

June 24, 1952

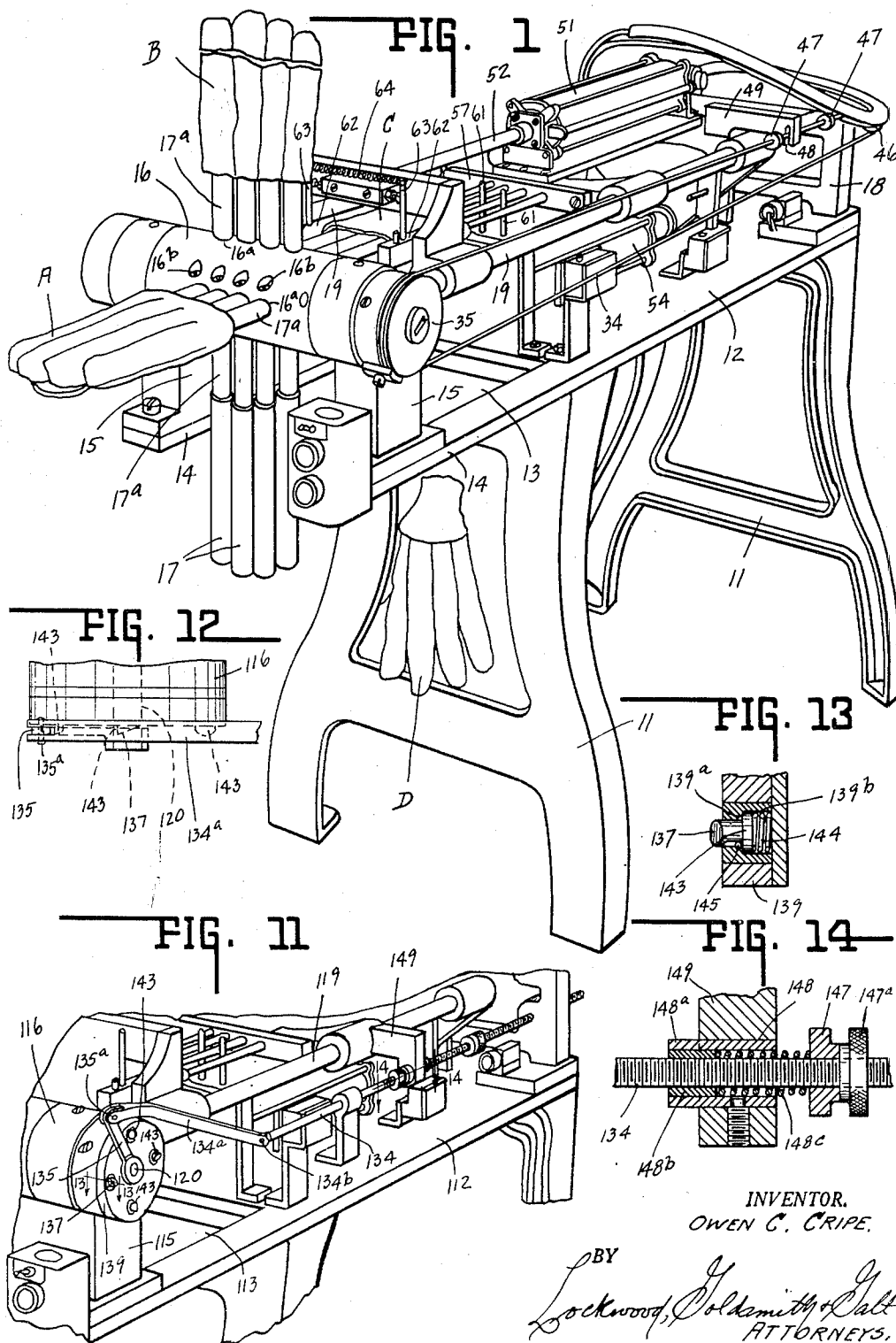
O. C. CRIPE

2,601,504

GLOVE TURNING MACHINE

Filed July 9, 1948

3 Sheets-Sheet 1



INVENTOR.
OWEN C. CRIPE.

BY
Lockwood, Goldsmith & Calt
ATTORNEYS.

June 24, 1952

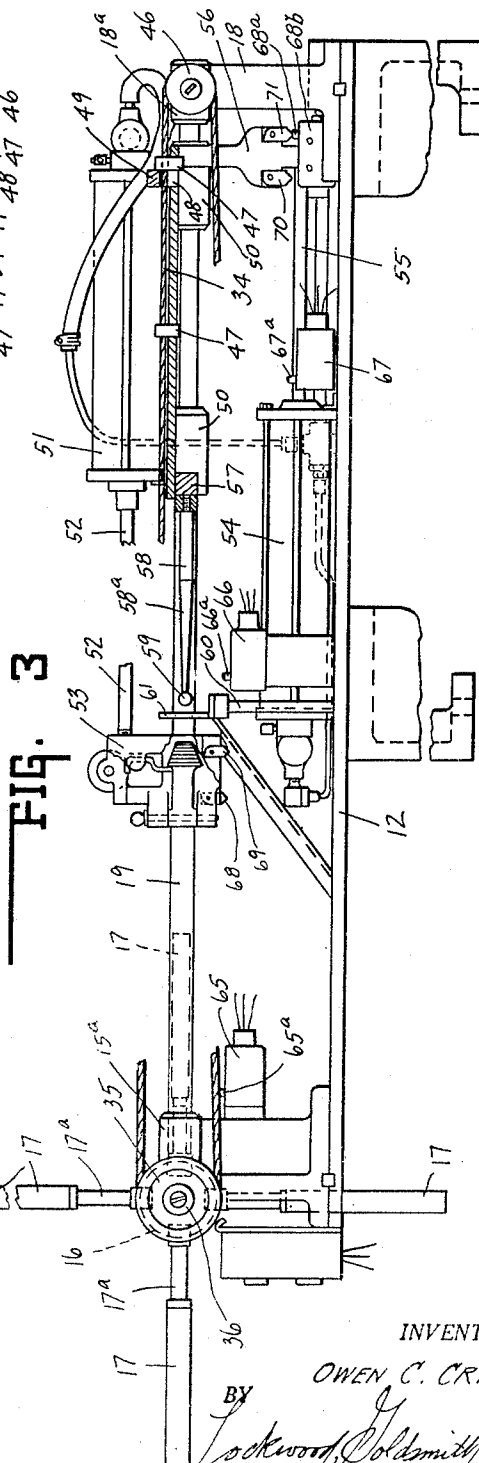
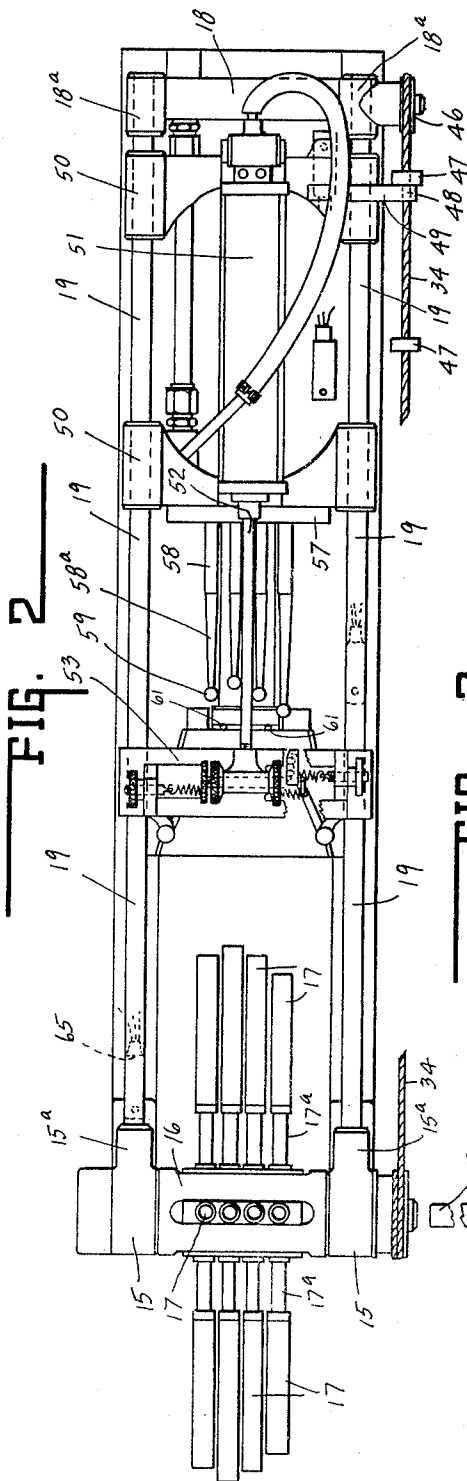
O. C. CRIPE

2,601,504

GLOVE TURNING MACHINE

Filed July 9, 1948

3 Sheets-Sheet 2



INVENTOR.

OWEN C. CRIPE.

BY

Lockwood, Coldsmith & Calt.
ATTORNEYS.

June 24, 1952

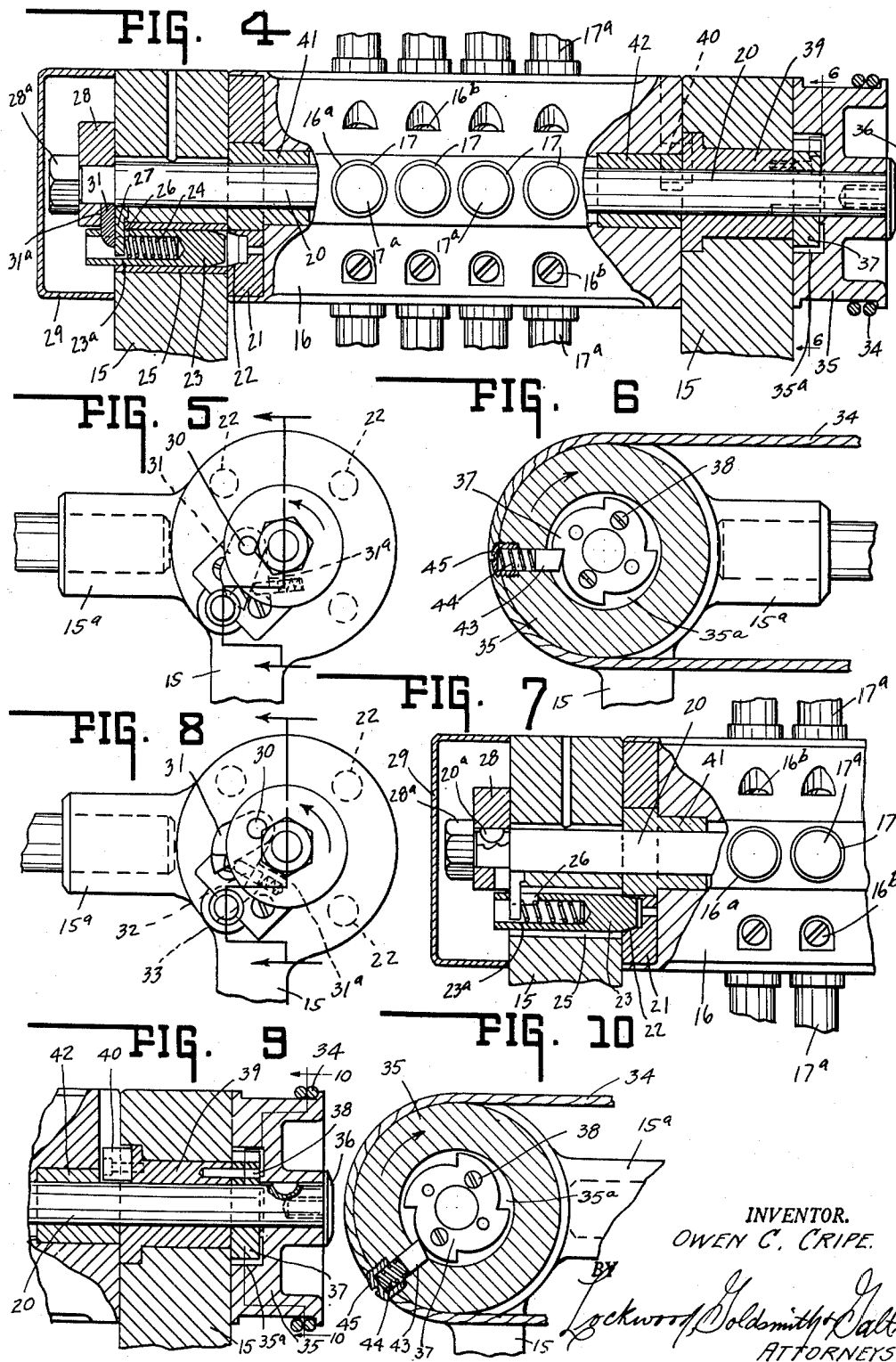
O. C. CRIPE

2,601,504

GLOVE TURNING MACHINE

Filed July 9, 1948

3 Sheets-Sheet 3



INVENTOR.
OWEN C. CRIPE.

BY *John W. Goldsmith & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,601,504

GLOVE TURNING MACHINE

Owen C. Cripe, Walton, Ind.

Application July 9, 1948, Serial No. 37,770

16 Claims. (Cl. 223-40)

1

This invention relates to a glove turning machine.

The chief object of this invention is to turn gloves more expeditiously and automatically by a cyclically operable machine of extremely simple character.

Another object of the invention is to provide a machine which may be supplied with gloves to be turned and after application, which may be manual, the gloves are automatically turned and then "stripped" or discharged from the machine.

In machines of this general type it heretofore has been the practice to provide an intermittently rotatable element with a plurality of units, each adapted to "take" a sewed glove at one station, automatically turn the sewed fingers inside out or to the normal position, depending upon whether the finger sewing is to be disposed inwardly or outwardly, and then remove the turned glove.

This practice is also herein adhered to.

The chief feature of the present invention resides in the simplification of such turning device.

Another feature of the invention resides in the hydraulic or pneumatic type of power employed and its control, the former being utilized with water, oil or the like, and the latter being utilized with compressed air or the like.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Fig. 1 is a perspective view of one embodiment of the invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a side elevation of the same.

Fig. 4 is an elevation view of the drum unit, the intermittently rotatable support for the same, the support for that support and the power application thereto, parts being broken away to show the same and other parts in section, the parts being shown in the dwell position with lock pin disengaged.

Fig. 5 is a side elevation of the parts shown in the left hand portion of Fig. 4.

Fig. 6 is a sectional view of the parts shown in the right hand portion of Fig. 4 taken on line 6-6 of Fig. 4 in the direction of the arrows.

Fig. 7 is a view similar to the left hand portion of Fig. 4 with parts in another and locked position corresponding to the glove turning period.

Fig. 8 is a view similar to Fig. 5 and shows the parts in glove turning period position.

Fig. 9 is a view similar to the right hand

2

portion of Fig. 4 with the parts in another position.

Fig. 10 is a view similar to Fig. 6 taken on the line 10-10 of Fig. 9 in the direction of the arrows showing the parts in glove turning period position.

Fig. 11 is a perspective view of a portion of a modified form of the invention, the modification being directed more particularly to the power for indexing the finger drum.

Fig. 12 is a plan view of a portion of a modified form of the invention on a slightly larger scale than Fig. 11, and more particularly of the driving end of said drum and its actuator.

Fig. 13 is a central sectional view of one of the indexing pins taken on line 13-13 of Fig. 11 in the direction of the arrows.

Fig. 14 is a central sectional view of the power cushioning mechanism taken on line 14-14 of Fig. 11 in the direction of the arrows.

In the drawings there is illustrated an embodiment of the invention selected for exemplification thereof. In Fig. 1, 11 indicates conventional leg structures that at the upper ends are suitably secured to the bed or base plate 12.

The latter at one end is notched out as indicated 13. Adjacent thereto and at the ends 14 of said plate are the uprights or brackets 15 which rotatably support a drum structure indicated generally by numeral 16 in Fig. 1.

Projecting radially therefrom are the finger groups, herein four in number, disposed at 90 degrees. Each group or unit comprises four finger tubes designated generally by the numeral 17. These tubes in drum rotation clear the base 12 by reason of notch 13 being provided therein.

At the opposite end of the machine base 11 supports bracket 18. Brackets 15 and brackets 18 have inwardly directed aligned sockets 15a and 18a, see Fig. 2, and disposed therein are the guide and connecting members 19.

Reference will now be had to the left hand portions of Figs. 1 to 3 and Figs. 4 to 10, inclusive. As shown in the first mentioned figures the finger drum is socketed at 16a to take stems 17a having threaded connection with tubes 17. Each stem is locked to the drum as at 16b.

In Fig. 4 it will be observed that there is rotatably mounted in the brackets 15 a shaft 20 and that said shaft projects through the two brackets. Between the brackets said shaft mounts the drum 16 aforesaid. This drum includes a plate 21 that is provided with four quadrant disposed openings 22 successively engaged by a locking pin or plunger 23 normally con-

strained to locking position by the spring 24, the spring herein being nested in bore 23a of said pin and the pin in turn being slidably mounted in the bushing 25. The pin is longitudinally slotted as at 26 and disposed in said slot is the spring retainer 27. The locking pin is only capable of reciprocation toward and away from the drum.

The end of the shaft 20 has secured thereto a member 28 by means of nut 28a. The mechanism associated therewith may be enveloped by a detachable cover cap 29 if desired. Note that in Fig. 4 the locking pin is shown retracted. Fig. 7 shows the locking pin projected and disposed in locking relation which holds the drum stationary during glove or finger turning operation hereinafter to be described.

As shown the member 28 is keyed at 20a to shaft 20. The shaft 20 has oscillatory movement only. The member 28 pivotally supports at 30 a member 31 which in effect is a cam and lock. Member 28 is cut away at 31a to accommodate this cam pawl. Plunger 32 is slidably supported by member 28 and is constrained by spring 33 to the position shown in Fig. 8. In the oscillation of said shaft 20 this pawl is effective upon plunger 23 to retract it and hold it retracted for an appreciable angular movement. When the shaft 20 reverses, the pawl accordingly is held out of locking engagement with the drum 16 so that the drum may be indexed a quarter turn at which time the pawl hold out arrangement is slidably disassociated so that the plunger, under the influence of its spring 24, moves toward the drum and engages in one of the sockets or seats 22 then registering therewith. This holds the drum stationary while the glove or finger turning operation is effected.

Reference will now be had more particularly to Figs. 4, 6, 7, 9 and 10 wherein the means for oscillating the shaft and the means for intermittently and step-by-step rotating the drum is effected. A cable 34, which may be of wire, is wound about a pulley 35 which pulley is mounted on said shaft 20 and clamped thereto at 36. This cable oscillates this pulley. The pulley or power drum is recessed as at 35a forming a chamber wherein there is disposed a ratchet 37 that is rotatably mounted upon the shaft 20 and is rigidly secured as at 38 to a sleeve 39 disposed about shaft 20 and is rotatable in the right end bracket 15. A key 40 locks the sleeve 39 to the drum 16 so that the drum moves with the ratchet and the sleeve 39. The drum as shown at 41 and 42 includes bushings that rotatably support it upon the shaft 20. The cable drum 35 mounts a pawl 43 which herein is shown adapted for radial reciprocation being normally constrained toward the ratchet by the spring 44 retained as at 45, see Figs. 6 and 10.

Fig. 6 shows the parts at the end of the indexing travel of the finger drum. Fig. 10 shows the parts in the reverse rotation of shaft 20 and the ratcheting of the pawl. When the pawl 43 has been rotated, see Fig. 10, to the six o'clock position, the pawl advances inwardly and engages the adjacent tooth face of the ratchet and upon the reverse cable travel, the ratchet and finger drum are advanced ninety degrees whereupon the plunger 23 seats in one of the drum sockets 22. Upon the movement of the parts aforesaid corresponding to drum 35 moving from Fig. 6 toward Fig. 10, it will be obvious that the drum 16 and ratchet 37 remain stationary. At the proper time the plunger 23 is retracted to release the finger drum 16 so that it may be advanced or

indexed ninety degrees by ratchet rotation. When the end of that travel is obtained the plunger 23 is released from its withdrawing force and again locks the finger drum 16 in indexed position.

Reference will now be had more particularly to Figs. 1 to 3 inclusive. The cable 34, see the right-hand end of the several fingers, is also mounted upon a pulley 46 carried by the bracket 18. The cable 34 also is provided with two adjustably mounted stop blocks or abutments 47. The cable 34 is slidable in a slot or opening 48 in a bracket or arm member 49 which is reciprocable toward and away from the drums. When the arm is moved to the left it leaves the right hand block 47 and travels toward the left hand block without effecting any cable movement. It then picks up the left hand block and causes the upper run of the cable to move toward the left and thus causes the drum to rotate in a counterclockwise direction.

When the arm 49 is moved toward the position shown in Fig. 2 it initially leaves the left hand block 47 and travels toward the right hand block until it engages same. During this interval of arm travel no rotation of the cable drum is effected. Thereafter the arm 49 intercepts the right hand block 47 and moves both blocks and the cable to the right to the position shown in Figs. 2 and 3. This causes clockwise rotation of the drum 35 and this clockwise rotation of the drum corresponds to the indexing travel of the finger drum 16. In other words, when the arm 49 is moved toward the drums there is effected the ratcheting aforesaid. This ratcheting effects plunger pin withdrawal into the drum and seating of the pin in the drum and all, obviously, in timed relation to the operation just described.

Slidably mounted upon guides 19 is the overhead carriage 50 which includes cylinder 51. Disposed in same is a piston (not shown) connected to rod 52. This carries a stripper mechanism designated generally by numeral 53. Same also slides on guides 19.

Disposed below the plane of the guides is cylinder 54. A piston (not shown) therein is connected to rod 55. The two rods are oppositely directed and the exposed end of rod 55 is connected to arm 56 depending from the carriage 50.

Pressure fluid is alternately supplied to opposite ends of the cylinders and in timed relation. Thus pressure fluid supplied to the right hand end of cylinder 54 causes the piston therein, rod 55 and carriage 50 to advance toward the two drums. Pressure fluid applied to the right end of cylinder 51 then projects rod 52 towards the drums.

Pressure fluid supplied to the opposite ends of these cylinders projects rod 55 and retracts rod 52. The operation is in timed relation and sequential. In place of fluid pressure for one way power application a spring may be employed. Such spring is compressed by fluid pressure in the initial travel of the piston and upon pressure fluid release, the compressed spring returns the piston to starting position.

Limit switches are provided to control solenoid operable valves to effect pressure fluid supply and/or pressure fluid release. These valves are or may be arranged to waste the cylinder trapped fluid in reverse piston travel. Also each pressure fluid supply and/or waste line may include a manually adjustable valve to regulate the travel speed of the several rods and associated parts.

Herein carriage 50 mounts a transverse sup-

port 57 to which is adjustably secured in spaced relation the members 58 which project toward the finger drum 16. These members or plungers are tapered as shown at 58a and terminate in ball ends 59.

With the finger drum 16 stationary and a glove disposed upon tubes 17 the advance of balls 59 into the ends of the tubes serves to draw the glove fingers upon the portions 58a while in the tubes until each of the tube enclosed glove fingers is turned inside out. At this time the stripper mechanism 53 is further advanced and the glove passes through the same. Then the stripper is retracted to remove the glove from the tubes 17. Also the members 58-59 are retracted.

The freed glove then drops from the machine as shown at D in Fig. 1. A indicates the glove as initially applied to same. B indicates an advanced position thereof while C indicates the finger turning position.

Since finger drum 16 is only indexed when the upper run of the cable is moved toward the right in Figs. 1 to 3 it will be obvious that this action only occurs when carriage 50 is retracted to the right, see same figures, by projection of rod 55, the locking pin 23 being previously retracted from a seat 22 as previously described.

There is provided a stationary support 60 carrying upwardly extending members 61 which are disposed between the four fingers for facilitating glove discharge. The stripper mechanism 53 comprises two opposed members 62 with upwardly directed support 63 and these are yieldingly contracted toward each other by means of a common tension spring 64. At the left end of the machine is a travel limit stop and quick action switch designated generally by the numeral 65. This switch is provided with a button 65a which is engageable by actuator 68 carried by the stripper mechanism, when that mechanism is projected to its extreme left-hand position. Under such circumstances the switch energizes a solenoid control valve. There is also provided a stationary switch structure 66 with button 66a which is engaged by member 69 in the travel of the carriage 50 and stripper 53 and that switch in turn controls the circuit to a solenoid in turn controlling a valve.

Then there is an additional control 67 having a button 67a that is engaged when the contactor 70 reaches the extent of its forward travel. There is also a switch 68b having a button 68a engaged by contactor 71 when the piston rod 55 is fully projected or when the carriage 50 is fully projected to the right.

The sequence of the operation is as follows: Fluid pressure is applied to cylinder 54 to advance the carriage 50 to the left. This moves both stripper and fingers 58 to the left. When the piston rod 55 is sufficiently retracted switch 67 is actuated to supply pressure fluid to the right end of cylinder 51. This causes piston rod 52 to be projected and this projection occurs to the extent determined until the stripper 53 (member 68) actuates the switch 65. When this switch is actuated, pressure fluid is reversely applied to cylinder 51 to retract the stripper with respect to cylinder 51. When this has been effected the cam 69 is arranged to trip a switch, close a circuit controlling the supply of pressure fluid to the other end of the cylinder 54 to project its rod 55 and at the same time retract the carriage 50, cylinder 51 and stripper 53. This is continued until the cam 71 actuates the switch 68b to cut

off the pressure supply and recondition the application of pressure to the other end of the cylinder 54. Whereupon the cycle is repeated.

In this reciprocatory travel of the carriage 50 the arm 49 has been moved to and fro as previously described to effect in timed relation the unlocking of the finger drum 16 and the indexing thereof occurs, to wit, station to station, step by step rotation as previously described.

In Figs. 11 to 14 there is illustrated a modified form of the invention, same relating more particularly to the finger drum power and indexing mechanism. Herein generally numerals of the one hundred series designate parts like or similar to those previously described and designated by numerals of the primary series.

For example in Fig. 11, 116 indicates the finger drum rotatably mounted on shaft 120. Herein shaft 120 mounts arm 135 pivotally connected at 135a to link 134a pivotally connected at 134b to actuating rod 134. The exposed end of sleeve 139 herein may include the internal pawl and ratchet connection but herein same is unnecessary. In the sleeve pockets 139b, closed by the retainers 139a, there is the headed pin 143 normally constrained outwardly by spring 144. Key 145 prevents pin rotation. The exposed end of pin 143 is beveled as at 137.

There are as many pins as there are stations for the drum. In link advance to the left, see Fig. 12, the arm 135 rotates counter clockwise, see Fig. 11, and engages face 137 of the uppermost pin 143 and forces same inwardly until the arm has passed the pin whereupon the pin, due to spring 144, pops out. Upon reverse rotation of arm 135 same engages that pin and picks it up and the drum 116 for drum indexing.

Note that the drum is held stationary as before during the counter clockwise rotation of the arm, and in the clockwise rotation thereof the drum lock is initially released and held released until the drum has been indexed whereupon the drum lock is reestablished, all as previously described and incident to oscillation of shaft 120.

The means for reciprocating rod 134 includes arm or bracket 149 carried by the upper carriage slidable on guides 119. This bracket, see Fig. 14, has a hole 148. The rod 134 slides through this hole. The rod may be suitably supported in guide brackets as shown. The rod carries stops 147 which are threaded upon the rod and locked by nut 147a.

Thus the rod 134 is alternately picked by arm 149 and reciprocated. As before there is a dwell period determined by the spacing between stops 147. To cushion the index stroke and rod pickup there is provided, see Fig. 14, a sleeve 148a in hole 148. Sleeve 148b is hardened and is carried by sleeve 148a and is rigid with cushion spring 148c.

The operation of this form of the invention is substantially that previously described except rod 134 is substituted for cable 34 and the immediate associated parts are modified as illustrated and last described.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a glove and like turning machine the combination of a step-by-step intermittently unidirectionally rotatable drum, a plurality of finger units supported thereby and projecting therefrom, an oscillatory shaft, a unidirectional clutch interposed between shaft and drum, a movable drum lock normally constrained to drum locking position, and shaft operable means disposed adjacent the lock for withdrawing same from locking position while the drum is clutch driven.

2. A machine as defined by claim 1 wherein the lock is a spring urged bolt and the shaft operable means comprises an oscillatory element and a tiltable member carried thereby and operatively associated with said bolt.

3. A machine as defined by claim 1 wherein there is provided a cable drum upon said shaft, and an endless cable is wrapped thereon, and reciprocatory power means for reciprocating the cable to and fro.

4. In a glove turning machine having a step-by-step rotatable drum, a support reciprocatory toward and away from said drum, a plurality of finger plunger members and a plurality of finger tube members having partial telescopic association for glove finger turning, the drum supporting one type of members and the reciprocatory support the other type, the combination therewith of reciprocatory power means reciprocating said support in timed relation to drum rotation, control means for said power means, a stripper movable with said support, additional power means for reciprocating the stripper relative to the support, and control means for said additional power means, the latter being coordinated with the first mentioned control means.

5. A glove turning machine as defined by claim 4 wherein each power means is of fluid pressure operable type and each control means is of valve type.

6. A glove turning machine as defined by claim 5 wherein each valve type control means is of solenoid operable type, and travel limit operable switch means controls the solenoids.

7. In a glove turning machine having a step-by-step rotatable drum, a support reciprocatory toward and away from said drum, a plurality of finger plunger members and a plurality of finger tube members having partial telescopic association for glove finger turning, the drum supporting one type of members and the reciprocatory support the other type, the combination therewith of reciprocatory power means reciprocating said support in timed relation to drum rotation, control means for said power means, the said power means being of fluid pressure operable cylinder and piston type.

8. A glove turning machine as defined by claim 7 wherein the control means for the power means is of travel limit controlled valve type.

9. A glove turning machine as defined by claim 8 wherein the travel limit controlled valve is of solenoid operable type controlled by a travel limit operable switch.

10. In a glove turning machine having a step-by-step rotatable drum, a support reciprocatory toward and away from said drum, a plurality of finger plunger members and a plurality of finger tube members having partial telescopic association for glove finger turning, the drum supporting one type of members and the reciprocatory support the other type, the combination therewith of reciprocatory power means reciprocating said support in timed relation to drum rotation, control means for said power means, a stripper movable with said support, additional power means for reciprocating the stripper relative to the support, and control means for said additional power means, the latter being coordinated with the first mentioned means, each of the power means being of fluid pressure operable cylinder and piston type, the rods thereof projecting beyond the cylinders and in opposite directions.

11. A glove turning machine as defined by claim 10 wherein the control means for the power means is of travel limit controlled valve type.

12. A glove turning machine as defined by claim 11 wherein the travel limit controlled valve is of solenoid operable type controlled by a travel limit operable switch.

13. A machine as defined by claim 1 wherein the clutch is of oscillatory arm and multiple cam and lock pin type.

14. A machine as defined by claim 1 wherein there is provided a cam pin plate rotatable upon said shaft and operatively connected to the step-by-step rotatable drum, a lever arm upon the shaft, a link connected to said arm, and reciprocatory power means for oscillating said arm to and fro.

15. A machine as defined by claim 14 wherein spaced stops are provided upon a rod connected to said link, said stops being alternately engageable by the reciprocatory power means.

16. A machine as defined by claim 15 wherein cushion means is provided for cushioning contact between said power means and at least one of the stops.

OWEN C. CRIPE.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
978,434	Crosby	Dec. 13, 1910
1,348,077	Baum	July 27, 1920
1,668,397	Dersom	May 1, 1928
2,426,698	Leach	Sept. 2, 1947
2,434,816	Suftko	Jan. 20, 1948