving a strip of cloth past said rolls so as to be successively engaged there-

by, each of said rolls having apertures through which the printing fluid is adapted to pass, and certain of said rollers having depressions for spanning the dots printed by the preceding roller.

2. A multiple color dot printing machine, comprising a frame, a plurality of solid drums located longitudinally of said frame, means for vertically and simultaneously adjusting said drums, a printing drum coacting with each of the first-mentioned drums, each of said printing drums having apertures for the passage of printing liquid and all of said printing drums except the first being formed with recesses for accommodating the matter printed by the various preceding rollers, and means for feeding the cloth to be printed between the printing drums and the first-mentioned drums.

3. In a multiple color dot printing machine, a printing drum comprising a body formed with apertures therein through which printing liquid is adapted to be passed, and a plurality of recesses extending from the surface inwardly, said recesses acting to accommodate printed matter on a strip of cloth passing beneath the drum.

4. In a multiple color dot printing machine, a printing drum having a plurality of apertures for the passage of printing fluid in the interior to the exterior of the drum, and groups of recesses on the outer surface.

5. In a multiple color dot printing machine, a printing drum, a gear wheel connected with said drum, a plurality of wedges for securing said gear wheel to the drum, and means for adjusting said gear wheel in respect to the drum, said means including posts mounted respectively on the gear wheel and on the drum, and a threaded member rotatably mounted in one of the posts and screwed into the other post.

6. In a color dot printing machine, a printing drum having apertures therein through which the printing liquid is to flow and groups of recesses on the exterior surface, a stationary container mounted within said printing drum, a pair of spaced resilient blades for confining said liquid as it passes from said container, and means for varying the tension on one of said blades.

7. In a multiple color dot printing machine, a plurality of printing rolls for printing dots on fabric passed therebeneath, means for causing said rolls to rotate at the same speed, the first of said rolls having apertures therein, and the remaining rolls having apertures therein for the passage of printing liquid, and also recesses on the outer face for straddling the dots of the previous rollers.

8. In a multiple color dot printing machine, a plurality of printing drums, a gear connected to each of said drums, pinions meshing said gears causing said drums to rotate at the same speed, a flange member connected to each of said drums, and a pulley structure arranged on each side of each drum straddling the respective flange members thereof for keeping the drum in alignment.

9. In a multiple color dot printing machine, a plurality of printing drums, each drum being formed with apertures for the passage of printing fluid from the interior of the drums to a point exteriorly thereof for printing fabric passing beneath the drums, the second of said printing drums being formed with a plurality of recesses exteriorly for accommodating the dots applied to said fabric by the first drum, and means for causing said drums to operate in time relation.

10. In a multiple color dot printing machine, a plurality of drums for printing designs on fabric, each of said drums having apertures therein adapted to accommodate the passage of printing fluid, means for causing printing fluid to pass through said apertures, the second of said drums being formed with recesses exteriorly and positioned to accommodate the designs printed by the first drum and the succeeding drums being formed with recesses exteriorly for accommodating the design printed on said fabric by all the preceding drums, and means for causing all of said drums to function in proper time relationship.

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