Aug. 21, 1945. R. MITTELSTADT 2,383,011

GARMENT TREATING FORM

Filed Sept. 24, 1941

Fig. 1.

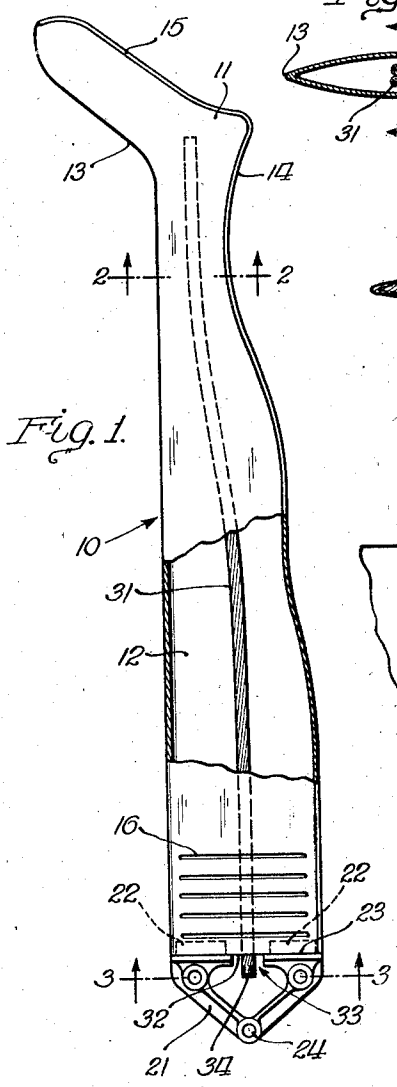


Fig. 2.

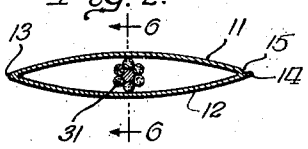


Fig. 6.

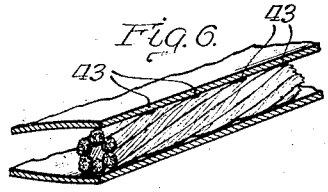


Fig. 3.

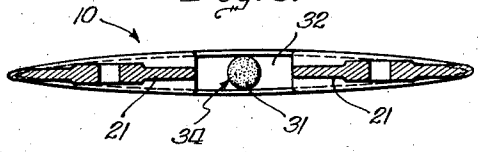


Fig. 5.

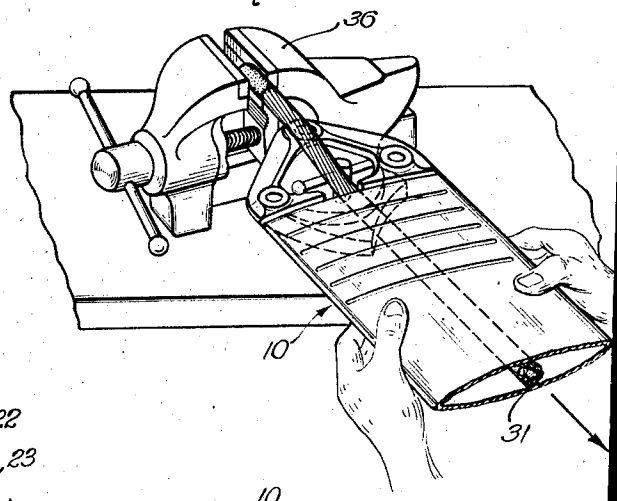


Fig. 4.

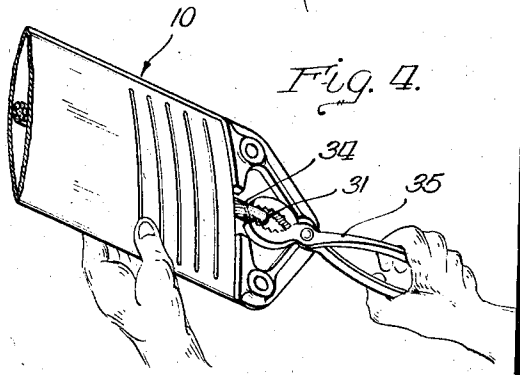
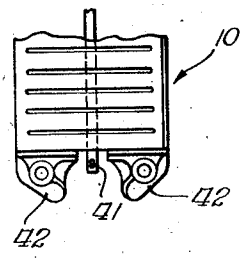


Fig. 7.



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Patented Aug. 21, 1945 2,383,011

UNITED STATES PATENT OFFICE

2,383,011

GARMENT TREATING FORM

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Application September 24, 1941, Serial No. 412,101

4 Claims. (Cl. 223—76)

This invention relates to a garment form, but more specifically has reference to a form adapted to receive thereover a hosiery article for treatment, for example, setting the shape thereof.

During the recent past there has come upon the market a synthetic fiber capable of being formed into yarn for the knitting of hosiery, known to the trade as nylon, and of which one typical embodiment is the polymer, polyhexamethylene adipamide. One characteristic of this fiber is its thermoplastic nature necessitating, after a garment has been fabricated therefrom, as for example by knitting, a "setting" operation by a suitable agent under predetermined conditions of heat and moisture for a predetermined period before being entered into the dye bath, otherwise the heated dyeing fluid will impart serious irremovable wrinkles and distorted stitches to the fabric.

In the case of hosiery articles this setting operation is described as "preboarding" in that the article, after being knit, is first placed over a suitable form having a contour substantially representing the finished outline of the stocking and then the form with the stocking is placed in a closed chamber for the setting treatment, for example, filling the chamber with saturated steam at a temperature of, say 240° F., and permitting the stocking to remain therein for, say 3 minutes. In actual production a large number of such forms with their associated stockings would be inserted at one time in a sufficiently large chamber. After this operation has been performed the fabric structure is sufficiently fixed to resist any further change under the action of the hot dyeing fluid, provided of course, as is usual, that the dyeing is at a lower temperature and/or for a shorter period of time than the setting treatment. Following the dyeing operation the article is again boarded for a simple pressing operation commonly termed "boarding." This operation also takes place over a shaped form similar to the previous form and at the conclusion thereof the article is removed and ready for packaging.

The setting process just described is known to the trade as the Du Pont preboarding process. However, there is in substantial use another method of handling nylon articles, for example, stockings, termed the Dunn process, in which the articles, after being knitted, are "preset" by suspending the same in a chamber loosely, i. e., not over a shaped form, and subjecting them to a hot, wet treatment by means of a suitable setting agent, for example, in a closed chamber containing water vapor at a temperature of, say 206° F., for about 20 minutes. This process yields substantially the same result prior to the dyeing operation as the Du Pont process, in that the articles may now be dyed without the danger of distorting the fabric structure. However, there is this important difference, that after the dyeing operation the stockings are then placed over a shaped form and placed in the presence of a setting medium under conditions of heat and moisture, but at a higher temperature than the presetting, for example, in a closed chamber containing saturated steam at a temperature of about 240° F. for about three minutes, and, for convenience, this may be termed a "final boarding."

The invention herein disclosed is not intended to be limited in its use to the Dunn process, but may be availed of in any similar process in which the goods are subjected to the presence of the setting medium in a dyed condition and wherein the injurious localized bleaching effects resulting from prior form constructions may be remedied by using this invention.

In either the Du Pont or the Dunn processes a form must be used, but in the case of the Dunn process, since the articles are dyed when they are placed on the final boarding form, it is necessary that the form adopt a uniform temperature over its surface as the form is raised to the temperature of the setting medium surrounding it. If this were not so and some portion of the form lagged substantially in adopting that temperature, the setting medium, usually steam, would condense to a greater extent on a portion having a lower temperature and this excessive moisture, where it met the fabric, would tend to bleed the dyestuff therefrom, leaving somewhat objectionable bleached areas.

Conventional forms for the aforesaid preboarding or final boarding operation heretofore have generally been comprised of two thin metal sheets cut to the desired form contour and joined at the edges by welding or otherwise to yield crease-producing edges. The form halves are first formed in a substantially half-oval conformation so that when assembled together the form itself has a generally oval cross section, all as known to those skilled in the art.

In order to preserve the oval cross section and facilitate construction, it has been customary to insert, substantially along the median line of the form, a rib, which not only serves to space the sides of the form at the minor axis of the oval, but enables easy straightening of the entire form after the edges are joined. Describing this in further detail, it may be said that, practically, it

is not possible to form the sides of the object with great accuracy and straightness as there are hundreds of contours of forms prescribed by users and the cost of stamping and forming dies for each contour would be entirely prohibitive. Accordingly, the sides of the form are curved by using separate sectional dies which may be adapted to a large variety of shapes by using them in a large variety of combinations. The result of using these dies is to produce form sides having general surface irregularities and, furthermore, after the welding has been completed the heat of the torch or arc has further so distorted the form sides that the form must be placed in a press and carefully straightened by hand. Accordingly, the sides of the form must be supported internally by a rib or equivalent. In the absence of a central rib the straightening operation would collapse the sides of the form irretrievably.

In these prior forms the central rib was comprised of solid bar usually of rectangular cross section, and this became a permanent part of the structure. Accordingly, when such form was used in connection with the Dunn process the mass of metal at the center line, being comparatively much thicker than the form sides and hence less penetrable by heat, would heat up so much slower than the remainder of the form that there was excessive condensation along that area of the form represented by contact with the rib, resulting in the objectionable bleaching heretofore referred to. An ideal form would be one in which the rib is entirely absent.

Accordingly, it is the primary object of this invention to construct a form of the type described and for the use intended provided with a rib serving every necessary function during fabrication and then removable before the form is used for its intended purpose.

Another object is to provide such a removable rib which may be extracted from the form without damaging the form or modifying the predetermined garment receiving surface.

A still further aim is to employ a flexible removable rib that will adapt itself substantially to such a position with respect to the form as to offer support along the minor axis as it changes its location along the median line of the form.

Another object is to employ for a rib of the type described, flexible metal rope or cable which will not only satisfy the foregoing objective but will follow the easiest exit as it is removed from the form.

Another object is to employ a steel cable as just referred to which has been treated by galvanizing or other appropriate corrosion inhibiting method. Consequently, if it is desired for some purposes not to remove the rib, the corrosive effect of moisture entering the form will be substantially diminished, if not entirely prohibited.

Further objects will appear as the description proceeds.

In the drawing:

Figure 1 is a side elevation showing a recognized type of boarding form with a portion broken away to reveal the improved rib construction:

Figure 2 is a cross section on the line 2—2 of Figure 1;

Figure 3 is a cross section on the line 3—3 of Figure 1;

Figure 4 is a perspective view showing the first step of removing the rib from the form;

Figure 5 shows the final step of removing the rib;

Figure 6 is a cross section on the line 6—6 of Figure 2, and

Figure 7 shows a modified form construction.

Referring first to Figures 1 and 2, 11 represents one-half or side of the form 10 and 12 the other half or side, which are first cut from a flat sheet of metal to the desired contour, then by means of sectional dies formed in a press to a substantially half-oval configuration, and joined by welding or other equivalent means at the front crease-producing edge 13 and the rear crease-producing edge 14, to yield a unitary garment receiving body structure. Frequently, but not necessarily, a seam-seating groove 15 is rolled along the rear edge extending from the tip of the toe to the lowermost extremity of the form, which serves to align the seam, if any, of the stocking with respect to the crease-producing edges. If desired, length markers 16 may be impressed in the sides 11 and 12 before the same are assembled for the purpose of indicating to the operator the length to which it is desired to draw the stocking down on the form. At its lower extremity the form is provided with a base member 21, in this instance shown as a casting or drop forging of substantially triangular shape, provided with form mounting ears 22 adapted to enter the open lower end of the form to which it is joined by welding or otherwise along the junction 23. Holes 24 are provided in member 21 to receive bolts for mounting said form with respect to the treating apparatus proper.

Before the form sides 11 and 12 are temporarily clamped together preliminary to the welding operation, there is laid between them a rib 31 extending from a point near the heel portion through the open end 32 (Figure 3) of the form body and projecting beyond the lower end thereof as indicated generally at 33.

Preferably the rib 31 is comprised of ordinary stranded wire cable which has been galvanized, cadmium plated or otherwise prepared to resist corrosion. Moreover, it is preferred to employ cable provided with a non-metallic central core, e. g., hemp, to reduce the mass of rib metal to be heated while preserving the required outer diameter of the rib.

Due to the concave nature of the form sides 11 and 12, the flexible cable 31 will tend to distort from its normal substantially straight direction and locate itself along the median axis of the form which represents the position of the minor axis, or the axis of greatest internal width, of the cross section at all points along the form. It will be apprehended that section 2—2 (Figure 2) is a typical cross section of the form at any point from a region near the heel and extending to the lowermost end of the form.

Prior to being laid between the form sides, the end 34 of the rib 31 is sweated with solder, brazed or welded to unite the cut end of the cable and to present a non-yielding extremity thereof for a purpose to be presently described.

The form as now prepared and shown complete in Figure 1 may be used for any function wherein the precaution to be observed in final boarding under the Dunn or the like process does not exist. However, in the event the form is to be utilized for that process or one similar, the rib may be readily removed as shown in Figures 4 and 5, as follows:

Referring now to Figure 4, the solid end 34 of the rib 31 is grasped with a pair of pliers 35 and

the rib partially moved outward from its position within the form, say to the position shown in Figure 5. As soon as a sufficient length of the rib has been withdrawn to permit grasping the same beyond the bottom of the form base **21**, the end of the rib may then be placed between the jaws of a vise **36**, the form grasped with the hands and drawn away from the rib. This operation will not perceptibly affect the curvature of the form sides since they were originally substantially prepared thus and subsequent straightening operations had rendered them true. If preferred, the end of the cable adjacent the lower open end of the form may be tack welded, or otherwise temporarily fastened to the sides of the form to insure that the rib **31** will not be accidentally dislodged.

It is to be understood that although it is preferred to use a rib composed of flexible material, as for example, twisted wire cable, this invention is not necessarily limited thereto inasmuch as a rigid rib as shown in Figure 7 may be employed, in which case perhaps more friction would be presented against its withdrawal. The peculiar advantage of the flexible cable rib is that it touches the inner surface of the sides of the form in spaced apart points only as shown at **43** in Figure 6, thereby reducing the contacts between the sides and rib to a point where under some conditions of treatment it may not be necessary to remove the rib, whereas with the older solid rectangular or even cylindrical rib the extended contact would result in bleaching. Furthermore, because of the point contact between the inner surface of the form sides and the cable, removal of this type of rib is considerably facilitated, as the friction is substantially reduced over what would be the case if a common type of rectangular rib is employed.

It is not essential to continue the rib beyond a point in the neighborhood of the heel and into the toe, as the foot portion of the form is of relatively smaller cross section than the leg portion and is shorter in length. It may be formed with one or two dies rather than several thereof as previously set out. For these reasons straightening of that zone of the form is less of a problem. However, it is perfectly within the scope of this invention to continue the rib into the toe portion of the form.

It will be appreciated also that to facilitate assembly of the form sides with the rib, the inner surface of the sides **11** and **12** may be provided with L-shaped lugs, one leg welded to the said surface and the upstanding legs forming guides between which the cable **31** may be laid, so that it may not accidentally become shifted during assembly. This would be especially true if it were desired to continue a cable rib into the foot portion of the form, as the natural resiliency of the cable where it is turned at the corner where the foot forms an angle with the leg would tend to displace that portion of the rib associated with the foot to the upper side of the median line.

A feature of great advantage is that a rib of this nature may be used solely as a convenience in manufacturing inasmuch as after the form has been completely straightened, ready for the trade, the rib may be removed and reused in fabricating other forms, resulting in considerable economy of manufacture in the salvage of the rib material.

In Figure 7 there is shown a modification of the principal embodiment, in which the rib is provided at its lower projecting extremity with a hole **41** and in this case the form base, instead of being a unitary triangular structure such as **21**, comprises two parts **42**, thereby allowing a clear space therebetween beyond the projecting end of the rib. Accordingly, an appropriately formed implement may be inserted in said hole **41** and the rib withdrawn manually or otherwise without interference with the form base.

I claim:

1. A garment form including in combination a hollow structure to receive the garment thereover and an inner rib comprising flexible stranded metallic cable, said rib adapted to control the inner surfaces of the said structure over substantially the entire length of said rib.

2. A garment form including in combination a hollow structure to receive the garment thereover and an inner rib comprising flexible stranded metallic cable with a non-metallic core, said rib adapted to contact the inner surfaces of the said structure over substantially the entire length of said rib.

3. A garment form including in combination a hollow structure to receive the garment thereover and an inner flexible rib extending substantially the entire length of the structure and protruding freely beyond the end thereof, said protruding portion being provided with means engageable by an implement whereby said rib may be separated from the structure.

4. A device as in claim 3 in which said flexible rib comprises stranded metallic cable.

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