May 9, 1950 W. C. WAGENER 2,506,910

HOSIERY SUSPENDING DEVICE

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Fig. 1.

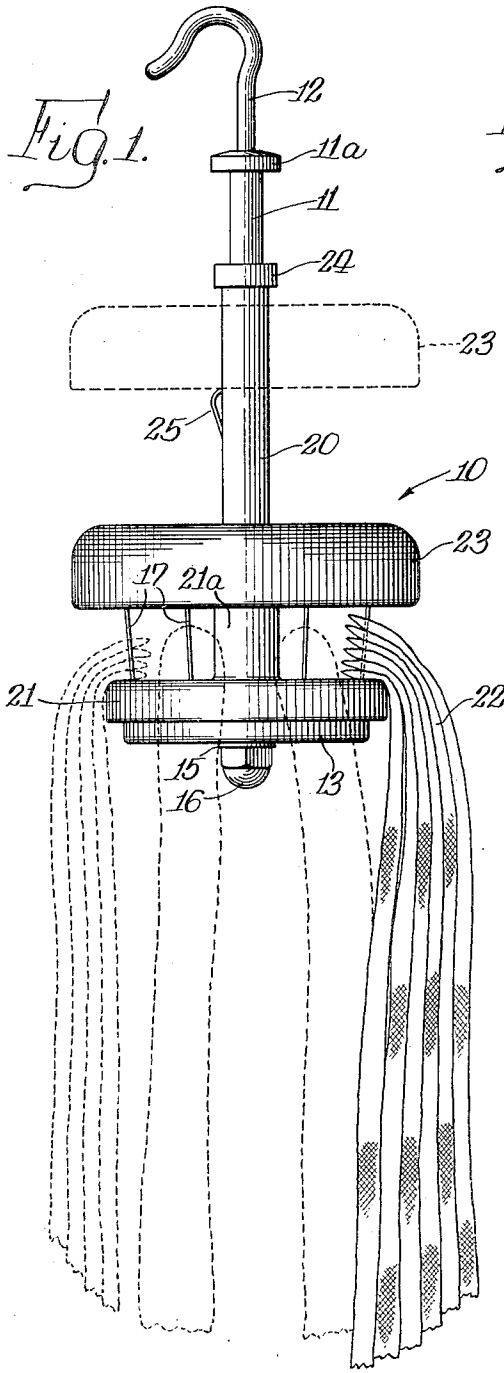
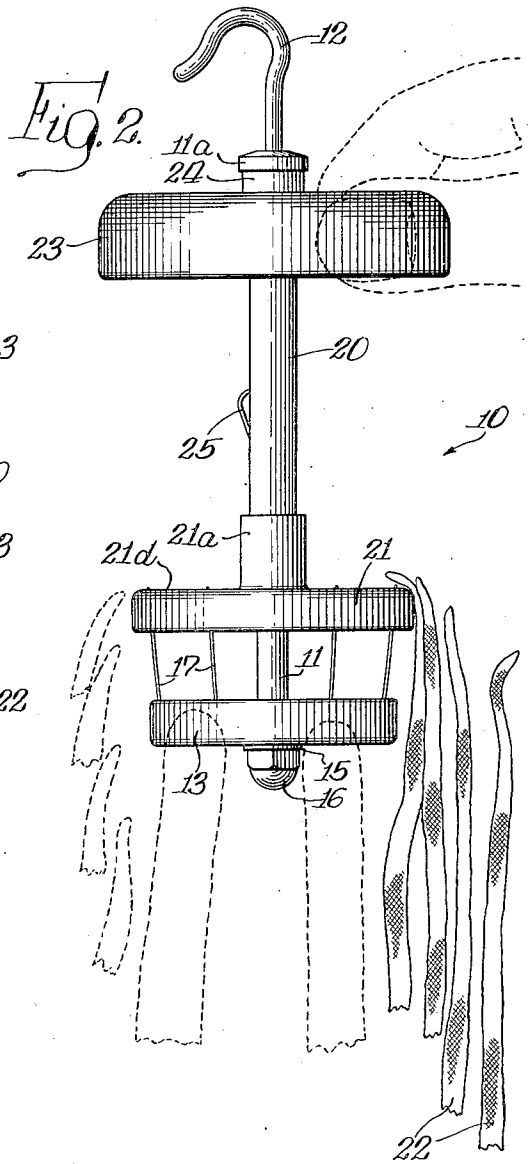


Fig. 2.



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Fig. 3.

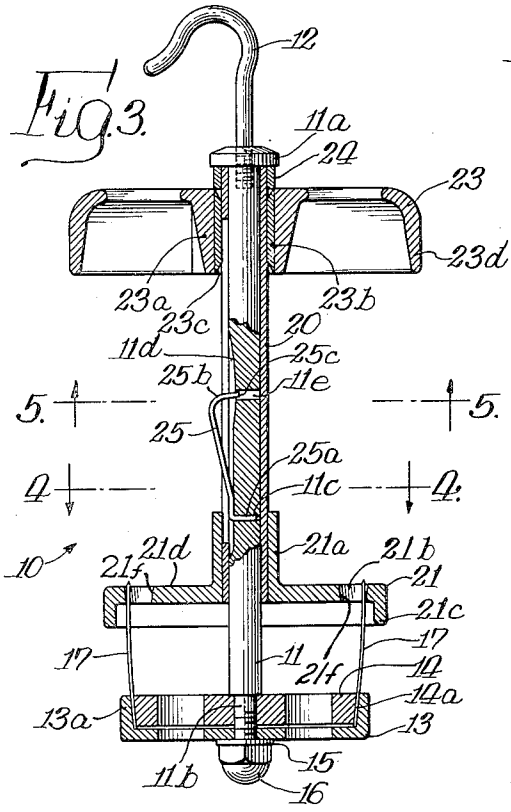


Fig. 5.

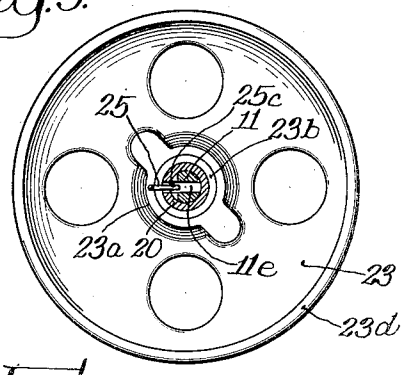


Fig. 6.

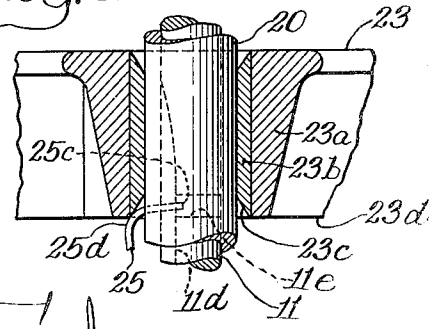


Fig. 7.

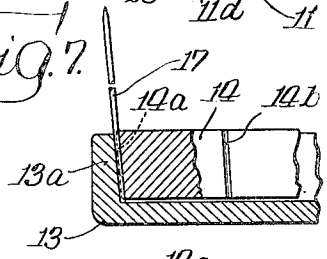


Fig. 4.

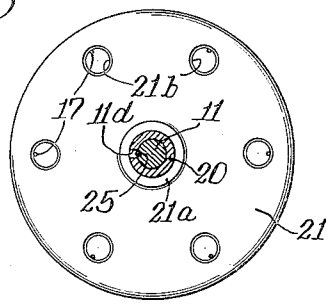
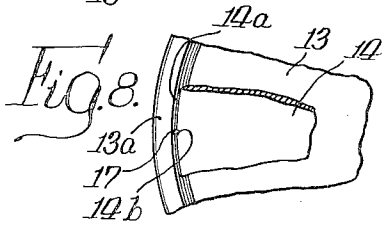


Fig. 8.



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UNITED STATES PATENT OFFICE

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HOSIERY SUSPENDING DEVICE

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Application December 12, 1946, Serial No. 715,801

5 Claims. (Cl. 211—113)

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This invention relates to improvements in devices for suspending textile articles, such as hosiery, while they are undergoing a process of treatment in an enclosed chamber or the like and it may be used with particular advantage in supporting stockings knitted from synthetic linear polyamide fibers such as nylon while the hosiery is being subjected to a presetting operation by exposure to the action of steam or water vapor. The present invention is an improvement on that described and claimed in United States Letters Patent to George E. Dunn and Henry Richter, No. 2,340,520, dated February 1, 1944, and the device of the present invention may be used, for example, in supporting hosiery or other textile articles in an enclosed treating chamber of the type disclosed in United States Letters Patent of George E. Dunn, No. 2,350,021, dated May 30, 1944.

In said Letters Patent No. 2,340,520, there is shown a form of hosiery suspending device comprising a plurality of upwardly extending needles upon which the tips of the toe portions of the hosiery are adapted to be impaled so that the stockings are suspended from these needles in the treating chamber and have no support except that provided by the needles. A stripping plate is mounted for relative movement with respect to the needles and after the treating of the hosiery has been completed, this stripping device is moved to cause the hosiery to be discharged from the needles. In this prior device, the stripping device occupies a position at the bottoms of the needles during the treating operation and the upper ends of the needles are protected by a shroud or cap member which is spaced somewhat from the needles when it is in its lower position with its outer marginal flange extending somewhat below the upper ends of the needles. After the treatment has been concluded, both the stripping device and the shroud are moved upwardly with respect to the needles and the stripping device travels to a level substantially above the tips of the needles so that the hosiery is thereby discharged from engagement with the needles and is compelled to fall by gravity into a container below. Thereafter, the stripping device is moved downwardly again to its lower position and in the operation of this prior device, the relative movement of the stripping device and the needles has been found to be damaging to the needles because of their engagement with the walls of the apertures in the stripping plate or with the surrounding flange thereof, with the

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result that the needles become damaged and have to be replaced at intervals.

The principal object of the present invention is to overcome the above-mentioned difficulties by providing an improved hosiery suspending device of the type referred to in which the relative movement of the stripping plate and the needles is effected to discharge the hosiery from the needles, while maintaining a continuous contact between the needles and the stripping plate so that the stripping plate does not engage and damage the points of the needles when it is returned to its normal lower position. A further object of the invention is to provide a hosiery suspending device comprising a series of needles and a relatively movable stripping plate provided with a plurality of relatively small apertures which are continuously engaged by the needles in all of the positions of the stripping plate. Still another object of the invention is to provide a hosiery suspending device comprising a series of needles and a cooperating stripping plate having needle receiving apertures which have tapered walls so that there is only a line contact between a needle and its aperture in all of the positions of the stripping plate. A further object of the invention is to provide a hosiery suspending device comprising a series of needles and a relatively movable stripping plate having apertures continuously engaged by the needles and having a range of travel such that, when the stripping plate is in the position to discharge the hosiery from the needles, the points of the needles will be substantially flush with or project only slightly above the upper surface of the stripping plate. Other objects and advantages of the invention, relating to various features of construction and arrangement, will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings,

Figure 1 shows a side elevation of the improved hosiery suspending device of the present invention with a plurality of stockings suspended from the needles and with both the stripping plate and the protecting shroud in their lower positions which they occupy during the operation of the hosiery treating process, the position of the protecting shroud during the operation of placing hosiery on the needles being illustrated by dotted lines;

Fig. 2 shows a side elevation of the device illustrated in Fig. 1 with the protecting shroud

moved upwardly by a manual operation to cause the upward movement of the stripping plate to its stripping position wherein the stockings are discharged from the ends of the needles;

Fig. 3 shows a vertical axial section through the hosiery suspending device shown in Figs. 1 and 2 with the parts in the relative positions which they occupy in Fig. 2;

Fig. 4 shows a horizontal section taken on the line 4—4 of Fig. 3;

Fig. 5 shows a horizontal section taken on the line 5—5 of Fig. 3 with the protecting shroud in the lower position which is illustrated in Fig. 1;

Fig. 6 shows an enlarged detail section through the hub of the protecting shroud and associated parts illustrating the operation of the shroud in releasing the spring by which the shroud is held at times in the position shown by dotted lines in Fig. 1;

Fig. 7 shows an enlarged vertical section through the lateral portion of the retaining and supporting members by which the needles are secured in position; and

Fig. 8 shows a top plan view of the details illustrated in Fig. 7 with a portion of the inner clamping member cut away.

As illustrated in the drawings, the improved hosiery suspending device 10 comprises a stem or spindle 11 of cylindrical form provided at its upper end with a collar 11*a* and having attached to the upper end thereof a hook 12 by which it may be suspended from a support during the operation of placing hosiery on the needles and during the subsequent treatment of the hosiery in a treating chamber. The spindle 11 has a reduced portion 11*b* at the lower end thereof which is engaged by a cup-shaped retaining member 13 and a clamping member 14, both of circular form, which are centrally apertured to be fitted by the part 11*b*. These members 13 and 14 are secured on the stem or spindle 11 by a washer 15 and a nut 16 which engage the threaded part 11*b*. As shown particularly in Figs. 7 and 8, the annular flange 13*a* of the retaining member and the outer annular surface 14*a* of the clamping member are both flared outwardly and upwardly and the surface 14*a* is provided at intervals with equally spaced upwardly extending grooves 14*b*, of semicircular cross section, which are adapted to be fitted by portions of the lower ends of the steel needles 17. The flange 13*a* of the retaining member is spaced sufficiently from the surface 14*a* of the clamping member to accommodate the thicknesses of the needles 17 which are seated in the grooves 14*b* while at the same time contacting the outer edges of these needles. With the needles assembled in the grooves 14*b* and the retaining member 13 loosely applied thereto, the tightening of the nut 16 will bring about a wedging action between the retaining member and the clamping member so that the needles will then be held firmly in position and will be inclined upwardly and outwardly.

The stem or spindle 11 has slidably mounted thereon a sleeve 20 which has its lower end fitted within and secured to the hub portion 21*a* of the stripping plate 21 which is provided in the radial disc portion thereof with a series of apertures 21*b* having side walls 21*f*, each of which is engaged at all times by one of the needles 17. When the needles are loaded with hosiery 22, as shown in Fig. 1, the stripping plate 21 rests on the upper surfaces of the members 13 and 14 and its annular flange 21*c* extends downwardly around the outer margin of the member 13, as illustrated in Fig. 1. The sleeve 20 is adapted to be moved upwardly to a position wherein its upper end engages the collar 11*a* at the upper end of the spindle and when in that position, the stripping plate occupies the positions shown in Figs. 2 and 3 wherein the points of the needles 17 extend only slightly above the upper surface 21*d* of the stripping plate, this projection being so limited that the movement of the stripping plate to this position will cause the hosiery to be discharged from the needles as shown in Fig. 2. It will be observed that the holes 21*b* in the stripping plate, although of circular cross section, are flared upwardly and that, when the stripping plate is in its upper position, the needles 17 are bowed between their upper and lower ends, thus causing the needles to have line contacts only with the walls of the apertures 21*b* so that the frictional wear caused by relative movement of the stripping plate with respect to the needles is reduced to a minimum.

For the purpose of effecting a manual upward movement of the sleeve 20, a combined protecting shroud and operating member 23 is provided. This member has a central hub portion 23*a* provided with a relatively fixed hard metal bushing 23*b* which slides upon the sleeve 20 and which has both of its end surfaces tapered outwardly away from the sleeve as shown at 23*c* for a purpose hereinafter described. The member 23 is provided at its outer margin with a downwardly extending annular flange 23*d* and when the shroud 23 is in its lower position, as shown in Fig. 1, the flange 23*d* extends somewhat below the plane of the upper ends of the needles 17 so that the needles are thereby protected. When the shroud 23 is in this lower position, its hub 23*a* is adapted to rest upon the hub 21*a* of the stripping plate 21 which will then be in its lower position as shown in Fig. 1. In order that the shroud 23 may be used as an operating member to effect upward movement of the sleeve 20, a collar 24 is secured to the upper end of the sleeve 20 in a position to be engaged by the upper end of the shroud 23 so that after the shroud has been seized by the fingers of the operator, it may be moved into engagement with the collar 24 and this collar and the sleeve 20 may then be moved upwardly from the position shown in Fig. 1 to the position shown in Fig. 2, thereby moving the stripping plate 21 to its stripping position.

In order to support the shroud 23 in an inoperative position at the time that the needles 17 are being loaded with hosiery, a leaf spring 25 is secured to the stem or spindle 11, as shown particularly in Figs. 3 and 6. One end 25*a* of this spring is secured in a transverse aperture 11*c* formed in the spindle and the spring extends outwardly from this fixed end opposite a groove 11*d* which is formed in the spindle. The spring terminates at its upper end in a bowed portion 25*b* having an extremity 25*c* adapted to move into an aperture 11*e* formed in the spindle when the spring is compressed. When the spring is in its normal outer position as shown in Figs. 1, 2, and 3, it may be utilized to support the shroud 23 in its inoperative position shown by dotted lines in Fig. 1, thereby permitting the operator to place the tips of the toe portions of the stockings 22 over the needles. When the several needles have been loaded with the desired number of stockings, the shroud 23 is moved downwardly over the spring 25 to the position shown by the full lines in Fig. 1. During this operation, the tapered end surface 23*c* of the

bushing 23b engages the bowed portion of the spring 25 and wedges it inwardly into the groove 11d, as illustrated in Fig. 6. The device 10 with its load of hosiery 22 is then ready to be moved to the treating chamber.

After the treating process has been carried out, the suspending device 10 is removed from the chamber and placed upon a temporary support with the treated hosiery suspended therefrom. Then, the operator seizes the shroud 23 and moves it upwardly on the sleeve 20, thereby causing the tapered upper end surface of the bushing 23b to wedge the spring 25 into the groove 11d so that the shroud is permitted to pass over the spring and to travel to the upper end of the sleeve where it engages the collar 24. Further upward movement of the shroud 23 then elevates the sleeve 20 from the position shown in Fig. 1 to that shown in Figs. 2 and 3, thereby moving the stripping plate 21 and causing the stockings 22 to be discharged from the needles in the manner illustrated in Fig. 2. In order to decrease the weight of the device, all of the parts 13, 14, and 23 are preferably provided in the horizontal portions thereof with relatively large apertures.

Although one form of the invention has been shown or described by way of illustration, it will be understood that it may be constructed in various other forms which come within the scope of the appended claims.

I claim:

1. In a device of the class described, a support, a needle mounted on said support to carry by impalement a textile article, a stripping plate having an aperture with a side wall engaged by said needle, means for moving said plate to strip said needle, and means for limiting the movement of said plate to maintain continuous engagement of said needle with said side wall.

2. In a device of the class described, a support, a needle mounted on said support to carry by impalement a textile article, a stripping plate having an aperture with a side wall engaged by said needle, means for moving said plate to strip said needle, and means for limiting the movement of said plate to maintain continuous engagement of said needle with said side wall, said needle having its point substantially flush with the face of said plate when said plate is in stripping position.

3. In a device of the class described, a support, a needle mounted on said support to carry by impalement a textile article, a stripping plate having an aperture with a side wall engaged by said needle, means for moving said plate to strip said needle, and means for limiting the movement of said plate to maintain continuous contact of said needle with the wall of said aperture, said needle having a line contact with the wall of said aperture.

4. In a device of the class described, a supporting stem, means carried by said stem for supporting an annular series of upwardly extending needles mounted to have a normal outward inclination from their lower ends, said needles being adapted to carry by impalement a plurality of textile articles, a stripping plate slidably mounted on said stem and having a plurality of apertures with side walls each engaged by one of said needles, the walls of said apertures being flared upwardly, means for moving said plate upwardly to strip said textile articles from said needles, and means for limiting the movement of said plate to maintain continuous engagement of said needles with said side walls, said needles being bowed between their ends and having line contacts with the flared walls of said apertures when said plate is in its uppermost position.

5. In a device of the class described, a supporting stem, means carried by said stem for supporting a plurality of upwardly extending needles, said needles being adapted to carry by impalement a plurality of textile articles, a sleeve slidably mounted on said stem, a stripping plate carried by said sleeve and provided with a plurality of apertures having side walls engaged by said needles, means for moving said sleeve upwardly on said stem to cause said plate to eject said textile articles from said needles, and means for limiting the upward movement of said sleeve and thereby maintaining said needles continuously in contact with the walls of said apertures.

WILLIAM C. WAGENER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,637,688	Emel	Aug. 2, 1927
1,858,595	Parker et al.	May 17, 1932
2,340,520	Dunn et al.	Feb. 1, 1944

Certificate of Correction

Patent No. 2,506,910 May 9, 1950

WILLIAM C. WAGENER

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 6, line 18, for the words "with side walls each" read *each with side walls*;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of August, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.