Feb. 27, 1951 H. B. KOTH 2,543,413

APPARATUS FOR FINISHING FABRIC

Filed Jan. 8, 1946 2 Sheets-Sheet 1

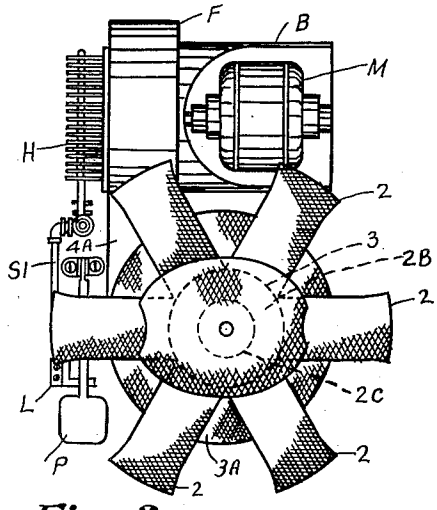


Fig. 2

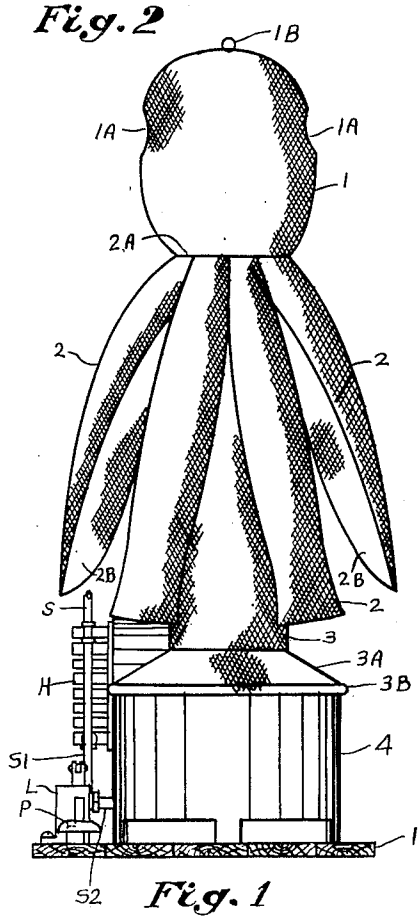


Fig. 1

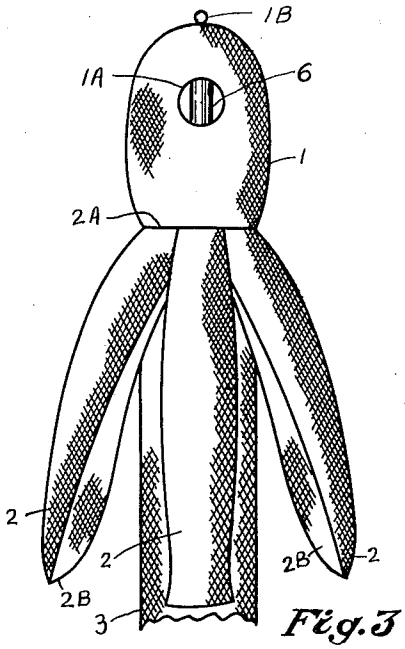


Fig. 3

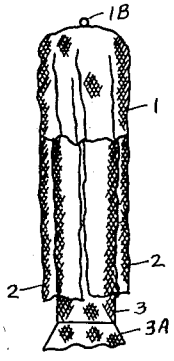


Fig. 5

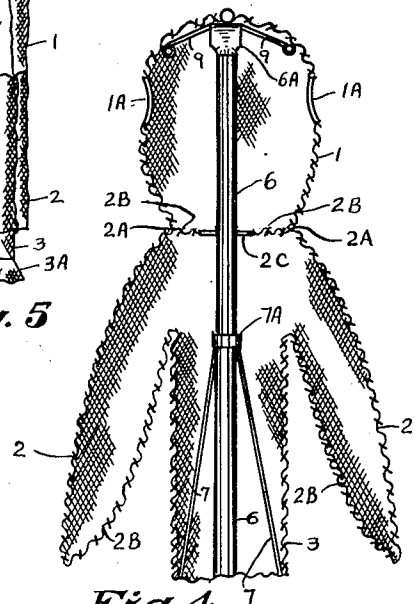


Fig. 4

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APPARATUS FOR FINISHING FABRIC

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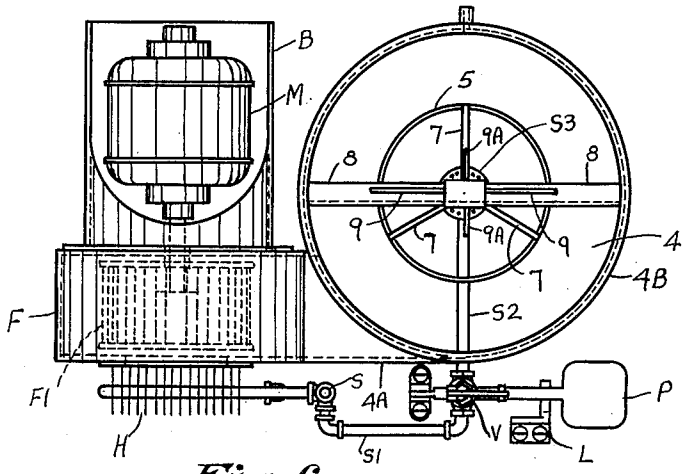


Fig. 6

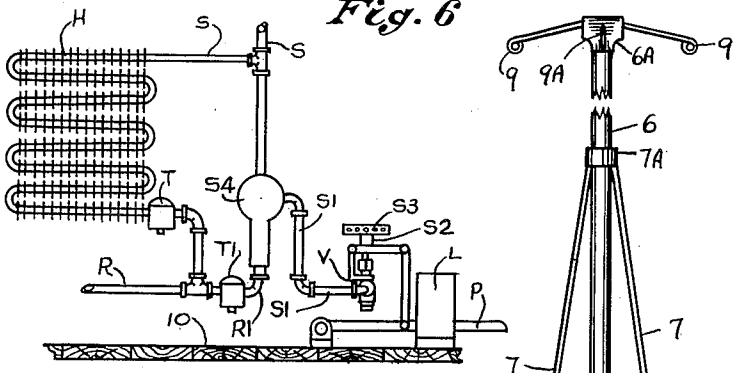


Fig. 8

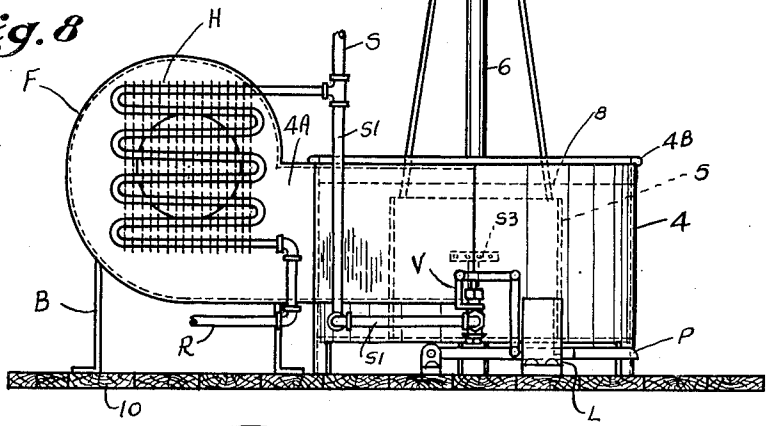


Fig. 7

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APPARATUS FOR FINISHING FABRIC

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Application January 8, 1946, Serial No. 639,858

13 Claims. (Cl. 223—67)

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This invention relates to a method and apparatus of finishing fabric articles, and has for its principal object the finishing of garments such as dresses, skirts and coats, etc.

More particularly the invention relates to apparatus upon which a garment is placed and held in suitable position while steam and/or hot air, or other fluid medium for conditioning a fabric, is discharged into the interior of the garment and allowed to permeate therethrough to accomplish the desired finishing and/or conditioning of the fabric thereof.

The primary object of the invention is to provide means for holding the skirt of a dress, etc., or the body portion of a coat, etc., in a smooth distended position while hot air is discharged into the interior of the garment to "cure" or "set" the fabric in a smooth, finished condition ready for wear.

Another object of the invention is to provide apparatus that will accommodate a complete range of garment sizes, and one that will provide the same quality of finish on garments of all sizes.

Another object of the invention is to provide a fabric core upon which the garment is placed, which core serves to distribute the steam, hot air, or other fluid medium for conditioning a fabric, substantially uniformly throughout the interior of a garment.

A further object of the invention is to provide relatively large openings in the fabric core to discharge freely larger amounts of steam, hot air, or other fabric conditioning mediums, at predetermined portions of a garment, as, for instance, the shoulder and sleeve portions thereof.

A further object of the invention is to provide a plurality of arms depending from the waistline position of a garment, which arms move freely outwardly at their lower extremities to gently move the lower portion of a garment, as, for instance, the skirt portion of a dress, into a smooth distended position.

A still further object of my invention is to construct the aforesaid arms of tubular-shaped fabric material having the lower extremities closed and the upper extremities communicating with the interior of the fabric core, so that the fluid medium discharged into the core will flow into the tubular arms and move them outwardly at their lower extremities.

The advantages of these and other objects will become apparent as the following description is read in connection with the accompanying drawings, in which:

Figure 1 is a front elevational view of a garment finishing apparatus embodying the features of the present invention, and illustrated in distended condition;

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Figure 2 is a plan view of Figure 1;

Figure 3 is a partial side-elevational view of Figure 1;

Figure 4 is a partial sectional view of Figure 1 taken along the vertical center line to illustrate the construction of the fabric core 1 and 3, and the construction of the tubular arms 2;

Figure 5 is partial front elevational view of the apparatus shown in Figure 1, illustrating the fabric core and tubular arms in deflated condition, and on a somewhat smaller scale;

Figure 6 is a plan view of Figure 1 shown on an enlarged scale and with the fabric core removed to show the construction of interior parts;

Figure 7 is a side-elevational view of Figure 1 also shown on an enlarged scale and with the fabric core removed; and

Figure 8 is a schematic drawing illustrating a modified arrangement for the steam connections to the heater H and steamer S3.

In the drawings illustrating one embodiment of the invention, the arms 2, for moving the lower portion of garment into a smooth distended position, are shown as tubular fabric members secured to a fabric core at the waistline, and arranged for free movement at their lower extremities, so that sufficient fluid pressure within the core and arms will cause the arms to swing or move outwardly, as shown in Figures 1, 2, 3 and 4.

The particular embodiment illustrated in the drawings is for finishing ladies' dresses. However, lightweight coats, skirts and similar garments can be efficiently finished on the machine. For heavier coats, etc., slight modifications may be required, such as the construction of the blouse portion 1 of the core, and the relative location of the waistline, etc., but it is apparent that such modifications are clearly within the scope of this invention, and I do not desire to be limited to the specific constructions shown in the drawings other than by the scope of appended claims.

As may be determined from the objects set forth in the preamble of the specification, the apparatus is intended primarily to finish the entire garment, so that the garment is ready for wear, except for a few minor "touch-ups" that may be required on belts, frills or other cloth trimmings, which in effect, provide multiple cloth thicknesses that do not finish as rapidly as the single thickness portions of the garment, and, for this reason, may be finished more rapidly by "hand finishing" methods well known in the industry.

Heretofore, apparatuses employing a hollow dummy tautly covered with fabric have been used to finish a garment clothed thereon, by discharging steam and hot air outwardly through the fabric covering and the garment. However, such devices, in addition to being very expensive, are very limited as to the style, shape and size of garment that can be efficiently finished thereon.

Also, devices employing a collapsible cloth bag have been used, upon which a garment is clothed and forcibly distended by the pressure of a fluid medium expanding the cloth bag outwardly against the interior garment. While such a device is simple; yet it is very limited in its application to garment finishing, as the bag must have a large shape to distend large garments, and when thus used on small garments, the folds and wrinkles in the cloth bag mark the garment, and produce an undesirable finish. Also the bag has a tendency to "balloon out" the garment at the lower hem, and often provides an excessive pressure on light, delicate fabrics tending to injure them. Likewise, the "ballooning" of the bag at the hem of a skirt, for instance, causes the skirt to crawl upwardly, and wrinkle the garment at the waistline.

Thus, as adverted to at the outset, the present invention has for its primary object the provision of a garment finishing machine that will accommodate a large variation in style, shape, size and fabric texture, and effectively finish the garment, ready for wear, with a minimum of hand touch up.

With reference to Figures 1 to 5 of the drawings, the dress finishing machine employs a fabric core having a blouse portion 1 and a lower cylindrical portion 3. A plurality of tubular fabric arms 2 are secured to the core at the waistline 2A, which arms are arranged to respond to fluid pressure therein and move outwardly, to thus move outwardly the skirt portion of a dress clothed thereon into a smooth distended position.

A baffle 2B, preferably constructed of loosely woven cotton fabric, is placed within the fabric core, which baffle serves to limit or restrict the flow of steam and/or hot air into the blouse portion 1 of the core, and to direct a relatively greater flow of steam and/or hot air into the tubular fabric arms 2.

While the fabric baffle 2B may be constructed in several different ways to accomplish the aforesaid objects, it is preferable to construct the baffle as a fabric disc secured at its periphery to the fabric core structure substantially at the waistline 2A, and to provide the baffle with a centrally located aperture 2C through which the column 6 passes, and likewise the steam and/or hot air passes into the blouse portion of the core structure.

As shown in the drawings, the blouse portion 1 of the fabric core is shaped so that, when distended by fluid pressure therein, the blouse of a garment clothed thereon will distend freely away from the core in response to the pressure of the fluid medium discharging through the fabric core and tubular arms.

As shown in Figures 3 and 4, the blouse portion 1 of the core is provided with openings 1A through which fluid medium within the core is discharged freely into the shoulder and sleeve portions of the garment, so that the shoulder and sleeve portions of the garment are distended and conditioned by this relatively large flow of fluid medium through the openings 1A.

A ball shaped member 1B is secured to the

upper portion of the fabric core 1, and a heavy fabric flange 3A is secured to the lower extremity of the cylindrical fabric core 3, which flange is provided with a rim portion 3B that is secured to the upper portion of the chamber 4 by a draw string or its equivalent. In this respect it is to be understood that the fabric flange 3A may be replaced with a metal flange having the same general shape, so that the lower end of the cylindrical core 3 can be secured thereto by a draw string or its equivalent.

As illustrated in Figures 3, 4, 6 and 7, the fabric core is supported above the chamber 4 by a central column 6 having a connection 6A to which supporting rods 9 and 9A are secured. Thus in deflated condition, the blouse portion 1 of the core rests upon the supporting rods 9 and 9A.

The central column 6 is rigidly supported by rods 7, which rods have their upper ends secured to the column 6 at 7A, and their lower ends secured to the upper end of the inner chamber 5. As shown in Figures 6 and 7 the lower end of column 6 is secured to a crossbar 8 that is secured to the upper end of chamber 4.

The outer chamber 4 consists of a sheet metal pot having cylindrical vertical walls, a closed bottom and an open top. The inner chamber 5 consists of a sheet-metal, cylindrical wall secured to the bottom of chamber 4 to provide substantially an open pot within the larger outer chamber 4.

As shown in Figure 6, the cylindrical walls of the respective chambers are arranged substantially concentric to provide an annular chamber or passageway therebetween.

As shown in Figures 1, 2, 6 and 7, a motor driven blower or fan F1 is mounted to the rear of the chamber 4. This blower is preferably of the sirocco type having a scroll or fan housing F with the discharge thereof connected to the outer chamber 4 by means of a duct 4A, so that the air pressure of the fan F1 is blown into the annular chamber between the cylindrical walls of the inner and outer pots, and then upwardly into the fabric core secured to the outer pot or chamber 4. As shown in Figures 2, 6 and 7, the fan F1 is directly mounted upon the shaft of an electric motor M, which motor is mounted upon a base B carried by the fan housing F. In operation, the motor M is electrically connected to a suitable source of electrical power, and the motor circuit is provided with a suitable electrical switch, so that the operator can start and stop the motor M to apply and discontinue air pressure within the fabric core structure.

A steam heating coil H is placed over the intake opening of the fan housing F for heating the air driven by the fan F1 into the fabric core. As shown in Figure 7, the steam heating coil has one end connected to a steam supply line S, and the other end connected to a steam return line R, which return line is provided with a suitable steam trap.

As illustrated in Figures 6 and 7, a steamer S3 is mounted within the inner pot 5 for discharging steam into the interior of the fabric core 3, etc. The steamer S3 is connected to the steam supply line S by steam connections S1 and S2, which connections have a normally closed steam valve V included therein for controlling the flow of steam to the steamer S3.

A mechanical pedal P is connected to the valve V, so that the operator may open the valve V by stepping upon the pedal P. The valve is of the spring-return type and the spring serves to restore the valve to its closed condition. A

notched latch member L is placed adjacent the lever of pedal P, so that the pedal lever can be moved sidewise beneath the notch in the latch L by the operator to mechanically hold the valve V open. Thus, to close the valve, the operator merely shifts the pedal P sidewise from beneath the notch in the latch L and the valve spring restores the valve to its closed condition.

While not shown in the drawings, the steamer S3 can be covered with several layers of heavy felt, or its equivalent, to muffle the sound of the steam discharged from the steamer,

In Figure 8 a modified arrangement for the steam connections to the heater H and steamer S3 is diagrammatically illustrated. The steam supply line is indicated by the character S and the steam return line by R. The heater or steam heating coil H has one end connected to the steam supply line S and the other end connected to the steam return line R with a steam trap T interposed in the connection to the steam return line.

A steam separator S4 has its upper end connected to the steam supply line S and its lower end connected to the steam return line R with a steam trap T1 interposed in the connection to the steam return line. The construction of steam separators is well known to those skilled in the art and primarily consists of a chamber into which steam is delivered, so that water of condensation will gravitate to the bottom of the chamber and the dry steam will remain in the upper portion of the chamber.

The steamer S3 is connected to the upper portion of the steam separator S4 by steam connections S1 and S2, which connections have a normally closed steam valve V included therein for controlling the flow of dry steam to the steamer S3. In placing the steam separator S4 upon the machine, it is preferable to locate the same so that the connections S1 and S2 can be kept as short as possible to minimize condensation in the dry steam delivered to the steamer S3 from the separator S4.

In Figures 6, 7 and 8 like numerals and characters have been employed to identify similar parts, so that the relationship of the various steam connections will be readily apparent to those skilled in the art.

In Figures 1, 7 and 8, the floor upon which the machine rests is indicated by the numeral 10.

Normally, the electrical switch in the motor circuit is open and the valve V is closed. In this condition the motor M is at rest, and the fabric core and fabric arms are in the deflated condition illustrated in Figure 5.

The operator places a garment over the fabric core structure, and the garment hanger is placed to the rear of the fabric core and supported upon the ball-shaped member 1B.

The pedal P is then operated by the operator and moved into latching position beneath the notch in the latch L, so that steam is discharged into the interior of the fabric core.

The cloth from which the fabric core and fabric arms are constructed is permeable, so that the steam readily discharges outwardly through the fabric structure of the core and conditions the fabric of the garment. As described hereinbefore, openings 1A are provided in the blouse portion 1 of the fabric core so that a relatively free flow of steam is discharged therethrough for conditioning the shoulders and sleeves of the garment.

As well known in the industry, steam discharged upon the fabric of a garment makes the fabric

moist and limp, so that all wrinkles almost instantly disappear from the fabric of the garment.

During this steaming operation, the pressure and volume of steam is sufficient to inflate the fabric core structure, and the tubular arms and fabric core assume substantially the positions illustrated in Figures 1 to 4, so that the escaping steam, together with the arms, hold the garment in a smooth distended condition.

However, to dry, set and otherwise cure the fabric of the garment so that the wrinkles will not reappear, the motor switch is closed by the operator and a blast of hot air at a temperature of approximately 130° F. is forced into the interior of the fabric core, to supplement the flow of steam discharging thereinto.

The pressure and volume of the hot air is sufficient to inflate the fabric core and the fabric arms, so that the fabric arms almost instantly move outwardly, as illustrated in Figures 1 to 4, and gently move the skirt of the dress to a smooth distended position.

Since the fabric core structure is permeable, the hot air will discharge therethrough and thence outwardly through the fabric of the garment.

Likewise a free flow of hot air is discharged through the openings 1A in the fabric core 1 and the shoulders and sleeves of the garment are distended to a smooth condition. Also, the hot air discharged through the fabric core distends the blouse of the dress, so that it is freely moved away from the blouse portion 1 of the fabric core.

The operator then trips the pedal P to discontinue the flow of steam, but the motor M remains in operation to maintain the pressure of hot air within the fabric core and garment.

In the smooth distended condition of the garment, the hot air passing through the fabric thereof, sets and cures the fabric in a smooth condition, ready for wear, except for occasional touch ups that may be required in belts and fabric trims of the garment.

After a brief interval the electrical switch in the motor circuit is opened, and the motor M stops, thus removing air pressure within the garment and fabric core structure, and the fabric core structure instantly returns to the deflated condition illustrated in Figure 5, and the finished garment is easily removed by the operator.

While the fabric core structure may be made of most any type of woven material, it is preferable to use a smooth material such as celanese or nylon for the blouse portion 1 of the fabric core and the outer faces of the arms 2, so that a garment will freely slip over these respective fabric members in clothing and unclothing the machine. For the inner faces 2B of the arms, and the cylindrical core 3, it is preferable to use a relatively loosely woven cotton fabric.

It is also to be understood that the diameter of the cylindrical core 3 and the diameter of the arms 2 is such that they will inflate to their full distended shape, free of wrinkles, when clothed by a garment having a small or tight skirt. With this relation there is space between each arm, especially at the waistline, to allow hot air, steam, or other garment conditioning medium, escaping from the cylindrical core 3 to pass upwardly into the blouse of the garment for conditioning and finishing same.

There are, of course, other modifications and arrangements that will become apparent to those

skilled in the art as a result of this invention. Therefore, I do not desire to be limited to the precise embodiment illustrated and described herein, other than by the scope of the appended claims.

I claim:

1. Apparatus for finishing garments including a supporting member adapted to be clothed by a garment; a plurality of permeable depending arms spaced about the supporting member having their upper ends hingedly mounted upon the supporting member at substantially the waistline position of a garment clothed thereon, and their lower ends free so that the arms can swing outwardly against the lower portion of a garment and move the same into a smooth distended condition; and means for moving the arms outwardly against a garment clothed on the said supporting member.

2. Apparatus for finishing garments including a supporting member adapted to be clothed by a garment, a plurality of permeable inflatable tubular-shaped arms spaced about the supporting member having their lower ends closed and their upper ends secured to the supporting member at substantially the waistline position of a garment clothed thereon, so that the arms, when inflated, will swing angularly outwardly from the supporting member and move the lower portion of a garment clothed thereon into a smooth distended condition; and means for inflating the said arms.

3. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric core having a perimeter substantially less than that of a garment clothed thereon, and a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid therein; a plurality of depending arms spaced about the core having their upper ends hingedly mounted upon the apparatus at substantially the waistline position of a garment clothed on the core, and their lower ends free so that the arms can swing outwardly against the lower portion of a garment and move the same into a smooth distended condition; and means for moving the arms outwardly against a garment clothed on the said core.

4. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric-core having a perimeter substantially less than that of a garment clothed thereon, and a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid therein; a plurality of inflatable tubular-shaped arms spaced about the core having their lower ends closed and their upper ends secured to the core at substantially the waistline position of a garment clothed thereon, so that the arms, when inflated, will swing angularly outwardly from the core and move the lower portion of a garment clothed thereon into a smooth distended condition; and means for inflating the said arms.

5. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment and having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric-core having a perimeter substantially less than that of a garment clothed thereon, and a permeability sufficient to discharge the treating fluid into a garment while maintaining pressure of the fluid therein; and a plurality of inflatable tubular-shaped arms spaced about the core and positioned to engage the lower portion of a garment clothed thereon, the arms having their lower ends closed and their upper ends secured to and communicating with the interior of the core, so that the arms will inflate in response to the pressure of the fluid medium introduced into the core, and swing angularly outwardly from the core and move the lower portion of a garment clothed thereon into a smooth distended condition.

6. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment and having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid under pressure; said fabric-core having a perimeter substantially less than that of a garment clothed thereon, and a permeability sufficient to discharge the treating fluid into a garment while maintaining pressure of the fluid medium therein; a plurality of depending arms spaced about the core having their upper ends hingedly mounted upon the apparatus at substantially the waistline position of a garment clothed on the core, and their lower ends free so that the arms can swing outwardly against the lower portion of a garment and move the same into a smooth distended condition; and means operating in response to the pressure of the fluid introduced into the core, for moving the arms outwardly against a garment clothed thereon.

7. Apparatus for finishing garments including a supporting member adapted to be clothed by a garment; a plurality of depending arms spaced about the supporting member having their upper ends hingedly mounted upon the supporting member at substantially the waistline position of a garment clothed thereon, and their lower ends free so that the arms can swing outwardly against the lower portion of a garment and move the same into a smooth distended condition; means for introducing a fluid treating medium under pressure into the interior of the garment; and means operating in response to the pressure of the fluid medium, for moving the arms outwardly against a garment clothed on the said supporting member.

8. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric having a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid within the core; and a fabric baffle placed within the core to restrict the flow of the treating fluid into the upper portion of the fabric-core.

9. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment and having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric-core having a perimeter substantially less than that of a garment clothed thereon, and a permeability sufficient to discharge the treating fluid into a garment while maintaining pressure of the fluid therein; a plurality of inflatable tubular-shaped arms spaced

about the core having their lower ends closed and their upper ends secured to and communicating with the interior thereof, so that the arms will inflate in response to the pressure of the fluid introduced into the core, and swing angularly outwardly from the core and move the lower portion of a garment clothed thereon into a smooth distended condition; and a baffle mounted within the core above the connection of the arms thereto, to restrict the flow of the treating fluid into the upper portion of the core and to direct a relatively greater flow of the fluid into the tubular arms.

10. Apparatus for finishing garments including a tubular-shaped fabric core adapted to be clothed by a garment having the upper end substantially closed and the lower end open for the introduction of a garment treating fluid therein; said fabric having a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid within the core, a plurality of inflatable arms connected to the core; and a baffle placed within the core above the connection of the inflatable arms for restricting the flow of the treating fluid into the upper portion of the fabric core.

11. Apparatus for finishing garments including a supporting member adapted to be clothed by a garment; a plurality of depending arms spaced about the supporting member having their upper ends hingedly mounted upon the supporting member at substantially the waistline position of a garment clothed thereon and their lower ends free so that the arms can swing outwardly against the lower portion of a garment and move the same into a smooth distended condition; and a fabric baffle within the supporting member above the upper ends of the arms.

12. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment, the core having the lower end open for the introduction of a garment treating fluid therein, said core having a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid within the core, and said core having openings therein registering substantially with the shoulder and sleeve portions of a garment clothed thereon for discharging freely greater amounts of fluid upon the shoulder and sleeve portions of the garment, and a baffle for restricting the flow of treating fluid positioned intermediate the open lower end of the core and the openings for the shoulder and sleeve portions of a garment clothed on the core.

13. Apparatus for finishing garments including a tubular-shaped fabric-core adapted to be clothed by a garment, the core having the lower end open for the introduction of a garment treating fluid therein, a permeability sufficient to discharge the treating fluid into the garment while maintaining pressure of the fluid within the core, and openings registering substantially with the shoulder and sleeve portions of a garment clothed thereon for discharging freely greater amounts of fluid upon the shoulder and sleeve portions of the garment, a plurality of inflatable arms connected to the core below the sleeve openings therein, and a baffle for restricting the flow of treating fluid positioned between the sleeve openings through the core and the connection of the inflatable arms to the core.

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