Sept. 7, 1954 J. MIRAN 2,688,304

FLOCKING APPARATUS

Filed June 14, 1951

2 Sheets-Sheet 1

Fig. 1

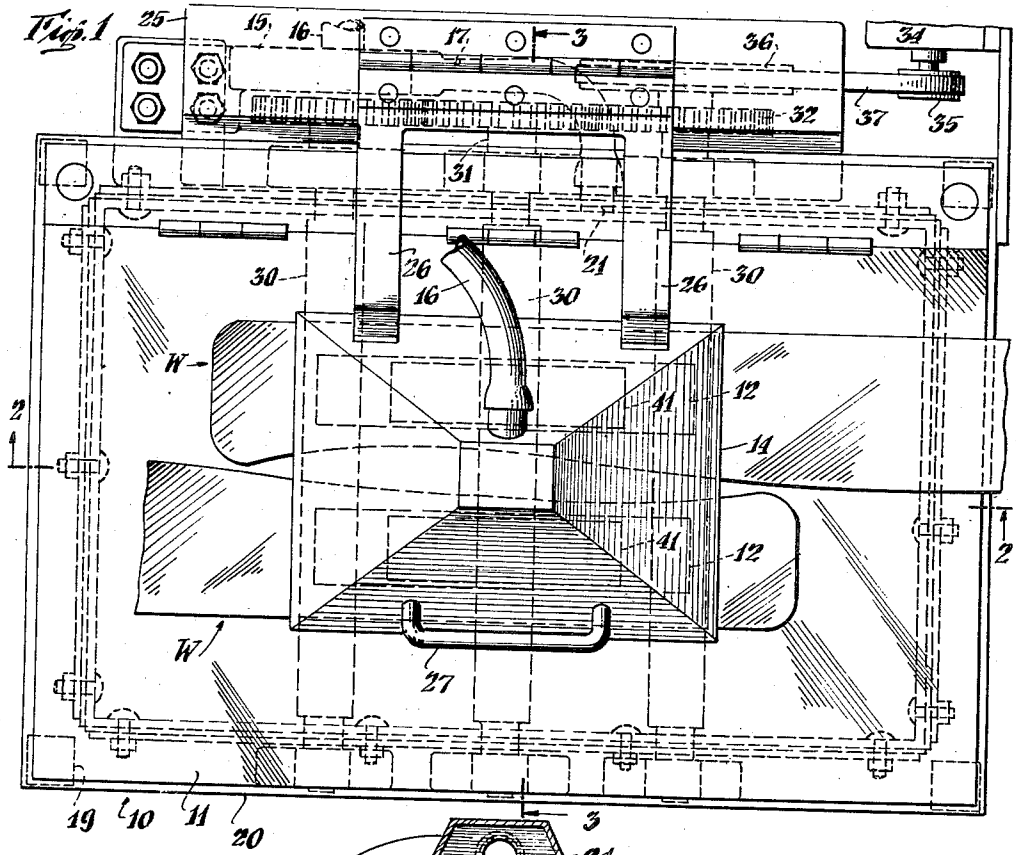
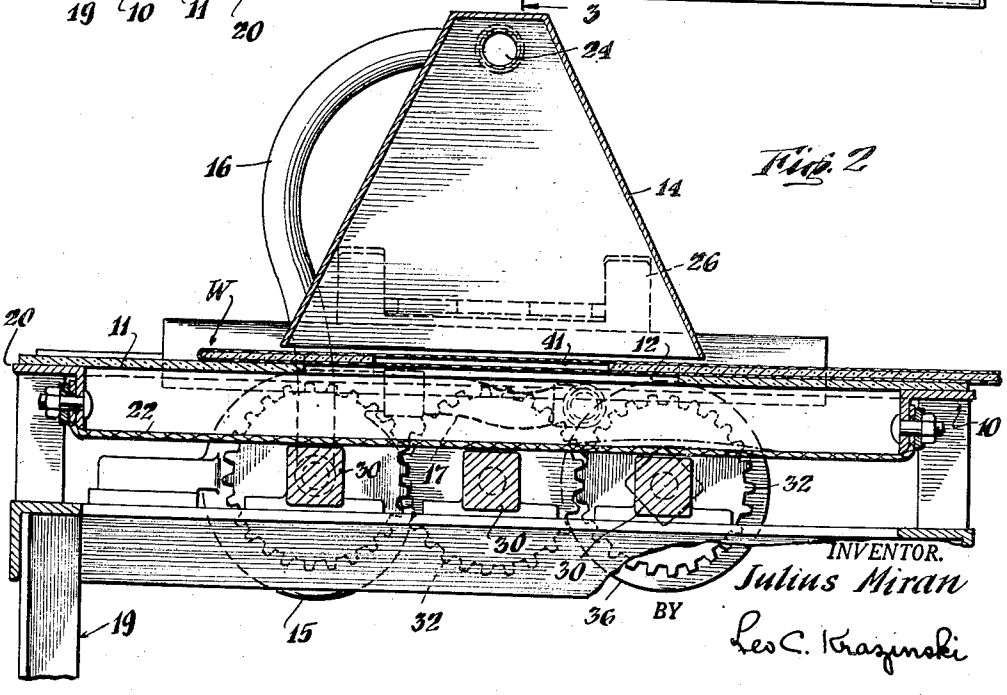


Fig. 2



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Fig. 3

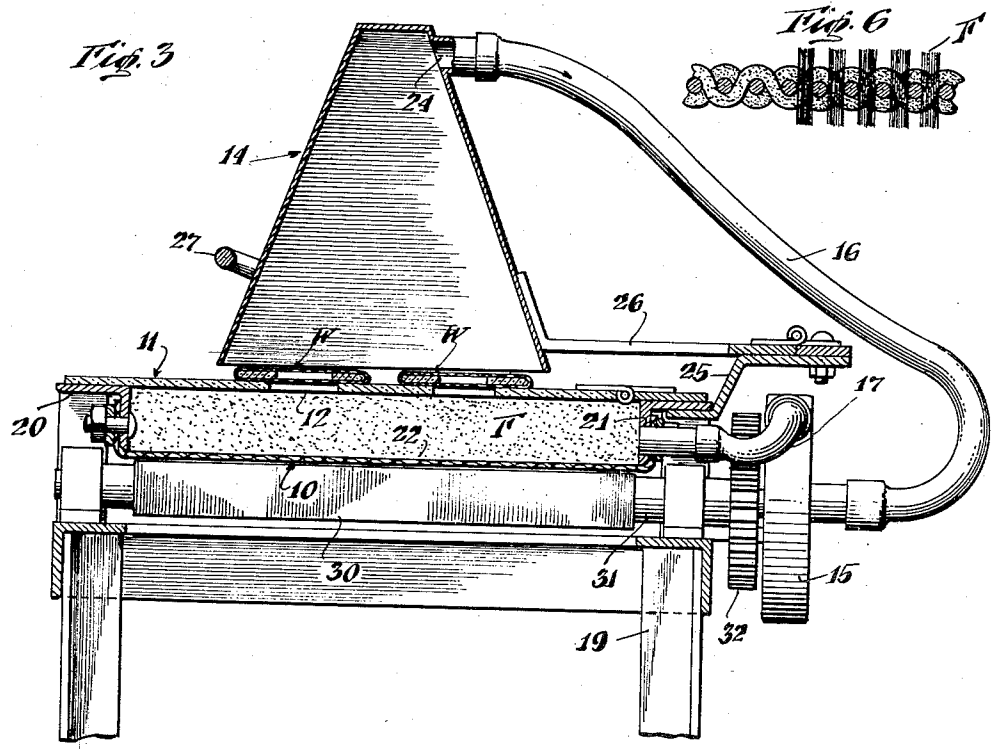


Fig. 6

Fig. 4

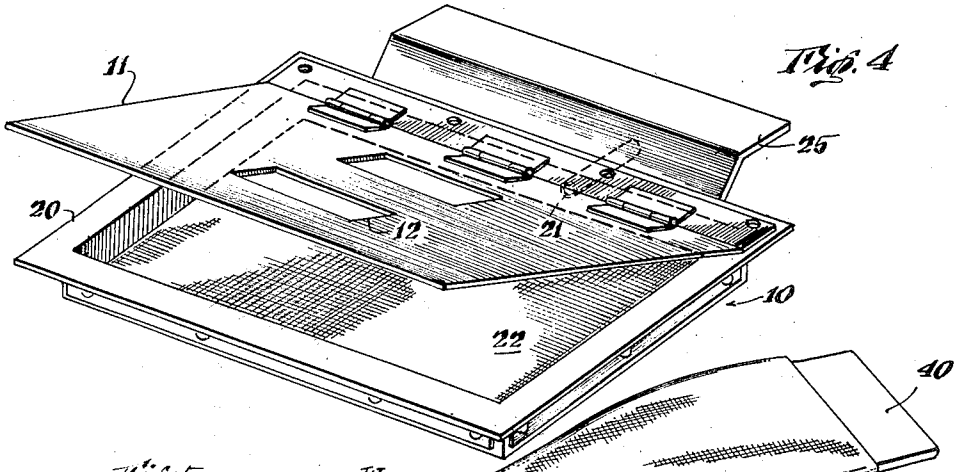
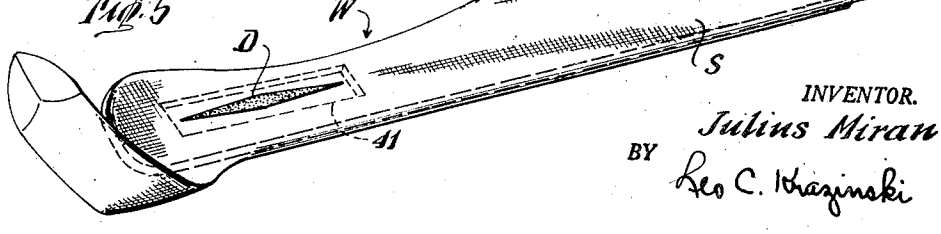


Fig. 5



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FLOCKING APPARATUS

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5 Claims. (Cl. 118—51)

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The present invention relates to applying flock to textile fabrics to provide plush-like designs thereon; and, more particularly, is concerned with applying flock to mesh fabric, for example, hosiery and the like.

Heretofore it has been customary to apply flock to produce plush-like designs on ladies' hosiery. A common practice is to apply the flock on the outer surface of the hose at a zone so that, when the hose is worn, the design will be displayed at the outer side of the leg. This requires the manufacture of two distinct types of hose to provide a pair, namely, one to be worn on the right leg and another to be worn on the left leg. Consequently, the wearer in putting on the hose must take care to put the same on the proper leg.

Also, for example, should the right hose be damaged and no longer be fit for wear, the left hose becomes useless unless another right hose is available. While women usually buy two pairs of stockings of identical color and design to have at least one wearable pair until three stockings have become unwearable, this scheme is not feasible in connection with hose decorated and constructed in the manner just described. This is because under the foregoing example the remaining right hose would be worn with each left hose and would get double the wear of the two left hose whereby the remaining right hose normally wears out before both of the left hose and no overall economy is effected.

While it has been proposed to apply flock to hose in a manner that a design is displayed at both sides of the leg, this increases the cost of decoration and is contrary to fashion.

The present invention aims to overcome the foregoing difficulties and objections by applying the flock to the stockings in a manner so that a plush-like design is provided on both the outer and inner surfaces thereof. Only one design is displayed on each stocking and only one type of stocking is manufactured. Since hosiery nowadays is formed of knitted materials having identical inner and outer surfaces and reversible seams, a pair of stockings is provided by turning one of them in-side-out in relation to the other so that one serves as the stocking for the right leg and the other serves as the stocking for the left leg with the design of each positioned for display at the outer side of the leg. In this manner, a right leg stocking may be readily converted into a left leg stocking, or vice versa, simply by reversing the surfaces thereof. This enables the wearer to take advantage of the usual

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economy attained in possessing four identical stockings.

Accordingly, an object of the present invention is to provide simple and practical apparatus for applying flock in a manner to achieve the foregoing advantage.

Another object is to provide such apparatus wherein the work on which the flock is to be applied can be readily placed into and removed out of operating position.

Another object is to provide such apparatus wherein the work is supported in a manner to facilitate application of flock at opposite surfaces.

Another object is to provide such apparatus wherein a stream of flock is passed through the fabric.

Another object is to provide such apparatus wherein the flock is collected and recirculated.

Another object is to provide such apparatus wherein the flock is conditioned to facilitate passage through the fabric.

Another object is to provide such apparatus wherein the flock conditioning means and circulating means are arranged for cooperation with each other.

Another object is to provide an improved method of applying flock to achieve the advantages of the present invention.

A further object is to accomplish the foregoing in an economical manner.

Other and further objects will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description as is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a plan view of apparatus in accordance with the invention.

Fig. 2 is a sectional view taken along the line 2—2 on Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 on Fig. 1.

Fig. 4 is a perspective view of a flock receptacle illustrated apart from the apparatus.

Fig. 5 is a perspective view of a form for supporting the work on which the flock is to be applied, a stocking being illustrated by way of example.

Fig. 6 is an enlarged fragmentary sectional

view of mesh fabric having flock applied to opposite surfaces thereof.

Referring to the drawings in detail and more particularly to Figs. 1 to 3 thereof, there is shown a flocking machine which generally comprises a receptacle 10 for containing flock F, a cover 11 for the receptacle formed with one or more openings 12 (two being shown) across which the work W is adapted to be placed, a hood 14 above the work and confining the opening, and means for inducing the flow of flock through the work including a blower 15, a flexible conduit 16 connecting the hood to the inlet of the blower and a conduit 17 connecting the outlet of the blower to the receptacle (Fig. 3).

The receptacle 10, as shown in Figs. 3 and 4, is of generally shallow, rectangular shape and is supported in horizontal position on a suitable base or stand 19. The receptacle has rigid side walls formed with a peripheral flange 20 at the upper edge thereof, and one of the side walls is formed with an opening 21 to which the conduit 17 is connected (Figs. 2 and 3). Preferably, the receptacle is removably bolted to the base 19 to hold it in position during operation of the machine. The bottom 22 of the receptacle is formed of flexible material, such as sturdy canvas fabric or the like, which is impervious to the flock and being adapted to generate electrostatic charges when rubbed as described hereinafter.

The cover 11 is of flat rectangular shape and the marginal portions thereof are adapted to overlie the flange 20 to form a seal for preventing the escape of flock. The cover is hinged to the receptacle at one side edge thereof (Figs. 3 and 4) to enable the same to be tilted upwardly, to attain access to the receptacle for placing flock therein. The openings 12 are shown as being rectangular but may be of any other shape, if desired, and are located in the central zone of the cover.

The hood 14, as shown, is of generally rectangular, frusto-pyramidal shape and has an opening 24 adjacent its upper end to which the conduit 16 is connected. The hood is supported on the base 19 in a manner to enable the same to be tilted upwardly and outwardly of the receptacle 10 to facilitate tilting of the cover 11. This is accomplished by providing a lateral extension 25 at one side of the base to which an arm 26 is hinged carrying the hood at its free end. A handle 27 may be provided on the hood at the side opposite the arm. The conduit 16 by being flexible does not interfere with the tilting of the hood.

The flock F comprises textile fibers of a relatively short pile forming length comprising wool, mohair, silk or other natural or synthetic textile fibers. Preferably, these fibers extend endwise in perpendicular relation with respect to the fabric on which they are applied to provide an improved pile effect and to facilitate passage through the mesh of the fabric for application to opposite surfaces thereof, as is contemplated by the present invention. Such arrangement of the flock particles is attained by generating static electricity among the same to make them mutually repel each other and so stand on end on the fabric to be flocked. This electrostatic charge may be created by rapidly rubbing the bottom 22 of the receptacle and oscillating and violently agitating the flock particles in the receptacle to cause the same to rub against each other.

In order to accomplish the foregoing in a practical manner, a plurality of parallel non-circular rods 30 (three being shown) are journalled for rotation on the base 19 and are positioned for contacting the underside of the bottom 22 of the receptacle (Figs. 1 to 3). Each of these rods has a laterally extending shaft portion 31 each having gear means 32 thereon meshing with the gear means adjacent thereto, whereby simultaneous rotation of the rods may be effected, for example, by a motor 34 mounted on the base having a drive pulley 35 connected to a pulley 36 on one of the shaft portions 31 by a belt 37 (Fig. 1). Operation of the blower 15 is effected by connecting its drive shaft directly to one of the shaft portions 31. The foregoing provides a simple drive for the machine which is in compact arrangement.

When the machine just described is utilized for flocking stockings or the like (Figs. 2 and 5) each stocking is placed on a form 40 adapted to hold the same taut and to open up the mesh of the fabric at the zone where a flocked design D is to be applied. This form is provided with an opening 41 at the flocking zone which is of greater area than the design and of the same or smaller area than the cover openings 12. The stocking S and the form 40 constitute the work W previously mentioned. When the work is positioned in the machine (Figs. 1 and 3) the openings 12 and 41 are in registry to enable flock from the receptacle 10 to pass therethrough.

In operating the machine and carrying out the method in accordance with the present invention, the hood 14 and cover 11 are raised, the receptacle 10 is charged by placing a quantity of flock F therein and the cover is closed.

Stockings S are placed on forms 40 and suitable adhesive is applied in the form of the design D to be applied, the form herein being an elongate diamond for purposes of illustration. Preferably, sufficient adhesive is applied to the outer surface of the stocking fabric to establish an identical adhesive coating at opposite surfaces of the fabric. The work is then placed on the cover 11, as shown in Fig. 3, the hood 14 is lowered to enclose the flocking zone, and the motor 34 is started, whereby the rods 30 electrostatically charge the flock particles and the blower 15 induces the flow of a stream of flock particles through the openings 12 and 41.

The flock is forced through the mesh of the stocking fabric causing certain particles to be adhered to the surface facing the receptacle and causing other particles to be adhered to the opposite surface whereby flocking is applied to both surfaces of the fabric, as shown in Fig. 6. The excess of flock particles passing through the opened mesh of the fabric to the sides of the adhesively coated area enter the hood 14 and are exhausted therefrom by the suction produced at the inlet of the blower 15. These particles again pass through the blower and the receptacle to provide for a continuous circulation of flock particles.

When a sufficient amount of flock has been applied, the hood 14 is raised, the work W is removed, other work is inserted and the hood is again lowered thus enabling the flocking operation to be carried out in a rapid and time saving fashion. When the supply of flock in the receptacle and the circulating system is depleted to a considerable extent, the motor is stopped and the receptacle is recharged in the manner already described.

From the foregoing description, it will be seen that the present invention provides a novel and

improved machine for and method of flocking mesh fabric to produce a flocked pile design at opposite surfaces of the fabric. The machine is simple, economical, compact and sturdy in construction and can be operated at a low cost by unskilled operators. The articles flocked in the manner described possess greater utility and are provided without any increase in cost or additional operations.

While the present invention has been described primarily in connection with flocking hosiery, it will be appreciated that the apparatus and method herein may be utilized in applying flock to other articles where it is desirable to have a design on both surfaces of the fabric. For example, the flocking in accordance with the invention may be applied to wearing apparel or other decorations where both surfaces of the fabric are displayed or such articles may be reversibly applied.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matters are to be interpreted as illustrative and not in any limiting sense.

What I claim is:

1. Flocking apparatus comprising a receptacle for containing flock, a cover hinged to said receptacle at the top and one side thereof and formed with an opening across which fabric to be flocked is adapted to be placed, a blower having an inlet and an outlet, a conduit connecting said outlet and said receptacle, a hood above said cover confining said opening, hinge means for mounting said hood to tilt the same away from said cover, and a flexible conduit connecting said hood and said blower inlet.

2. Apparatus according to claim 1, wherein said hood is hinged adjacent the side of said receptacle at which said cover is hinged and said blower is adjacent the side of the receptacle at which said cover is hinged.

3. Flocking apparatus comprising a receptacle for containing flock having a cover at the top thereof formed with an opening across which fabric to be flocked is adapted to be placed and

having a flexible bottom, means for vibrating said bottom including drive means and a driving connection adjacent one side of said receptacle, and a blower with its outlet operatively connected to said receptacle and driven by said driving connection for inducing the flow of a stream of flock produced by said vibrating means from said receptacle through said cover opening.

4. Apparatus according to claim 3, including a hood above and confining said opening, a conduit connecting said hood to an inlet of said blower, and a conduit connecting the outlet of said blower to said receptacle.

5. Flocking apparatus comprising a support, a plurality of parallel non-circular bars mounted for rotation on said support each having shaft means at one end thereof, gear means on each shaft means meshing with adjacent gear means, drive means connected to one of said shaft means, a blower having its shaft connected to one of said shaft means, a receptacle mounted on said support having a flexible bottom in contact with said bars and adapted to be vibrated thereby, a cover for said receptacle having an opening therein, a hood above and confining said opening, hinge means connecting said hood to said support at the side thereof at which said shaft means are located, a flexible conduit connecting said hood to the inlet of said blower, and a conduit connecting the outlet of said blower to said receptacle.

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