May 26, 1942. J. H. RICHA 2,284,232

METHOD OF AND APPARATUS FOR FINISHING GARMENTS

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Fig. 1.

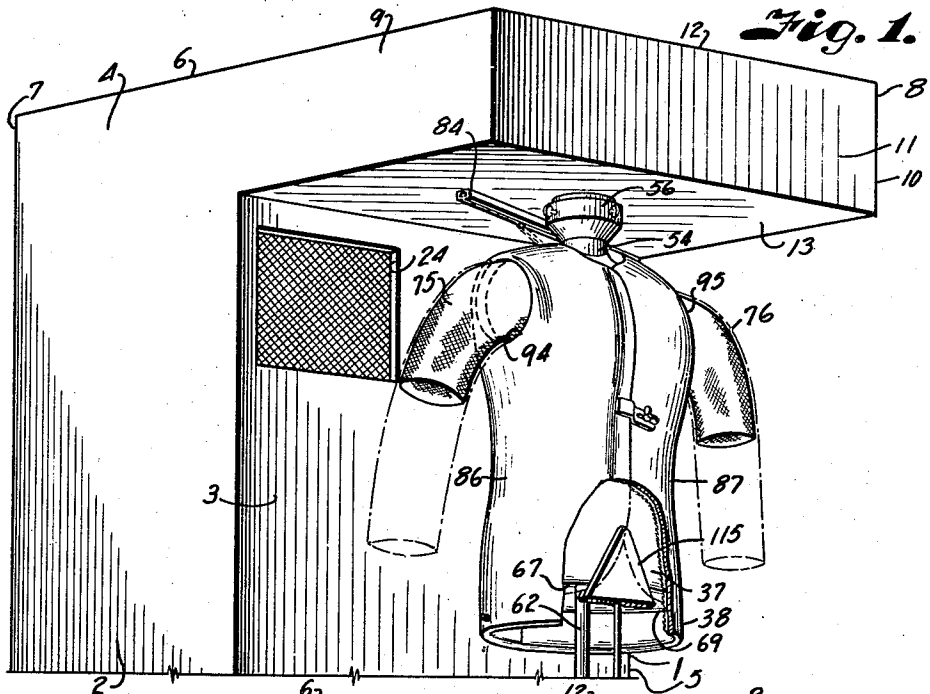
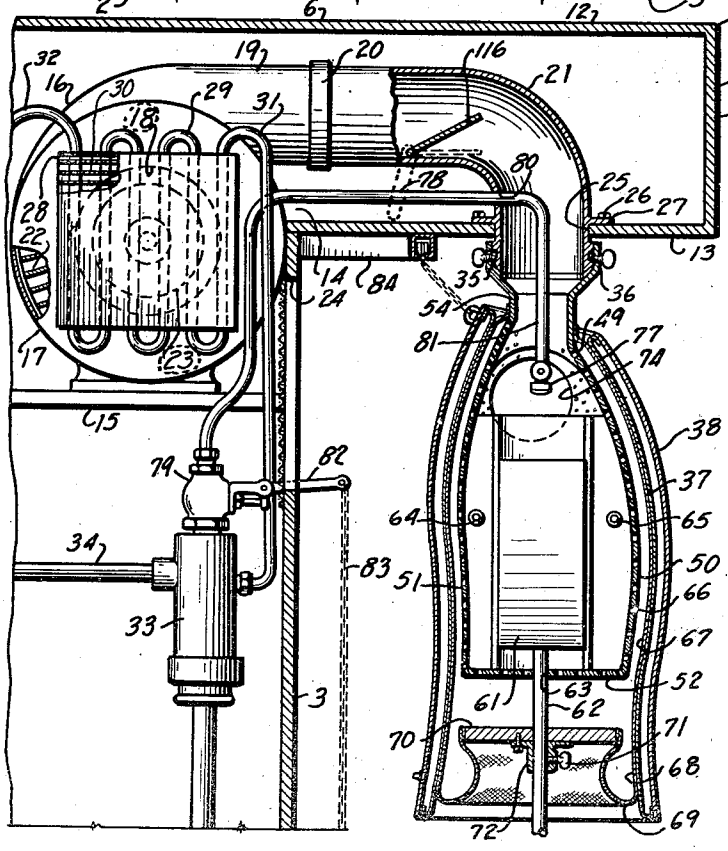


Fig. 2.



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Fig. 3.

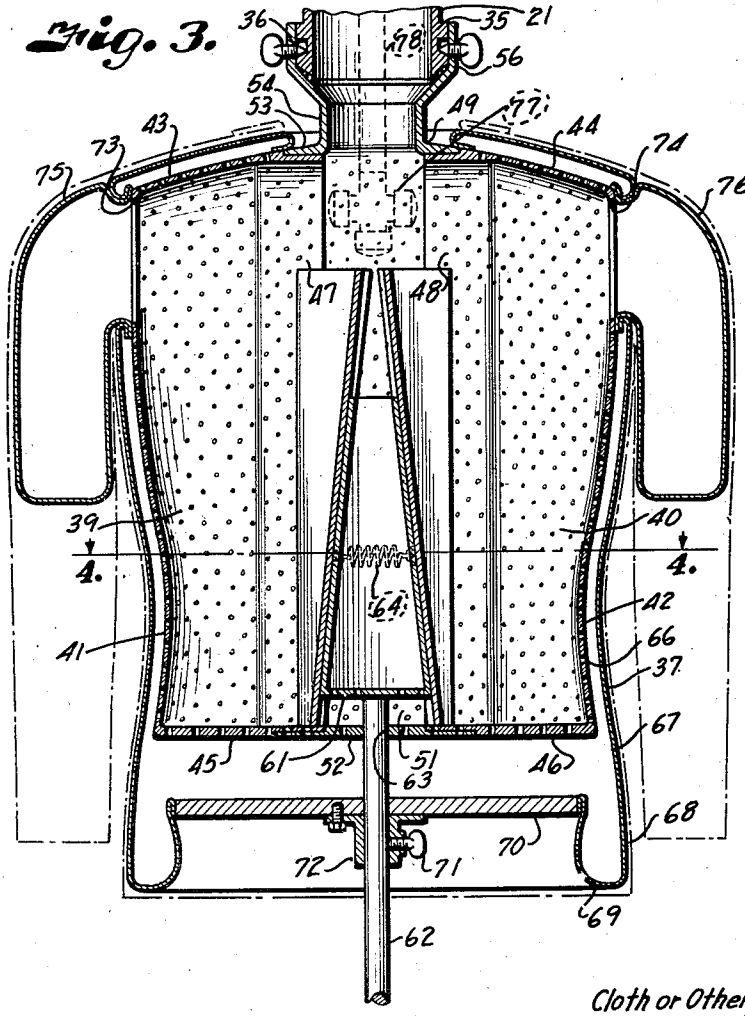


Fig. 4.

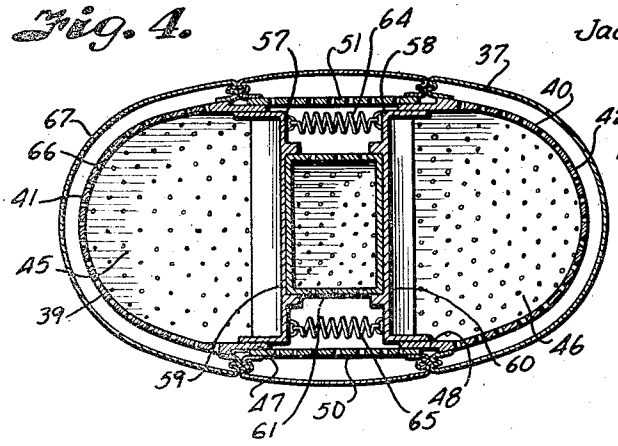
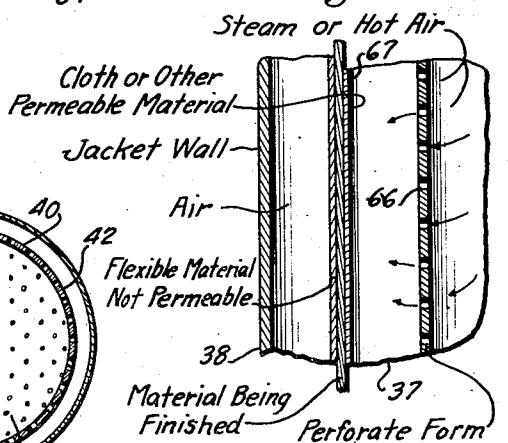


Fig. 5.



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Fig. 6.

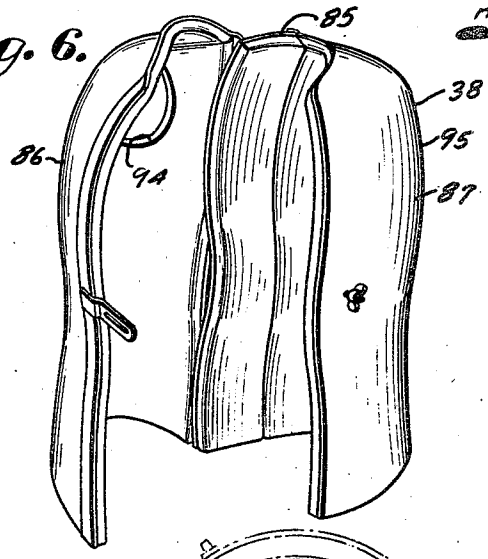
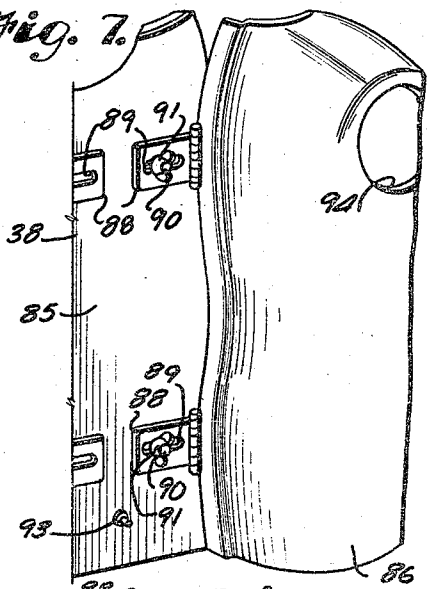


Fig. 7.



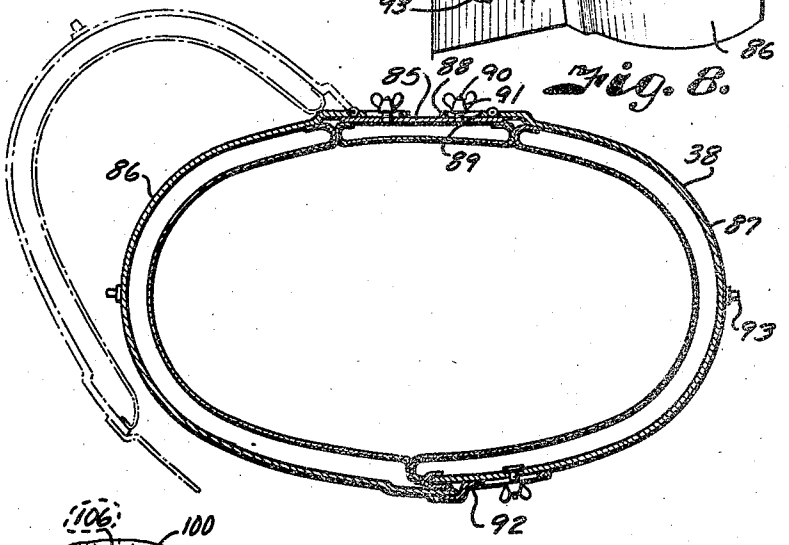


Fig. 8.

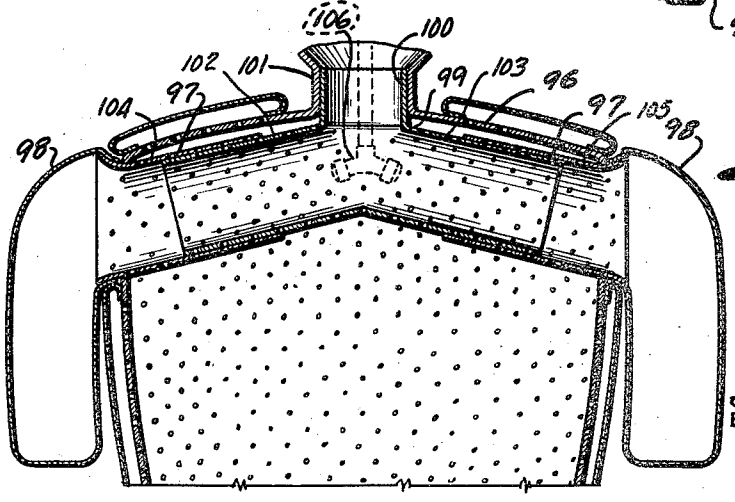


Fig. 9.

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Fig. 10.

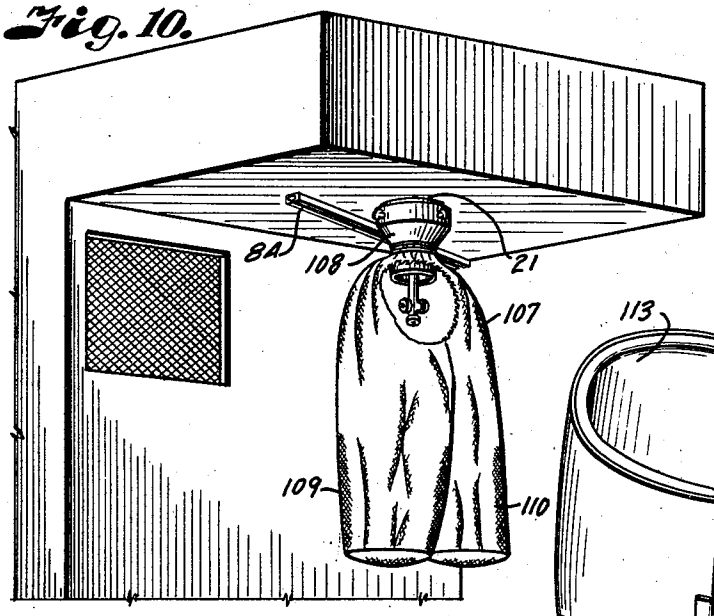


Fig. 11.

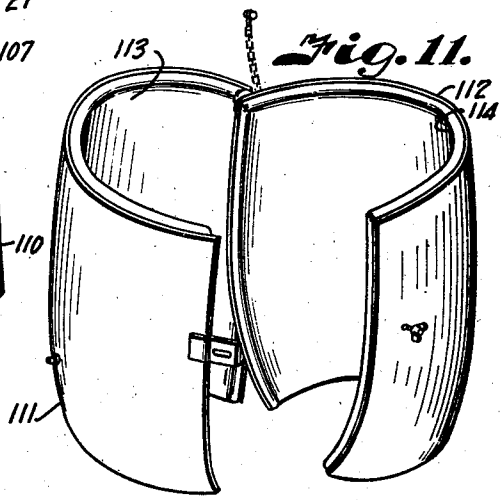


Fig. 12.

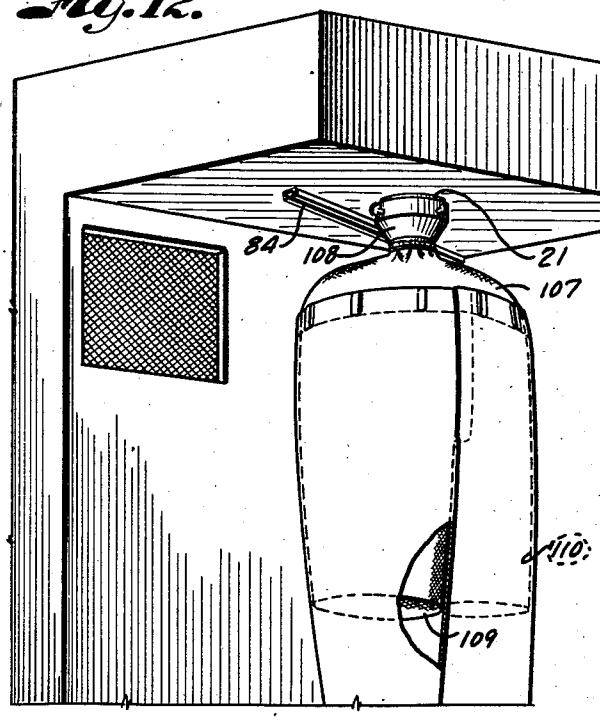
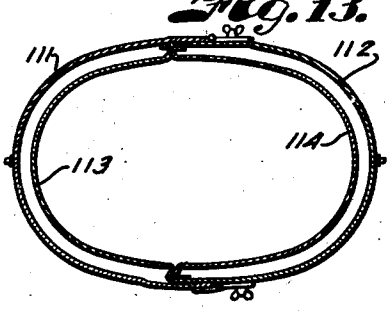


Fig. 13.



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UNITED STATES PATENT OFFICE

2,284,232

METHOD OF AND APPARATUS FOR FINISHING GARMENTS

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Application January 2, 1940, Serial No. 311,981

16 Claims. (Cl. 223—57)

This invention relates to a method of and apparatus for finishing fabric articles such as clothing and the like, and has for its principal object to provide for finishing such articles with a minimum number of lays. For example, it is the usual practice to finish coats, after they have been cleaned, on bucks of steam pressing machines, and many lays of the garment are required to complete the steaming and pressing operation. With the present invention a garment of this character may be completely finished in a single operation, and which results in better work for the reason that the garment is set and cured in its original shape and entirely free of draws, press marks, or overlaps.

Other objects of the invention are to provide a method of finishing garments wherein the nap of the fabric is raised incidental to the finishing process; and to provide an inflatable bag-like form on which the garment is applied and inflated to its original size and shape through the interior applications of steam and/or heated air.

A further object of the invention is to provide an exterior bag-like form arranged to cooperate with the interior bag for pressing the fabric of a garment therebetween.

It is also an object of the invention to provide mechanism to prevent belling of the edges of a garment incidental to inflation.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a garment finishing apparatus constructed in accordance with my invention, the particular apparatus illustrated being adapted for finishing coats and like garments, a part of which is broken away to show the clamp for retaining the lower front of a coat to prevent spreading thereof.

Fig. 2 is a vertical section through the apparatus.

Fig. 3 is a section through the inner form at right angles to the section shown in Fig. 2 with the outer form removed.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged diagrammatic view showing a portion of a garment engaged between the inflatable bag portions of the apparatus.

Fig. 6 is a detail perspective view of the outer inflatable form with the sections thereof in spaced condition.

Fig. 7 is a fragmentary view from the opposite side of the outer form, particularly illustrating the adjustable hinge connections of the sections.

Fig. 8 is a horizontal section through the outer inflatable form.

Fig. 9 is a vertical section through a modified form of the invention.

Fig. 10 is a perspective view of a finishing apparatus embodying the features of the present invention, especially designed for finishing the upper portion of a pair of trousers.

Fig. 11 is a perspective view of an outer inflatable form for the apparatus shown in Fig. 10.

Fig. 12 is a view similar to Fig. 10, showing a pair of trousers applied to the inflatable bag.

Fig. 13 is a horizontal section through the inflatable form illustrated in Fig. 11.

Referring more in detail to the drawings:

1 designates a finishing apparatus constructed in accordance with the present invention and with which I am able to practice my improved method of finishing fabric garments and similar articles.

The apparatus illustrated in Fig. 1 includes a cabinet-like housing 2, including a front wall 3, side walls 4 and 5, a top 6, and a rear wall 7. Projecting from the upper portion of the front wall 3, at the top thereof, is an extension 8, having sides 9 and 10 which may be formed as extensions of the side walls 4 and 5, a front 11, a top 12 coextensive with the top 6, and an under side 13 spaced below the top 12 to form an opening 14 above the wall 3.

The cabinet thus described forms a compartment for housing the working parts of the apparatus, and the extension provides a support for suspending the garment supporting appliances therefrom, as later described.

Supported in the body of the cabinet, at a point below the opening 14, is a bracket 15 mounting a blower 16, including a casing 17 having an air inlet 18 in a side thereof and a discharge outlet 19 terminating in a collar 20 to which an L-shaped duct 21 is connected. The blower also includes a rotor 22 that is operable in the casing by a motor 23, also supported on the bracket and having its armature connected with the rotor on the side of the casing opposite the air inlet opening 18 so that air is drawn into the cabinet through a screened opening 24 in the front wall, through the inlet opening of the blower casing, and discharged through the L-shaped duct 21. The duct 21 has its outlet end turned downwardly and extends through an

opening 25 provided in the under part 13 of the cabinet extension, the duct being secured in position by fastening devices 26 extending through a flange 27 thereon and connected with the part 13.

In order that the circulated air may be heated, the air inlet opening 18 is covered by a heating unit 28, including a steam coil 29 provided with fins 30 between which air is drawn through the opening 18, the steam coil having an inlet pipe 31 and an outlet pipe 32. The inlet pipe 31 is connected with a separator 33 that is preferably contained in the cabinet and is supplied with steam through a pipe 34 leading to a suitable source of supply.

The outlet of the conduit 21 projects below the cabinet extension and has an annular collar 35 provided with a circumferential groove 36. The garment supporting appliance consists of an inflatable form 37, which, in some instances, may be used in conjunction with an outer, inflatable form 38. The inflatable form 37 is swivelly suspended from the collar 35 and substantially conforms in shape to the article to be finished, for example a coat, as illustrated in Figs. 1 to 8 inclusive. The form 37 is preferably extensible and therefore includes a pair of adjustable sections 39 and 40 having side portions 41 and 42 conforming to the sides of a garment to be placed on the form and the upper portions of the sections terminate in shoulder portions 43 and 44. The lower ends of the sections are closed by plates 45 and 46. The facing sides of the sections are open and have side edges 47 and 48 arranged to telescope within a central section 49 comprising a substantially rectangular frame having front and back plate portions 50—51 forming connecting continuations of the sides 47 and 48, a bottom portion 52 corresponding to the bottom plates 45 and 46 of the side sections, and an upper portion 53 having a tubular neck 54 terminating in a flange 55 that is sleeved over the collar 35 and swivelly secured thereto by set-screws 56, the set-screws 56 being threaded in the flange and having their ends engaged in the annular groove 36 as clearly shown in Fig. 3. The side edges of the side sections are thus adapted to telescope within the central section to adjust the form for width, as now to be described.

Connecting the side edges 47 and 48 of the side sections are brackets 57 and 58 having upwardly converging web portions 59 and 60 between which is slidably mounted a hollow wedge member 61, the wedge member being moved vertically by a rod 62 slidable through a bearing opening 63 at the bottom portion 52 of the central section. The sections are interconnected by springs 64 and 65 which have their ends secured to the brackets 57 and 58. The walls forming the side and central sections of the form, including the walls of the wedge, are provided with a plurality of perforations 66 wherethrough air and steam discharged into the form are distributed to expand a bag 67 in which the form sections are encased. The bag 67 is flexible and may be formed of any suitable material and of sufficient fullness to be expanded against the inner facing of the coat. The bag is constructed of a material permeable to a fluid medium, such as the air discharged by the blower and/or steam, and the material is preferably a fabric woven with sufficient tightness to provide limited permeability for effecting ballooning or distention thereof and maintenance of a certain pressure therein when the steam and/or air is passed therethrough. The weaving, however, is sufficiently open to permit restricted discharge of the steam and/or air through the meshes thereof for treating and softening the fabric of the coat, or other garment as the case may be, while maintaining ballooning action of the steam and/or air to restore the coat to its original shape and effect cure of the fabric thereof.

The bottom portion of the bag extends below the perforated form, as at 68, and is looped inwardly, as at 69, to connect with a closure plate 70, the closure plate 70 being adjustably mounted on the rod 62 so as to vary the length of the bag in accordance with the length of the coat, the plate being adjusted so that the loop portion 69 terminates approximately at the edge of the coat as shown in Fig. 3. The plate is secured in adjusted position by a set-screw or similar fastening device 71 threaded in the sleeve 72 through which the rod 62 is passed. Fixed to the bag and preferably attached circumferentially of arm openings 73 and 74 are similar bags 75 and 76 substantially conforming in shape to the shoulder portion of the garment at the sleeves and which extend downwardly therein so that a portion of the air and/or steam is discharged therein to balloon the sleeves and shoulders thereof to their normal shape.

Steam is supplied to the interior of the form through a nozzle 77 that is connected with a pipe 78 extending from a control valve 79 that is fixed to the separator 33, upwardly through the cabinet, laterally into the extension, and through an opening 80 in the L-shaped duct 21 to terminate in a depending leg 81 carrying the nozzle 77. The valve 79 has an actuating lever 82 adapted to be operated by a flexible connection 83 with a foot pedal or the like (not shown).

When the outer form 38 is used, it is suspended from a track 84 that is attached to the under side 13 of the cabinet extension and to the rear of the inflatable form just described. The outer form 38 includes a back section 85 and side sections 86 and 87 that are adjustably hinged thereto to conform to the variable width of the inner form. The adjustable hinge connections include straps 88 fixed to the side sections and having slots 89 engaging fastening devices 90 anchored in the back section 85, the straps being adjustably clamped to the central section by wing nuts 91 as shown in Figs. 7 and 8. The side sections are curved to substantially conform to the sides of the garment and are secured at the front by a clasp 92 of any suitable design. The interior face of the side sections, as well as the back section 85, is provided with a flexible bag-like covering which may be a woven fabric and which, when inflated, cooperates with the inner bag to press the garment therebetween. A pressure medium such as air is admitted to the chambers of the outer section through connections as indicated at 93 (Fig. 8). When the outer form is used the sleeves of the garment are extended through shoulder openings 94 and 95 therein.

In the modification of the invention illustrated in Fig. 9 the form 96 is not extensible, however, the shoulder or arm portions 97 which carry sleeve expanding bags 98 are adjustable to vary the width of the shoulder portion of the garment. This is effected by providing a T-shaped fitting 99 having a branch 100 engageable in the neck portion 101 of the form and having laterally diverging branches 102 and 103 on which tubular extensions 104 and 105 are telescopingly mounted.

The tubular extensions in this instance carry the bags 98 which extend the sleeve and shoulder portions of the garment to their original form. The T-fitting and tubular extensions are perforated so that steam and air delivered through the nozzle 106 are passed through the perforations to the interior of the form.

In Figs. 10 to 12 inclusive is shown a flexible bag-like form for simultaneously finishing the waist, seat, and thigh portions of a pair of trousers or similar bifurcated garment. In this instance the outer form may be omitted and the bag 107 is attached directly to a fitting 108 that is swivelly suspended from the collar of the L-shaped duct 21. The bag includes leg portions 109 and 110 having closed ends and which are substantially larger in size than the largest garment to be finished. This bag is also constructed of fabric having limited permeability and is of the material described in connection with the bags of the other forms to maintain inflation thereof while passing air and/or steam through the meshes thereof to treat and cure the fabric of the trousers. In this modification of the invention an outer form may be used which includes a pair of sections 111 and 112 which generally conform to the exterior portion of the trousers and are provided with inflatable bags 113 and 114 similar to the outer form previously described. This form may also be movably suspended from the track 84.

In using an apparatus constructed in accordance with that illustrated in Figs. 1 to 5 inclusive, the coat is applied over the bag covering of the inner form, with the bag in collapsed condition, and the front lower corners of the coat are clamped together by a suitable clamp as indicated at 115, the arm bags 75 and 76 being extended through the armholes of the sleeves. The width of the form is extended to conform to the size of the coat by manipulation of the wedge 61. Steam is then admitted into the bag of the form upon opening the valve 79 so that the pressure inflates or balloons the bag and fills out all portions of the garment to their original shape. Simultaneously with inflation the steam permeates through the meshes of the bag and through the fabric of the garment, softening the fibers so that the garment is readily returned to its original shape by the ballooning effect of the bag. After shutting off the steam, heated air is admitted to the interior of the form upon openng of a valve 116 in the air duct and starting operation of the blower. The supply of air is continued to maintain the inflation or ballooning of the bag until the garment is dry and has cured in its original shape. If desired, the outer form may be applied over the garment as shown in Fig. 1, the sleeves of the garments and arm bags being extended through the shoulder openings of the outer form as shown. Air may then be admitted to inflate the bags of the outer form so that the pressure thereof acts against the outer surface of the coat in cooperation with the pressure of the inner bag on the inner surface of the coat. When the heated air is discharged through the bag, the suction of the inlet of the blower acting on the air in the cabinet draws the heated air through the screened opening 24 and this air is recirculated through the garment.

The form of the invention shown in Fig. 9 operates in the same manner as the preferred form except that the adjustment is made across the shoulder by manipulating the extension tubes carrying the arm bags.

To finish a pair of trousers on the form of the invention shown in Figs. 10 to 13 inclusive, the trousers are applied to the bag 107 while it is in collapsed condition, after which air and/or steam are admitted to inflate the bag within the trousers. Upon admission of steam the fabric of the trousers is softened so that they are returned to their original shape by the ballooning action of the bag. Air is discharged into and through the meshes of the bag to maintain distention and effect curing of the trousers while retained in their original shape. If desired, the outer form shown in Fig. 7 may be applied over the trousers to press the outer surfaces thereof upon inflation of the bags 113 and 114.

From the foregoing it is obvious that I have provided a simple and inexpensive method of finishing garments, and that the garments may be processed with minimum operations. It is also obvious that the inflated bags adjust themselves into all portions of the garment so that parts thereof are finished that cannot be reached or effected on ordinary pressing equipment.

What I claim and desire to secure by Letters Patent is:

1. The method of finishing a fabric garment including, clothing the garment upon an inflatable and permeable bag while the bag is in deflated condition, distending the garment to its normal shape by inflating the bag with a pressure medium, simultaneously subjecting the fabric of the garment to the inflating medium by permeation of the inflating medium through the bag into contact with the garment, and applying pressure to the exterior of the garment.

2. The method of finishing a fabric garment including, clothing the garment upon an inflatable and permeable bag while the bag is in deflated condition, distending the garment to its normal shape by inflating the bag with steam, simultaneously softening the fabric of the garment with steam permeating through the bag into contact with the garment, and pressing the exterior of the garment with an inflatable bag enveloping the garment and inflated thereagainst.

3. The method of finishing a fabric garment including, clothing the garment upon an inflatable and permeable bag while the bag is in deflated condition, distending the garment to its normal shape by inflating the bag, moistening the garment, maintaining distention of the moistened garment by the bag, pressing the exterior of the garment with an inflatable bag enveloping the garment and inflated thereagainst while the bag is distended on the permeable bag, and drying the garment between said bags by permeating the inflating medium through the permeable bag into contact with the garment.

4. The method of finishing a fabric garment including, clothing the garment upon an inflatable and permeable bag while the bag is in deflated condition, distending the garment to its normal shape by inflating the bag with steam, simultaneously softening the fabric of the garment with steam permeating through the bag into contact with the garment, pressing the exterior of the garment with an inflatable bag enveloping the garment and inflated thereagainst, suspending flow of the steam, maintaining distention of the garment within said enveloping bag by introduction of hot air into the first mentioned bag, and drying the garment while maintained between said bags by permeating the hot

inflating air through the permeable bag into contact with the garment.

5. The method of finishing a fabric garment including, clothing the garment upon an inflatable and permeable bag while the bag is in deflated condition, enveloping the garment with an outer inflatable bag, distending the garment to its normal shape by inflating the bags, simultaneously softening the fabric of the garment with steam permeating through the walls of one of the bags into contact with the garment, suspending flow of the steam, maintaining distention of the garment between said bags by introduction of hot air into the bag to which the steam was admitted, and drying the garment while maintained between said bags by permeating the hot inflating air through said bag into contact with the garment.

6. Apparatus for finishing garments of the character described including, a support, a fluid medium inlet connection depending on the support, a flexible bag adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, means suspending the bag from said connection, and means for introducing the fluid medium into the bag through said inlet connection for ballooning the bag to the expanded shape of the garment, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment simultaneously with expansion of the garment.

7. Apparatus for finishing garments of the character described including, a perforated form, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, and means for introducing the fluid medium into the form for discharge into the bag through said perforations for ballooning the bag about the form to the expanded shape of the garment, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment simultaneously with expansion of the garment.

8. Apparatus for finishing garments of the character described including, a support having a depending fluid medium inlet connection, a perforated form suspended from said inlet connection, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, and means for introducing the fluid medium into the form through said inlet connection for discharge into the bag through said perforations for ballooning the bag about the form to the expanded shape of the garment, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment simultaneously with expansion of the garment.

9. Apparatus for finishing garments of the character described including, a flexible bag adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, means for introducing the fluid medium into the bag for ballooning the bag to the expanded shape of the garment, an outer flexible and inflatable bag adapted to envelop the garment, and means for admitting an inflating medium into the outer bag, one of said bags having a permeable portion for discharging the inflating medium through the garment for conditioning the fabric of the garment while maintaining expansion of the garment.

10. Apparatus for finishing garments of the character described including, a flexible bag adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, means for introducing the fluid medium into the bag for ballooning the bag to the expanded shape of the garment, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment simultaneously with expansion of the garment, an outer inflatable bag adapted to envelop the garment while contained on said permeable bag, and means connected with the outer bag for introducing a pressure medium into said outer bag.

11. Apparatus for finishing garments of the character described including, a perforated form, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, means for introducing the fluid medium into the form for discharge into the bag through said perforations for ballooning the bag about the form to the expanded shape of the garment, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment simultaneously with expansion of the garment, an outer form adapted to close over the extended garment while clothed on said bag, a flexible bag lining the outer form and adapted to be distended against the garment by pressure of a fluid medium, and means for introducing a pressure medium into the bag lining the outer form.

12. Apparatus for finishing garments of the character described including, a perforated inner form, a flexible bag loosely enveloping the inner form and adapted to be distended to the natural shape of a garment clothed thereon, an outer form, and a flexible bag loosely lining the outer form and adapted to be distended against the garment by a fluid pressure medium, one of said bags having a permeable portion for discharging the fluid medium through the garment for conditioning the fabric of the garment simultaneously with pressing of the garment between said bags.

13. Apparatus for finishing garments of the character described including, an inner form comprising a pair of perforated sections arranged to be adjusted to and from each other, a flexible and permeable bag loosely enveloping the inner form and adapted to be distended to the natural shape of a garment clothed thereon, an outer form comprising a pair of sections, adjustable hinge means connecting the sections to adjust said sections to close over the inner form, flexible bags loosely lining the sections of the outer form and adapted to be distended against the garment by a fluid pressure medium, and means for discharging fluid medium into the bags to press the garment between said bags and condition the fabric of the garment by the fluid medium discharged through the permeable bag.

14. An apparatus for finishing garments of the character described including, a form, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, shoulder sections having movable support on the form, sleeve expanding bags carried on the shoul-

der sections and cooperating with portions of the bag to distend the shoulder portions of the garment, and means for introducing the fluid medium into the bag and into the sleeve expanding bags, said first named bag having a permeable portion for discharging the fluid medium into the garment clothed thereon and for conditioning the fabric of the garment simultaneously with distention of the garment.

15. An apparatus for finishing garments of the character described including, a form, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, shoulder sections having movable support on the form, sleeve expanding bags carried on the shoulder sections and cooperating with portions of the bag to distend the shoulder portions of the garment, and means for introducing the fluid medium into the bag and into the sleeve expanding bags, said bags having permeable portions for discharging the fluid medium into the garment clothed thereon and for conditioning the fabric of the garment simultaneously with distention of the garment.

16. Apparatus for finishing garments of the character described including, a form having the general shape o a torso, a flexible bag loosely enveloping the form and adapted to be distendable within a garment clothed thereon in response to pressure of a fluid medium, said bag having a permeable body portion for discharging the fluid medium through the garment clothed thereon for conditioning the fabric of the garment, means for introducing a fluid inflating and conditioning medium into the bag, and means exterior of the bag for engaging the outer surface of the garment to control expansion of the garment responsive to inflation of the bag.

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