April 3, 1956 W. C. GLOVER, JR 2,740,566

SHIRT FINISHING MACHINE

Filed April 2, 1951 3 Sheets-Sheet 1

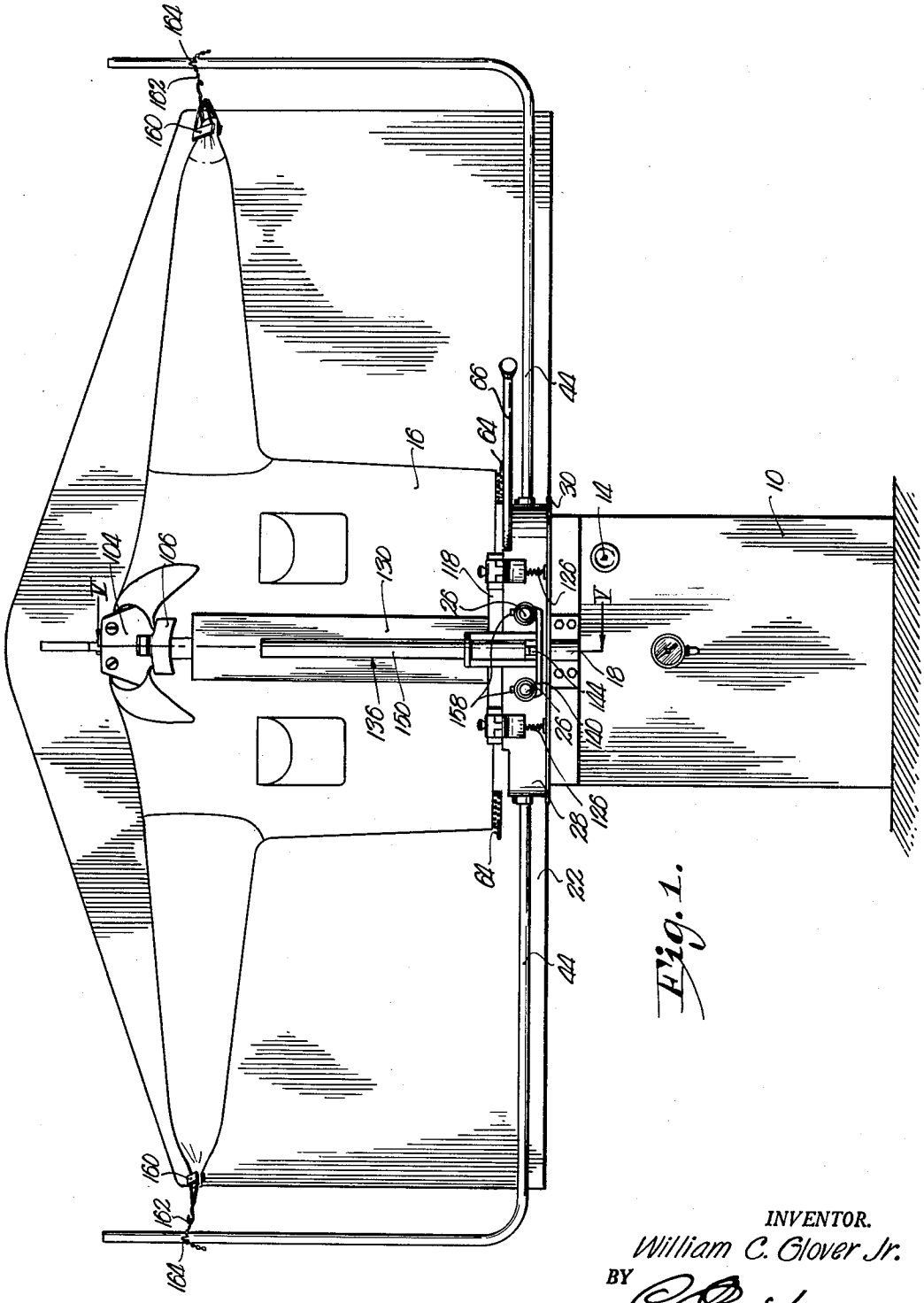


Fig. 1.

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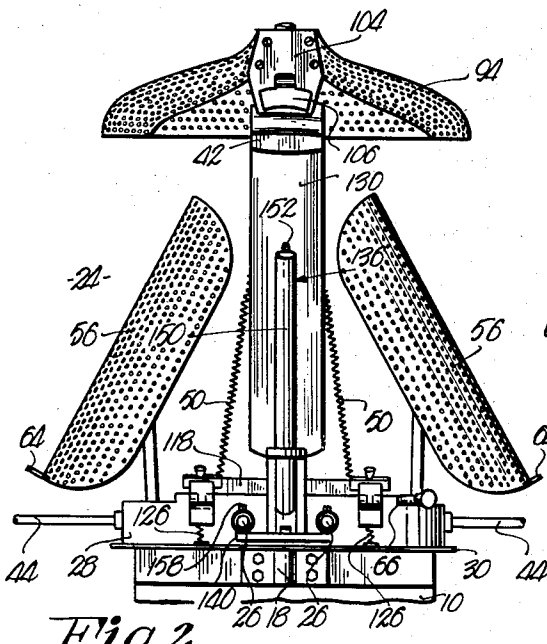


Fig. 2.

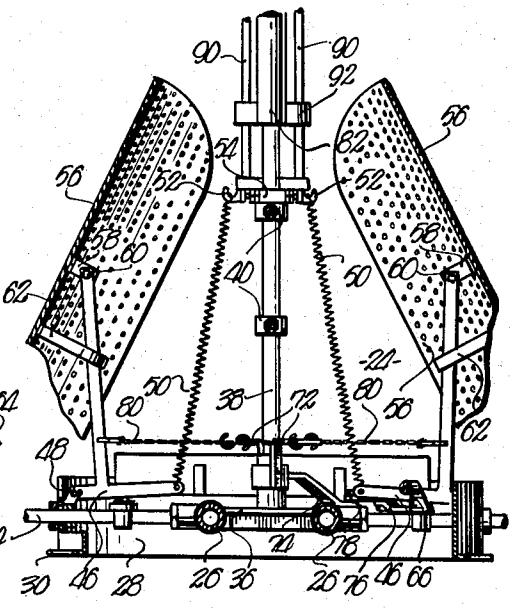


Fig. 4.

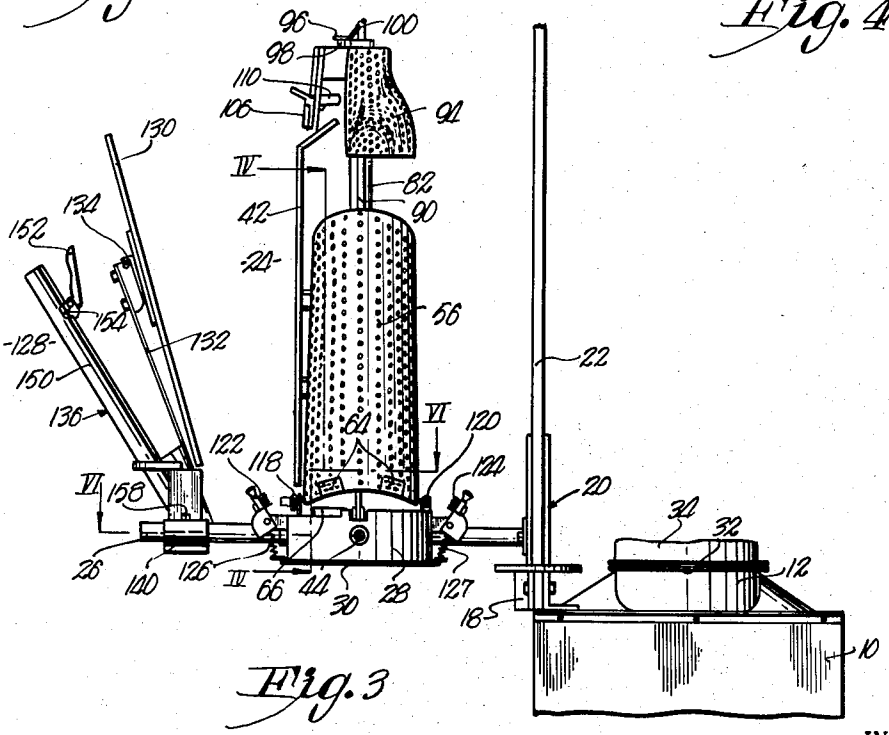


Fig. 3

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SHIRT FINISHING MACHINE

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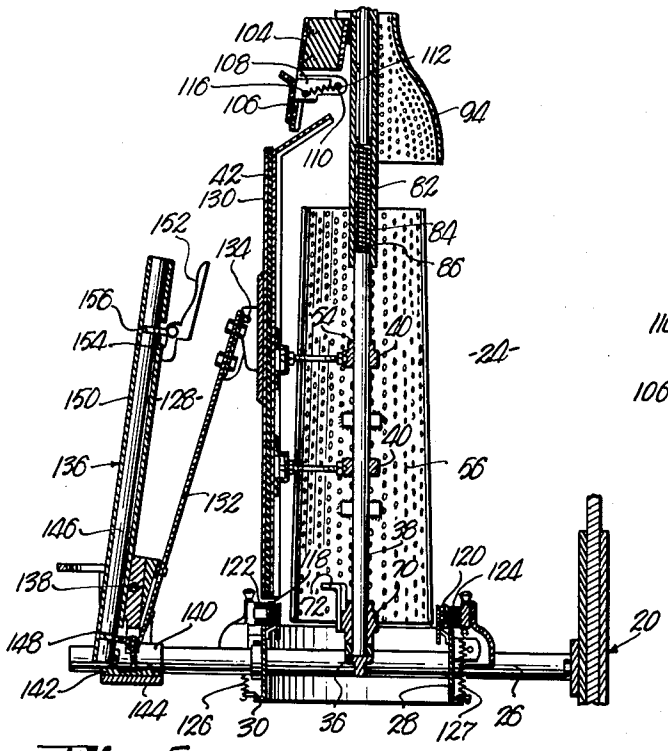


Fig. 5.

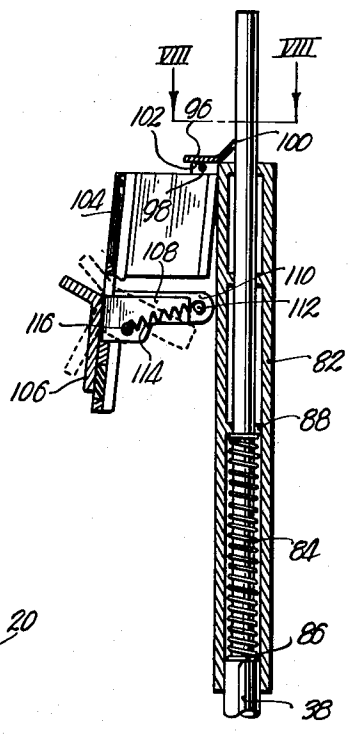


Fig. 7.

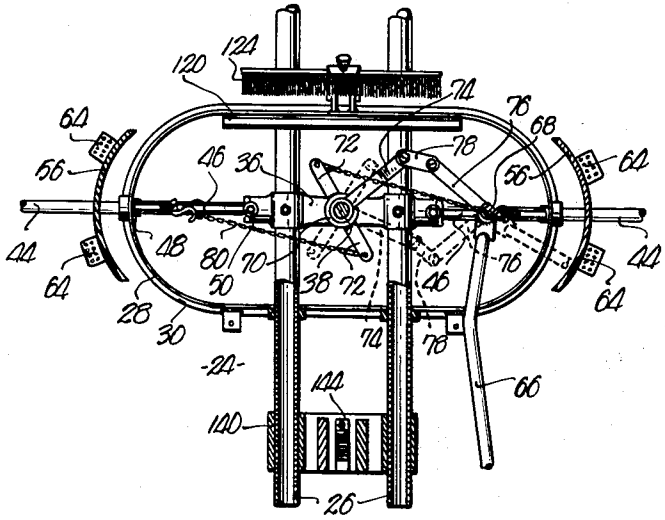


Fig. 6.

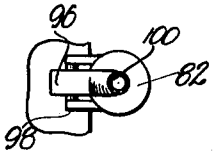


Fig. 8.

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2,740,566

SHIRT FINISHING MACHINE

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Application April 2, 1951, Serial No. 218,848

5 Claims. (Cl. 223—70)

This invention relates to the cleaning and renovation of garments and has for its primary object the provision of improvements in an expansible support or carrier for the garment to be treated.

A harassing problem is presented to launderers and dry cleaning establishments in the handling of sport shirts because of the relatively large number of differing materials used and the widely different nature of the garments themselves in regard to shape, size and configuration.

It is accordingly the most important object of the present invention to provide a finishing machine for articles of wear of this character that is universally adaptable for receiving virtually all types, sizes and shapes of sport shirts and to reduce the time normally consumed in finishing the same after laundering or cleaning.

It is an important object of the present invention to provide a garment carrier that is adapted to be rotated with the garment mounted thereon to and from a position for receiving a hot fluid blast, the carrier itself being provided with expansible structure that is shiftable to and from a position engaging the shirt and thereby holding and forming the same during the time the garment is disposed to receive the aforesaid fluid blast.

Another object of the present invention is to provide a garment carrier that includes opposed forming and holding elements for the garment, each of which is individually mounted for free swinging movement to an operative position by virtue of engagement with the garment itself.

Another object of the present invention is the provision of a garment carrier that includes means for holding the garment taut in two directions, one of the assemblies including a standard having a garment hanger thereon that is reciprocable on the standard and cooperable with clamping devices which, in the case of shirts, are adapted to grip the shirttail and hold the same in place.

Another aim of this invention is to provide a garment finishing machine having novel clamping structure engageable with the shirt along the buttons and buttonholes and including a manually shiftable lever provided with a resilient bar for receiving the clamping means thereof.

Many additional objects include the way in which the transverse forming and molding means is actuated through a toggle joint; the manner of yieldably holding the latter at one end of its path of travel; the way in which the garment hanger is yieldably held at one end of its path of travel; the way in which the exterior clamp is rendered adjustable with respect to stationary structure; and many other more minor objects, all of which will be made clear as the following specification progresses.

In the drawing:

Figure 1 is a front elevational view of a shirt finishing machine made pursuant to the present invention and showing a shirt operably mounted thereon.

Fig. 2 is a fragmentary, front elevational view showing the machine in an inoperative condition.

Fig. 3 is a fragmentary, end elevational view.

Fig. 4 is a cross-sectional view taken on irregular line IV—IV of Fig. 3.

Fig. 5 is a fragmentary, vertical, cross-sectional view taken on line V—V of Fig. 1, with the shirt removed.

Fig. 6 is a cross-sectional view taken on irregular line VI—VI of Fig. 3.

Fig. 7 is an enlarged, fragmentary, detailed, sectional view similar to Fig. 5; and

Fig. 8 is a detailed, cross-sectional view taken on line VIII—VIII of Fig. 7.

In Figure 1 of the drawings, there is illustrated a box-like housing **10**, within which is a heating coil (not shown) supplied with steam or other heating fluid from any conventional source. A screened aperture (not shown) is provided in one side of the housing **10** and a fan (not shown) associated with the heating coil, is adapted to draw air through the screened inlet. Such air is placed through an elliptical outlet that is formed in the uppermost end of a throat **12** in the top of housing **10**.

The operation of the fan is controlled by an electric switch **14** and the blast of air is projected upwardly through a garment such as a shirt illustrated in Fig. 1 and designated by the numeral **16**. The housing **10** is provided with a bearing **18** along one side of the throat **12** that supports a frame, broadly designated by the numeral **20** for rotation on a substantially vertical axis.

Frame **20** includes an upright center partition or panel **22** and a pair of expansible garment carriers, one only of which is illustrated in the drawings and designated broadly by the numeral **24**. Each garment carrier **24** has a pair of spaced, horizontal supporting rods **26** forming a part of the frame work **20** that in turn rigidly support intermediate their ends, an elliptical throat **28** having a continuous out-turned flange **30** that is shaped complementally with a similar flange **32** on throat **12** and circumscribing the outlet opening thereof.

It is to be understood that a carrier **24** is provided on each side respectively of the partition panel **22** and in Fig. 3 of the drawings, a throat **34** only of one of such carriers **24** is illustrated, which throat **34** corresponds to throat **28**. The two carriers **24** are identical and one only need be described. The two rods **26** thereof additionally support a bracket **35** within the throat **28** adapted to receive and support an elongated vertical standard **38** upon which is mounted a number of laterally projecting holding means **40** for a relatively narrow, foraminous, rigid strip **42** in spaced parallelism to the standard **38**.

A pair of L-shaped rods **44** project outwardly in opposite directions from the throat member **28** to which they are secured and additionally held in place by the bracket **36** in substantially perpendicular relationship to the upstanding strip. Each rod **44** respectively pivotally carries a T-shaped bar **46** for swinging movement on a substantially horizontal axis as at **48**. Bars **46** are yieldably held at one end of their swinging path of travel away from each other by a spring **50** connected thereto and to a hook **52** on a bracket **54** secured to the standard **38** intermediate the ends thereof. Each bar **46** respectively carries a combination shaping and holding member **56** that is foraminous throughout and arcuate in transverse cross-section as indicated in Fig. 6 of the drawings. Each member **56** is provided with a lug **58** on its innermost convex face that is pivotally secured as at **60** on the uppermost end of bar **46**, it being seen that the pivotal axes **48** and **60** are all substantially parallel.

The innermost convex face of the members 56 is also provided with a U-shaped guide 62 that is looped over the corresponding bar 46 below the lug 58. A pair of outwardly projecting tabs 64 is provided on each member 56 respectively at the lowermost edge thereof.

Swinging movement is imparted to the bars 46 simultaneously against the action of the springs 50 through the medium of a manually operable handle 66 that is pivotally secured as at 68 to one of the rods 44 within the confines of throat 28.

A sleeve 70 rotatably mounted on standard 38 is provided with a pair of oppositely extending radial fingers 72 and with a third finger 74, the latter of which is operably connected with handle 66 by toggle linkage which includes a bar 76 on handle 66 and swingable therewith, together with a short link 78 that pivotally interconnects bar 76 and finger 74. The bars 46 are connected with a respective finger 72 by a short chain or other coupling 80.

An elongated tube 82 is reciprocably carried by the standard 38 adjacent the uppermost end of the latter and a spring 84 coiled about the standard 38 within the tube 82 holds the latter biased upwardly by virtue of the fact that one end of spring 84 bears against a shoulder 86 on standard 38 and the other end of spring 84 rests against an in-turned annular flange 88 within tube 82. Spaced-apart guide rods 90 carried by the standard 38 above and below the tube 82, serve to stabilize the latter by virtue of bearings 92 on the tube 82 for each rod 90 respectively. The tube 82 carries a foraminous hanger 94 having the shape of the neck and shoulders of shirt 16 and being rigidly secured to the tube 82 in any suitable manner. A latch 96 is pivotally secured to the tube 82 as at 98 for swinging movement to and from a position where its relatively sharp, arcuate edge 100 engages the standard 38 and thereby holds the tube 82 against upward movement under influence of spring 84.

A small spring 102 is provided for the latch 96 to hold the same biased against the standard 38. Tube 82 also carries a plate 104 that is provided with a T-shaped clamp 106 for shirt 16. Clamp 106 has a pair of spaced-apart projections 108 that extend through the plate 104 between a pair of spaced brackets 110 that are in turn interconnected at the innermost ends thereof by pin 112. Each projection 108 respectively is pivotally secured to its proximal bracket 110 by a pintle not shown for swinging movement in the manner indicated by dotted lines in Fig. 7 of the drawings. Over-center spring means connects pin 112 with a second pin 116 joining the extensions 108.

The tail of shirt 16 is held clamped adjacent the throat 28 by means of a pair of opposed, elongated plates 118 and 120 of soft, pliable material and mounted on the throat 28 at the uppermost edge thereof, and cooperating bristled heads 122 and 124 respectively. There is provided a pair of the heads 122 each pivotally mounted for swinging movement toward and away from plate 118 and having an over-center spring 126. Likewise, the single head 124 is pivotally mounted for swinging movement toward and away from its plate 120 and has an over-center spring 127. The bristles forming a part of the heads 122 and 124 are relatively stiff, yet of such nature as to have no deleterious effect upon the tail of shirt 16.

An external clamping assembly, broadly designated by the numeral 128, is provided for the shirt 16 and includes an elongated plate 130 that is transversely curved to conform to the curvature of strip 42 and provided with pliable material on its innermost face. In an operative position, plate 130 is in parallelism vertically with the strip 42 and held in such condition clamped against the shirt 16, which in turn bears against the strip 42 by an elongated, resilient member 132 that is pivotally connected to the plate 130 as at 134 and rigidly secured at its lowermost end to a lever 136. The lever 136 has pivotal connection by means of a cross pin 138 connecting with a bracket 140. A rack 142 is formed on the bracket 140 for receiving a swingable L-shaped trigger or latch 144. A portion of latch 144 partially circumscribes a reciprocable rod 146 within an annular groove 148 of the latter, rod 146 being carried by a tube 150 forming a part of the lever 136.

A swingable handle 152 on the tube 150 is provided with a bifurcated extension 154 that rides in an annular groove 156 in rod 146. The entire unit 128 is shiftable toward and away from the strip 42 on the rods 26 to which bracket 140 is secured by virtue of setscrews 158 that are carried by the bracket 140 and releasably engage the rods 26. Prior to placing of garment 16 on one of the carriers 24, the lever 136 is operated to swing the plate 130 away from strip 42 in the manner shown in Fig. 3 of the drawings. The handle 66 is swung to one end of its path of travel as shown in full lines in Fig. 6 to move the bars 46 toward each other as indicated in Figs. 2 and 3. And, the hanger 94 is moved downwardly toward the lowermost end of its path of travel against the action of spring 84, it being noted that latch 96 need not be manipulated for this purpose. Shirt 16 is thereupon placed upon the hanger 94 and the front panels brought together adjacent the collar to receive the clamping means 106.

It is to be noted that the clamp 106 can be merely flipped in place by the action of spring 114 and when in the position shown by full lines in Fig. 7, the clamp 106 will hold the shirt 16 tightly against the plate 104.

The shirt 16 is limited in its downward positioning by the tabs 64 and as shown in Figs. 2 and 4, the members 56 assume the inclined position illustrated by the action of gravity. The operator thereupon flips the bristled heads 122 and 124 in place to clamp the tail of shirt 16 in place against the plates 118 and 120. The operator then releases the latch 96, and the hanger 94 automatically moves upwardly under the influence of spring 84 to place the shirt 16 in a taut condition vertically. Lever 136 is thereupon pushed toward the shirt 16 until the plate 130 comes into engagement therewith along the buttons and buttonholes of shirt 16 to clamp the latter tightly against foraminous strip 42. Continued pushing action on the lever 136 will provide a yielding grip of plate 130 on the shirt 16 by virtue of the resilient member 132 and swinging movement of lever 136 on pin 138 is prevented by the latch 144 engaging one of the teeth of rack 142, there being a spring, not shown, for holding the trigger 144 biased toward the rack 142.

The next operation on the part of the operator is to swing the handle 66 from the full-line position of Fig. 6 to the dotted line position shown in this figure. Such action swings the fingers 72 and by virtue of the couplings 80, moves the bars 46 away from each other on their pivotal axes 48 by action of springs 50. As soon as the members 56 come into engagement with the sides of the shirt 16, they will assume a substantially vertical position and thereby yieldably maintain the shirt 16 taut in a horizontal direction. The operator may thereupon swing the entire framework 20 within bearing 18 to a position where the shirt 16 is disposed directly above the outlet opening in throat 12. The hot blast of air emanating from housing 10 will thereupon "balloon" the shirt 16 and the same will be dried in a short period of time. It is preferable that the collar, cuffs and buttonhole facing of the shirt be left in a slightly damp condition to facilitate final finishing of the shirt.

Normally, the blast of air will cause the sleeves of the shirt 16 to extend outwardly in a horizontal condition, but if desired, such sleeves may be held in the position illustrated in Fig. 1 of the drawings by means of releasable clamps 160, each having a chain 162 thereon that is secured to a corresponding rod 44 at a selected length by means of a hook 164 on the latter. By virtue of the partition panel 22, it is possible for an operator to position shirt 16 on one of the assemblies 24 when another shirt is being dried above housing 10. Continuous rotational movement of the framework 20 permits such drying, mounting and removing of shirt 16 by a single

operator, rendering the entire operation rapid and efficient. Releasing of the shirt **16** is rapid in that by grasping handle **152** and moving the same toward the tube **150**, rod **146** is shifted downwardly to release trigger **144** with respect to rack **142**. The entire unit **128** may thereupon be swung away from the shirt **16**. The clamping means **122, 124** and **106** may be quickly released by a flipping action and the members **56** will assume the position shown in Figs. 2 and 4 by merely swinging the handle **66** to the full-line position shown in Fig. 6 of the drawings.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In an expansible garment carrier, a pair of spaced, elongated bars pivotally mounted at one end of the bars for swinging movement toward and away from each other; a garment-shaping and holding member for each bar respectively, each member being secured solely to its bar at the opposite end of the latter for swinging movement on an axis substantially parallel with the swinging axes of the bars; and structure including oscillatory means between the bars and operably connected thereto for swinging the same in one direction, yieldable means joined with the bars for holding the same biased in the opposite direction, a manually shiftable element, and a toggle joint interconnecting said element and said means for locking the bars at one end of their paths of travel.

2. In an expansible shirt carrier, an upright standard; a hanger assembly reciprocable on the longitudinal axis of the standard near the upper end thereof; resilient means on the standard and engaging the assembly for yieldably biasing the same upwardly toward said upper end of the standard; manually releasable lock means on the assembly for holding the latter against upward movement; clamping means on the carrier adjacent the lower end of the standard and cooperable with said assembly for holding a shirt on the assembly longitudinally taut as the assembly is moved on the standard by said resilient means upon release of said lock means; structure on the carrier and disposed within the shirt when the same is on the assembly, said structure including a pair of opposed forming members movable to and from a position holding the shirt transversely taut; and manually manipulable mechanism coupled with said structure for moving the members to said position.

3. In an expansible garment carrier as set forth in claim 2, wherein is provided a rigid strip mounted on the carrier within the shirt, an opposed plate exteriorly of the shirt for holding the latter closed along the front opening thereof, and manually releasable means connected with the plate for clamping the plate against the strip with the portion of the shirt therebetween.

4. In an expansible shirt carrier, an upright standard; a hanger assembly reciprocable on the longitudinal axis of the standard; resilient means on the standard and engaging the assembly for yieldably biasing the same upwardly on the standard; manually releasable lock means on the assembly and engageable with the standard for holding the assembly against upward movement; and clamping means on the carrier adjacent the lower end of the standard and engageable with the shirt for holding the same as the lock means is released and the assembly moved upwardly on the standard by said resilient means to tension the shirt longitudinally.

5. In a shirt finishing machine, a pair of substantially upright, elongated forming members adapted to receive a shirt in telescoping relationship to the body of the shirt; and means on the machine for shifting the members away from each other to hold the shirt body transversely taut, said means including a support for each member respectively, the supports being between the members and being pivotally mounted for swinging movement in a common plane toward and away from each other, each member being secured solely to its support for swinging movement therewith and relative thereto, whereby the members conform to the shape of the shirt body when the supports are swung away from each other to move the members tightly against the sides of said shirt body.

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