

Nov. 15, 1938.

W. L. GRIFFIN, SR

2,136,902

HOSE STRIPPER

Filed May 11, 1937

3 Sheets-Sheet 1

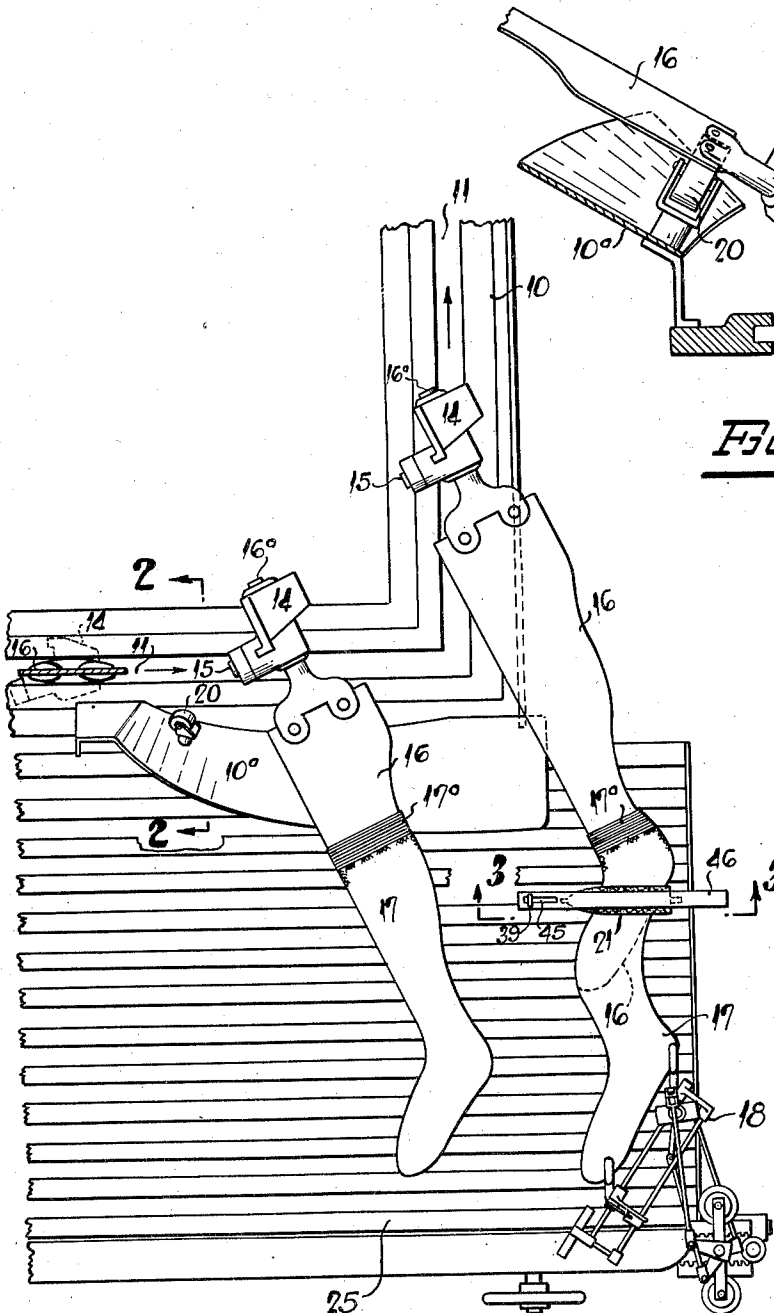


Fig. 1

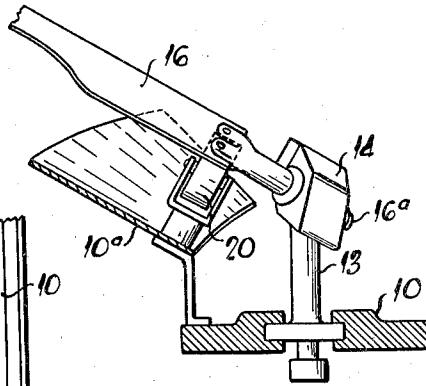


Fig. 2

Inventor:  
WILLIAM L. GRIFFIN, SR

384

Raney & Sator  
Attorneys

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W. L. GRIFFIN, SR

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Fig. 3

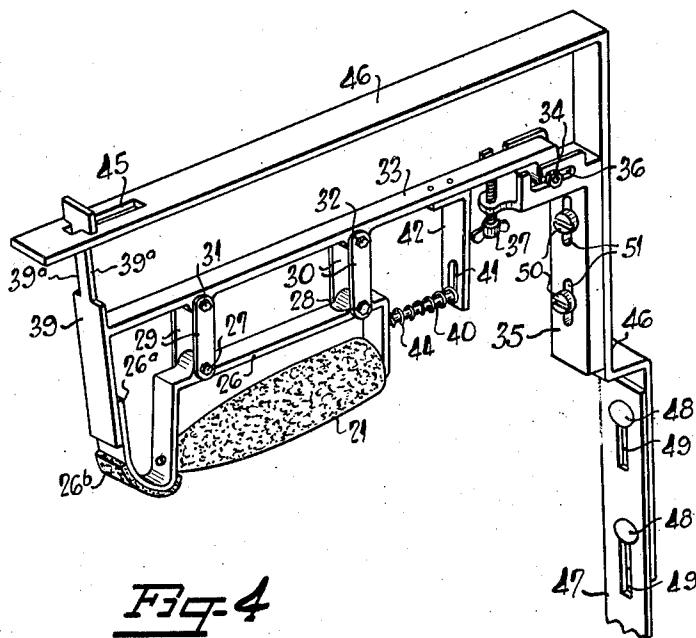
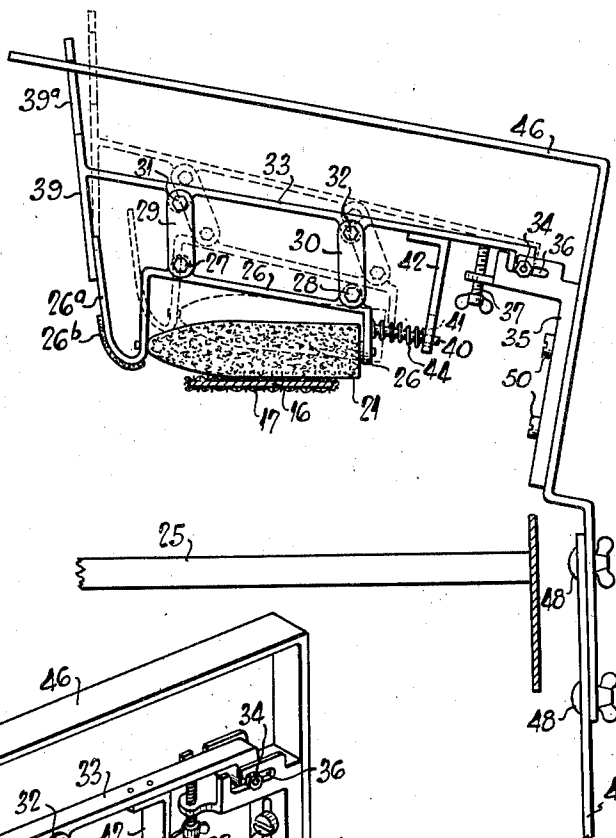


Fig. 4

Inventor:  
WILLIAM L. GRIFFIN, SR

334

James E. Eaton

Attorney

Nov. 15, 1938.

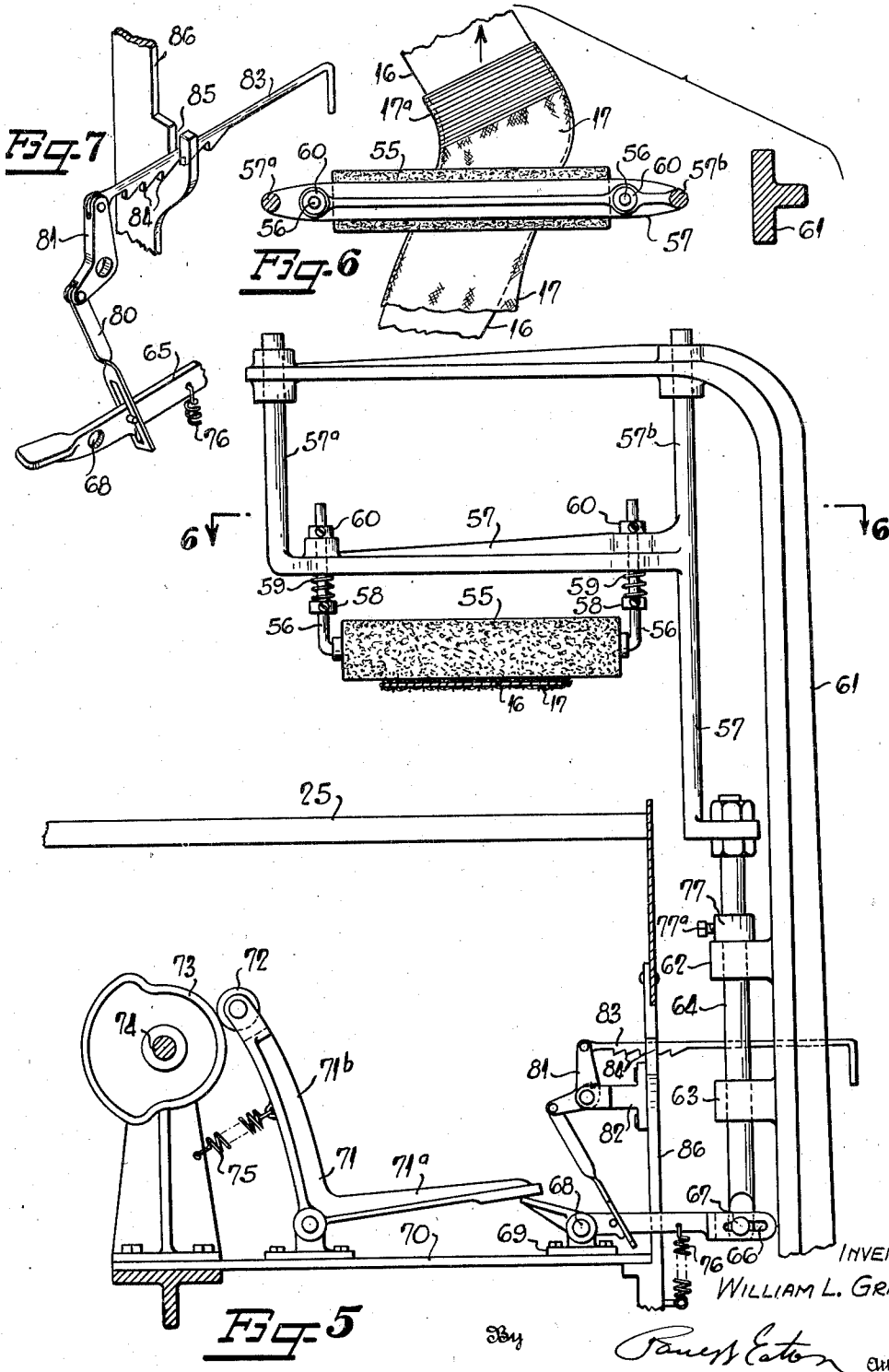
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3 Sheets-Sheet 3



## UNITED STATES PATENT OFFICE

2,136,902

## HOSE STRIPPER

William L. Griffin, Sr., Charlotte, N. C., assignor  
to Nebel Knitting Company, Charlotte, N. C., a  
corporation of North Carolina

Application May 11, 1937, Serial No. 142,010

6 Claims. (Cl. 223—112)

This invention relates to a top stripping mechanism for removing stockings from forms after they have been dried and more especially for the removal of elastic top stockings or any stocking having portions thereof made wholly or partially of elastic strands.

In conventional hosiery driers a series of stocking forms are movably mounted in spaced relation on suitable frames. These forms pass through a drying chamber with stockings thereon in a substantially vertical position. When the forms emerge from the drying chamber they are caused to assume a substantially horizontal position where the toe and heel portions of the form and stocking are clamped by a suitable finger motion or gripping device. As the stocking form continues to be moved, the stocking remains in stationary position thereby allowing the form to be removed therefrom, after which the finger motion releases its grip upon the toe and heel of the stocking so as to permit the stocking to fall downwardly upon a suitable table in a straight formation.

When an elastic top stocking is stretched over this form for the purpose of drying, it is evident that the form will be tightly engaged by this elastic top as it is withdrawn. Upon the release of the top from the heel of the form the top of the stocking will jump backwardly past the finger motion in a tangled condition. In other words, the elastic top of each stocking, as the form is withdrawn therefrom, will not retain its normal position with relation to the rest of the stocking so as to fall down onto the shifting table in a straight position.

It is therefore, an object of this invention to provide means for engaging a stocking on a form, as the form is being withdrawn therefrom, to hold the top of the stocking in a substantially stationary position during the withdrawal. In the drawings, I have shown a flexibly mounted, felt covered roller which is adapted to rest upon the top of the form and near the top of a stocking which is being removed therefrom. During the withdrawal of the form from the stocking one thickness of the stocking is disposed between the top of the form and the felt covered roller; consequently, the top of the stocking will be held in a substantially stationary position during the withdrawal of the form. As the elastic top of the stocking is released from the projecting heel of the form, this roller will hold the top in a substantially stationary position so that all parts of the stocking will be allowed to fall downwardly

in straight formation when the finger motion releases the toe and heel of the same.

Heretofore, it has been necessary for a helper to stand near the form as it is being withdrawn and to hold this top in a stationary position in order that the hose might be properly removed. My improvement eliminates this necessity of the additional helper, and the hose are automatically laid out in straight piles so that they can be easily handled in subsequent operations.

It is a further object of this invention to provide an apparatus of the class described for engaging the top of an elastic top hose during its removal from a form, comprising a movable felt covered roller capable of being raised or lowered at the proper time so as to engage the top of the stocking only at the time the form is being withdrawn therefrom. The roller is raised in order to allow the proper clearance for the next succeeding form as it moves under the roller. This means for raising and lowering is positively driven from a suitable drive shaft of the machine and its movement is synchronized with the movement of the board forms which have the elastic top stockings mounted thereon.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a boarding machine showing my apparatus applied thereto;

Figure 2 is a sectional, detail view taken along line 2—2 in Figure 1 but showing a boarding form as it is being moved from vertical position to horizontal position, and also showing means for axially tilting the forward edge of the board forms about their longitudinal axes so that these edges will be allowed to move under the engaging means;

Figure 3 is a vertical, sectional view taken along line 3—3 in Figure 1;

Figure 4 is an isometric view of the engaging means shown in Figure 3;

Figure 5 is a sectional view similar to Figure 3 but showing a slightly modified form of the invention in which positive means are employed for raising and lowering the engaging means;

Figure 6 is a sectional, plan view taken along line 6—6 in Figure 5;

Figure 7 is an isometric view of the means for holding the roller out of contact with the hose.

Referring more specifically to the drawings, the numeral 10 denotes a portion of the frame of a hosiery drier which has a slot 11 therein in which

a suitable board supporting bracket 13 is slidably mounted. This bracket has a casing 14 pivotally secured thereto as at 15 so as to allow the board form 16 to be rotated from a vertical position to a substantially horizontal position. The board form is also rotatably mounted in the casing 14 as at 16a, and is allowed to have rotative movement about its longitudinal axis.

As has been previously stated, these forms are in a substantially vertical position while they are being passed through the drying chamber, not shown, and when they emerge from this chamber they are caused to assume a horizontal position as shown in Figure 1, so that a gripping mechanism such as indicated by reference character 18, may engage the toe and heel of the stocking and allow the form 16 to be withdrawn therefrom. The forms 16 are adapted to have a suitable stocking 17 mounted on the free end thereof, each of the stockings having an elastic top 17a secured thereto.

During the change of position from vertical to horizontal, the form 16 assumes a position as shown in Figure 2 in its downward travel. It is necessary that the forward edge of the board be in a slightly lower plane when in horizontal position than the trailing edge, so that this forward edge will not contact the framework of the apparatus for holding the top of the stocking in a stationary position.

In order to produce this slight axial rotation of the form 16, about its pivot point 16a, a suitable roller 20 has been secured to the shield 10a of frame 10, (Figures 1 and 2). As the board form 16 rotates downwardly about its pivot point 15, the trailing edge of the board is allowed to contact the top of the roller 20 which will impart a slight axial rotation to the board, and then when the front edge of the board moves beneath the engaging roller 21 (Figures 1, 3 and 4), there will be no danger of the form striking the framework in which the roller is mounted, which might result in damage to the framework.

When the form has moved to a horizontal position, the finger motion 18 grips the heel and toe of the stocking along with the form 16. Upon further movement of the form away from the finger motion, the heel and toe of the form are withdrawn from the stocking and leaving the foot of the stocking engaged by the finger motion. At the same time, the roller 21 is resting near the top and upon one thickness of the stocking from which the form is being withdrawn. Since the elastic top 17a of the stocking will naturally cling closely to the form, it is evident that when this portion passes over the heel of the form, as shown in the right-hand portion of Figure 1, there will be a tendency for the stocking to stretch. If some means are not provided for holding the top stationary, the release of the stocking from this heel will cause the stocking to jump in a reverse direction from the direction of travel of the form and toward the finger motion 18. By providing the felt covered roller 21, which has the proper contact with the top of the stocking at the point of removal, the top is held in a substantially stationary position during this release thereby allowing each stocking to fall downwardly on top of shifting table 25 in a straight formation so that they may be easily handled in subsequent operations.

The roller 21 is rotatably mounted in inverted U-shaped frame member 26, which member is pivotally suspended as at 27 and 28 to upwardly projecting links 29 and 30, said links in turn,

being pivotally supported as at 31 and 32 to a support 33. The support 33 is pivoted to L-shaped member 35 which has slots 36 therein in which a bolt 34 is adapted to be adjustably mounted.

In order to adjust the position of the pivoted member 33, and its associated roller 21, relative to the L-shaped member 35, a suitable set screw 37 threadably penetrates the laterally projecting portion of member 35 and has its end normally engaging the lower side of the member 33.

The free end of the member 33 has a member 39 secured thereto by any suitable means such as welding and the lower end of this member normally acts as a stop for projection 26a which is integral with the roller frame 26. In other words, the movement of the roller 21 to the left in Figures 1, 3 and 4, is limited by the lower portion of projection 39. The right-hand end of the framework 26 has a pin 40 extending therefrom, said pin having its end penetrating a suitable slot 41 in a downwardly extending bracket 42, which bracket is secured to the pivoted member 33. The pin 40 has a compression spring 44 disposed therearound which spring has one end thereof engaging the frame 26 and its other end engaging bracket 42. This spring normally presses the member 26a against the lower end of the projection 39, but allows the frame and the roller to move an appreciable amount to the right, if, for any reason, the board form 16 should contact the felt lining 26b of member 26 while the form is being moved thereunder.

The upper end of the member 39 has notches 39a cut in opposed sides thereof which are adapted to fit in slot 45 of a support 46. This support 46 is L-shaped and has its downwardly extending leg secured to upwardly extending bar 47 by any suitable means such as bolts 48. These bolts penetrate slots 49 in the bar 47 and allow the entire framework to be adjusted vertically relative to the moving forms. An additional vertical adjustment may be effected by means of suitable set screws 50 which penetrate slots 51 in the vertical leg of L-shaped member 35 and are threadably secured in member 46.

After the entire assembly has been adjusted to the proper position, the form 16 will move thereunder with the stocking thereon and be properly engaged by the roller 21. If, for any reason, the form should not be properly adjusted and the forward edge is accidentally allowed to contact the felt lining 26b, the parts will give way and assume substantially the dotted line position as shown in Figure 3, thereby preventing any damage.

After the form has been withdrawn from the stocking the conventional finger motion 18 will release the heel and toe to allow the stocking to fall downwardly upon the shifting table 25. At this time the next succeeding form 16 will move to the proper position where the finger motion 18 will again engage the heel and toe of the same, and at the same time, the roller 21 will engage the top thereof.

Figures 5 and 6 show a slightly modified form of the invention in which a roller 55 engages the stocking 17 during its removal from the form. This roller is mounted for vertical movement so as to allow it to be alternately raised and lowered. This roller 55 is mounted on a suitable U-shaped rod 56, which rod has its upper ends slidably mounted in framework 57. The rod 56 has adjustably mounted on each of its vertical portions, collars 58 which normally support the

lower end of compression springs 59, the upper end of the compression springs resting against the lower side of framework 57. These springs normally press the roller 55 downwardly to a position where collars 60 on the upper ends of rods 56 will be in the position shown in Figure 5.

If, for any reason, the board form 16 would offer an excessive upward pressure, the springs 59 will give way, thereby adding a resilient feature to the roller. The frame 57 has upwardly extending prongs 57a and 57b which are slidably mounted in the horizontally disposed portion of a bracket 61. This bracket extends upwardly from the floor of the building and has projections 62 and 63 integral therewith in which is slidably mounted a vertically disposed shaft 64, the upper end of said shaft having the lower end of bracket 57 secured thereto. Pivotaly secured to the lower end of the shaft 64 is a lever 65 which has a slot 66 therein, said slot being penetrated by a bolt 67. The lever 65 is pivoted intermediate its ends as at 68 to a bracket 69 and this bracket, in turn, is supported by platform 70.

Upon counter-clockwise rotation of the lever 65 in Figure 5, it is evident that the rod 64 and the framework 57 will be moved upwardly. This upward movement is necessary when the board form 16 is being moved beneath the roller 55, so that the roller and the framework will offer no possible obstruction to the moving form. The rotation of the lever 65, which is necessary to accomplish this result, is effected by means of a suitable bell crank lever 71 which has a horizontally projecting leg 71a which rests upon the left-hand end of the lever 65. A vertically disposed leg 71b of the bell crank lever 71 has a roller 72 mounted therein which contacts a cam 73 on a drive shaft 74. A spring 75 normally tends to hold the roller 72 in contact with this cam, whereas, a spring 76 is employed to normally hold the rod 64 and its associated framework 57 in lowermost position to a point where a collar 77 will engage the lug 62. In order to properly limit the downward movement of members 57 and 64, a set screw 77a penetrates the collar 77 and has its end engaging the rod 64. This collar may be moved along the shaft 64 to the desired position until the proper adjustment has been effected, however, it is to be understood that the collar is only used as a safety means for limiting the downward travel of the parts.

At the time the finger motion 21 takes hold of the toe and heel of the board to strip the stocking therefrom the roller 55 is lowered to engage the top of the stocking on the board. The roller remains in this position until the stocking is cleared of the board, then it raises to an elevated position to allow the next board to move thereunder. As will be noted by the cam 73 in Figure 5, the duration of time that the roller 55 remains in contact with the top of the stocking and the board, is slightly greater than the time it remains in an elevated position. This will insure that the top of the stocking will be properly engaged at all times during the removal of the form therefrom.

Sometimes it is desired to place the engaging means in an inoperative position, as in case when stockings with a nonelastic top are being dried. In order to accomplish this result, a stirrup 80 is provided having its lower slotted end slidably mounted around the right-hand portion of lever 65. The upper end of this stirrup is pivoted to the horizontal leg of a bell crank 81 which, in turn, is pivoted to a bracket 82. The vertical

leg of the bell crank 81 has one end of rod 83 secured thereto and this rod has teeth 84 on the lower side thereof which engage the lower portion of slot 85 in post 86. When the rod 83 is pulled to the right in Figure 5, the lever 65 is rotated in a counter-clockwise manner to raise the members 57 and 64 so that roller 55 will be in a non-engaging position.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. In a hosiery drying machine having moving forms on which the hosiery is disposed and having grippers for engaging the foot of each hose and holding the same while the moving form leaves the hose, a roller for engaging the leg portion of the hose and exerting pressure on the leg and form while the form is being withdrawn from the hose, and means for moving the roller towards and away from the hose in timed relation to the travel of the forms in the machine.

2. In a hose drying and forming machine having a plurality of forms on which the stockings are disposed, means for engaging the foot portion of a stocking and holding the same while the form on which the stocking is disposed is removed from the stocking, a roller driven by contact with the stocking for engaging the upper part of the stocking and applying pressure to the stocking and the form on which it is disposed to prevent the top of the stocking from leaving the form at a greater rate of travel than the other portions of the stocking, and means for moving the means for engaging the top portion of the stocking towards and away from the path travelled by the forms in timed relation to the travel of the forms.

3. In a stocking boarding machine having a plurality of forms, provided with leg and foot portions for receiving stockings for drying and forming the same, and also having means for moving said forms through the machine and also having means for engaging the foot portion of the stockings one at a time to remove the stockings from the forms, as the forms move away from the means for engaging the foot portions of the stockings, a roller positioned so that the foot portion of the form passes directly beneath the roller whereby the roller will press against the foot portions of the forms, after the foot portion of each form has moved a substantial distance from the point where the means engaged the stocking to remove it from the form, for engaging the top portion of the stocking while it is passing over the foot portion of a form to offer frictional contact with the stocking to retard movement of the top portion of the stocking to prevent the top portion of the stocking from moving at a greater rate than the other portions of the stocking.

4. In a hose drying and forming machine having a plurality of moving forms provided with leg and foot portions, on which the stockings are disposed, clamping means for engaging the foot portion of a stocking and holding the same while the form on which the stocking is disposed is moved away from the clamping means, and a roller so positioned that the foot portion of the form passes directly beneath the roller for engaging the upper part of the stocking while the said upper part is

passing over the foot portion of the form and applying pressure to the stocking and the foot portion of the form on which it is disposed to offer frictional resistance to the movement of the top of the stocking to prevent the top portion of the stocking from leaving the form at a greater rate of travel than the other portions of the stocking.

5. In a machine having a plurality of moving forms provided with foot, heel and leg portions, on which hosiery is shaped and dried, means for engaging the foot portion of a stocking and holding it while the moving form is withdrawn from the stocking, and a roller so positioned that the foot portion of the form passes directly beneath the roller whereby the roller will press against the foot portion of the form for engaging the top portion of the stocking as it passes over the foot portion of the form and applying pressure thereto to prevent the top of the stocking from

jumping over the heel of the form and moving relative to the form at a greater rate than the other portions of the stocking.

6. In a hosiery boarding machine having a plurality of moving forms provided with leg, heel and foot portions for receiving hosiery, means for moving the forms in an endless path, gripping means for engaging the foot portion of a stocking on a form when a form reaches a predetermined point in the machine, and a roller so positioned that the foot portion of the form passes directly beneath the roller whereby the roller will engage the top of the stocking as the top of the stocking is passing over the heel of the form and presses the top of the stocking against its form while the foot portion of the stocking is held by the gripping means to cause the travelling form to be withdrawn from the stocking, and thus preventing the top from jumping off the form.

WILLIAM L. GRIFFIN, SR.