Feb. 1, 1944. G. E. DUNN ET AL 2,340,520

STOCKING SUSPENDING DEVICE

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Fig. 1.

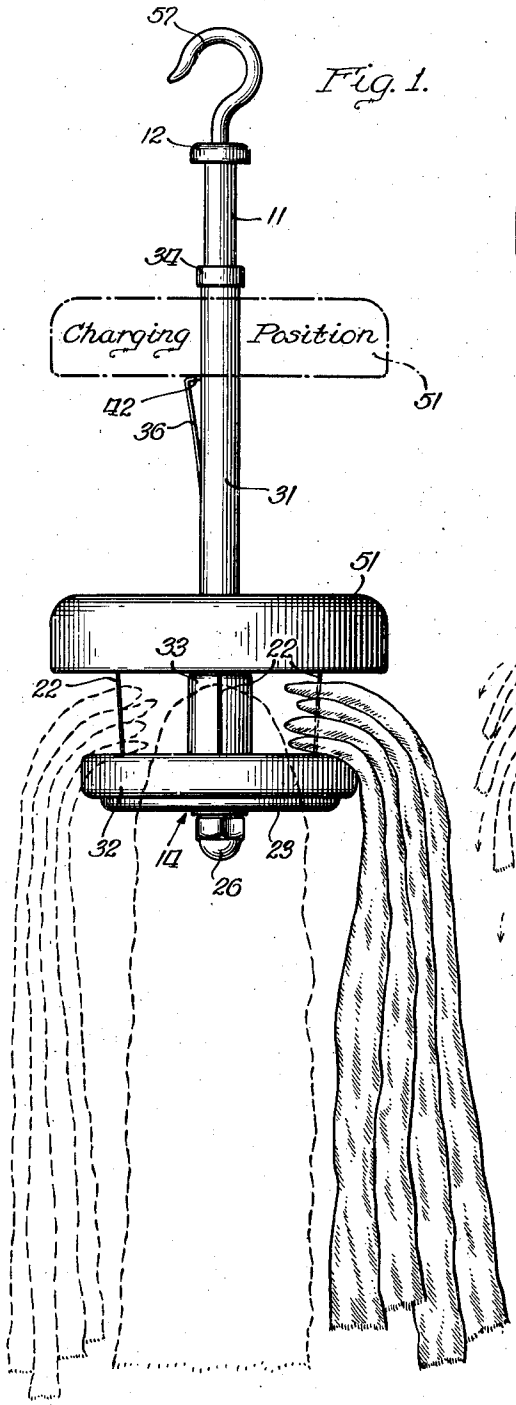
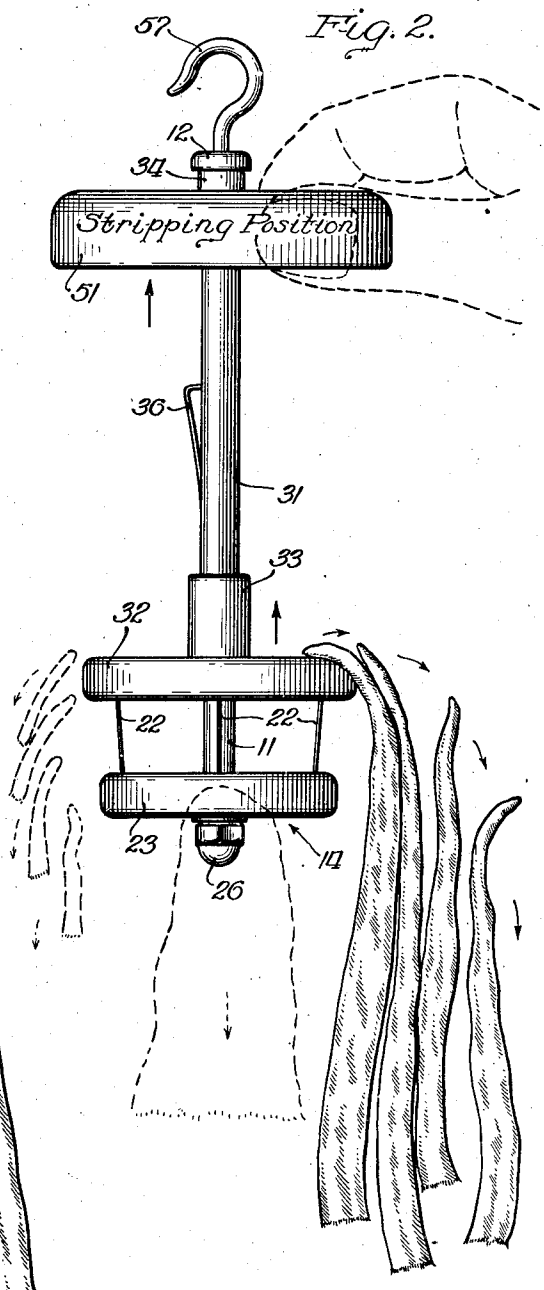



Fig. 2.




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Fig. 3.

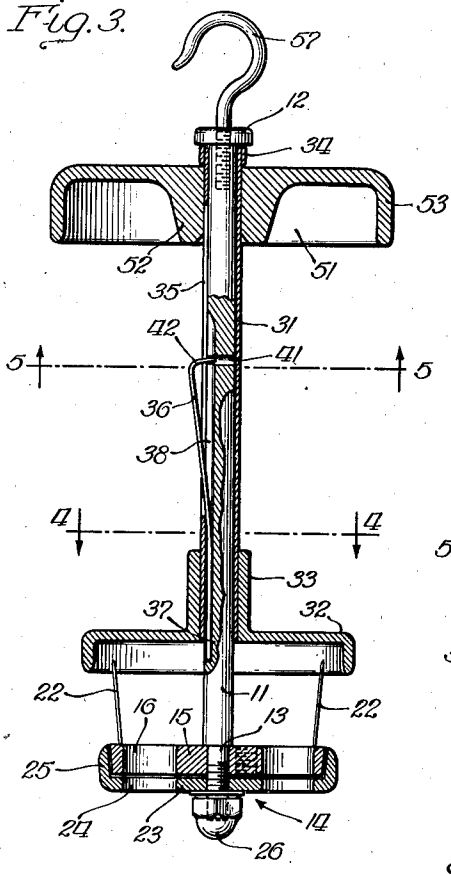



Fig. 5.

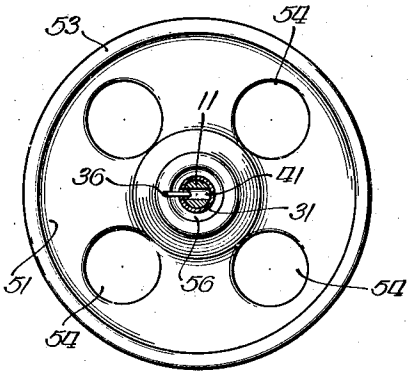



Fig. 6.

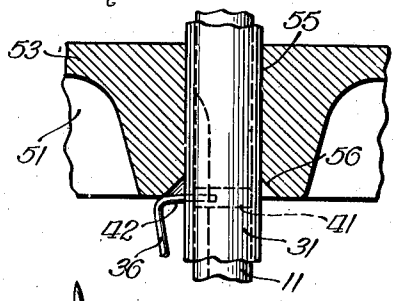



Fig. 4.

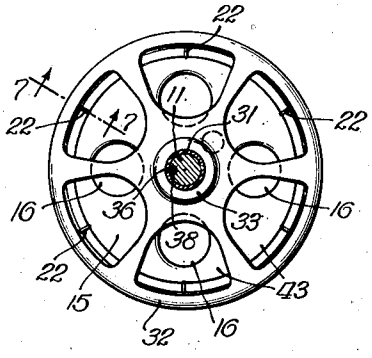



Fig. 7.

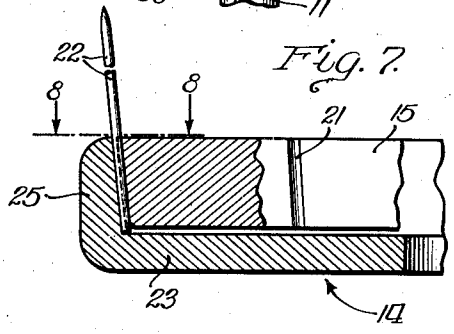
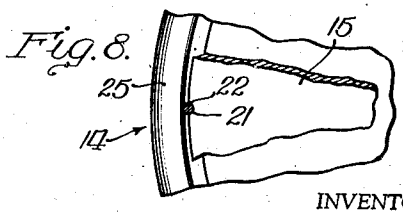



Fig. 8.




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# UNITED STATES PATENT OFFICE

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## STOCKING SUSPENDING DEVICE

George E. Dunn and Henry Richter, Kankakee, Ill., assignors to Paramount Textile Machinery Co., Chicago, Ill.

Application December 5, 1940, Serial No. 368,647

3 Claims. (Cl. 211—59)

This invention relates to a device for suspending textile articles while they undergo a treating process, and has more particular relation to a device to support stockings while being subjected to the action of a treating medium. For example, in preparing stockings knitted from nylon (one of a group of synthetic linear condensation fiber-forming polyamides) for the dyeing operation they are, in one known process, subjected to a presetting operation by exposing the article to the action of water vapor or steam confined in a closed chamber.

This application is a continuation-in-part of application Serial Number 351,654, filed August 7, 1940, by George E. Dunn and Henry Richter. In that case there is disclosed an apparatus for, and method of supporting nylon stockings for a presetting operation on suspending units which receive the stockings by impalement of the toe portion thereof upon points on the suspending unit, and a simple device of that nature is shown therein. The present application relates to improvements in suspending units of that character.

As pointed out in the aforementioned application, one method of supporting the stockings is by impaling the toe portion thereof on a needle, the point passing between the loops of the knit fabric, whereby each stocking hangs in a loose unstressed condition for maximum treating efficiency, or else holding the stocking by gripping a minute area of the fabric. For convenience in production, each suspending unit is adapted to accommodate a relatively small number of stockings as, for example, two dozen pairs or twenty-four stockings. After being charged, a number of these units are placed in a suitable cabinet for the treating process.

The principal object of this invention is the provision in a device of the character described of improved means for supporting the impaling points for ease in initial assembly and replacement.

Another object is the mounting of the points in a position designed for maximum convenience of the operative.

Still another object is the provision of novel means for retaining the needle shroud in inoperative position and returning the same to operative position.

A further object is to provide means for stripping by a single motion all of the stockings held on the unit.

In a modified form of the device the principal object is to provide novel fabric gripping members cooperating with a removable opposed gripping surface.

Further aims will appear as the description proceeds.

In the drawings:

Figure 1 is a side elevation of the device showing the stockings in position, the needle protecting shroud over the needles and the stripper in its lowermost position;

Figure 2 shows the stripper in its uppermost position and the stockings in process of being stripped;

Figure 3 is a partial medial cross section of the device as shown in Figure 2;

Figure 4 is a cross section on the line 4—4 of Figure 3;

Figure 5 is a cross section on the line 5—5 of Figure 3;

Figure 6 is a detail on a somewhat enlarged scale showing the operating relationship of the shroud and its spring;

Figure 7 is a cross section on the line 7—7 of Figure 4; and

Figure 8 is a cross section on the line 8—8 of Figure 7.

Referring to Figures 1, 2 and 3, 11 represents the spindle of the device, which is in the form of a cylindrical rod terminating at its upper end in an integral collar 12 of somewhat increased diameter.

Spindle 11 terminates at its lower end in a reduced threaded portion 13, on which is mounted the needle clamping assembly generally represented as 14. Assembly 14 comprises a central core 15 formed as a frustum of a cone and drilled out as at 16 with a plurality of holes, to reduce the weight thereof. On the periphery of the member 15 is a plurality of flutes 21 substantially of semi-circular cross section (Figures 7 and 8) adapted to partially receive a plurality of impaling points or needles 22, there being in this instance six such needles, as shown in Figure 4, although the number may be varied at will as will be obvious. Located adjacent the bottom face of the member 15 is a cup-shaped retaining ring 23 formed with holes 24 similar to and for the same purpose as the holes 16. The rim 25 of the ring 23 is co-extensive with the peripheral area of member 15 and embraces the plurality of needles 22 (Figure 7). A central hole in ring 23 fits over the reduced portion 13 and a cap nut 26 is screwed on the threaded portion thereof to clamp the member 15 and ring 23 together thereby to clamp the needles 22 in their proper position. Inasmuch as the periphery of the member 15 is part of a conical surface, needles 22 are given an outward inclination to facilitate the placing of the stocking thereover by the operative. Furthermore, the juxtaposed sloping faces of member 15 and ring 23 together form a wedging contact against the intervening needles 22 to hold them firmly in their predetermined position. As will be seen from Figures 3 and 7 a slight clearance is allowed between member 15 and ring 23 to permit the aforesaid clamping action. Needles 22 are

preferably formed of stainless steel wire or similar stiff, non-corrosive material.

Surrounding the spindle 11 and in axially sliding relationship therewith is the tube 31, having affixed thereto at its lower extremity the stripper plate 32, substantially of inverted cup-shape and provided with a hub 33 to maintain the same on tube 31, tube 31 and hub 33 being joined by soldering, riveting, or any equivalent means. Tube 31 is provided at its upper end with a collar 34 affixed thereto and in one side with an extended axial slot 35 for clearance around the spring 36. Said spring 36 is of the umbrella type and soldered or otherwise fastened at 37 to the spindle 11, being received in an axial groove 38 formed therein. A hole 41 diametrally through the spindle 11 receives the inturned extremity 42 of spring 36 to guide the same at its upper end and prevent dislocation thereof from its slot 38. Stripper 32 is provided with a plurality of substantially triangular openings 43 to lessen the weight thereof and through which the needles 22 may pass when the said plate is in its lowermost position.

Mounted outside the tube 31, and slidable with respect thereto by means of hole 55 is the needle protecting shroud 51, also substantially of inverted cup shape and provided with rim 53 and hub 52 to maintain alignment thereof with respect to tube 31. Said shroud is also formed with holes 54 (Figure 5) to lessen the weight thereof. Referring to Figures 5 and 6, it will be noted that the lower side of said hub at the edge of the hole 55 is chamfered as at 56 for a purpose to be described.

Threadedly engaged with the upper extremity of the spindle 11 is the supporting hook 57 by which the entire assembly may be carried on a stand after being charged by the operator and by which the device may be suspended in the treating chamber.

Operation of the device is as follows: Assuming that the unit is devoid of stockings, that is to say, has just been stripped of its load, the shroud 51 will be in the dotted line position of Figure 1 leaving the needles exposed, the stripping plate 32 and the sleeve 31 will be in their respective lowermost positions as shown in Figure 1.

The operator then charges the unit by impaling, say four stockings on each needle 22, the entire device being held for this purpose in a spring clamp of any convenient type, as for example that shown in Application Serial Number 351,654, hereinbefore referred to. Preferably the extreme tip of the toe of the stocking including its heavier reinforced fabric is engaged on the needle. After charging, the operator grasps the shroud 51 and by rotating it slightly, the chamfered portion 56 will, by the cam action thereof against the portion 42, direct the spring 36 inwardly, the inturned portion 42 entering the hole 41 and the remainder of the spring entering the groove 38, so that shroud 51 may be moved down on sleeve 31 to the position shown in full lines in Figure 1, in which position the shroud protects the needle points, to obviate accidental injury to the operative. Hub 33 serves as a stop to limit the downward movement of shroud 51. The unit is now ready for transference to the treating chamber.

After the treatment has been concluded, each unit is held in the hand, as for example, by means of hook 57, and the operative, with the other hand (see Figure 2) grasps the member 51 and raises it to its uppermost position, as shown by full lines in Figure 2. When the upper surface of shroud 51 strikes collar 34 it raises the tube 31 and with it the stripper 32, spring 36 compressing to inward position to permit passage of the shroud. This upward movement of the stripper will cause the rim thereof (Figure 4) to shed the stockings from the points, whereupon they fall into a bag, or other convenient container underneath. The shroud is then released, whereupon it will drop back to rest upon the spring 36, as shown in Figure 1, thereby releasing the tube 31 and stripper 32 to normal position, ready for another charge.

It will be seen from the foregoing that the important feature of the invention is the combined action of raising the protecting shroud and stripping plate in one motion, the automatic retention of the shroud in its upper position and the return of the stripper to its proper normal position without further effort on the part of the operative, gravity being relied upon solely.

A further important feature resides in the particular nature of the spring 36 and chamfer 56 to enable the spring to be compressed to released position by a partial twist of the shroud.

Another important feature resides in the novel needle positioning and retaining elements, whereby the same may be quickly assembled or removed, and the cooperation of two engaging conical surfaces to provide a clamping action on the needles while holding them in the most convenient position for the operative, as clearly brought out in Figure 7.

Further advantages reside in the use of extremely light parts, thereby making for economy of manufacture and ease of operation.

We claim:

1. In a device of the class described, a central support; a plurality of pointed elements mounted on said support for carrying by impalement thereon a plurality of articles; means common to all of said elements for stripping said articles from said elements; and a shield for said elements slidable with respect to said support and adapted to be moved from element shielding position to a position clear of said elements to effect actuation of the stripping means.

2. In a device of the class described, a central support; a plurality of pointed elements mounted on said support for carrying by impalement thereon a plurality of articles; means common to all of said elements for stripping said articles from said elements; a shield for said elements slidable with respect to said support and adapted to be moved from element shielding position to a position clear of said elements to effect actuation of the stripping means; and second means to maintain said shield in element-clearing position.

3. In a device of the class described, a central support; a plurality of pointed elements mounted on said support for carrying by impalement thereon a plurality of articles; a shield for said elements adapted to occupy normal and shielding positions; means carried on said support to maintain said shield in normal position, said shield being provided with a cam surface adapted to engage said means for releasing said means to permit movement of said shield to shielding position.

GEORGE E. DUNN.
HENRY RICHTER.