June 6, 1950 J. KELLER 2,510,341

GLOVE TURNING APPARATUS

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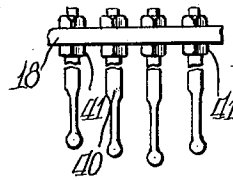


Fig. 2

Fig. 1

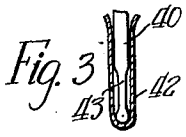


Fig. 3

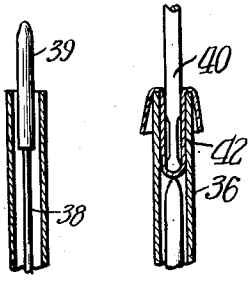


Fig. 4

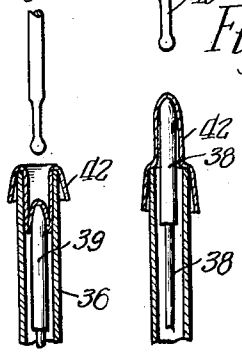


Fig. 5

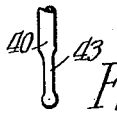


Fig. 6

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GLOVE TURNING APPARATUS

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7 Claims. (Cl. 223—40)

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This invention pertains to improvements in glove turning apparatus of the type employed in inverting glove fingers after the manufacturing step of stitching the same on the inner side.

It is an object of the invention to provide a turning apparatus which is effective to simultaneously reverse or invert at least four fingers of a formed and stitched glove with minimum consumption of time and effort on the part of an operator.

A further object is to provide a highly simplified and compact apparatus of the type described which is operated under the control of a double acting pneumatic plunger and cylinder and reversing valve therefor, whereby a single pedal operation by the operator effects the complete cycle of operations involved.

Yet another object is to provide an apparatus having a novel association of cylindrical stripper sleeves and sets of fixedly related stripping plungers and glove positioning fingers which are reciprocable relative to the sleeves, whereby unfailing reversal of the glove fingers is effected without possibility of damage thereto.

The foregoing statements are indicative in a general way of the nature of the invention, but other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the device.

One embodiment of the invention is presented herein for the purpose of exemplification, but it will be appreciated that the invention is susceptible of incorporation in other modified forms coming equally within the scope of the appended claims.

In the drawings,

Fig. 1 is a conventionalized, somewhat diagrammatic view in vertical longitudinal section, taken from front to rear through an apparatus in accordance with my invention, illustrating the relationship of the parts thereof;

Fig. 2 is a fragmentary view in section on a line generally corresponding to line 2—2 of Fig. 1, further illustrating the construction and arrangement of the referred to glove positioning fingers and the stripping cylinders and plungers; and

Figs. 3, 4, 5 and 6 are fragmentary views in vertical section generally similar to Fig. 1, illustrating successive positioning of the parts throughout the cycle of turning a glove.

The present invention provides a highly simplified glove turning apparatus, adapted to effect considerable economy of time and labor in the operation of inverting gloves as a final operation

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in the production thereof. It will be understood that many types of gloves, such as rough workmen's gloves, have the fingers and body thereof stitched on the inner side, so that, following completion of the glove assembly operations, they must be reversed or inverted to the normal position in which they are worn. The present device was evolved to accomplish this operation, and embodies a set of tubular stripping sleeves, each with a stripping plunger normally withdrawn therein and reciprocable relative thereto, along with a corresponding set of glove positioning fingers normally spaced above the sleeves and in fixed relation to the plungers, but reciprocable into the sleeves during the operation of the apparatus. By these instrumentalities assurance is had that the glove fingers will be unfailingly reversed without possibility of damage thereto.

Further novel features of the invention reside in the provision of means for effecting a counterbalanced reciprocation of the parts and in other specific features to be described.

Referring to Fig. 1, the reference numeral 10 generally designates a table or base which is supported on suitable legs and has an upright support and guide 12 extending above its upper surface. This guide is illustrated in the form of a channeled member having flanges 13 connected by an intermediate web 14; however, the particular form and configuration thereof are not controlling in the invention, and any desirable type of rigid vertical guiding and supporting structure may be employed.

On the forward side thereof the upright 12 is provided with a top, forwardly extending bracket 15, between which and the table 10 an elongated, vertical guide post 16 is disposed in parallel relation to the upright web 12. While only one such post appears in the drawing, any desired number may be provided, depending upon the desired stability and cost of the apparatus. An intermediate bracket 17 may be welded to the upright 12 if desired, in which the post is medially braced to increase the rigidity of support thereof.

The reference numeral 18 in general designates a reciprocable head which, in the illustrated embodiment, is of generally L-shaped configuration, reinforced by a central, generally triangular web 19. This head is apertured at vertically aligned points 20, 21 for sliding reception on post 16 on opposite vertical sides of the fixed bracket 17, and a coil compression spring 22 is disposed concentrically of the post between the head and table 10 for the purpose of counterbalancing the weight of the head and associated moving parts.

Reciprocation of head 18 is accomplished by means of a double-acting air cylinder 23 which is appropriately mounted in fixed position on the apparatus. In the illustrated embodiment the cylinder is secured to the upright 12, as by welding or by other means not necessary to illustrate or describe. A piston or plunger 24 is reciprocable vertically in cylinder 23, being secured to a connecting rod 25 which extends through packings in either opposite ends of the cylinder. Said rod at its upper end is rigidly connected to a lateral arm 26 which extends through a vertical slot 27 in upright web 14 and is secured at its forward extremity to the head 18.

At its lower end the piston rod 25 is rigidly secured to a crosshead 28, which crosshead is further connected to head 19 at an intermediate point by means of a vertical pivoted link 29. This link extends upwardly through an aperture in table 10 and is pivoted at its top extremity to head 18.

The cylinder 25 has air fittings 30, 31 at opposite ends thereof which are connected by pressure tubes 32, 33 respectively to a conventional type of pedal operated, reversing valve 34, in turn connected by a supply line 35 with a source of air or other operating fluid under pressure. The valve control pedal 34', by which the operator controls the apparatus, extends forwardly of the table 10 to a convenient point.

The above and following instrumentalities are all conventionally illustrated, no attempt having been made to show exact details or proportions, and it is apparent that many refinements in design or arrangement are possible. It will be appreciated that as operating pressure is applied to one end or the other of cylinder 23 under control of valve 34, the head 18, connecting rod 25 and crosshead 28 will be caused to reciprocate vertically, being guided in a vertical sliding movement on the post 16. To this end, link 29 serves to equalize the application of lifting effort on the head and crosshead and to prevent wracking action thereon. As stated, spring 22 serves to compensate for the weight of the reciprocating parts, so that the work done on opposite sides of the piston 24 will be equal.

At its forward end, the table 10 carries a plurality of vertically extending, tubular stripping sleeves 36 which are of hollow, cylindrical character. These sleeves are secured in lateral alignment on the table, over a corresponding number of apertures 37 in the latter. Said apertures receive the parallel upright rods 38 attached to a block 38' which has a vertical slot 38'' therein receiving the forward end of crosshead 28. Rods 38 extend for a considerable vertical distance through the sleeves and have attached to the upper ends thereof the stripping plungers 39. Crosshead 28 carries a depending spring guide 39' which extends through and beneath block 38', a coil spring 39'' encircling said guide and abutting the block and an adjustable washer 39''' at its opposite ends. Therefore, as crosshead 28 reciprocates downwardly, block 38' will be reciprocated therewith, after a lost motion interval and when the crosshead abuts the top and bottom of slot 38''. The plungers 39 are positioned with reference to one another and the sleeves in the manner illustrated in Fig. 2.

In vertical alignment with each of the plungers 39 the upper reciprocable head 18 carries a corresponding number of vertical glove positioning fingers 40. These are mounted for vertical adjustment relative to the head 18 by nuts 41 which

threadedly engage the upper extremities of the fingers on either side of the head. It will be noted that the fingers are in substantially vertically spaced relation above the plungers 39, enabling the fingers of a glove to be turned, designated 42, to be conveniently positioned upside down over said fingers 40, and as the head 18 reciprocates downwardly with the plungers, the glove fingers will enter the sleeve 36 a substantial distance, as illustrated in Fig. 4.

In operation, with the parts in the position illustrated in Fig. 1, an operator first positions the four fingers of a glove to be turned on the glove positioning fingers 40, in the manner illustrated in Fig. 3. He then depresses the pedal of the reversing valve 34, which causes operating fluid to be admitted above piston 24, shifting head 18 and crosshead 28 downwardly. This causes the fingers 40 to insert the glove fingers to a substantially telescoped position internally of the stripping sleeves 36. Spring 39'' maintains block 38' and plungers 39 in elevated condition until fingers 40 engage the descending glove whereupon the plungers also descend. Alternatively, the length of slot 38'' may be designed so that the block is depressed by direct action of crosshead 28. The stroke of fingers 40 is sufficient to cause full insertion of the glove fingers into sleeves 36 without damage to the interconnecting webs or palm, and is readily adjustable by manipulating the nuts 41. The operator then strips the upper part of the glove down over the sleeves 36 in the manner illustrated in Fig. 4.

With the parts in the position noted, the operator then releases pedal 36 which automatically causes reversal of the application of pressure fluid to the lower end of cylinder 23, whereupon the head and crosshead rise.

Block 38' follows in contact with the glove fingers under the force of spring 39'', causing initial reversal of said fingers, until said spring reaches relaxed condition. Thereafter the crosshead continues to rise under air pressure, separating fingers 43 from plungers 39, as illustrated in Fig. 5. When the crosshead strikes the top of slot 38'' immediately thereafter, the ascent of the plungers is completed under air pressure, positively completing the reversal of the glove, as shown in Fig. 6. Reference to Fig. 5 indicates that there is sufficient radial clearance between the plunger and sleeve 36 to avoid destructive jamming or rubbing and enable ready reversal of the fingers. When the parts come to rest, the glove is lifted off the plungers in a fully turned condition.

While I have illustrated an extremely simple embodiment of the invention, and in fact one of the primary advantages of the apparatus is its simplicity, it is appreciated that many refinements can be introduced into the apparatus, for example, a full five fingers of each glove can be inverted in one operation, with certain simple changes. Likewise, the plungers 39 are intended to have electric or like heating elements embodied therein, so as to effect a hot pressing and conformation of the fingers as they are turned on the plungers. Further provisions, such as automatic control and timing instrumentalities, will suggest themselves to those skilled in the art.

What I claim is:

1. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head guid-

ed for reciprocation relative to the support and sleeves, said head carrying a like number of glove positioning fingers in axial alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers movably mounted for reciprocation in and relative to said respective sleeves and operative to engage the thus positioned and inserted glove fingers and to shift and reverse the same relative to said respective sleeves upon movement of the plungers in the opposite direction, and means to shift said plungers in said opposite direction, including means coupling said plungers to said head for conjoint movement with said glove positioning fingers.

2. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head guided for reciprocation relative to the support and sleeves, said head carrying a like number of glove positioning fingers in axial alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers movably mounted for reciprocation in and relative to said respective sleeves and operative to engage the thus positioned and inserted glove fingers and to shift and reverse the same relative to said respective sleeves upon movement of the plungers in the opposite direction, and means to shift said plungers in said opposite direction, including means coupling said plungers to said head for conjoint movement with said glove positioning fingers, comprising a lost motion connection between said plungers and head.

3. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head guided for reciprocation relative to the support and sleeves, said head carrying a like number of glove positioning fingers in axial alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers movably mounted for reciprocation in and relative to said respective sleeves and operative to engage the thus positioned and inserted glove fingers and to shift and reverse the same relative to said respective sleeves upon movement of the plungers in the opposite direction, means connecting said plungers to said head for conjoint movement with said glove positioning fingers relative to the respective stripper sleeves, and spring means between the support and head to counterbalance the weight of the latter.

4. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head member guided for reciprocation relative to the support and sleeves, said head member carrying a like number of glove positioning fingers in alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers reciprocable in said respective sleeves and operative upon movement in the opposite direction to reverse the thus positioned and inserted glove fingers, means connecting said plungers to said head member for conjoint movement with said glove positioning fingers relative to the respective stripper sleeves, comprising a crosshead member operably connected to said plungers, and reversible actuating means connecting said head and crosshead members.

5. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head member guided for reciprocation relative to the support and sleeves, said head member carrying a like number of glove positioning fingers in alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers reciprocable in said respective sleeves and operative upon movement in the opposite direction to reverse the thus positioned and inserted glove fingers, means connecting said plungers to said head member for conjoint movement with said glove positioning fingers relative to the respective stripper sleeves, comprising a crosshead member operably connected to said plungers, and reversible actuating means connecting said head and crosshead members, an equalizing link connecting the head and crosshead members at a point between said actuating means and sleeves, and spring means disposed between the support and head member adjacent said link to counterbalance the weight of the head member.

6. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head guided for reciprocation relative to the support and sleeves, said head carrying a like number of glove positioning fingers in axial alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers movably disposed in said respective sleeves and operative to engage the thus positioned and inserted glove fingers and to shift and reverse the same relative to said respective sleeves upon movement of the plungers in the opposite direction, and means connecting said plungers to said head for conjoint movement with said glove positioning fingers relative to the respective stripper sleeves, said connecting means including means enabling relative movement of said positioning fingers and plungers during a stroke thereof.

7. In a glove turning apparatus, a support having a plurality of tubular stripper sleeves thereon corresponding in number to the glove fingers to be turned, a reciprocating head guided for reciprocation relative to the support and sleeves, said head carrying a plurality of glove positioning fingers in axial alignment with the respective sleeves and each adapted to telescope substantially in one thereof on a stroke of the head in one direction, thereby to insert into the respective sleeves glove fingers initially positioned on the fingers, a like number of plungers movably disposed in said respective sleeves and op-

erative to engage the thus positioned and inserted glove fingers and to shift and reverse the same relative to said respective sleeves upon movement of the plungers in the opposite direction, means connecting said plungers to said head for conjoint movement with said glove positioning fingers relative to the respective stripper sleeves, and spring means between the base and head to counterbalance the weight of the latter, said connecting means including means enabling relative movement of said positioning fingers and plungers during a stroke thereof.

JOSEPH KELLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
748,463	Ayres	Dec. 29, 1903
1,735,688	Lowry	Nov. 12, 1929
2,427,933	Summers	Sept. 23, 1947

FOREIGN PATENTS

Number	Country	Date
252,892	Great Britain	June 10, 1926