March 21, 1933. M. L. KAPLAN 1,902,330

COLLAR STRETCHING MACHINE

Filed April 25, 1931 4 Sheets-Sheet 1

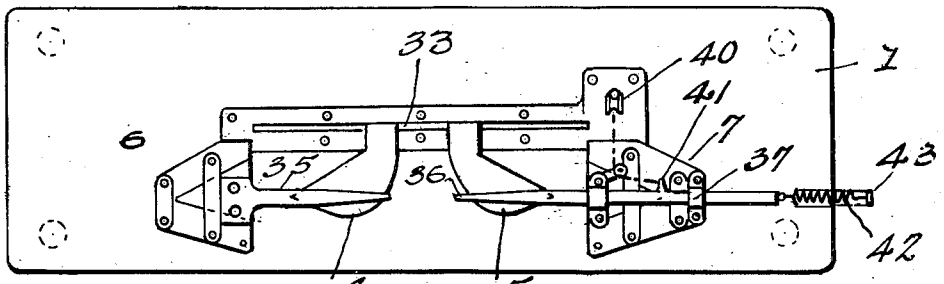


FIG. 1.

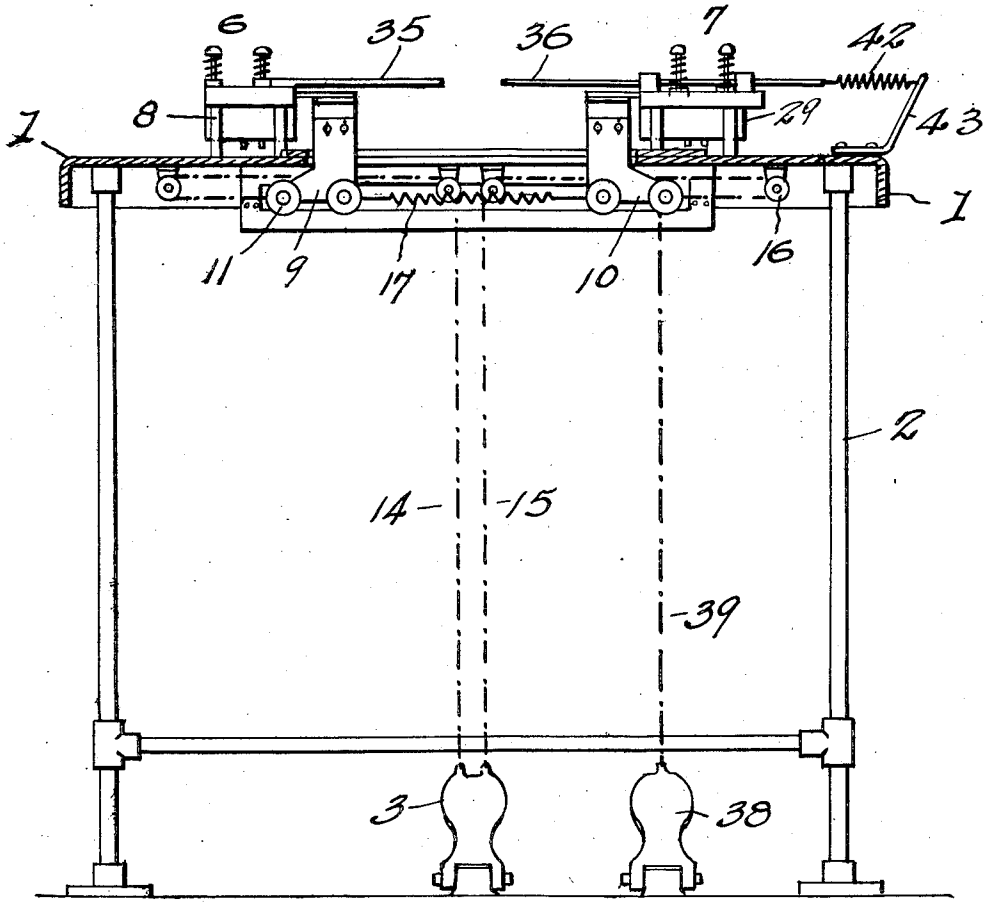


FIG 2.

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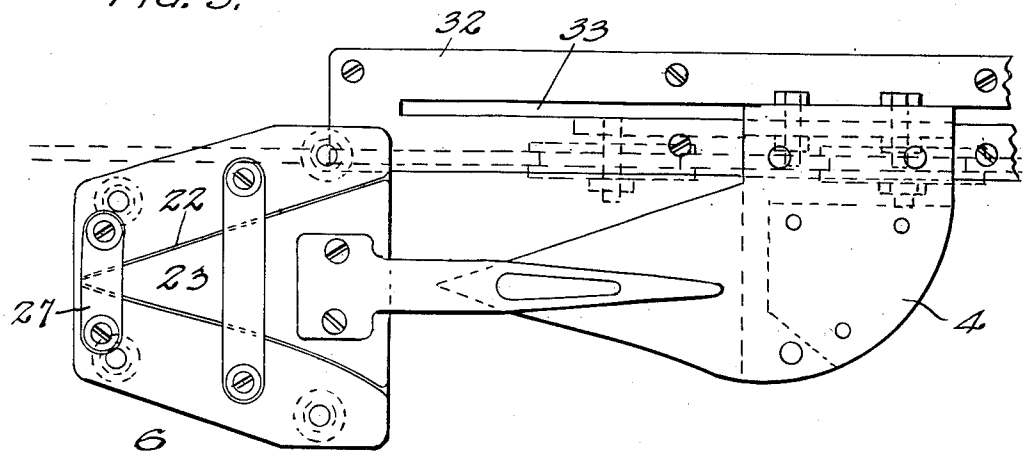
Attorney

March 21, 1933. M. L. KAPLAN 1,902,330

COLLAR STRETCHING MACHINE

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FIG. 3.



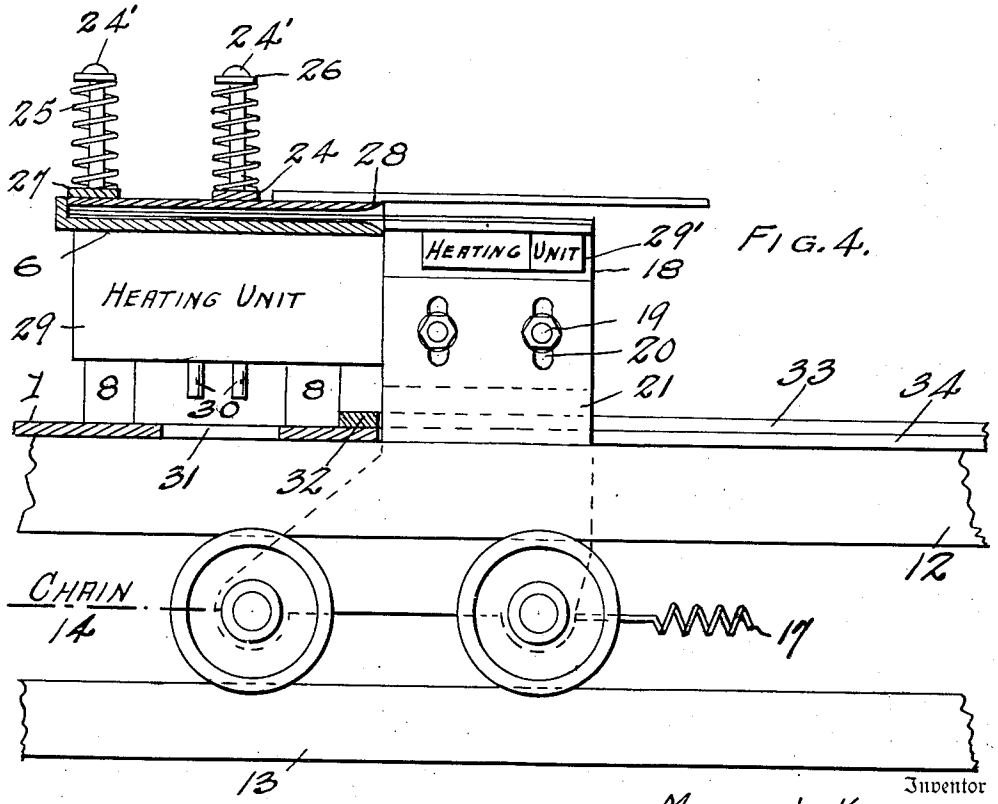


FIG. 4.

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COLLAR STRETCHING MACHINE

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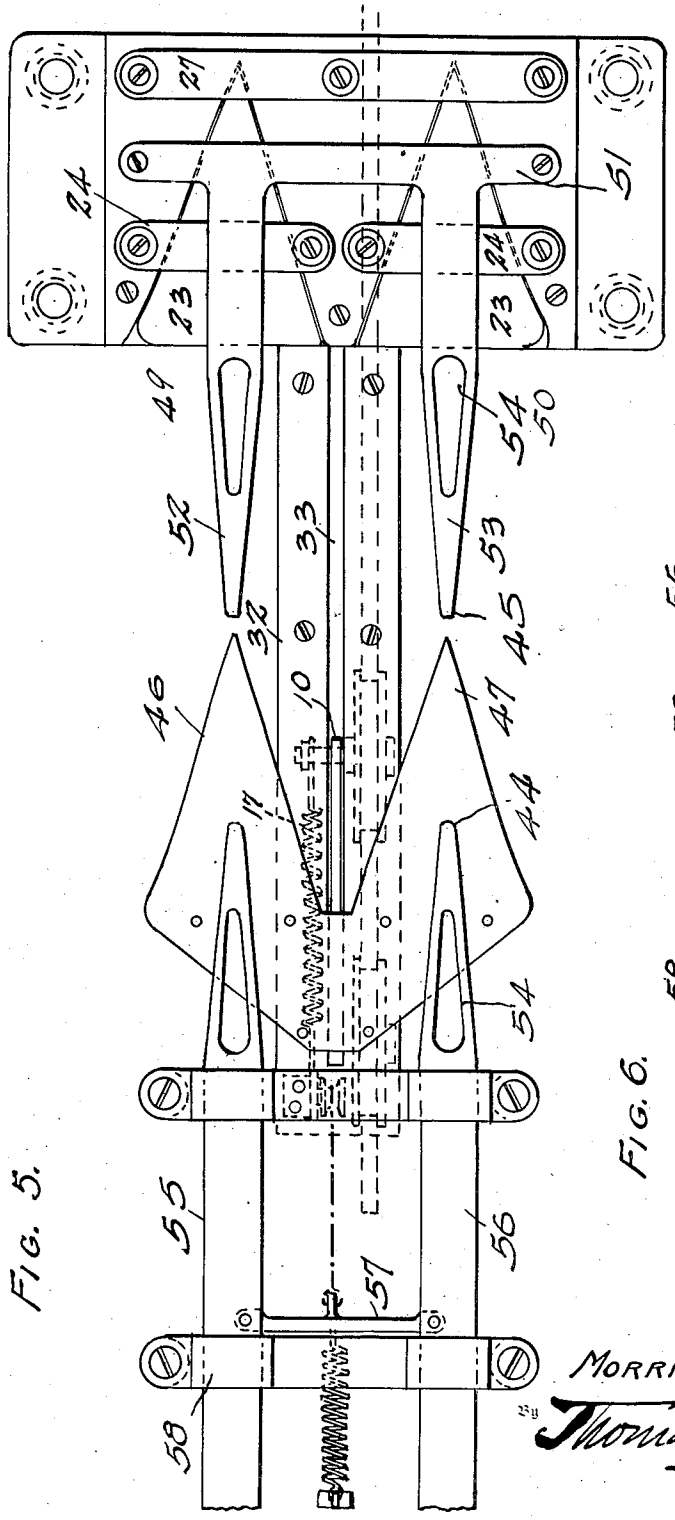


FIG. 5.



FIG. 7.

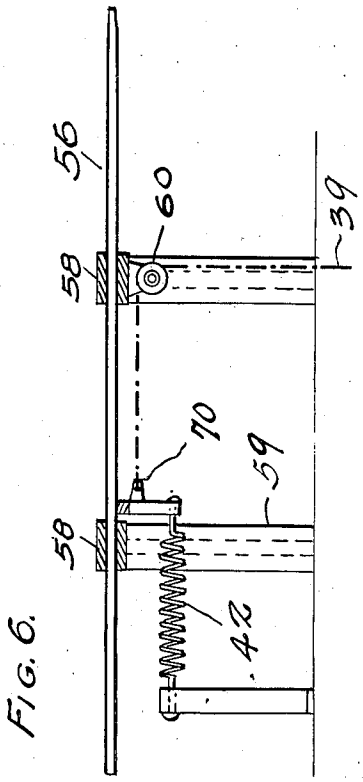


FIG. 6.

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COLLAR STRETCHING MACHINE

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FIG. 8.

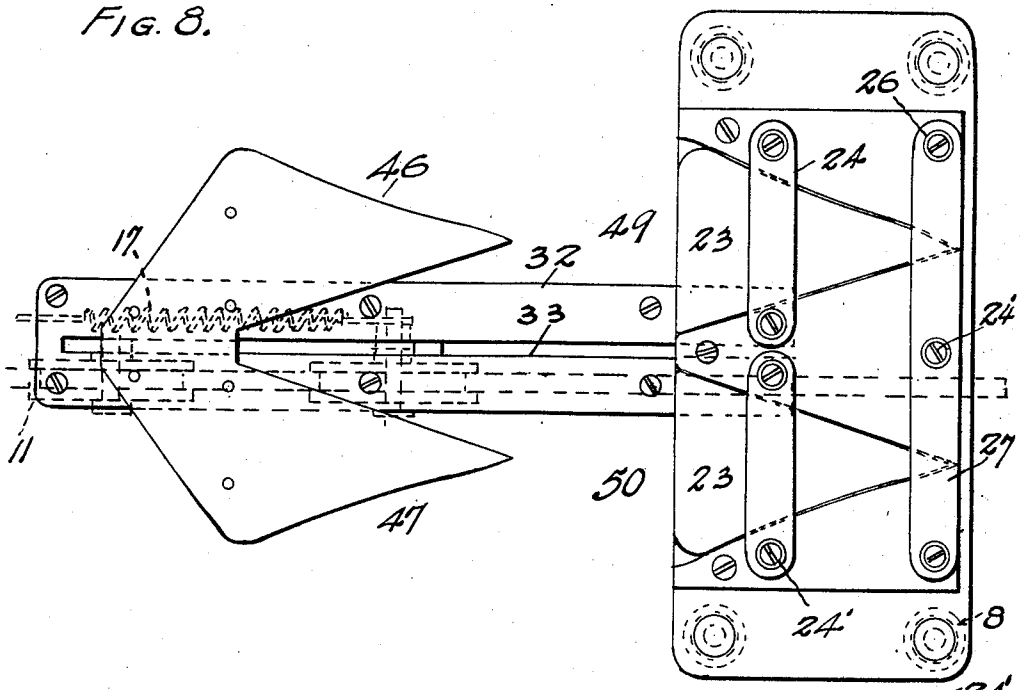
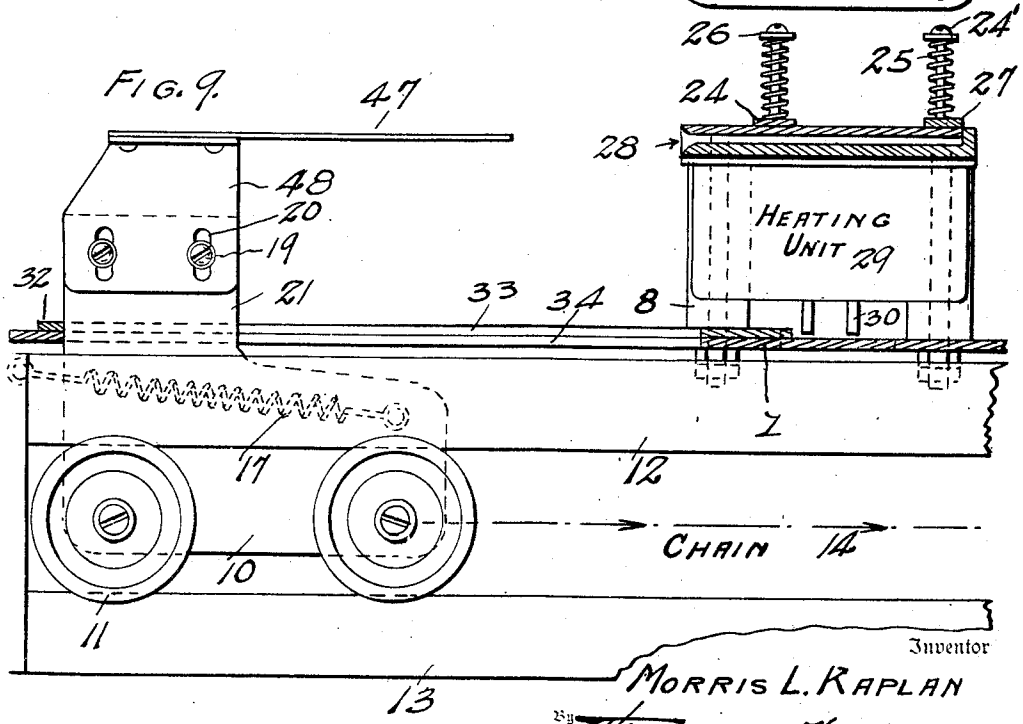


FIG. 9.



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Patented Mar. 21, 1933 1,902,330

UNITED STATES PATENT OFFICE

MORRIS L. KAPLAN, OF HAZLETON, PENNSYLVANIA

COLLAR STRETCHING MACHINE

Application filed April 25, 1931. Serial No. 532,913.

My present invention relates to an improved collar-stretching machine by means of which collars, cuffs, collar bands, lapels, and pockets, forming parts of various garments, may be stretched and shaped before final completion and attachment of these parts to the garments.

The machine of my invention is particularly adapted for stretching and shaping collars, which, as is well known in the trade, after having been sewed about their outer edges, except for the inner edge, are turned right side out. The stretching machine of my invention is equipped with means whereby the partly completed collar may be thus turned, and after the turning operation, the points of the collar are stretched and shaped to eliminate wrinkles and to insure accuracy and uniformity in appearance of the collars.

In the operation of stretching and shaping the collar points a heated mold is utilized in connection with a reciprocable die which is inserted in the collar point, or the collar point is first slipped, by hand over the die, and then the die with the collar point thereon is projected into the heated mold. The mold is of the expansible type and automatically adjusts itself to different thicknesses of material in the make-up of the collar, and the stretching, shaping, and elimination of wrinkles from the collar points is accomplished by frictional contact between the outer layers of the collar point and the inner faces of the heated mold. This sliding, frictional contact of the material with the mold, especially in the heated mold, smooths and shapes the collar point more effectively and more accurately than when the collar point is subjected to pressure according to machines now in use.

The dies on which the collar points are shaped are preferably employed in pairs, and in the accompanying drawings I have illustrated two forms of the dies wherein one pair comprises, alined, relatively movable dies operated in opposite directions, and another pair comprises two rigidly mounted and bodily movable dies, arranged side by side, but it will be understood that the number of dies employed in the machine may be varied for different purposes, and of course the complementary molds are varied.

The invention consists essentially in the combination with an expansible mold, of a die carrying the collar point and adapted to be inserted within the mold for frictional contact therewith; the mold is preferably heated to facilitate the smoothing and stretching or shaping of the collar; and the mold is preferably expansible to receive or accommodate different thickness of collars, while the die itself is interchangeable. By providing interchangeable molds and dies for the machine the molds and dies may quickly be interchanged for shaping different styles of collars, different shapes of lapels, or different shapes of pockets, in various garments.

Figure 1 is a plan view of the machine showing the pair of oppositely moving, alined dies, and their molds, the dies being in position to receive the collar points before the dies are projected into the molds, and a pair of turning fingers are shown which are used in turning a single collar point.

Figure 2 is a view in elevation of the machine, with the table in section, and showing the alined dies projected into their complementary molds.

Figure 3 is an enlarged plan view showing one of the molds and its die, and one of the turning fingers, of Figure 1.

Figure 4 is a vertical sectional view of part of the mold and table top, showing the die within the mold.

Figure 5 is a modified form of the invention wherein a double-die is shown in position to receive the two points of a collar, (after the collar has been turned on the double turning fingers) and a double-mold is shown in position to receive the double dies.

Figure 6 is a detail view partly in elevation and partly in section showing the double slide-fingers of the turning device of Figure 5.

Figure 7 is a detail view showing the joint between the stationary and slidable fingers of the turning device.

Figure 8 is a plan view of the double-die

and its double mold, with the turning device omitted.

Figure 9 is a view partly in sectional detail and partly in elevation showing the double die and mold of Figure 8.

It will be understood that various changes and alterations may be made in the structures illustrated, within the scope of my claims, and without departing from the principles of my invention.

In Figures 1, 2, 3, and 4 where single-coacting dies are illustrated a usual table 1 is supported on a suitable frame 2, and a pedal 3 is operated by the foot to project the dies 4 and 5 outwardly in opposite directions to the complementary molds 6 and 7 which are supported above the table top on posts as 8, or by other suitable means.

The dies are mounted on carriages 9 and 10 having rollers or wheels 11 that run between the rails 12, 13, and these carriages are connected by chains 14 and 15 to the foot pedal 3. The chains pass over guide pulleys 16 beneath the table top, which chains are arranged to project the dies into the molds when the pedal is depressed, and a spring 17, joining the two carriages, retracts the dies when the pedal is released.

The dies and the molds may each be changed to adapt the machine for different shapes of collars, cuffs, pockets, lapels etc. according to the styles or patterns employed, or desired for use, and different molds may be substituted for those shown.

The dies may be removed from their carriages and other dies substituted to conform to the molds, and for this purpose the dies are provided with attaching flanges 18 and bolts 19, the latter passing through slots 20 in the attaching plate 21 of the carriage. By means of the bolts and slots the dies may readily be attached, and adjusted on the plate of the carriage, to aline with the mold or molds.

The molds are made expansible in order that they may readily adapt themselves to different thicknesses of material in the collar points, and the molds expand automatically for this purpose. Each mold is provided with a top recess 22 conforming to the shape of the complementary die, and a complementary stretching and shaping plate 23 fits into the recess and forms the top wall of the mold. The plate rests in the recess and is pushed upwardly as the collar point on the die slides into the mold in frictional contact with the under face of the stretching plate and the upper face of the bottom of the die, and it will be apparent that this frictional, sliding contact stretches and smooths the upper and lower sides of the collar point. The substantially wedge-shape of the die and mold is effective in stretching, shaping and smoothing the two edges of the collar point on the die, as the edges of the die slide along the edge-walls of the mold.

The plate 23 is provided with an integral or rigid cross plate 24 and this cross plate or cross arm has perforated ends projecting beyond the plate for sliding, or vertically reciprocating movement on a pair of upright pins or screws 24′ secured to the body of the mold at the sides of the stretching or friction plate 23. A pair of springs 25 are coiled about the guide pins and interposed between washers 26 at the upper ends of the pins and the upper faces of the cross arm, and these springs provide a resilient resistance or yielding movement for the stretching plate, as the collar point is pushed into the mold.

An additional yielding cross arm 27, preferably loose from the stretching plate 23 or mold-plate extends across the point of the mold plate 23, and this cross-plate is guided in its yielding movement on pins 24′ as the tip end of the collar point is shaped in the pointed end of the mold.

To facilitate the entrance of the collar point and die into the mouth of the mold, the latter is provided with a flaring mouth as 28, fashioned by beveling the complementary or adjoining faces of the mold plate and the bottom of the mold, and this flaring mouth guides the movement of the collar point and die and centers them properly in the mold.

The entire mold is preferably heated to a suitable degree of temperature to aid in shaping, smoothing or stretching the collar point in the elimination of wrinkles, and the heating unit 29 may be an electrically heated unit having conductor points or prongs 30 to receive the electrical connecting plug that is entered up through a hole 31 in the table top and slipped over the prongs or pins, 30. Any suitable means may be employed for heating the mold, and the usual automatic control devices are used for maintaining the proper temperature or degree of heat for the mold.

The reciprocating mold-carriages 9 and 10, as they roll on their rails are guided by means of a plate 32 attached on the top of the table and provided with guide slots 33, and the table top is also slotted at 34 to accommodate the attaching plates.

In some instances the die may be heated independently of the mold, the mold may be heated independently of the die, or both the mold and the die may be heated, and for this purpose I provide the die with a heating unit as 29′ attached at the underside of the die as indicated in Figures 3 and 4, and I therefore do not limit myself to the heating of only one of the members used for shaping the collar, as either one, or both of these members may be heated and thus used in the shaping of the collar points.

In the manufacture of collars having a multiple-ply fold-over top, the plies are

stitched along only one edge, that is, the edge that becomes the outer edge of the completed collar, and the plies are stitched transversely or diagonally at the points or ends of the collar, leaving the inner edge of the collar open, and in this condition, or stage of manufacture of the collar, the latter is inside out. Before the collar-points are placed on the dies 4 and 5 the incompleted collar is turned to bring the outside of the collar to the outer side. Heretofore the operation of turning the collar has been performed by hand, on mandrels or fingers of a turning machine, and requires a special machine and an operator for the machine.

In my collar stretching machine I provide means for turning the collar, and thus eliminate the necessity for a separate turning machine.

In equipping the shaping machine for turning the collars, I employ a stationary finger or mandrel 35, which may be rigidly secured to the mold plate 23 as indicated, and which is situated above the die 4 and alined, longitudinally with its point. A complementary slide finger or mandrel 36 is arranged in opposed relation to the stationary finger, and adapted to reciprocate longitudinally above the die 5.

The slide finger is supported and adapted to reciprocate in bearing brackets 37 rigidly secured on the top of the mold 7, and a foot pedal 38, and chain 39 are employed to project the slide finger to the stationary finger. The chain passes upwardly through an opening in the table top and over guide pulleys 40, 40, and one end of the chain is attached to the slide finger as at 41 in Figure 1. Thus, by depressing the pedal the slide finger is projected to the stationary finger, and when the foot is released from the pedal, a spring 42 attached at the rear end of the slide finger and also to a bracket 43, retracts the slide finger.

In Figure 7 a detail construction of the co-operating free ends of the fingers is illustrated where the stationary finger is provided with a point or head 44 that fits into the socket or recess 45 of the finger 36.

In the form of the invention of Figures 1 through 4, the inverted collar, that is, the collar in its inside-out condition, is turned by successively turning its points on the fingers, and then the body of the collar either turns itself or may be turned by the fingers of the operator. Thus, one point of the collar is slipped over the finger 35 and then the pedal 38 is depressed to project finger 36 against the end of finger 35, as in Figure 7, thus clamping the tip of the collar point between the head and socket of the two fingers. Then, by hand, the operator overturns the collar point on the finger 35, releases the pedal to retract the slide finger, and the collar point is withdrawn from finger 35. The other collar-point is then overturned in the same manner, and at the same time the body of the collar is turned, right side out.

The collar is now ready for shaping and stretching, and its two points are slipped over the oppositely pointing dies 4 and 5 and the collar is arranged in its suspended position between the two dies. The pedal 3 is then depressed and the two dies are projected outwardly in opposite directions and caused to enter their respective molds for stretching, smoothing and shaping the collar points as previously described.

Thus the operation of the single machine overturns the collar and then shapes its points in successive steps with only one handling of the collar, and thereby eliminates the necessity for handling the collar by the operator at an overturning machine.

The form of my invention thus described embodies two single dies, arranged in pairs, and relatively movable, and it will be understood that a single die and its mold may be employed for stretching, smoothing, and shaping some of the portions of garments heretofore enumerated. But for speed and increased production, the relatively movable pair of dies is preferred.

In some instances the pair of dies are rigidly joined and are not relatively movable, but are fashioned as a double die, and this latter form of double die is illustrated in Figures 5 and 6 where the collar-turning device is combined with the double die, and in Figures 8 and 9 where the collar turning device is omitted.

The double die is projected to the heated mold by the use of the pedal and chain, and it is retracted, when the pedal is released, by a spring, in the same manner that the relatively movable pair of dies operates.

Thus the double dies 46 and 47 are fashioned from an integral flat plate, and secured on the attaching flange 48 that is adjustable on the plate 21 of the carriage 10, and the latter rolls on the rails 12 and 13.

The double mold, indicated as 49 and 50 is supported on the posts 8 above the table top and provided with the heating unit or units 29, and with the mold plates 23, and these plates are provided with the rigid or integral cross arms 24 and loose cross arm 27. The molds are expansible against the tension of the springs 25, and the mold plates are guided by the pins 24′ as in the first described form of my invention.

In this form of the invention the collar points are both slipped over the dies 46 and 47, and the collar then assumes a somewhat U-shape or horse-shoe shape, as its points are simultaneously projected into the heated molds for shaping.

In Figures 5 and 6, where the turning fingers are employed, the two points of the collar are overturned and positioned on the dies

46 and 47 with one and the same movement, by the joint use of the double dies and the double turner.

The double turner embodies a stationary member including a cross plate 51 which is secured on the top of the double mold, above the expansible mold plates of the double mold a sufficient distance to permit them to rise and fall, and this plate is fashioned with spaced double fingers 52 and 53, which are fashioned with slots or windows 54 to permit inspection, and re-alinement or adjustment of the turning fingers with the dies of the double die.

The complementary sliding fingers or mandrels 55 and 56 that coact with the stationary fingers are joined by a rigid cross arm 57 and the double fingers slide in bearing brackets 58 that are secured above the table top, as on posts 59 so that the finger points 45 are alined with the points of the double dies 46 and 47.

The double fingers are projected to the stationary fingers by depression of a pedal, as 38 and a chain 39, which chain is attached at 70 to the cross bar 57, after passing over guide pulleys as 60 in Figure 6. A retracting spring, as 42 returns the double fingers or double mandrel to position of Figure 5 after the pedal has been released.

For overturning the inverted collar, before shaping, the two points of the collar are slipped by hand over the ends of the two stationary fingers 52 and 53 in Figure 5, with the lining layer of the collar up and the material forming the outer face of the collar beneath, and the collar assumes a somewhat U-shape or horse-shoe shape.

The foot pedal, as 38, is now pressed downwardly and the double mandrel 55—56 is projected to bring its heads 44 against the socket end 45 of the stationary fingers 52 and 53, and the tips of the collar points are clamped between the head and socket and of the fingers.

In this position the double turning fingers 55—56 have been projected to the approximate position of the two points of the double die 46—47 and the fingers lie above and parallel with the double die, spaced slightly therefrom. By hand, the two collar points are now turned (inside out) and transferred from the stationary fingers 52 and 53 to the slidable fingers 55 and 56 and also over the front ends of the double die 46—47.

When the two collar points are placed on the fingers 52 and 53 the lining is exposed and on top, then when the collar is overturned and simultaneously passed from the stationary fingers to the slide fingers and the dies, the outer face of the collar is exposed and on top. As the collar points are transferred and while they are being turned the whole collar body is also turned, by hand, and the collar forms a U-shape or horseshoe shape on the fingers 55—56 and dies 46—47.

The operator now releases the pedal 38 and the spring 42 withdraws the fingers 55—56 from the collar points, and during this step, the points are properly arranged by hand on the double die.

As soon as the fingers 55—56 are withdrawn, the pedal, as 3, is depressed to project the double die, carrying the collar points to the right in Figure 5 and the points are entered in the complementary molds 49, 50 for stretching, smoothing and shaping the collar points.

During these steps in the operation of the machine, the operator manipulates the collar and properly arranges its points on the dies, and by retaining a hold on the bow of the U-shaped collar the operator assists in properly positioning the collar points on the dies in order that the encased dies will correctly enter the molds and smooth, stretch, and shape the collar points.

In all cases thus described, the top, bottom, and edges of the collar points are stretched, smoothed and shaped, in manner somewhat similar to the stretching or shaping of kid gloves on the hands, that is, the stretching, smoothing, and shaping are accomplished from the interior or inside of the collar points, and the points are shaped, by stretching and smoothing, and after the points have been withdrawn from the retracted dies (by hand) the points retain their shape, not only until they are laundered, but permanently, for the full life of the collar or the material from which it is fashioned.

It will be understood that the collars may be manipulated in various ways, by hand, in the operations of the machine, as for instance with the outside of the finished collar up or with the inside of the finished collar up. By the terms outside of the finished collar and the inside of the finished collar I refer to the side that is visible when the collar is worn and the side that is invisible, respectively. In some instances it is desirable that the points be shaped in one way, while in other instances, it is desirable that the points be shaped in another way or manner.

Various changes and alterations may be made in the exemplified structures illustrating the embodiment of my invention, and it will be understood that such changes are contemplated, and while I have shown two forms of the double machine for shaping both points of the collar simultaneously, it will be understood that a single die and mold may be employed. Likewise, the turning fingers may or may not be combined with the dies in the adaptation of my invention to various uses. The positions and shapes of the various parts in their relative arrangements may be changed, and other changes may be made within the scope of my claims without departing from the principles of my invention.

Having thus fully described my invention,

what I claim as new and desire to secure by Letters Patent is:

1. In a machine as described, the combination with a mold having a recess in one face, of a yieldable stretching-plate fitted in said recess, guide pins for said plate, and springs for urging the plate into said recess.

2. In a machine as described, the combination with a mold having a recess in one face, of a yieldable stretching plate forming one wall of the mold, a cross arm rigid with the plate and having perforated ends, guide pins on the mold for said ends, and springs on said pins bearing on the upper face of the arm.

3. In a machine as described, the combination with a mold, of a stretching-plate forming a movable wall of the mold, a cross arm rigid with the plate and having perforated ends, guide pins rigid with the mold and passing through said ends, springs on the pins bearing on the outer face of the arm, a second cross arm yieldingly supported on the mold, and springs bearing on said arm to hold it in frictional contact with an end of said plate.

4. In a collar shaping machine, the combination with a pair of molds, of a complementary pair of reciprocable dies adapted to carry the collar-points, and means for projecting said dies and the collar points into said molds for frictional contact therewith.

5. In a collar shaping machine, the combination with a pair of expansible molds, of a pair of reciprocable dies adapted to carry the collar-points, and means for projecting the dies and their collar points into the molds for frictional contact with the interior walls of the expansible molds.

6. In a collar shaping machine, the combination with a pair of expansible molds and means for heating the molds, of a pair of reciprocable dies adapted to carry the collar-points, and means for projecting the dies and their collar points into the molds for frictional contact with the interior walls of the expansible molds.

7. In a collar shaping machine, the combination with a pair of molds, of a pair of laterally arranged rigidly related reciprocable dies adapted to carry the collar points, and means for projecting said dies and their collar points into the molds for frictional contact with the interior walls of the mold.

8. In a machine as described, the combination with a pair of molds, of a pair of laterally arranged rigidly related reciprocable dies adapted to carry the collar-points, a pair of turning fingers stationary with the molds, a pair of co-acting slidable fingers movable with relation to the dies and in proximity thereto, means for operating the dies and means for operating said slidable fingers, whereby the collar points may be turned by use of the fingers and transferred to the dies and said slidable fingers, and whereby the slidable fingers may be withdrawn from the collar points, for the purpose described.

9. In a machine as described, the combination with a pair of molds and a pair of spaced turning fingers rigid therewith, of a double die and means for reciprocating said die with relation to the mold, a pair of slidable rigidly connected fingers alined with said double die and in close proximity thereto, means for projecting the slidable fingers into contact with the stationary fingers to clamp the tips of the collar points whereby the collar points may be transferred from the stationary fingers to the slidable fingers and double die, and means for withdrawing said slidable fingers from the collar points.

10. In a machine as described, the combination with a stationary mold having one open end, and a horizontally disposed track below the mold, of a die carriage reciprocable on the track, said carriage having an upright attaching plate, a vertically adjustable die and a downwardly extending attaching flange rigid therewith, and means for fastening said plate and flange with the die in adjusted relation to the mold.

In testimony whereof I affix my signature, April 18, 1931.

MORRIS L. KAPLAN.