Nov. 28, 1961 R. C. PARRISH 3,010,622

METHOD AND MEANS FOR FORMING HEAVY GLOVES

Original Filed Oct. 1, 1958 2 Sheets-Sheet 1

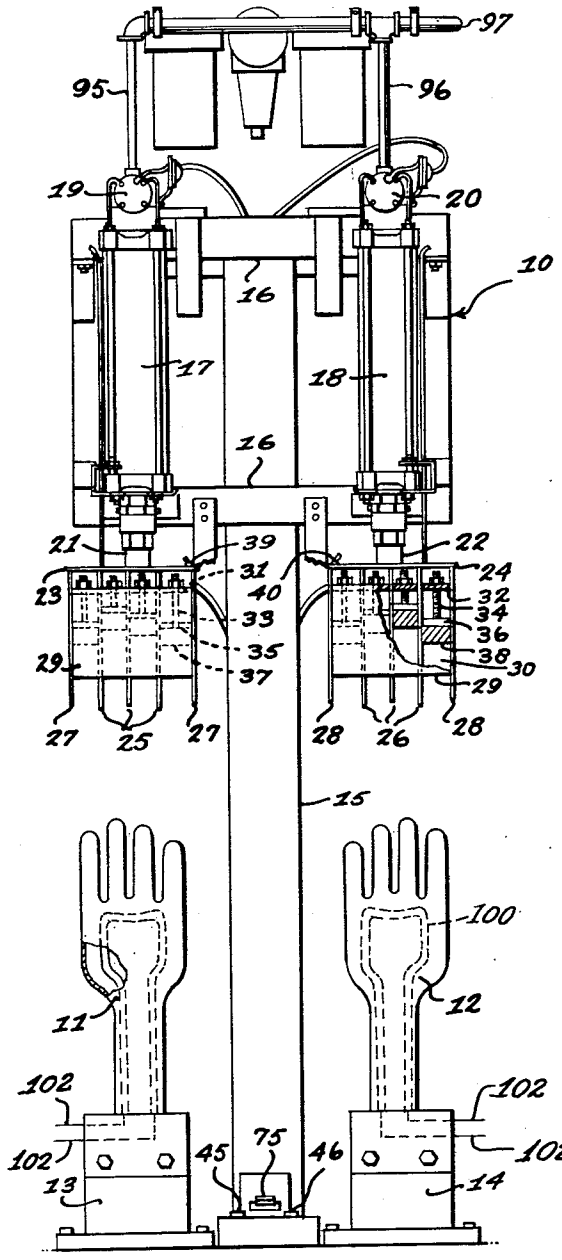


Fig. 1

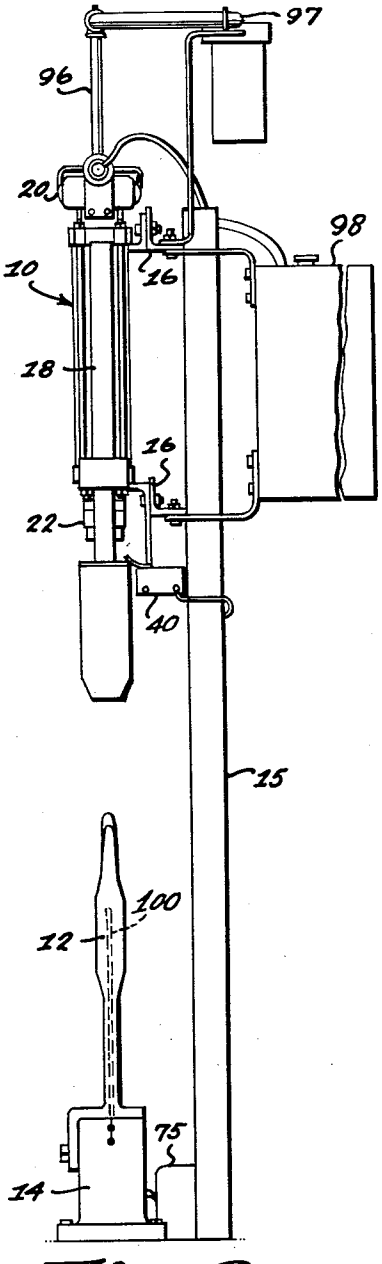


Fig. 2

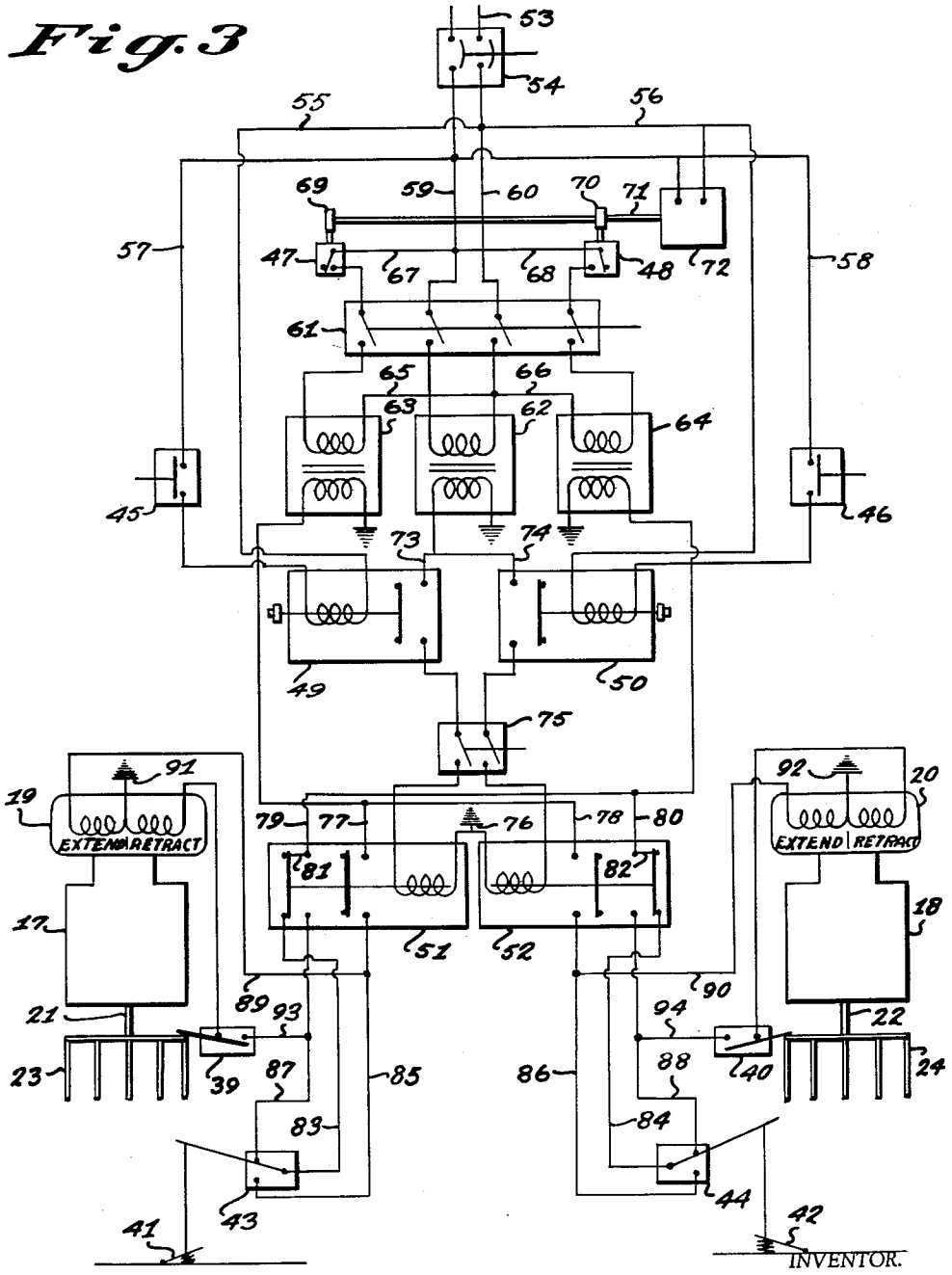
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Fig. 3



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METHOD AND MEANS FOR FORMING HEAVY GLOVES

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Original application Oct. 1, 1958, Ser. No. 764,545. Divided and this application July 1, 1960, Ser. No. 40,432
2 Claims. (Cl. 223—78)

This invention relates to the forming or shaping of gloves during the finishing treatment thereof in the course of glove manufacture, and more particularly to an improved forming treatment of relatively heavy gloves and to means for carrying out this treatment advantageously. This is a division of copending application Serial No. 764,545, filed October 1, 1958.

Following the sewing of glove blanks to form a glove structure, the resulting glove structure is normally disposed inside-out and is customarily turned to expose the right side and then shaped on a heated glove form. The shaping of the gloves on this form is a finishing treatment employed to round out or set the glove seams after the reversal thereof upon turning of the glove structure, and serves generally to smooth out the glove body and fingers in proper form.

In the manufacture of relatively heavy gloves, such as are formed from treated fabrics or leather or the like, adequate forming of the turned gloves is rendered more difficult by the heavier seams required in such gloves, which do not round out readily on reversal so that more than usual attention must be given to the smoothing and proper shaping of the turned glove structure, and this smoothing and shaping by the same token becomes more necessary in order to obtain a satisfactory appearance and feel in the finished glove.

The method and means provided by the present invention makes it possible to deal effectively and efficiently with this forming difficulty. Briefly described, the present invention is characterized by the use of means in combination with a glove form for pressing a glove on the form at the finger crotches, and simultaneously at the finger tips, to tension the glove fingers and set the finger seams effectively both inside and out. The present invention also contemplates the use of a pulsating pressure cycle by which the finger pressing means is caused to work on the glove fingers, over a timed or otherwise selected period, with repeated relief and reapplication of the pressure to enhance further the forming action obtained.

These and other features of the present invention are described in further detail below in connection with the accompanying drawings, in which:

FIG. 1 is a front elevation of glove forming means arranged in accordance with the present invention;

FIG. 2 is a side elevation corresponding to FIG. 1; and

FIG. 3 is a wiring diagram illustrating the operating control system for the forming means shown in FIGS. 1 and 2.

The illustrated embodiment of the glove forming means of the present invention is indicated generally in FIGS. 1 and 2 by the reference numeral **10**, and is shown arranged in relation to a pair of stationary glove forms **11** and **12**. The glove forms **11** and **12** are of the conventional type employed in the finishing treatment of gloves, particularly relatively heavy gloves for which the forming means **10** is especially adapted; the forms **11** and **12** being electrically heated for applying heat interiorly to a glove placed thereon for shaping and setting the glove structure, and being fixed in any convenient manner on a suitable base as indicated at **13** and **14** to provide for simultaneous forming treatment of a glove pair.

The forming means **10** may in turn be conveniently

disposed in relation to the glove forms **11** and **12** on a suitable framing support **15** standing uprightly from the same surface on which the forms **11** and **12** are mounted, and fitted with spaced cross arms **16** adjacent its upper end on which air motors **17** and **18** are carried in respective vertical alignment with the forms **11** and **12**. The air motors **17** and **18** comprise double-acting air cylinders actuated through electrically controlled air valves at **19** and **20** to extend and retract piston rods **21** and **22** having forming heads **23** and **24** mounted at the extending ends thereof.

These forming heads **23** and **24** are arranged to act on gloves carried by the forms **11** and **12** to enhance the forming disposition thereof according to the present invention, and for this purpose incorporate sets of flat prong elements **25** and **26** spaced sidewise in parallel relation for extension lengthwise between the respective finger portions of forms **11** and **12** toward the hand portions thereof. The prong elements **25** and **26** are shaped to bear, when so extended, at the finger crotches of gloves carried by the forms **11** and **12** in the same manner and for the same purpose as disclosed and claimed in copending application Serial No. 764,544, filed October 1, 1958, namely, to tension the glove fingers from the tips of the forms **11** and **12** and thereby dispose the gloves to excellent advantage during forming treatment.

In addition, the forming means **10** of the present invention further acts directly on the glove finger tips, and further provides for applying a pulsating or vibrating forming action at both the finger crotches and finger tips which improves substantially the forming result obtained with the relatively heavy gloves that the present invention is intended particularly to handle.

In order to effect the above noted additional forming action at the glove finger tips, the forming heads **23** and **24** have end plates **27** and **28** spaced at each side of the sets of prong elements **25** and **26**; side plates **29** and **30** extending across the respective prong elements **25** and **26**, and end plates **27** and **28**, to fix the spacing thereof; and anchor plates **31** and **32** fixed adjacent the upper edges of the side plates **29** and **30**, and between the prong elements **25** and **26** and end plates **27** and **28**, to carry adjusting screws **33** and **34** for tip plates **35** and **36** on which hard sponge rubber pads **37** and **38** are secured to apply a cushioned blow at the finger portion tips of glove forms **11** and **12**.

The operating control system for the above described forming means **10** is illustrated diagrammatically in FIG. 3, in which it will be seen that lever switches **39** and **40** (compare FIGS. 1 and 2) are disposed in relation to the forming heads **23** and **24** to be opened thereby at retracted position; foot pedals **41** and **42** are provided to operate double throw switches **43** and **44** that initiate extension of the forming heads **23** and **24** as explained further below; and starting push buttons **45** and **46** are arranged to commerce the previously mentioned pulsating forming action when desired. Also, double throw limit switches **47** and **48**, time delay relays **49** and **50**, and low voltage relays **51** and **52** are provided in relation to each of the forming heads **23** and **24**.

The operating control system is connected to a line circuit **53** through a circuit breaker switch at **54**. Beyond the line switch **54**, parallel circuit legs **55** and **56** run to one side of the respective energizing coils of the time delay relays **49** and **50**, while further parallel circuit legs **57** and **58** run to the other side thereof through the starting push buttons **45** and **46**. The line circuit **53** is additionally connected at **59** and **60** through two poles of a four-pole safety switch **61** to a step-down transformer **62**. Further step-down transformers **63** and **64** are connected from the line circuit **53** in parallel through circuit legs **65** and **66**,

and 67 and 68, the latter of which run through the respective double throw limit switches 47 and 48 and through respective poles of the four-pole safety switch 61.

The double throw limit switches 47 and 48 are actuated by cams 69 and 70 arranged on a shaft 71 for rotation by a gear motor 72 which may be of about ⅙ H.P. size, and which is connected across the line circuit 53 beyond switch 54 for operation. When line switch 54 is closed to operate the gear motor 72, the result of this arrangement is to oscillate the limit switches 47 and 48 oppositely between open and closed position; and when safety switch 61 is closed, the result is further to open and close alternately the respective circuit connections to the step-down transformers 63 and 64 so as to induce currents alternately at the secondaries thereof.

The secondaries of all of the step-down transformers 62, 63 and 64 are grounded at one side. The other side of the secondary of transformer 62, to which line current is supplied steadily, is connected in parallel at 73 and 74 through normally open poles of the time delay relays 49 and 50, and through a two-pole toggle switch 75, to the respective energizing coils of low voltage relays 51 and 52 which have a common ground connection at 76.

The other side of the secondaries of transformers 63 and 64 are each in turn connected in parallel at 77 and 78, and 79 and 80, to normally open poles of the low voltage relays 51 and 52; the normally open poles at 79 and 80 being bridged at 81 and 82 to the adjacent normally closed poles from which paired pole connections 83 and 84 run to the respective poles of foot pedal switches 43 and 44, while the paired normally open poles of each relay 51 and 52 have respective connections 85 and 86, and 87 and 88, running to the opposite contacts of foot pedal switches 43 and 44. The open pole connections 85 and 86 have branching legs 89 and 90 connected therefrom to one side of the energizing coils for the air motor valves 19 and 20, which are medially grounded at 91 and 92 and have the other sides thereof connected through the forming head limit switches 39 and 40 to branching legs 93 and 94 from the open pole connections 87 and 88.

The present invention includes means for heating the glove forms to facilitate forming of the gloves as the material of the gloves, especially heavy leather gloves, can be more easily worked when heated. In the embodiment illustrated the heating means comprises an electrical heating unit 100 mounted in the hollow interior of each form 11 and 12. The heating units 100 are Calrod units that have been shaped to the general outline of the palm and wrist portions of the form. Lead wires 102 connect these Calrod units 100 to a source of electrical power (not shown). In a present commercial application 230 volt capacity Calrod units are connected to 115 volt power supplies and the forms are thereby heated to a temperature of approximately 250° F.

The above described forming means 10 of the present invention is prepared for operation by connecting the electric heating units 100 of the glove forms 11 and 12 to heat these forms for use in the usual manner; turning on the air supply to the air motor valves 19 and 20, to which air lines are shown connected at 95 and 96 from a main supply line 97 fitted with the usual accessories therefor (see FIGS. 1 and 2); and closing the line switch 54 and safety switch 61, which may be located at a control equipment box 98 (see FIG. 2) mounted at the rear of the framing support 15.

Having readied the forming means 10 in this manner, a glove is placed on one of the forms such as 11, and the related foot pedal 41 is depressed to close a circuit through the branching leg 89 to the portion of the energizing coil for air motor valve 19 that actuates air motor 17 to extend forming head 23 to cause the prong elements 25 thereof, and the tip pads 37, to bear at the finger crotches of the glove on form 11, and simultaneously at the finger tip, to complete fully the forming disposition of the glove structure on the form 11. Upon extension of the forming head 23 in this manner, the related limit switch 39 is allowed to close which connects the branching circuit leg 93 to other retracting portion of the energizing coil for air motor valve 19 and permits raising and reapplication of the forming head 23 by releasing and then depressing again the foot pedal 41, in the event it appears such further manipulation is desirable for pressing the glove structure to the best advantage on the form 11. If, for any reason, it is desired to withdraw the forming head 23 fully at this time, it is only necessary to release entirely the foot pedal 41.

When the glove structure has been disposed as desired on the form 11 in the above noted manner, a pulsating or vibrating cycle for the forming head 23 can be commenced by momentarily closing the push button switch 45, which is preferably located between the glove forms 11 and 12 (along with the corresponding switch 46 for form 12) in convenient reach of an operator. The closing of push button switch 45 energizes the time delay relay 49 which will have been previously set for the desired duration of the pulsating cycle for forming head 23. When energized, the time delay relay acts to complete a circuit connection from the secondary of steady current transformer 62 to the energizing coil of low voltage relay 51, and thereby close the normally open poles of relay 51 to complete circuit connections in turn from the secondaries of the oscillating current transformers 63 and 64 to the opposite sides of the energizing coil of air motor valve 19.

Under these conditions, energizing current is supplied alternately by the transformers 63 and 64 to cause alternate energizing of the extending and retracting portions of air motor valve coil. As the forming head 23 will be extended when the pulsating cycle commences, the alternate impulse to the retracting portion of the air motor valve coil will take effect first to retract the forming head a short distance, whereupon the energizing impulse will change to the extending portion of the coil and the forming head 23 will be returned again to bear at the finger crotches and finger tips to the glove on form 11, while delivering a cushioned blow to the finger tips upon such return. This alternating retraction and reapplication of the forming head 23 will continue during the period timed by relays 49 and 50. The pulsating frequency and stroke of the forming head 23 during this period will be determined by the speed at which camshaft 71 is rotated by gear motor 72. If it is desired at any time to interrupt the pulsating cycle, this may be done by opening control switch 75, which may be located adjacent push button switches 45 and 46 for convenient access. Opening of control switch 75 will cause immediate withdrawal of forming head 23 to its retracted position.

If the pulsating cycle is not interrupted, it will be terminated automatically when time delay relay 49 returns to its normally open position so as to deenergize the low voltage relay 51 and selectively connect the retracting portion of the energizing coil of air motor valve 19 to retract fully the forming head 23, which will thereupon open switch 39 thereat and set the system for commencing a subsequent forming operation as soon as the glove just formed has been removed from the form 11 and replaced by another. The arrangement of the forming means 10 in relation to paired forms 11 and 12 makes it possible to place one glove of a pair on one of the forms 11 or 12 during the pulsating cycle for the other glove on the other form and thereby work the forms 11 and 12 alternately in a substantially continuous and particularly efficient and effective manner.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. The method of shaping gloves during the finishing treatment thereof in the course of glove manufacture, which method comprises placing a sewn glove on a finishing form therefor, heating said glove, and then pressing said glove on said form by pressure applied simultaneously at all the finger crotches and all finger tips of said glove.

2. The method defined in claim 1 and further characterized by the repeated relief and reapplication of said exterior pressure in a pulsating manner following the initial application thereof.

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