

July 2, 1940.

J. H. JOHNSTON

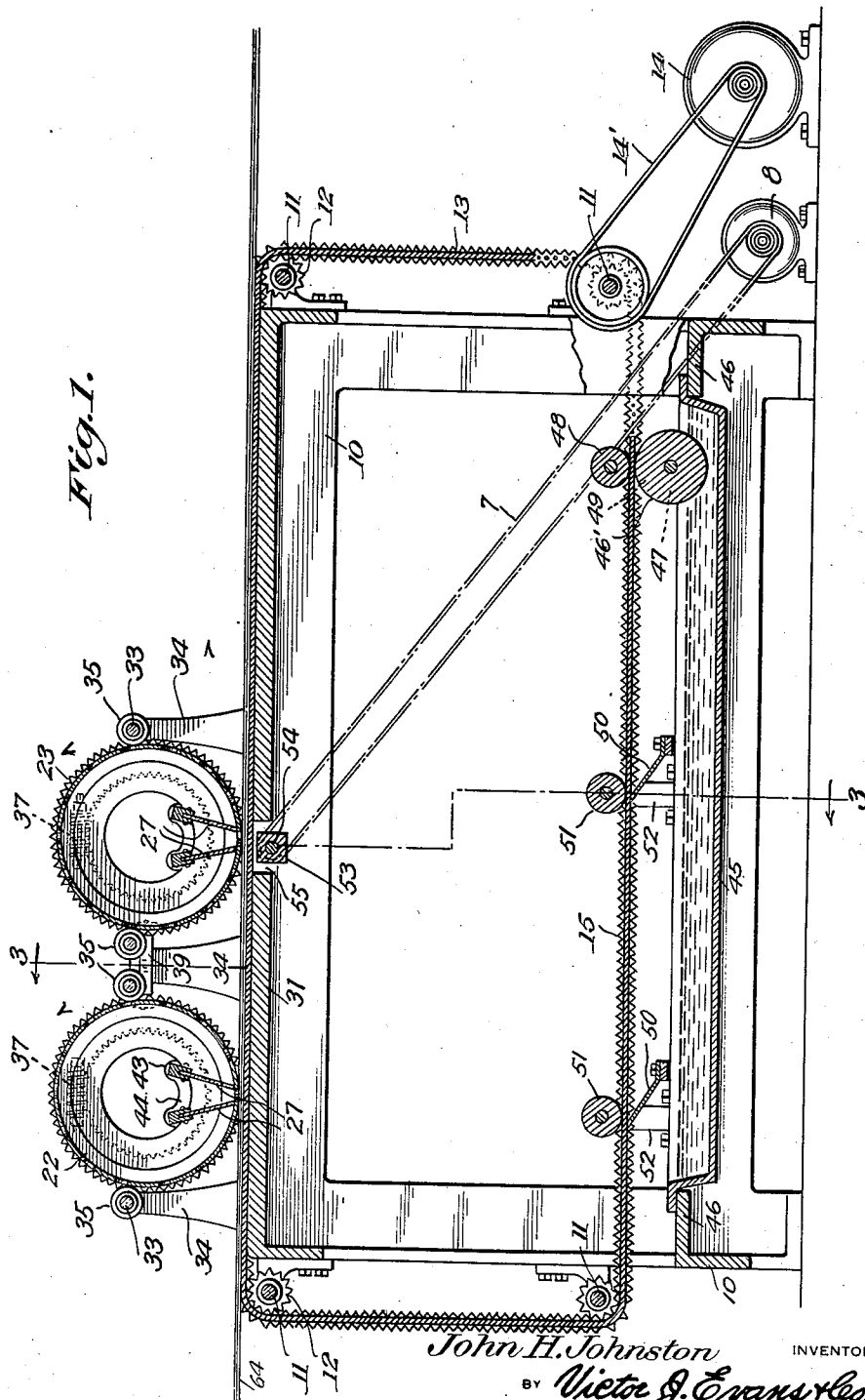
2,206,570

MULTICOLOR FLOCK PRINTING MACHINE

Filed April 4, 1938

4 Sheets-Sheet 1

Fig. 1.



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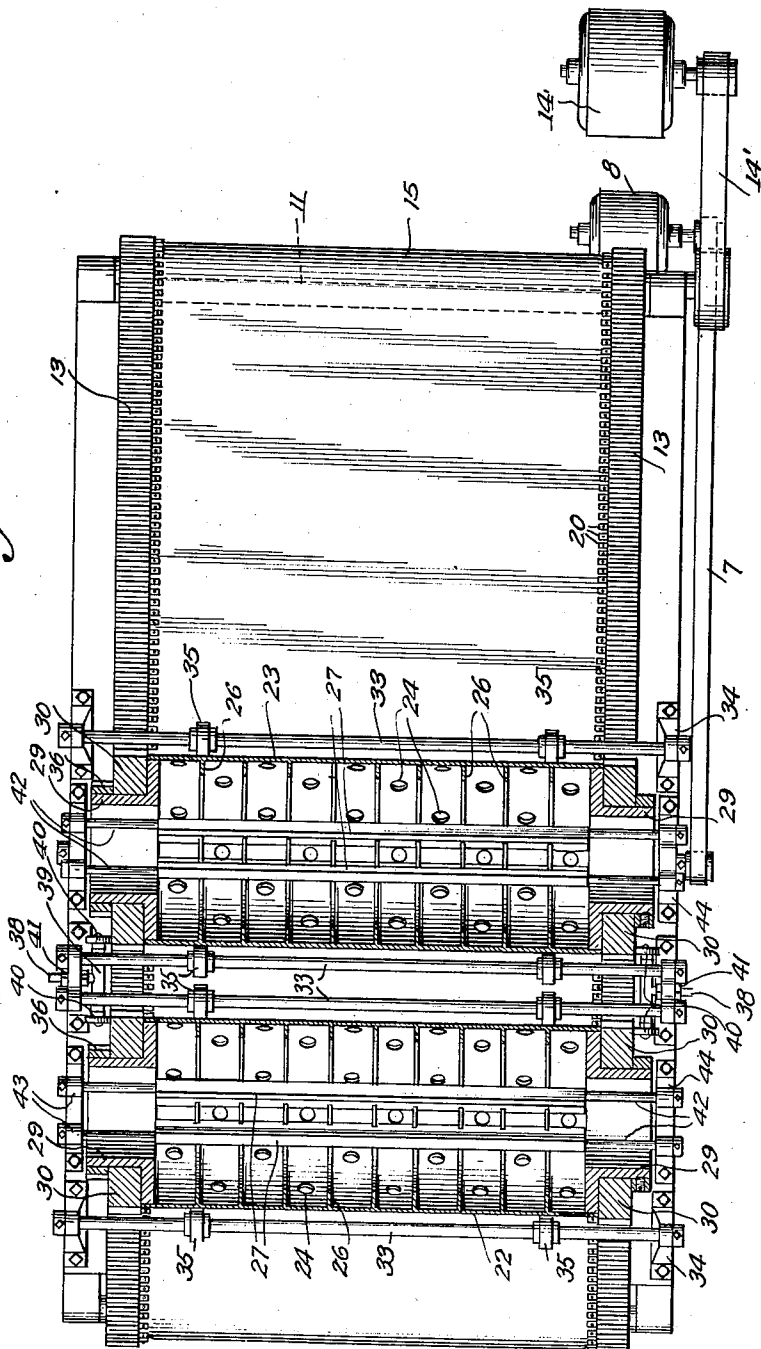
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Fig. 2.



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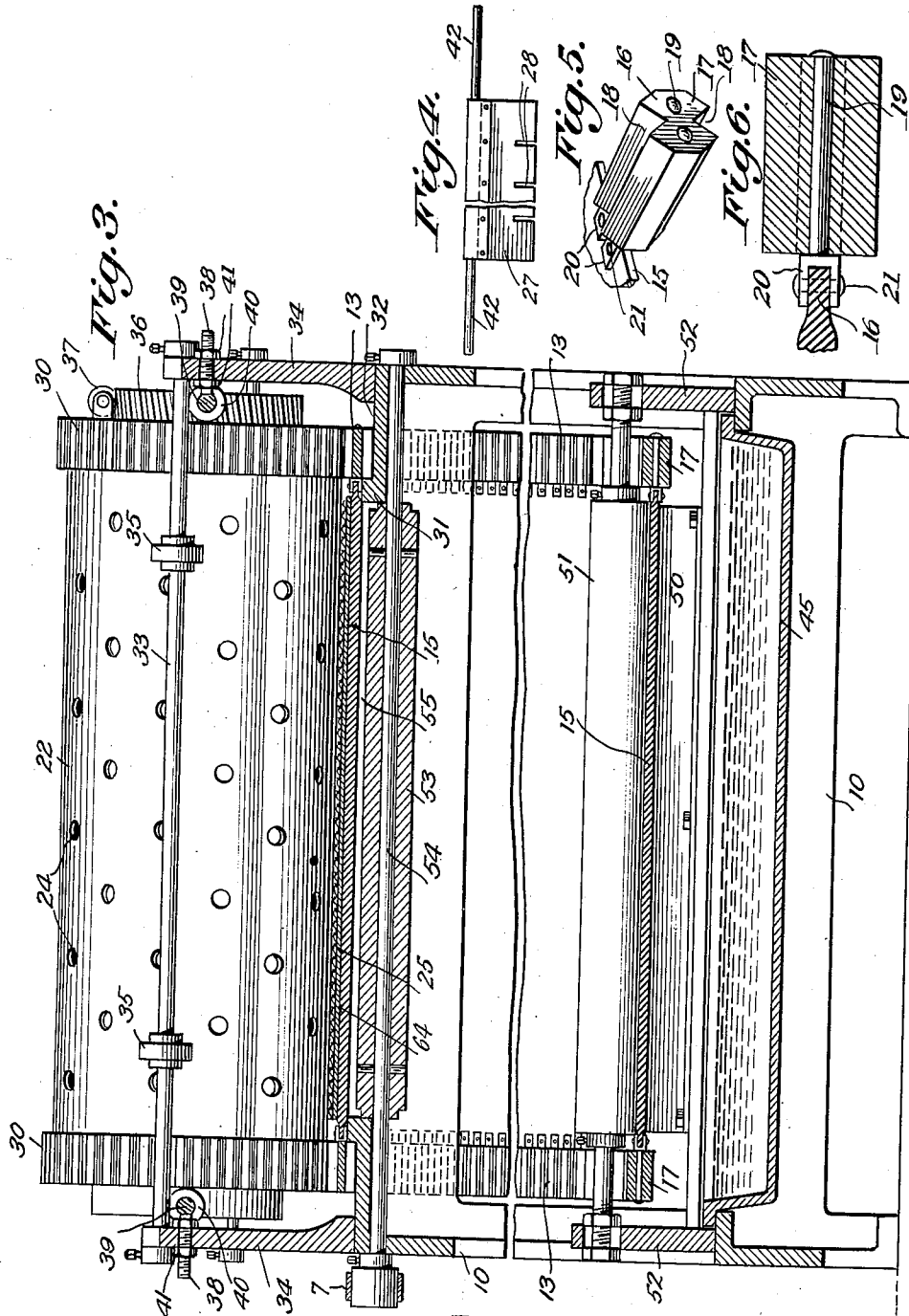
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Fig. 7.

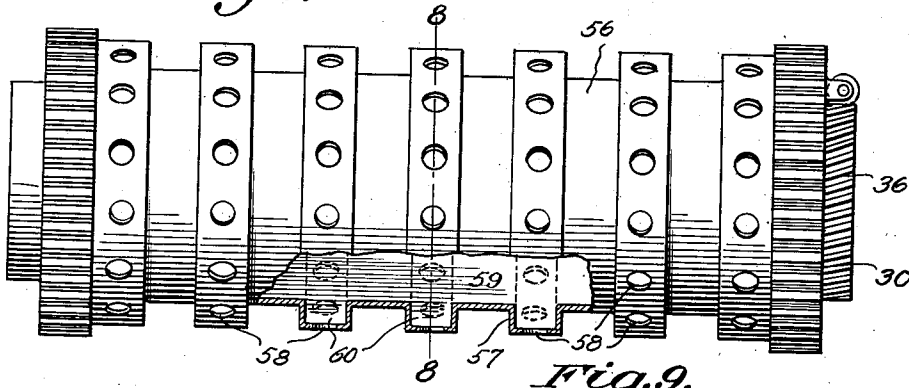


Fig. 9.

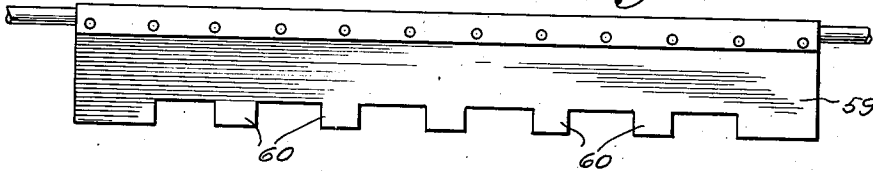


Fig. 10.

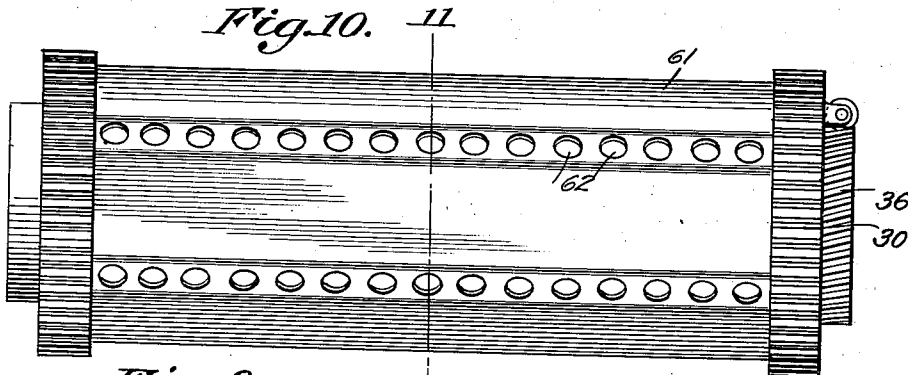


Fig. 8.

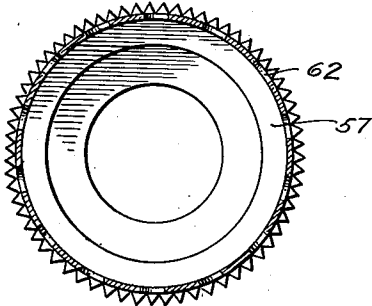
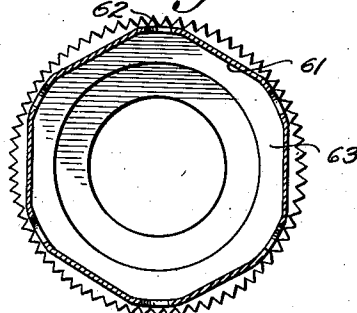


Fig. 11.



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UNITED STATES PATENT OFFICE

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MULTICOLOR FLOCK PRINTING MACHINE

John Hugh Johnston, Fall River, Mass.

Application April 4, 1938, Serial No. 200,013

4 Claims. (Cl. 101-116)

This invention relates to a multicolor flock printing machine.

An object of the invention is to provide a machine of this character wherein the printing of the various colors and the applying of the various corresponding colors of flock is performed in a single operation.

A further object is to provide a machine of this type having a novel stencil cylinder, being provided with a plurality of pockets for containing distinctively colored printing material.

A further object of the invention is to provide novel means for adjusting the stencil cylinders relatively to each other so that the design on the flock applying cylinder will accurately register with the adhesive applied to the textile fabric or the like by the adhesive applying cylinder.

A further object is to provide a device of this character which will be effective in operation, thoroughly reliable and inexpensive to manufacture and install.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming part of this specification,

Figure 1 is a longitudinal sectional view of a multicolor flock printing machine constructed in accordance with the invention.

Figure 2 is a plan view of the machine with the stencil cylinders and mountings therefor shown in section.

Figure 3 is a vertical sectional view of the machine taken on the line 3-3 of Figure 1.

Figure 4 is a fragmentary front elevation of one of the two slotted plates which coact with annular division walls in the stencil cylinder to form pockets for a plurality of distinctive colors.

Figure 5 is a perspective view of one of the links of the chain for moving the endless rubber blanket.

Figure 6 is an enlarged longitudinal sectional view of one of the links showing the connection between the link and the blanket.

Figure 7 is a front elevation of a modified form of stencil cylinder having channels for respectively different colored materials.

Figure 8 is a cross sectional view taken on the line 8-8 of Figure 7.

Figure 9 is a front elevation of a modified form

of stationary plate for use in the stencil cylinder shown in Figure 7.

Figure 10 is a front elevation of another modified form of stencil cylinder of hexagonal cross section.

Figure 11 is a cross sectional view taken on the line 11-11 of Figure 10.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, 10 designates a suitable frame which is equipped at the ends with superposed shafts 11 equipped with respective toothed gears 12 over which a pair of endless chains 13 are trained one on each side of the machine. The chains are driven by a motor 14 which is belted as shown at 14' to one of the shafts 11, or otherwise connected thereto.

The shafts 11 are equipped with idle rollers 4 over which is trained an endless rubber blanket 15. The blanket is connected at the longitudinal edges to the endless chain links 16, one of which is shown in Figure 5.

Each link comprises two similar integral sections 17 having oppositely disposed V-shaped grooves 18 to receive the teeth of the gears 12. Pins 19 are loosely mounted in openings formed axially in the sections of the link and are equipped with forked ends 20 which receive the edge portion 16 of the rubber blanket and are riveted to said edge portion as shown at 21.

In the present embodiment of the invention a pair of similar stencil cylinders is illustrated, the front cylinder 22 applying an adhesive such as lacquer for example to the textile fabric and the rear cylinder 23 applying flock to the printed stencil design formed by the first cylinder.

The stencil cylinders are duplicates of each other so that a description of one suffices for both.

The stencil cylinder is provided with a plurality of openings 24, best shown in Figure 3, through which the printed material is dispensed from the cylinder in the form of any desired design, the present example showing circular openings to form dots on the traveling web of textile fabric 25 carried by the rubber blanket in a path underneath the cylinder. As best shown in Figure 2 the cylinder is provided with a plurality of annular partition walls 26. A pair of plates 27 are mounted stationary in the revolving stencil cylinder and these plates slope toward each other from their upper ends toward their lower ends, as shown in Figure 1. Each plate is provided with a plurality of slots 28 in the bottom edge to receive the division walls 26. The stationary

plates 27 and revoluble division walls 26 coact in forming a row of pockets longitudinally of the bottom of the cylinder to receive respective supplies of different colored printing materials which gravitates through the stencil openings as the openings arrive between the stationary plates during rotation of the cylinder, and prints a design in a plurality of different colors transversely on the traveling web of material to be printed.

Each stencil cylinder is provided at the end with a cylindrical hub 29 which is loosely mounted in a gear 30 as best shown in Figure 2, the gear engaging the respective chain 13, as best shown in Figure 3. The chain is supported intermediate the rollers by a table 31 also best shown in Figure 3, the table having a recess 32 to support the chain. The stencil cylinder is removably clamped against the chain by shafts 33 arranged on opposite sides of the cylinder and extending longitudinally thereof. The shafts are mounted on standards 34 which rise from the table as best shown in Figures 1 and 3 and are disposed above the center of the respective stencil cylinder. Rollers 35 are disposed on each shaft and bear against the cylinder.

As previously stated the hubs of the stencil cylinder are loose in the gears 30. The purpose of this is to permit accurate adjustment of the two cylinders so that the design of flock material applied by the rear cylinder 23 will accurately register with the design of adhesive material applied by the front cylinder 22. For this purpose one hub 29 of the stencil cylinder is extended beyond the gear 30 and has fixed thereto a worm gear 36, as best shown in Figure 3. A worm 37 is fixed to the outer side of the gear 30 and meshes with the worm gear 36 to lock the gear 30, gear 36 and stencil cylinder for rotation as a unit. Should the design applied by the flock cylinder 23 not track, or register with the design of adhesive applied by the cylinder 22, by manually turning the worm 37 of either cylinder, the cylinder may be turned bodily in the gear 30 to cause the stencil design of the flock cylinder to accurately register with the design of adhesive when the latter passes underneath the design of the flock cylinder.

The stencil cylinder may be adjusted transversely of the table as a unit when desired and for this purpose a pair of adjusting pins 38 are threadedly engaged through the standards 34 which are disposed between the cylinders and each pin is provided with a transversely disposed head 39 equipped at the ends with rollers 40 which bear upon the driving gears 30 of both cylinders. Each pin is equipped with a pair of nuts 41 which engage opposite faces of the respective standard 34. By loosening the nuts of one pin and tightening the nuts of the other pin both cylinders may be simultaneously adjusted endwise transversely of the table.

The stationary plates 27 which form the end walls of the row of pockets in each stencil cylinder are provided at the ends with rods 42 which project through the hollow hubs 29 of the cylinder and are secured in bearings 43 carried by standards 44 which rise from the table as best shown in Figure 1.

Disposed below the traveling blanket is a pan 45 which is supported at the end upon brackets 46 secured to the frame 10. The pan is adapted to hold cleaning material for removing the adhesive from the blanket and maintain the blanket in clean condition at all times.

A roller 46', best shown in Figure 1, is mounted in bearings 47 carried by the pan and the roller is submerged for about one-half its diameter in the cleaning fluid. The upper side of the roller engages the working face of the blanket and applies the cleaning fluid thereto. A pressure roller 48 is mounted on a standard 49 in superposed relation to the roller 46 and presses the blanket down against the roller 46.

A plurality of scrapers 50 is arranged on the top of the pan and bear against the working face of the blanket after it has received a coating of cleaning material from the roller 47. These scrapers scrape the cleansing material and any accumulated adhesive from the working face of the blanket so that the blanket will pass on to the table in thoroughly cleansed condition. A pair of pressure rollers 51 are arranged on the standards 52 which rise from the pan and these rollers press the blanket down firmly against the scrapers.

By referring now to Figures 1 and 3 it will be seen that a bar 53 is mounted on a driven shaft 54 that is journaled in the frame. The bar is substantially square in cross section and projects through an opening 55 formed in the table underneath the bottom of the flock applying stencil cylinder 23. The corners of the bar strike in succession against the underneath face of the blanket to vibrate the blanket and beat into the adhesive applied by the first cylinder 22, the flock supplied by the second cylinder 23. The shaft 54 is driven by a motor 8 which is belted to the shaft as shown at 7 or otherwise connected thereto.

A modified form of stencil cylinder and a modified form of plate for forming a row of pockets in the cylinder, is shown in Figures 7, 8 and 9. Instead of employing partition walls on the inner face of the cylinder as shown in the preferred embodiment of the invention, the stencil cylinder 56 is provided with a plurality of spaced annular channels 57 which extend beyond the outer surface of the cylinder and are provided with stencil openings 58. These channels provide the side walls and bottom walls of a longitudinal row of pockets in the cylinder.

The end walls of the row of pockets is formed by plates 59 having a plurality of spaced tongues 60 which are received in the channels.

In Figures 10 and 11 there is shown another modified form of the invention in which the cylinder 61 is substantially hexagonal in cross section and the stencil openings 62 are arranged at the intersections of the flat faces of the cylinder. Annular partition walls 63 must be provided in this form of the invention to coact with suitable shaped plates to form the row of pockets in the cylinder.

It will be pointed out that in all forms of the invention the stencil cylinder is formed with partitions between motives of the design or pattern, these partitions forming pockets for the reception of different distinctive colors of material to be received therein for the purpose of printing a plurality of distinctive colors in one operation. In practice the pockets in the second cylinder 23 may be filled with flock to correspond in color with the adhesive in the first cylinder 22. Thus a multicolor flock printing process is produced, the patterns or designs of the second stencil cylinder 23 corresponding to the pattern or design in the first stencil cylinder 22 except that the holes are made a trifle larger in the second cylinder to permit sufficient coverage of

flock striking the adhesive and prevent any part of the cylinder touching the adhesive printing applied by the first cylinder.

5 If desired a paper web 64 may be run through the machine with the fabric in interleaved position between the fabric and the blanket to prevent any printing material which may be on the blanket from contact with the fabric. The paper and cleaning tank may be used separately or may
10 both be used if desired.

Since the operation of the parts has been described as the description progressed it is thought that the invention will be fully understood without further explanation.

15 What is claimed is:

1. In a flock printing apparatus, a traveling blanket for supporting the material to be printed, a pair of stencil cylinders rotatably mounted above the blanket, said cylinders being hollow,
20 one of said cylinders being adapted to apply an adhesive to the material to be printed and the following cylinder being adapted to apply flock to the material to be printed, the stencil openings in the following cylinder being larger than the
25 stencil openings in the first named cylinder to permit sufficient coverage of flock striking the adhesive and prevent any part of the cylinder touching the adhesive applied by the first cylinder, each cylinder having parallel annular
30 division walls concentric with the axis of the cylinder on the inner surface thereof, and stationary plates extending transversely of all of the division walls and forming a longitudinal row of pockets at the bottom of the cylinder to
35 receive respectively different colors of printing material and permit the same to gravitate through the stencil openings as the openings arrive between the stationary plates during rotation of the cylinder.

40 2. In a flock printing apparatus, a traveling blanket for supporting the material to be printed, a pair of rotatable stencil cylinders superposed upon the blanket, one of the cylinders being adapted to apply an adhesive to the material to be printed and the following cylinder being
45 adapted to apply flock to the adhesive, a rotary

beater bar engaging the underneath face of the blanket below the flock applying cylinder adapted to vibrate the blanket and beat the flock applied by the following cylinder into the adhesive applied by the first cylinder, each cylinder having
5 parallel annular division walls concentric with the axis of the cylinder on the inner surface thereof, and stationary plates extending transversely of all of the division walls and forming a longitudinal row of pockets at the bottom of
10 the cylinder to receive respectively different colors of printing material and permit the same to gravitate through the stencil openings as the openings arrive between the stationary plates during rotation of the cylinder.

3. In printing apparatus, a hollow revoluble stencil cylinder having stencil openings, a plurality of annular division walls integral with the inner wall of the cylinder and concentric with the axis of the cylinder, and a pair of stationary
20 plates disposed within the the cylinder longitudinally of the cylinder having portions fitting between the annular division walls to form pockets for respectively different colored printing material at the lowest point in the cylinder to permit
25 the printing material gravitating through the stencil openings as the openings arrive between the stationary plates during rotation of the cylinder.

4. In printing apparatus, a hollow stencil
30 cylinder having a plurality of spaced annular channels extending beyond the outer surface of the cylinder and provided with stencil openings, said channels being disposed concentric with the axis of the cylinder, and a pair of stationary
35 plates extending longitudinally of the cylinder at the lowest point thereof having spaced tongues received in said channels and coacting with the walls of the channels to form pockets for respective supplies of different colored printing material, said material being adapted to gravitate
40 through the stencil openings as the openings arrive between the plates during rotation of the cylinder.

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