Nov. 21, 1939. J. H. LEEF 2,180,938

METHOD OF AND APPARATUS FOR PRESSING TUBULAR GARMENT ELEMENTS

Filed Sept. 7, 1937 3 Sheets-Sheet 1

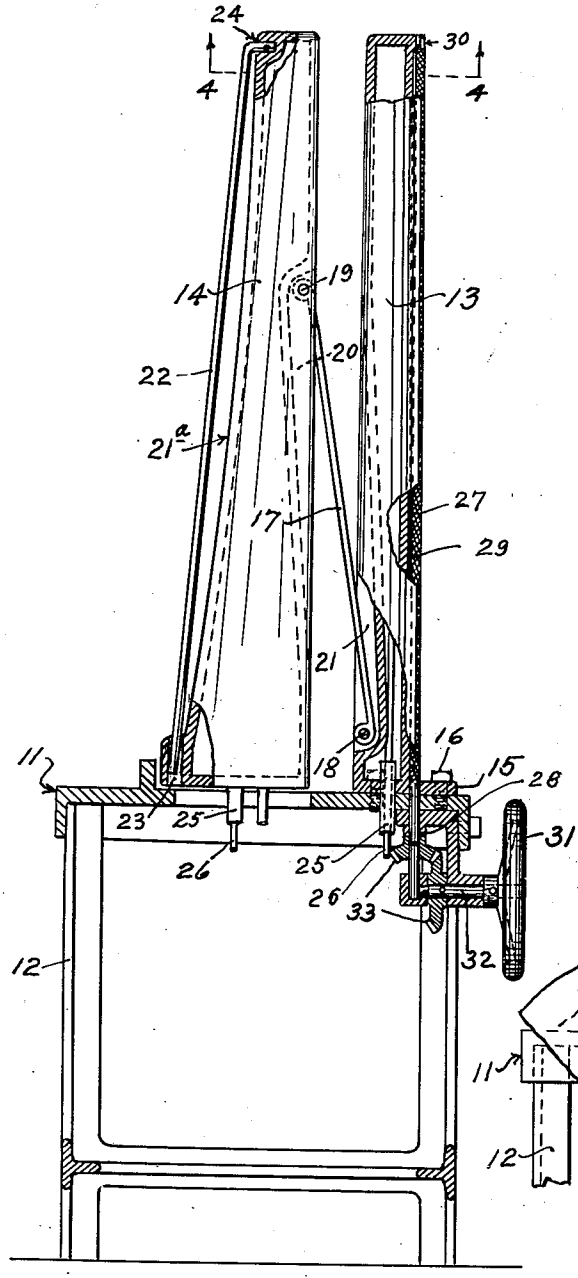


Fig. 1

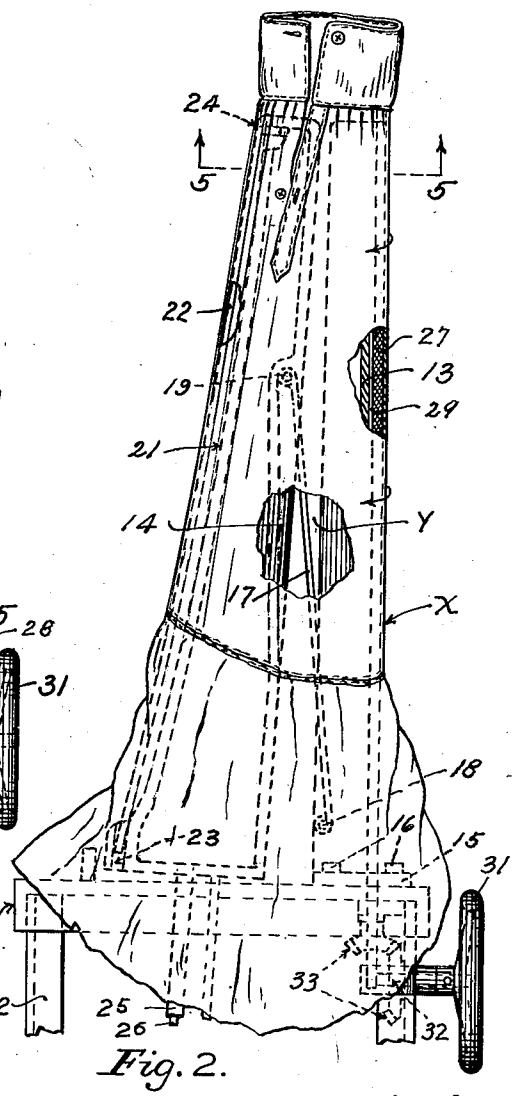


Fig. 2.

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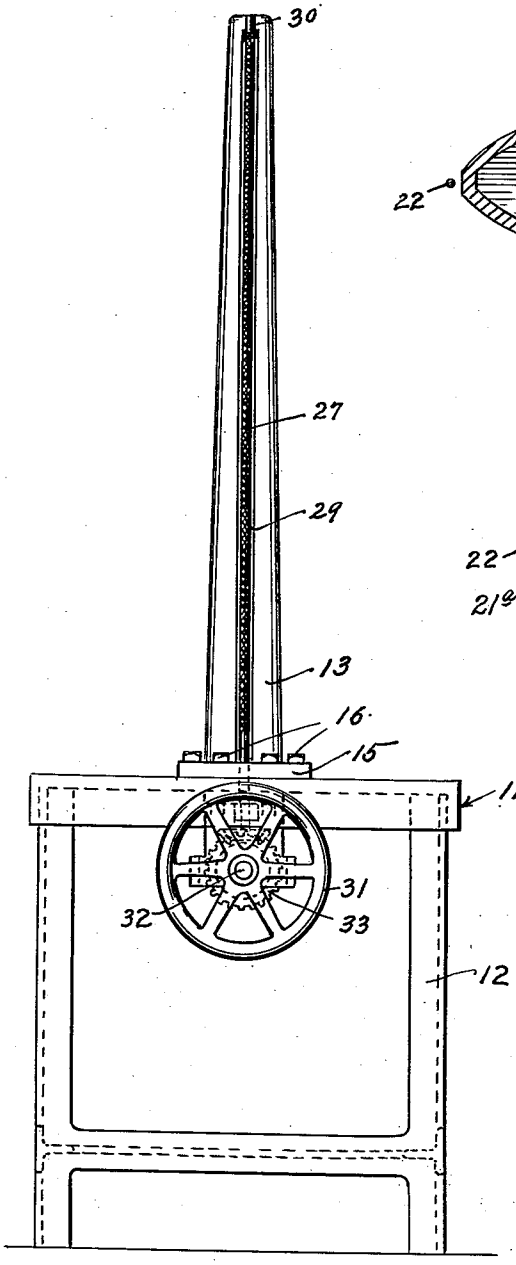


Fig. 3.

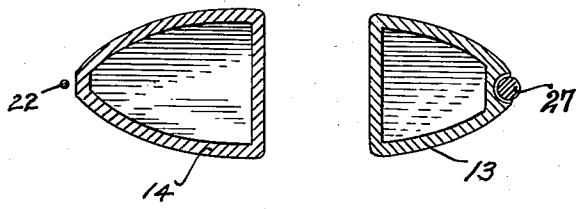


Fig. 4.

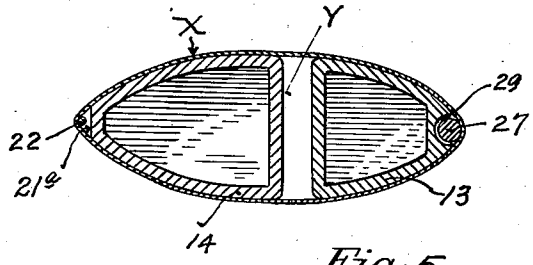


Fig. 5.

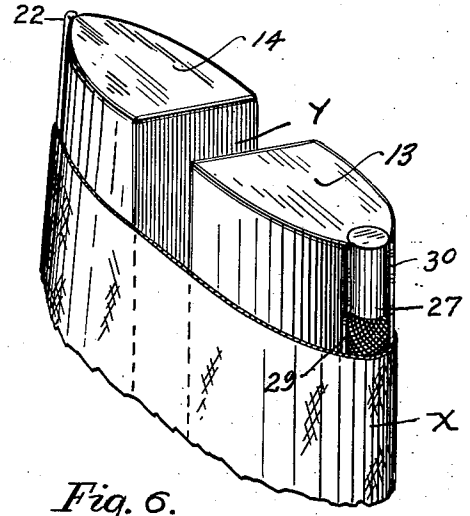


Fig. 6.

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METHOD OF AND APPARATUS FOR PRESSING TUBULAR GARMENT ELEMENTS

Filed Sept. 7, 1937 3 Sheets-Sheet 3

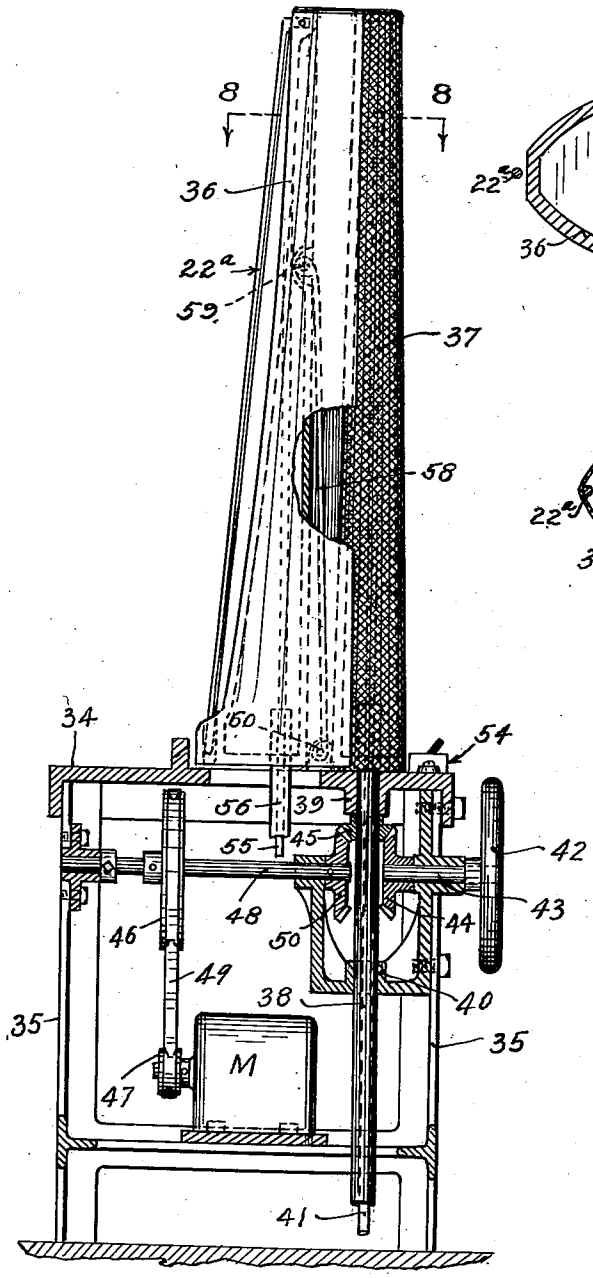


Fig. 7.

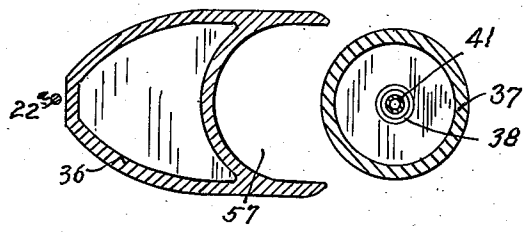


Fig. 8

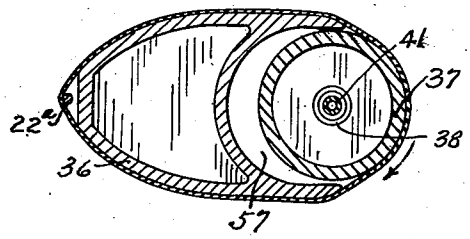


Fig. 9.

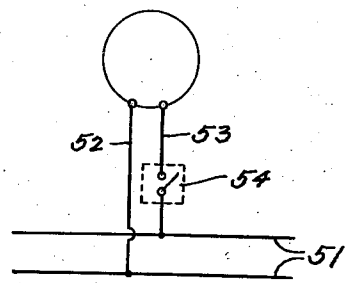


Fig. 10.

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Patented Nov. 21, 1939 2,180,938

UNITED STATES PATENT OFFICE

2,180,938

METHOD OF AND APPARATUS FOR PRESSING TUBULAR GARMENT ELEMENTS

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Application September 7, 1937, Serial No. 162,585

16 Claims. (Cl. 223—73)

Generally stated, my present invention relates to improved methods of and improved apparatus for pressing or ironing of tubular garment elements such, for example, as garment arms and legs.

More specifically stated, this invention relates to improved methods of pressing garment sleeves, legs, and the like through the medium of a pressing form or forms inserted into the sleeve, leg, or the like; and the invention further relates to improvements in pressing machines of the type incorporating pressing forms for insertion into garment sleeves, legs, and the like, said improved machines having as an object the provision of improved features for use in conveniently carrying out my improved methods.

In a still more specific sense, this invention relates to methods of obtaining greatly superior results through the use of garment sleeve or leg pressing machines of the type employing a plurality of elongated laterally spaced elements for insertion into a garment sleeve or leg and also relates to improvements in machines of this general type and which, type, is represented by the structures of prior art Patents Nos. 1,937,656 and 2,022,210, the former of which was issued jointly to myself and George H. Leef on December 5, 1933, and the latter of which was issued jointly to myself and George H. Leef on November 26, 1935. This general type of pressing machine is also represented in my pending application S. N. 141,465 filed by myself on May 8, 1937.

The garment sleeve or leg pressing machines of the prior art patents and application above identified, incorporate a plurality of elongated laterally separated form sections which, after insertion into a garment sleeve or leg, are separated laterally to an extent necessary to stretch the garment sleeve or leg smoothly over the forming surfaces thereof. The accepted method of using these machines, and other prior art devices of this type has consisted in the following steps, to wit: (*a*) insertion of a dampened garment sleeve or leg over the cooperating heated form sections; (*b*) separating or permitting separation of the cooperating form sections to stretch the tubular sleeve or leg smooth; (*c*) permitting the telescopically applied garment sleeve or leg to remain in smooth surface engagement with the forming surfaces of the said forming sections until thoroughly dried, and then removing the telescopically applied garment sleeve or leg.

While the machines of my prior art patents and application used in accordance with the above described methods, have met with considerable favor among the trade, particularly for use in connection with the pressing of overalls, working shirts, and the like, they have often been objected to even for this purpose on the grounds that the longitudinally extended portions of the garment sleeve or leg, which span the space between the separated form sections, dried so slowly as to retard the pressing process, and when ultimately dried, it would not be pressed out smoothly as compared to those surfaces thereof, which had been dried against heated form surfaces. In fact, prior to this invention, machines of this character have not been considered capable of turning out a grade of work that was acceptable in connection with dress shirts wherein a high standard of pressing is demanded.

After long periods of experimentation toward the solving of this problem, I found that the above noted objection could be entirely overcome and the quality of work turned out on such machines could be raised to a very high standard by adding to the previously accepted method of pressing on such machines the following steps, to wit: after those portions of the telescopically applied garment sleeve or leg that were in direct surface contact with a form section or sections, are dried and set, rotating the tubular garment sleeve or leg sufficiently to bring those portions thereof, which were not previously in direct surface engagement with the form or forms, and which are still in a dampened condition, into direct surface engagement with the form or forms. This added step in the process raises the quality of work to a high standard and can be carried out without losing the benefit of longitudinally extended crease lines usually pressed into the garment sleeve or leg during the primary pressing operation.

The above defined improved methods have been successfully practiced in connection with the machines of the above identified prior art patents and application, by rotating the garment sleeve or leg after the primary engaged portions had become dried, by direct engagement of the garment element with the hands of the operator, but the carrying out of the process or method in this manner is slow and causes considerable discomfort to the operator since the engaged surfaces are essentially hot, and therefore, to facilitate the carrying out of this method, the invention also provides novel mechanism for imparting the desired rotary movement to the garment sleeve, leg, or the like.

The above and other important improved objects and advantages of the invention will be

made apparent in the following specification, claims, and drawings.

In the accompanying drawings, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view partly in side elevation, partly in section, and with some parts broken away, of one form of pressing machine incorporating the invention;

Fig. 2 is a fragmentary view similar to Fig. 1 but showing a garment sleeve applied thereto;

Fig. 3 is a view looking from right toward the left with respect to Fig. 1;

Fig. 4 is an enlarged transverse sectional view taken on the line 4—4 of Fig. 1, and looking upwardly;

Fig. 5 is a sectional view similar to Fig. 4 but taken on the line 5—5 of Fig. 2;

Fig. 6 is an enlarged fragmentary perspective view of the upper end portions of the form sections or boots of Figs. 1 to 3, inclusive;

Fig. 7 is a view similar to Fig. 1, but illustrating a modified form of the invention;

Fig. 8 is a transverse sectional view taken on the line 8—8 of Fig. 7;

Fig. 9 is a view similar to Fig. 8 but showing the parts in a different position, and with a tubular garment element applied thereover; and

Fig. 10 is a diagrammatic view showing the hook-up of the motor and switch of Fig. 7.

With reference first to Figs. 1 to 6, inclusive, wherein the invention is shown as applied to a garment sleeve pressing machine incorporating cooperating pressing boots or forms of the kind disclosed in connection with the prior art patents and my prior art application before identified, numeral 11 indicates a supporting base or table top that is mounted on a suitable leg structure 12. Mounted on the supporting base 11 is a cooperating pair of pressing forms or boots 13 and 14. The boot 13 is rigidly anchored to the supporting base 11 through the medium of an integrally formed flange 15 and bolts or the like 16, and therefore, constitutes what will hereinafter be referred to as a fixed boot or form section. The boot or form section 14 is connected to and supported from the lower portion of the fixed form section 13 by means of a link 17 that is pivotally anchored at its lower portion to the fixed form section at 18, and at its upper is pivotally anchored at 19 to the intermediate portion of the form section or boot 14. The boot 14 is movable on the link 17 toward and from its cooperating form section 13, and is capable of pivotal movement thereon with respect to the section 13. The cooperating form sections of boots 13 and 14 thus mounted, one with respect to the other, will automatically adapt themselves to relative positions necessary to accommodate different sizes and shapes of garment sleeves, and since it is desired to permit the section 13 and section 14 to be brought into face to face contact when necessary, the opposite interfacings thereof are preferably provided with recesses 20 and 21 for reception of the link 17.

Due to the outward diverging angles assumed by the link 17 with respect to a vertical line, the movable form section 14 will, under the action of gravity, tend to move away from its respective cooperating form section 13 on the arc of a circle struck from the point of pivotal connection 18 of the link 17, and if such tendency is uninterrupted, the movable form section 14 will normally come to rest against the upper surfaces of the support 11.

Preferably and as illustrated, the form section 14 is concave from top to bottom at its outermost portion, indicated by 21*a*, and this concave portion is spanned by a resilient shaped variation compensating and crease forming rod 22. The lower end of this resilient rod 22 is loosely and axially slidably seated in a socket 23 in the base portion of the form section 14, and the upper end of said resilient rod is rigidly anchored in the upper extreme portion of the form section 14 at 24. Also, as illustrated and preferably, the form section 14 is considerably wider at its bottom than at its top, and is more or less V shaped in cross-section. The apex portion of the V is substantially in line with the forming rod 22. The form sections or boots 13 and 14 are in the nature of hollow metallic shells that are adapted to be heated by suitable means such as the injection of steam into the interior chamber thereof, and for this purpose, I have illustrated concentric steam inlet and outlet conduits 25 and 26.

The parts of the machine thus far described are substantially the same as in the devices of my prior art patents previously identified, and in the devices of my pending application also previously identified.

The preferred manner of applying the instant invention to machines of the kind described, consists in extending a rotatable rod 27 in parallel relation to the extreme outer longitudinally extended portion of the rigid or fixed form section 13. This rotatable rod 27 extends through the support base 11 and is journaled therein, and in a bearing 28 and is partially received in a channel 29 formed in the outermost portion of the fixed form section 13. At its upper extreme portion the rod 27 seats in an approximately half round bearing surface 30 formed in the form section 13. The intermediate portion of the rotatable rod 27, is preferably knurled or otherwise roughened, and this intermediate portion is preferably maintained separated from the walls of the channel 29 so that friction will occur only at the bearing surfaces near opposite ends thereof. Any suitable means for rotating the rotatable rod may be provided, but for this purpose, I have illustrated a hand wheel 31 that is mounted on a journaled shaft 32 which in turn is operatively connected to the lower end portion of the rod 27 through the medium of a pair of bevelled gears 33.

Operation of and preferred method of using the machine of Figs 1 to 6, inclusive

In accordance with the preferred method of using the machine described, a dampened garment sleeve will first be telescopically applied over the cooperating form sections 13 and 14 shoulder portion down, and the longitudinal seam aligned with the resilient forming rod 22 (see Figs. 2 and 5). The form sections 13 and 14 will, of course, be heated to a suitable temperature for this operation. Under the strain of telescopically applying the sleeve indicated by *x* in Figs. 2 and 5, the form section 14 will move toward the rigid or fixed form section 13 and move pivotally in respect thereto, so as to adapt the unit to the shape of the applied sleeve, but there will, however, usually be a considerable space between the sections 13 and 14 as will be seen at *y* in Figs. 2 and 5, since the form section 14 is subject to action of gravity, to move out-

wardly, the applied sleeve x will be stretched taut and smoothly over the pressing surfaces of the heated form sections 13 and 14 and should the sleeve be cut so that it is concave at its seam portion, this concave shape will be compensated for by the resilient rod 22. When those portions of the dampened sleeve that are initially in surface engagement with the form sections 13 and 14 are completely dried, those portions of the sleeve that span the space y between the laterally spaced form sections 13 and 14 will be damp and not well pressed as compared to those portions that have been in direct surface contact with the heated sections. At this point, the sleeve x will be rotated sufficiently to bring those portions thereof that have previously spanned the space between the sections 13 and 14 into direct surface contact with said forming sections, and when these latter portions have thoroughly dried against the heated surfaces, the sleeves may be removed. This rotating of the sleeve can readily be accomplished by rotating the rod 27 through the medium of the hand wheel 31. At this point it may be well to state that a telescopically applied tubular garment element, such as the sleeve, will tend to stick to the surfaces of the form sections 13 and 14 so long as it is moist or wet, but as soon as the engaged surfaces thereof are dried, the tubular garment element may be moved over the form surfaces with very little effort. Preferably, the applied sleeve will be rotated in this manner just sufficiently to bring the still unpressed and damp portion thereof into surface engagement with the form sections, and preferably these previously damp portions should not be brought into engagement with the forming rod 22. One of the important functions of the resilient rod 22 is to form in the sleeve, preferably adjacent or at its seam, a longitudinally extended crease line which will give the appearance of flat pressing and will aid in the folding of the shirt sleeve. Hence, the resilient rod 22 is preferably of as small a diameter as possibly consistent with the obtaining of the required tension. The rod 22, is very closely associated with, and at its end actually engages the heated form section 13. The engaging portion of the garment sleeve will be very rapidly dried during the initial pressing period and when dried will have formed therein by the rod 22, a longitudinally extended crease line which will be retained after the seam portion of the sleeve is rotated away from the rod and into engagement with a flatter surface of the heated form. It is also well to note that the portion of the sleeve engaged with the creasing rod 22 during the secondary pressing operation will not have a crease formed therein due to the sharp edge formed by the rod 22 because it will be thoroughly dried before having been brought into engagement with said rod.

Description of Figs. 7 to 10, inclusive

In these figures a supporting surface in the nature of a table top is indicated by 34 and a leg structure by 35. Extending from and mounted on the supporting surfaces 34 is a cooperating pair of pressing forms 36 and 37. The form section 37 in this instance, is in the nature of a cross-sectionally round longitudinally tapered tube that is closed at its top and bottom to afford a steam chamber therein. Extending axially through the closed bottom of the form section 37 is a steam distributor conduit 38 that serves also as a journaled shaft for said form 37. This combined conduit and journaled shaft 38 is journaled in a bearing 39 formed in the supporting table top 34 and also journaled in a bearing 40. Extending axially through the conduit acting hollow shaft 38 into the upper portion of the tapered tubular form 37, is a small steam inlet conduit 41. This steam inlet conduit 41 has an outside diameter considerably less than the internal diameter of the hollow shaft 38 so that steam and condensation may be discharged from the chamber of the form 37 between the inner walls of the hollow journaled shaft 38, and the outside of said inlet conduit 41. The steam inlet conduit 41 may be assumed to be connected to a suitable source of steam such as a boiler and the like, and the larger diameter tubular shaft 38, which serves as a discharge conduit, may be connected to discharge at any desired point remote from the pressing machine.

The tubular form 37 may be rotated manually through the medium of a hand wheel 42 that is mounted fast on one end of the journaled shaft 43, a bevelled gear 44 fast on the other end of the shaft 43, and a cooperating bevelled gear 45 fast on the tubular conduit acting shaft 38. If desired, the rotary tubular form 37 may be power operated by a suitable motor or the like M through the medium of driving connections comprising a pulley 47 fast on the motor shaft, a speed reducing pulley 46 that is fast on a journaled shaft 48, a belt 49 running over said pulleys, and a bevelled gear 50 that is fast on the shaft 48 and meshes with the bevelled gear 45. The motor M, is adapted to be energized from a suitable source of potential, such as a power line 51, through leads 52 and 53, in one of which is interposed a control switch 54, which is, preferably, located in convenient reach of the operator and is illustrated as being mounted on the supporting base 34 in Fig. 7.

The pressing form 36 is very similar to the form 14 of Figs. 1 to 6, inclusive, and is provided with a form creasing rod 22a that is like the forming and pressing rod 22 of Figs. 1 to 6, inclusive, and functions in the same manner. Steam may be introduced into the chamber formed in the interior of the hollow form 36 through the medium of small steam inlet conduit 55 and may be discharged from said chamber through a discharge conduit 56 that is concentric with the inlet 55.

By reference to Figs. 8 and 9 particularly, it will be seen that the non-rotary form 36 is provided in opposed relation to the rotary form 37 with a channel 57 for reception of the rotary tubular form 37. The form 36 is mounted for oscillatory movement on a horizontal axis, and for movements toward and from the rotary form 37 by means of a link 58 that is substantially like the link 17 of Figs. 1 to 6, inclusive. This link 58 is pivotally anchored to the intermediate portion of the form 36 at 59, and at its lower end said link is pivotally anchored at 60 to the base 34.

Under the action of gravity the form member 36 normally rests upon the supporting base 34 as shown in Fig. 7, and in which position the forms are spaced apart at a maximum distance as shown in Fig. 8. When a sleeve or other tubular garment element x, is drawn over the cooperating forms 36 and 37, said form 36 will move toward the cooperating form 37, and will move pivotally on the axis 59 to accommodate the sleeve or other tubular garment element placed thereon (see Fig. 9). The preferred method of

pressing garment elements in connection with this last described form of invention will be the same as that described in connection with Figs. 1 to 6, and is briefly described as follows:

Tubular garment elements will be drawn into place over the cooperating heated forms **36** and **37**, and when all those portions in direct surface engagement with said forms are dried and pressed, the tubular form **37** will be rotated sufficiently to bring those portions of the tubular garment element that span the space between the cooperating forms into surface engagement with one of the said forms, and the pressing operation will be completed when the last form engaged portions of the garment element have been dried in surface contact with the heated form.

Although I have herein recited certain different objects of the invention and have described in detail a preferred method and two forms of mechanisms adapted for use in carrying out the preferred method, I do not intend to be limited to any particualr method or structure except as defined in the appended claims.

What I claim is:

1. The method of pressing tubular garment elements which consist in placing a moistened tubular garment element telescopically over a heated form, the circumference of which is less than that of the tubular garment element at all points engaged by the latter, drawing a longitudinally extended circumferentially incomplete portion of the tubular garment element taut over the heated surfaces of said form, and after said form engaged portions of the tubular element are dried and pressed, rotating said tubular garment element with respect to the pressing surfaces of said form to bring undried and unpressed portions of garment element into engagement with the heated pressing surfaces of the form.

2. The method of pressing tubular garment elements which consist in telescoping into a damp tubular garment element an elongated heated form, the circumference of which is less than that of the tubular garment element at points engaged by the latter, and which is provided with a longitudinally extended crease forming surface, drawing the tubular garment portion taut over the pressing surfaces of said elongated form inclusive of the said crease forming surface thereof, and, after the portions of the tubular element engaging the heating surfaces of the form have been dried and pressed into shape, rotatively moving the said tubular garment element over the surfaces of the said form.

3. The method of pressing tubular garment elements which consist in telescoping into a damp tubular garment element an elongated heated form, the circumference of which is less than that of the tubular garment element at points engaged by the latter, and which is provided with a longitudinally extended crease forming surface, drawing the tubular garment portion taut over the pressing surfaces of said elongated form inclusive of the said crease forming surface thereof, and, after the portions of the tubular element engaging the heating surfaces of the form have been dried and pressed into shape, rotatively moving the said tubular garment element over the surfaces of the said form, a distance less than sufficient to bring the still damp surfaces of the tubular garment element into engagement with the crease forming surfaces of the form.

4. In a device of the class described, the combination of a cooperating pair of laterally spaced pressing forms one of which is mounted for movement from and toward the other thereof, and a rotatable element carried by one of said forms substantially paralleling and closely associated with the pressing surfaces thereof.

5. A pressing device comprising a plurality of cooperating substantially parallel heated form sections adapted to be inserted as a unit into a tubular garment element, means for mounting one of said sections for movement from and toward the other thereof, and means for rotating at least one of said sections with respect to the other thereof.

6. In a device of the class described the combination of a pair of cooperating pressing forms, means mounting one of the said pressing forms for movement toward and from and for pivotal movement with respect to the other said form, and means associated with one of said forms for imparting rotary movement over the said forms to a tubular garment element telescopically engaging the same.

7. The structure defined in claim 6 in which said last noted means is in the nature of a journaled rod closely associated with and substantially paralleling a pressure surface of one of said forms.

8. A device of the kind described comprising a base, an elongated boot rigidly secured to said base, a cooperating relatively movable form, a link pivoted near the base of said fixed boot and at its upper end pivotally connected to and supporting said relatively movable form, means for introducing heating medium into said forms throughout the relative adjustments thereof, the pivotal connection between said link and boot being such that the movable form will tend to move away from the relatively fixed form under the action of gravity, and means associated with at least one of said boots for imparting rotary movement over the surfaces of said form to a tubular garment element telescopically applied thereover.

9. The structure defined in claim 8 in which said last noted means is in the nature of a journaled rod closely associated with and approximately paralleling a longitudinally extended surface of one of the fixed forms.

10. The method of pressing tubular garment elements which consists in telescoping a damp tubular garment element over a cooperating pair of relatively laterally movable heated pressing forms, moving the cooperating forms laterally apart to stretch the garment elements taut over the heated pressing surfaces thereof and after those portions of the tubular garment element that are primarily engaged by the laterally spaced forms are dried and pressed, imparting rotary movement to the tubular garment elements to bring those portions thereof which were primarily between the laterally spaced forms into pressing engagement with the heated pressing forms.

11. In a device of the class described, the combination with an elongated non-rotary pressing form, of a rotary forming element extended in a substantially parallel relation to the said pressing form and adapted, when rotated, to revolve a telescopic tubular garment element over the pressing surfaces of said elongated non-rotary form, said elongated non-rotary pressing form being provided near the intermediate portion of its pressing surface with a longitudinally extended crease forming surface.

12. The method of pressing tubular garment

elements which consists in placing a moistened tubular garment element telescopically over a heated form, the circumference of which is less than that of the tubular garment element at all points engaged by the latter, drawing a longitudinally extended circumferentially incomplete portion of the tubular garment element taut over the heated surfaces of said form, and permitting the engaged portions of the tubular garment element to be dried and pressed while stationary, and after said form engaged portions of the tubular element are dried and pressed, rotating said tubular garment element with respect to the pressing surfaces of said form to bring undried and unpressed portions of the garment element into engagement with the heated pressing surfaces of the form, thereafter permitting the newly engaged tubular garment element surfaces to be dried and pressed while stationary.

13. The structure defined in claim 6 in which one of said co-operating pressing forms is rigidly mounted, and in which said last named means is in the nature of a journaled rod closely associated with and substantially paralleling an outer-most pressing surface of the rigid one of said pressing forms.

14. A forming and pressing device for tubular garment elements including a longitudinally tapered heatable pressing boot, means for tiltably mounting said boot relative to its longitudinal axis, roller means for imparting rotary movement to a garment element stretched over said boot and said roller, and means for transversely adjusting said device to cause said tiltably mounted boot to conform to angularities of said garment element while stretched thereon.

15. A forming and pressing device for tubular garment elements comprising cooperating laterally spaced sections having garment engaging surfaces, means for rotatably mounting one of said sections, and pivotal means between the garment engaging surfaces of said sections for mounting the other of said sections for parallel movements as well as relative tilting movements toward and from the adjacent side of said rotatably mounted section, whereby said sections will be automatically adjusted to conform to the angularity of a tubular garment telescoped thereon.

16. In a device of the class described, the combination with an elongated non-rotary pressing form, of a rotary forming element extended in a substantially parallel relation to the said pressing form and adapted when rotated to revolve a tubular garment over the pressing surfaces of said elongated non-rotary form, and means for heating the pressing form, said form being provided with a longitudinally extended crease forming surface.

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