H. COULSTON.

DEVICE FOR HOLDING STOCKINGS TO FORMS.

APPLICATION FILED OCT. 25, 1915.

1,190,119.

Patented July 4, 1916.

4 SHEETS—SHEET 1.

Fig. 1.

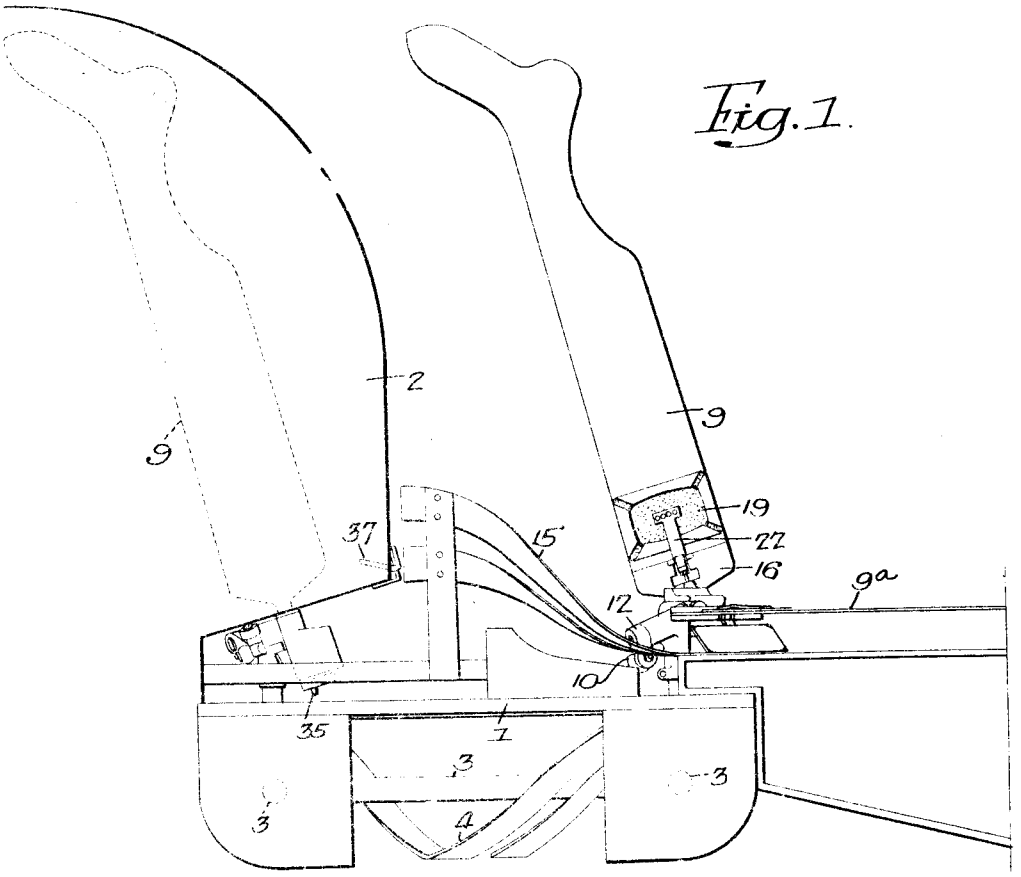


Fig. 4.

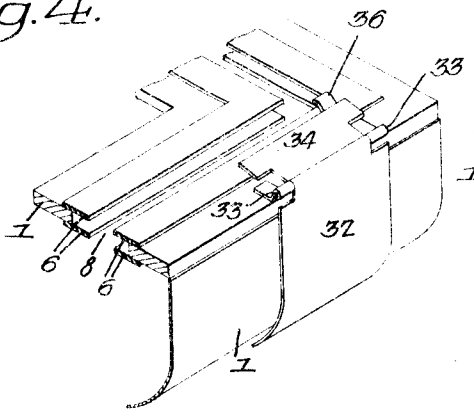
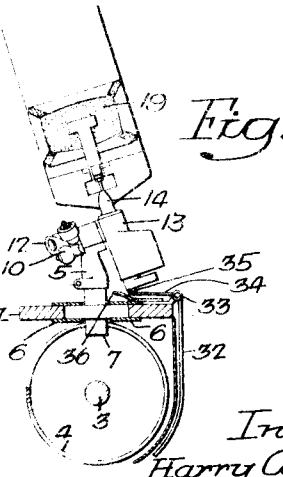


Fig. 3.



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4 SHEETS—SHEET 2.

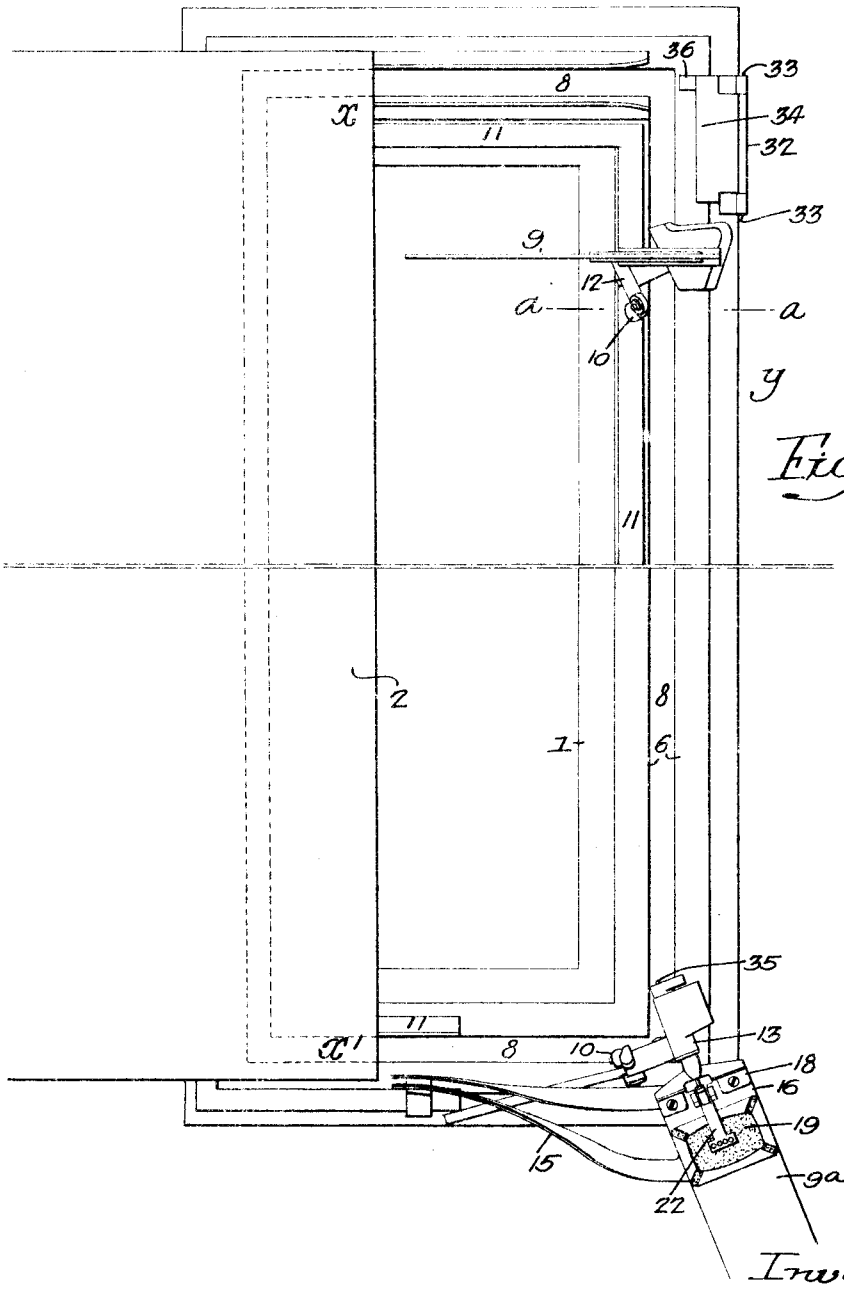


Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 5.

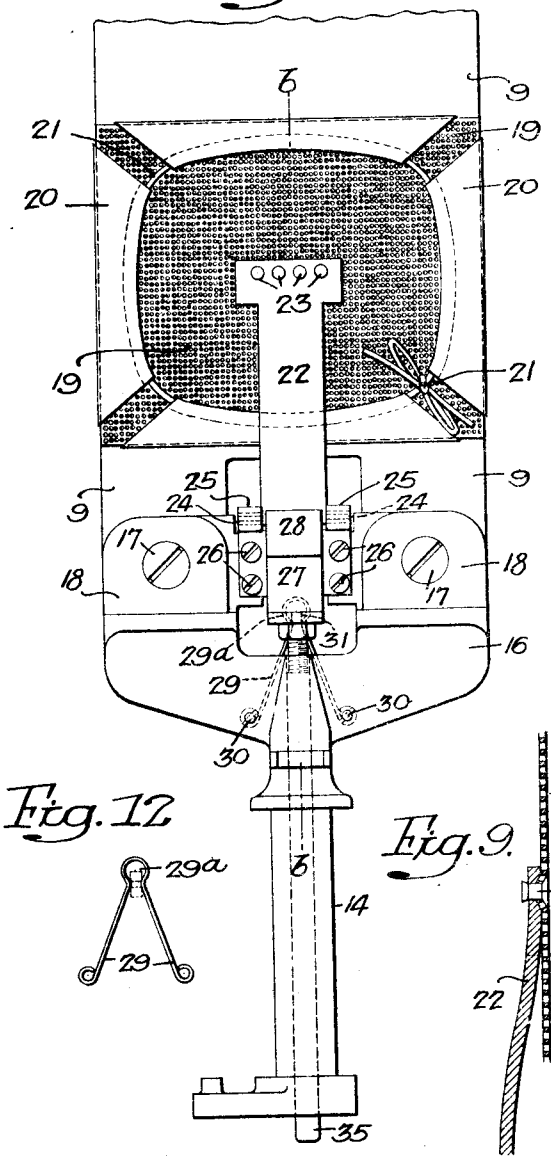


Fig. 6.

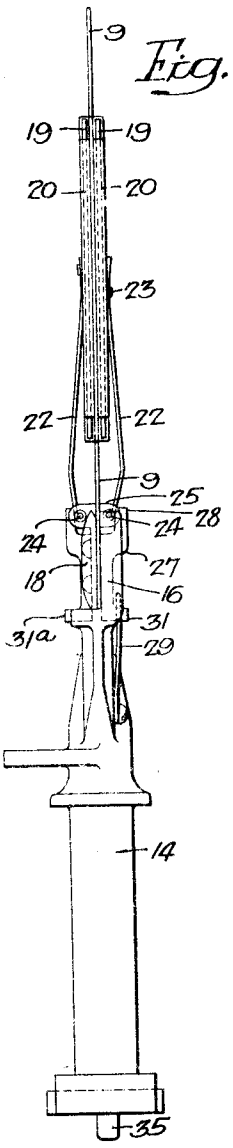


Fig. 12.

Fig. 9.

Fig. 11.

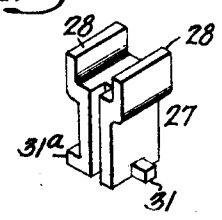
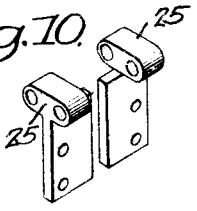


Fig. 10.



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4 SHEETS—SHEET 4.

Fig. 7.

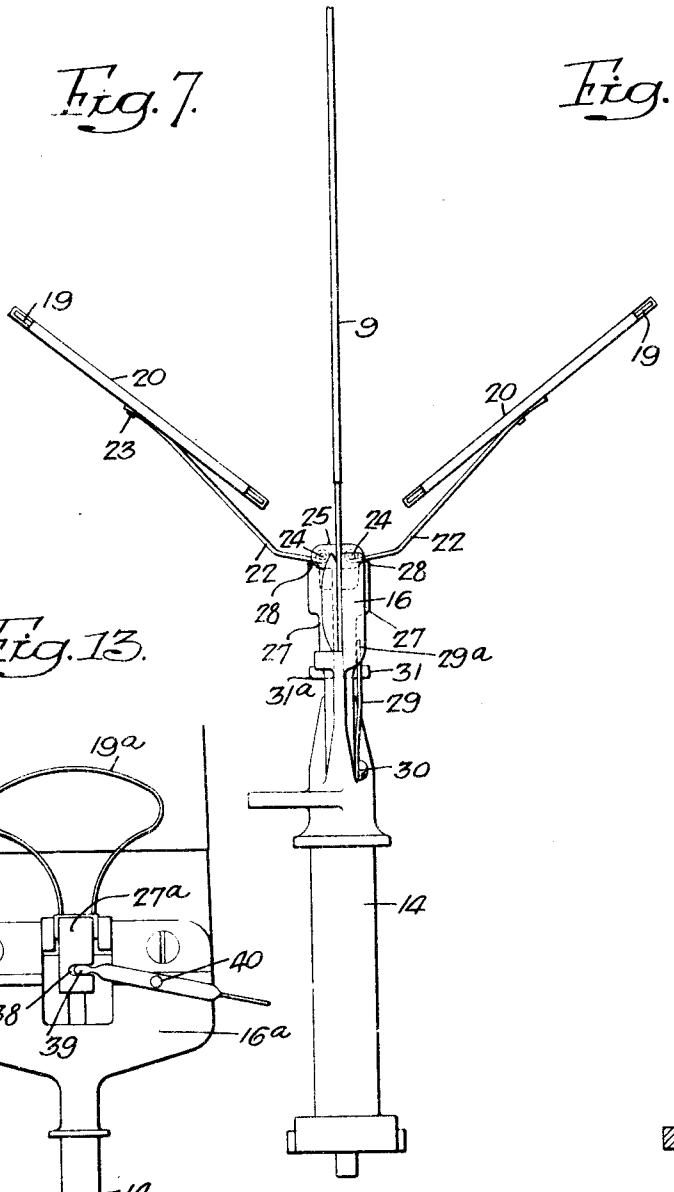
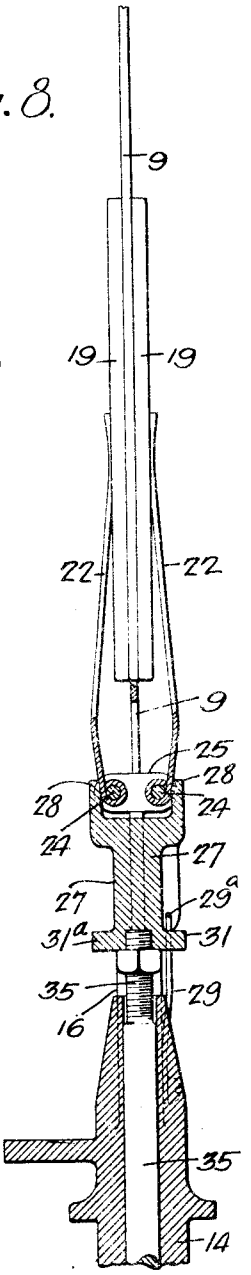


Fig. 13.

Fig. 8.



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UNITED STATES PATENT OFFICE.

HARRY COULSTON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DEVICE FOR HOLDING STOCKINGS TO FORMS.

1,190,119. Specification of Letters Patent. Patented July 4, 1916.

Application filed October 25, 1915. Serial No. 57,878.

To all whom it may concern:

Be it known that I, HARRY COULSTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Devices for Holding Stockings to Forms, of which the following is a specification.

My invention relates to certain improvements in stocking drying machines and particularly to that portion pertaining to the holding of the stocking on the form during the drying process.

While the invention is particularly adapted for holding stockings on the stocking forms of drying machines, it may be used in connection with any machine or device of which the stocking form is a part.

One object of my invention is to so construct the means for holding a stocking to a stocking form that it will retain the stocking in the proper position on the form so that, when the stocking is removed from the form, the open end of the stocking will be even and not drawn out of shape. The mechanism can be actuated either by hand or automatically so as to release the stocking to allow for its withdrawal.

A further object of the invention is to provide a retainer having a broad bearing surface, which will permit the free escape of moisture and which will accommodate itself to the stocking.

In the accompanying drawings:—Figure 1, is an end view of sufficient of a stocking drying machine to illustrate my invention as applied thereto; Fig. 2, is a plan view of the drying machine, showing two of the forms, one in a vertical position and the other in a horizontal position; Fig. 3, is a sectional view on the line *a*—*a*, Fig. 2; Fig. 4, is a detached perspective view of one end of the drying machine frame, showing the knee operating mechanism for closing the clamps; Fig. 5, is a side view of a stocking form carrier and illustrating one of the clamps; Fig. 6, is an end view of a stocking form carrier showing the clamps in the closed position; Fig. 7, is an end view of the stocking form carrier showing the clamps in the open position; Fig. 8, is a sectional view on the line *b*—*b*, Fig. 5; Fig. 9, is a sectional view, showing the method of pivotally connecting the perforated clamp to the arms; Fig. 10, is a detached perspective view of the bearing for the arms; Fig. 11, is a perspective view of the slide for actuating the arms; Fig. 12, is a side view of the spring for holding the clamp plates in the open or closed position; and Fig. 13, is a view of a modification illustrating a hand operated clamp.

Referring in the first instance to Figs. 1, 2 and 3 of the drawings, 1 is the table of a stocking drying machine. 2 is the drying chamber which is heated in any suitable manner. The details of construction of this machine are fully set forth and claimed in Patent No. 1,126,619, dated January 26th, 1915. I have shown sufficient of the machine to clearly illustrate my improved clamp.

3, 3 are the shafts on which are cams 4 which traverse the carriers 5 through guides 6 on the table 1. On the carriers are lugs, or other projections, 7, with which the cams engage, as clearly shown in Fig. 3. The guides 6 are spaced apart to form slots 8 and the longitudinal slots are connected by transverse slots so that each carrier travels in a longitudinal path and a portion of this path is under the drying chamber, and the forms, with the stockings thereon, travel through the drying chamber. This is clearly set forth and described in the above mentioned patent.

Mounted on the carriers are the stocking forms 9 and these forms are traversed a greater portion of the way in the vertical position, as illustrated in Fig. 1. The forms enter the drier at the end *x*, Fig. 2, and leave the drier at the end *x'*, and during this time the rollers 10 ride upon rails 11. These rollers are mounted on arms 12 which are pivotally mounted in the carriers 5 and have a head 13 in which is mounted the spindle 14 of the form 9, so that after the forms leave the drying chamber at *x'* the rail 11 is discontinued and the forms are then under the control of the guides 15, which allow the stocking forms to turn from the vertical position to the horizontal position, as indicated at 9^a, Figs. 1 and 2, and in this position the clamps are open as in Fig. 7, releasing the stocking so that the remaining mechanism, which grasps the heel and toe of the stocking, will hold the stocking as the form is withdrawn, due to the continuance of its movement. This mechanism is also

set forth and described in the above mentioned patent.

On the spindle is a clamping head 16 to which the form 9 is rigidly secured. Screws 17 pass through clamp plates 18 and through the head and hold the form 9 rigidly to the head. The form, in the present instance, is flat, and is preferably made of metal, being shaped to conform to the shape of the finished stocking.

19, 19 are perforated clamp plates, which are located on each side of the form 9. The clamp plates, in the present instance, are quadrangular in shape and are made of perforated metal to allow the moisture to escape from the portion of the stocking under the plates and, in order to protect the stocking, I preferably inclose the bearing surface with a fabric or wire covering 20, which is held in place by a drawing string 21, as shown clearly in Fig. 5, but this covering may be attached by other methods and the perforated plate may be made of other material than that shown, which would dispense with the covering. The plates are attached to arms 22 by a series of rivets 23 and, in order to allow the clamping plates to conform to the stocking, the plates are allowed to rock on the arms 22; the joint at the rivet being formed as clearly shown in Fig. 9. Each arm is loosely mounted on a spindle 24 and the two spindles are adapted to bearings 25, shaped as clearly shown in Fig. 10. This bearing is secured to the head 16 by screws 26, or other fastenings, or may be formed, in some instances, as an integral part of the head. The bearing is preferably made in two parts and these parts are separated as clearly shown in Fig. 10, so as to form a slideway for the slide 27, which is shaped as shown in Fig. 11, and this slide has a certain amount or vertical movement and has extensions 28 which, when moved to the farthest extent upward, pass the pivots 24 of the arms 2 and bear upon these arms, moving them from the open position, Fig. 7, to the closed position, Fig. 6.

A spring 29, shaped as clearly shown in Fig. 12, is secured to the head 16 at 30 and has a socket 29^a at the upper end to accommodate the lug 31^a on the slide so that, when the slide is raised, the lug forces its way through the space between the narrow portion of the spring and enters the socket, and when it is down it passes the narrow portion and is outside of the socket. This is clearly shown in the diagram, Fig. 12, by dotted lines, and, consequently, the clamps are held both in the closed and in the open position.

The action of the clamp is as follows:— The operator places the stocking on the form when the form is at the position opposite *y*, Fig. 2, and the clamp plates are in the open position, as in Fig. 7, and when the stocking is smoothed down on the form by the operator and when the form is opposite the knee lever 32 the operator presses the knee lever and closes the clamp plates and these plates firmly hold the open end of the stocking in position until released. The form then travels through the drying chamber and out at the opposite end thereof and the cams lower the stocking form to the horizontal position, in the present instance, and as the forms leave the drying chamber they are opened by the projection 31^a coming in contact with the inclined plate 37 so that when the stocking is removed the clamps are in the open position as clearly shown in Fig. 1, and they remain in the open position until another stocking is placed on the form. The form, as the carrier travels, is turned to the vertical position again so as to receive another stocking and the operation is repeated.

In Fig. 13, I have illustrated a clamp 19^a made of wire and pivoted similar to the head, as illustrated in the main figures of the drawings, and the slide 27^a has a socket 38 to receive one arm of the lever 39 pivoted to the head 16^a at 40. The other arm of the lever projects a sufficient distance to be pressed by hand so that, when the lever is pressed down, the clamps are closed against the stocking on the form and when the arm of the lever is raised the slide is withdrawn and the clamps fall to the open position. This construction can be used where the stockings are placed on the forms by hand and are removed from the forms by hand.

32 is a knee lever pivoted at 33 to a bearing on the frame, which is located directly under the path of the rod 35, which is secured to the slide 27 and, when the clamp plates are in the open position, this rod projects a sufficient distance so that when the knee lever 32 is pressed by the knee it will raise the portion 34 and will force the rod 35 upward and with it the slide and will close the clamp plates against the stocking on the form. Should the carrier pass this knee plate the projection 36 on the table will force the rod upward as it passes the corner, as clearly shown in Fig. 3. The object of having the knee lever is to allow the operator to actuate the clamp plates in order that the stocking may be in the proper position when the clamp plates are applied.

I claim:—

1. The combination of a stocking form; a clamp for holding the open end of the stocking to the form; and means for actuating the clamp to release the stocking so that it can be withdrawn from the form.

2. The combination of a stocking form; a clamp for holding the open end of a stocking to the form; means for opening and closing the clamp; a carrier for carrying said means; and automatic mechanism for actuating the

operating means as the carriers move in a predetermined path.

3. The combination of a carrier; means for actuating the carrier in a predetermined path; a stocking form mounted on the carrier; clamps for holding the lower portion of the stocking to the form; a slide arranged to actuate the clamps; a rod projecting from the slide; and means for moving the rod so as to close the clamps on the stocking.

4. The combination of a carrier arranged to travel in a predetermined path; a stocking form mounted on the carrier; clamps for holding the open end of the stocking to the form; a slide; means for actuating the slide to close the clamps on the stocking; and means for automatically releasing the slide prior to the removal of the stocking from the form.

5. The combination of a carrier; means for moving the carrier in a predetermined path; a stocking form mounted on the carrier; two pivoted clamping arms, one located on one side of the form and the other located on the opposite side; a vertically movable slide arranged to force the clamping arms into the closed position; a rod attached to the slide; means for raising the rod to cause the slide to move the arms into the closed position; a projection on the slide; and means connected to the projection to withdraw the slide and to release the arms.

6. The combination of a carrier; a head mounted thereon; a stocking form mounted on the head; two clamping arms pivoted to the head, one being located at one side of the form and the other being located at the opposite side thereof; a clamp plate secured to each arm and arranged to bear against the stocking and to hold it in position.

7. The combination of a carrier; a head mounted thereon; a stocking form mounted on the head; two clamping arms pivoted to the head, one being located at one side of the form and the other being located at the opposite side thereof; and a clamp plate secured to each arm and arranged to bear against the stocking and to hold it in position, each of said plates being perforated.

8. The combination of a carrier; a head mounted thereon; a stocking form mounted on the head; two clamping arms pivoted to the head, one being located at one side of the form and the other being located at the opposite side thereof; a clamp plate secured to each arm and arranged to bear against the stocking and to hold it in position, each of said plates being perforated; and a protecting fabric cover detachably secured to the said plates.

9. The combination of a carrier having a head; a stocking form secured to the head; arms pivoted to the head at each side of the form; clamping plates loosely pivoted to the arms so that they will accommodate themselves to the stocking when clamped thereto; and means for actuating the arms.

10. The combination of a carrier; a head mounted thereon; a stocking form secured to the head; a clamping arm pivoted to the head on each side of the form; clamp plates attached to the arms and arranged to clamp the stockings to the forms; a vertically movable slide; a rod extending from the slide so that the slide can be closed by moving the rod vertically in one direction; a projection on the slide arranged to be engaged by the means for withdrawing the slide to allow the clamping plates to open; a spring having a narrow neck, said spring being attached to the head; and a lug on the slide arranged to be held by the spring so as to retain the clamp plates in the closed and open position.

HARRY COULSTON.