

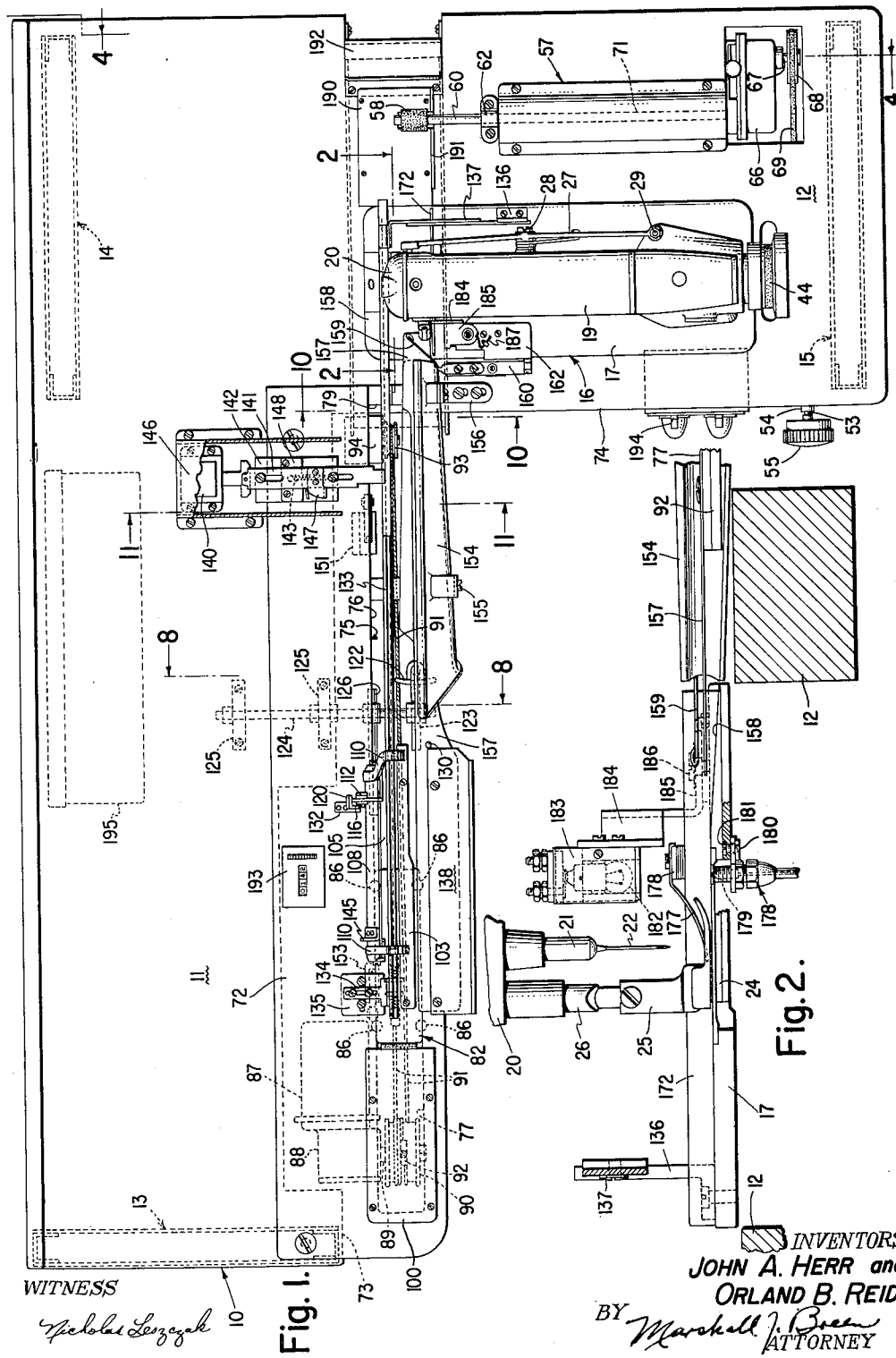
May 14, 1963

J. A. HERR ETAL
AUTOMATIC SEWING MACHINES

3,089,441

Filed Dec. 9, 1960

7 Sheets-Sheet 1



WITNESS

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Fig. 1.

Fig. 2.

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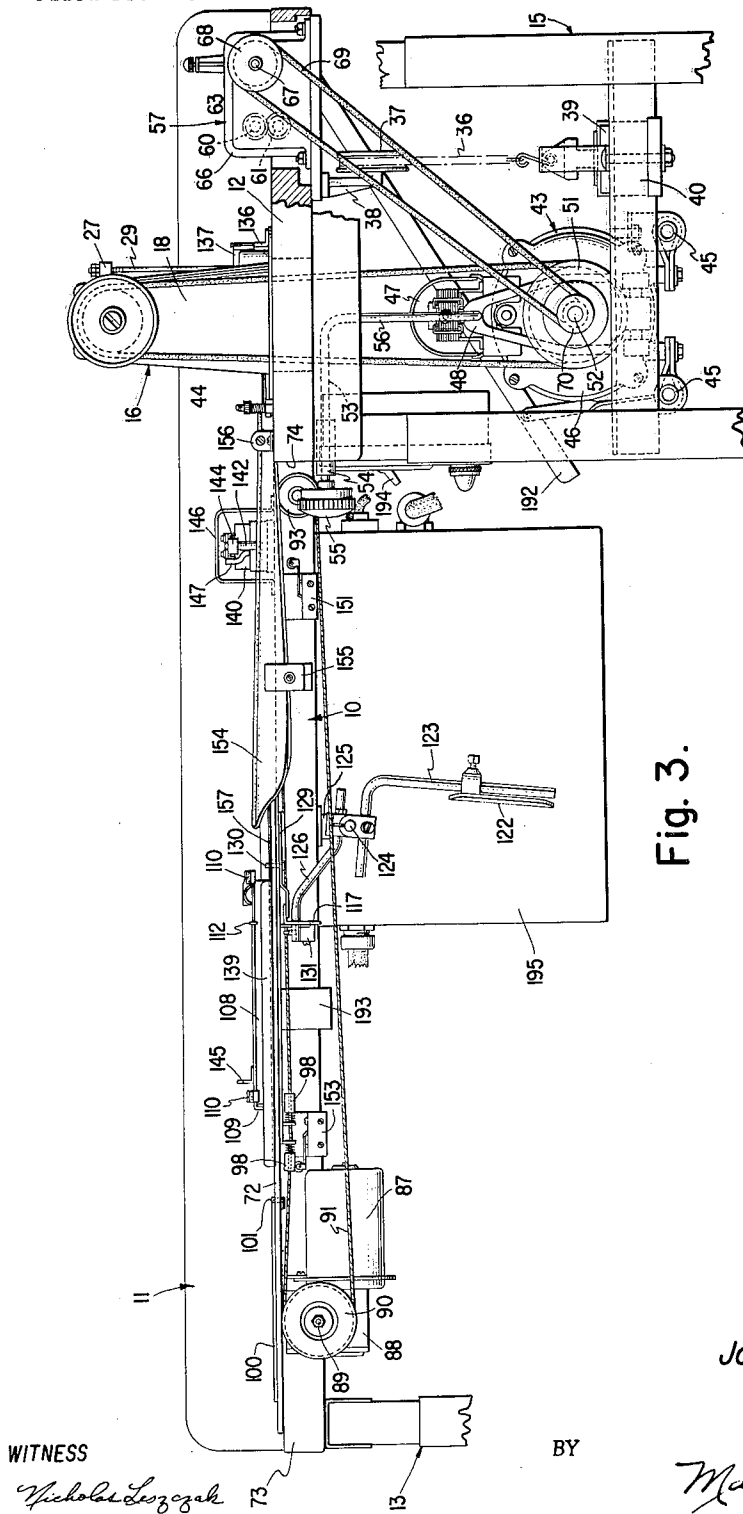
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AUTOMATIC SEWING MACHINES

Filed Dec. 9, 1960

7 Sheets-Sheet 2



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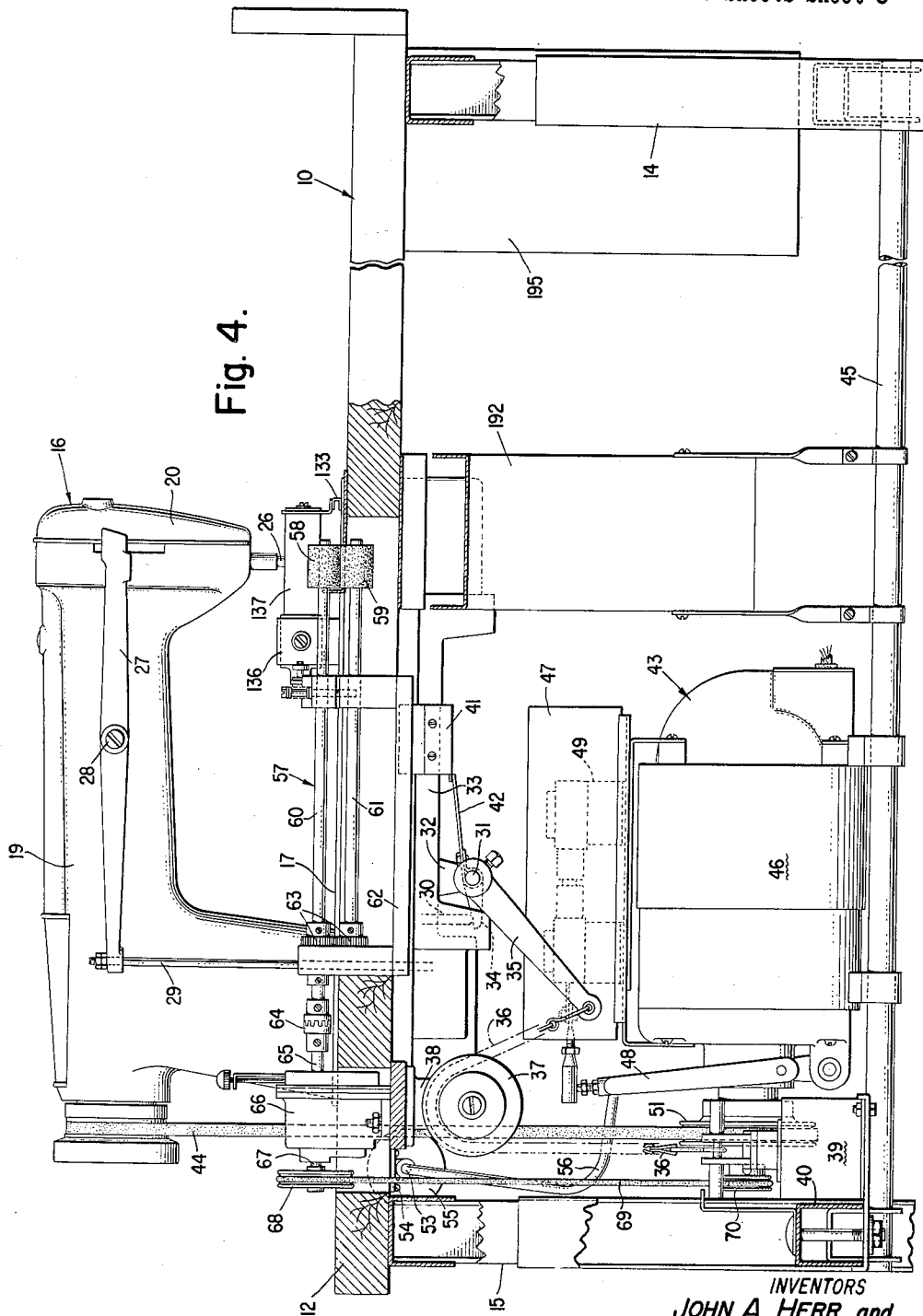
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AUTOMATIC SEWING MACHINES

Filed Dec. 9. 1960

7 Sheets-Sheet 3



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3,089,441

AUTOMATIC SEWING MACHINES

Filed Dec. 9, 1960

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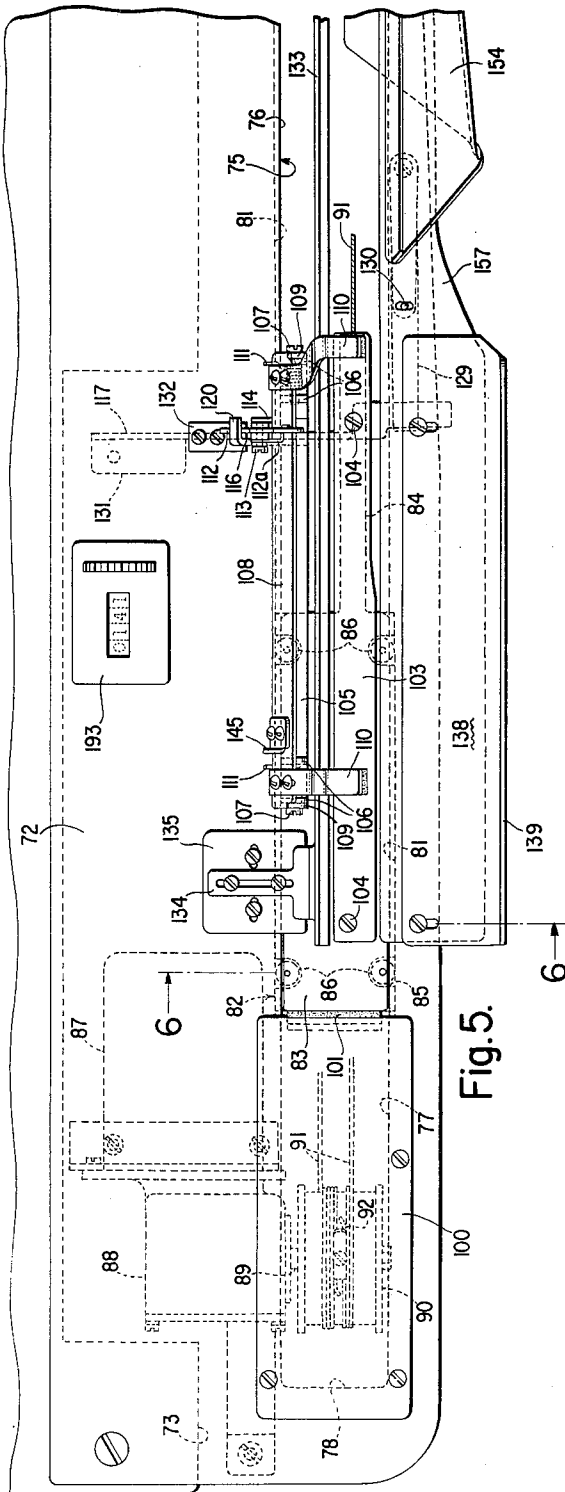


Fig. 5.

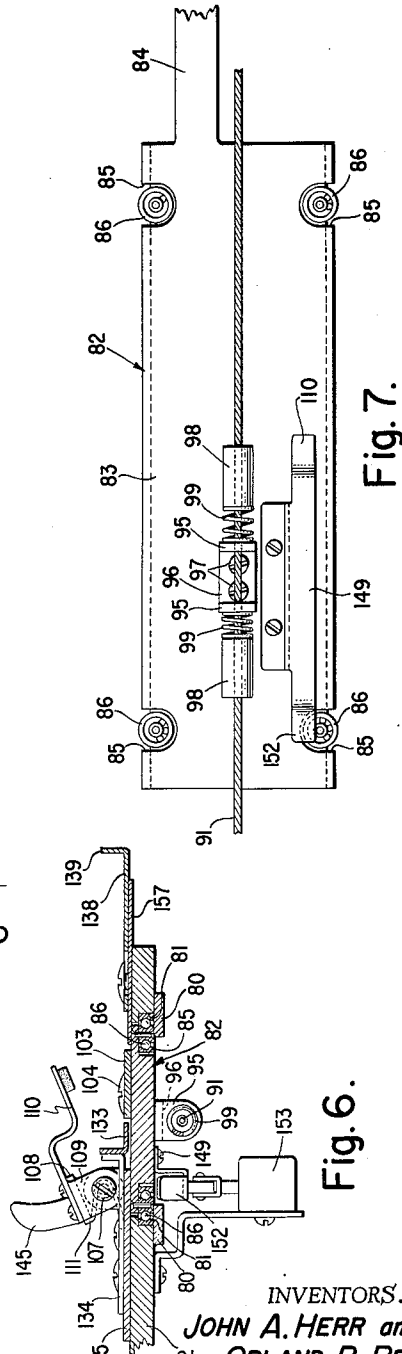


Fig. 7.

Fig. 6.

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3,089,441

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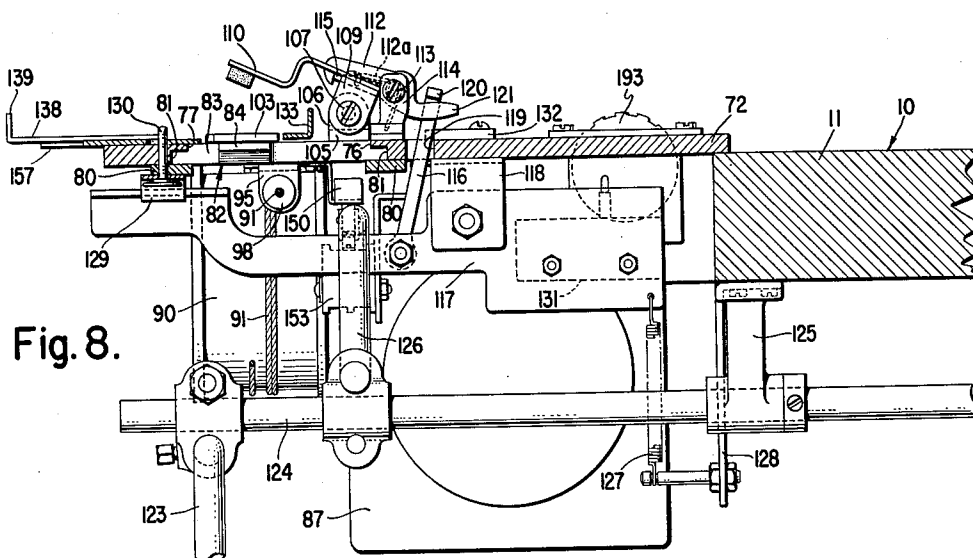


Fig. 8.

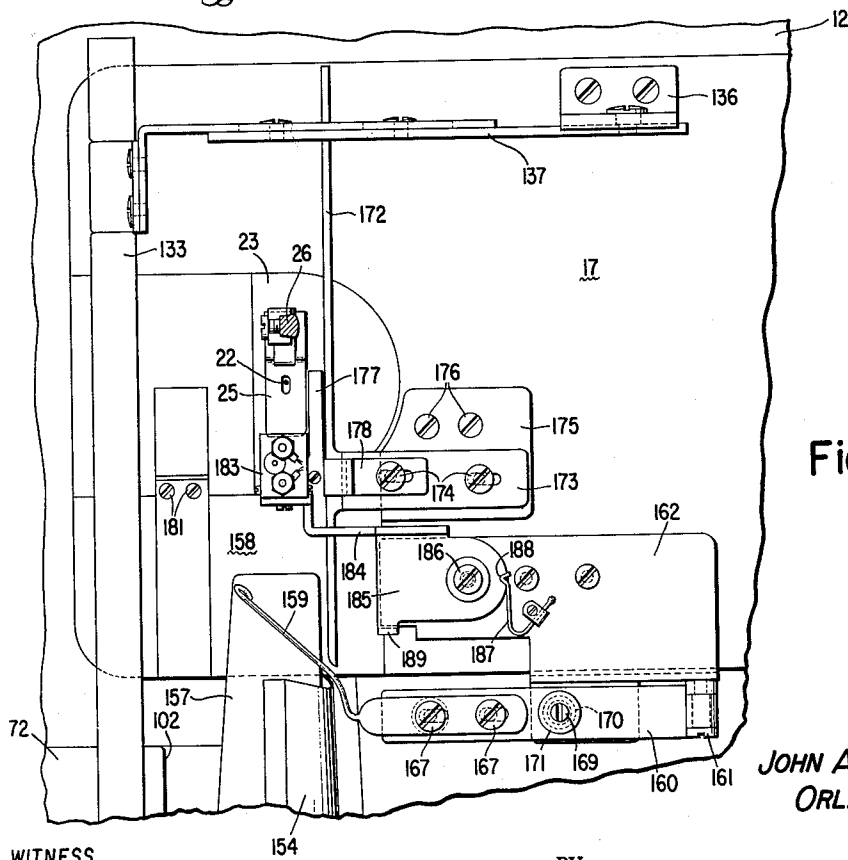


Fig. 9.

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3,089,441

Filed Dec. 9, 1960

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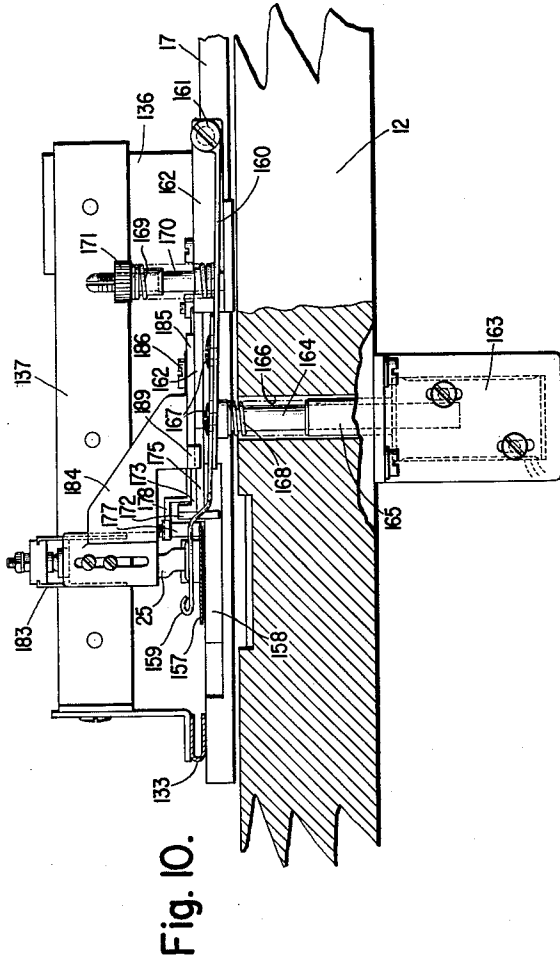


Fig. 10.

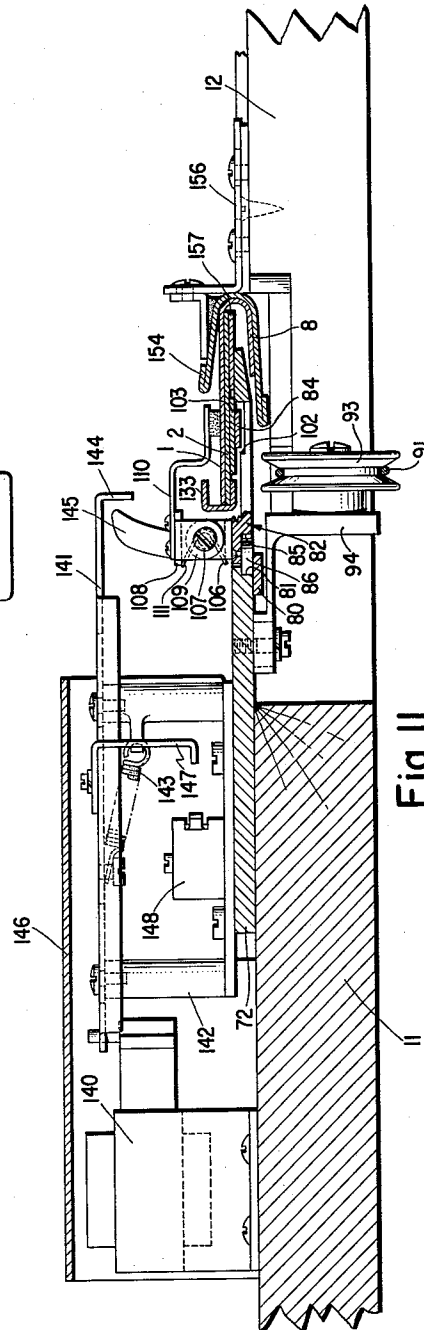


Fig. 11.

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3,089,441

AUTOMATIC SEWING MACHINES

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Filed Dec. 9, 1960, Ser. No. 74,820
9 Claims. (Cl. 112—2)

The present invention relates to sewing machines and particularly to automatic sewing machines.

The manufacture of garments such, for example, as men's shirts is essentially piece work. The various pieces of material that are to be made into a shirt are sewed in a succession of individual sewing operations into the completed garment. High rates of production are obtained by highly skilled operators using modern sewing machines. However, the work is tedious and the quantity and quality of the production is dependent upon the skill of the operator and the skill required for competitive production is acquired only after long experience. Moreover, the operator generally develops maximum skill in only a single operation and cannot be assigned to a different operation without loss of efficiency. Being essentially a straight-line assembly type of operation, all of the sewing stations must be in operation during working hours. Since operators cannot be freely transferred from one operation to another and proficient replacements are not generally available, the absence of any operator can cause considerable hardship.

In the prior United States patent applications of Reid et al., Serial No. 737,775, filed May 26, 1958, and of Abel et al., Serial No. 698,749, filed November 25, 1957, now Patent No. 2,985,122, granted May 23, 1961, there were disclosed and claimed sewing machines having a loading mechanism having a conveniently accessible loading position. In these machines the operator only loads the work on the loading mechanism and then initiates operation of the same which thereupon automatically cycles the loading mechanism and the sewing machine.

In this manner high production of uniformly high quality work can be obtained by a relatively unskilled operator, thus reducing the training period for new operators and the effect of the temporary absence of an operator. At the same time, manipulation of the work is minimized, thereby reducing operator fatigue. The present invention relates to an improvement of the above and has for an object to provide such a machine that is economical, trouble free in operation, and will dependably and efficiently produce uniformly high quality work at very high speeds. A further object of this invention is to provide simplified and automatically actuated means for controlling the operation of a sewing machine in response to the presentation of work thereto.

Briefly, the present invention comprises a work carrying element on which the work is loaded and held by a clamp means, means for automatically moving the element from the loading position to a position in which the work is presented to the sewing machine and then back to the loading position where it is stopped, together with means for automatically releasing the clamp means when the work carrying element is in the work presenting position and means for automatically initiating operation of the sewing machine which thereafter automatically stops at the completion of the sewing operation.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation,

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construction and advantages of it when read in conjunction with the accompanying drawings in which:

FIG. 1 is a top plan view of a machine in accordance with this invention.

FIG. 2 is a detail sectional view taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary front elevational view, partly in section, of the machine of FIG. 1.

FIG. 4 is a fragmentary sectional view taken substantially on the line 4—4 of FIG. 1.

FIG. 5 is a fragmentary top plan view similar to FIG. 1 but on an enlarged scale and illustrating the loading portion of the machine of FIG. 1.

FIG. 6 is a detail sectional view taken substantially on the line 6—6 of FIG. 5.

FIG. 7 is a fragmentary bottom plan view of the trolley which forms a part of the traverse mechanism.

FIG. 8 is a fragmentary sectional view taken substantially on the line 8—8 of FIG. 1.

FIG. 9 is a fragmentary horizontal sectional view illustrating a portion of the bed of the sewing machine in top plan.

FIG. 10 is a fragmentary sectional view taken substantially on the line 10—10 of FIG. 1.

FIG. 11 is a fragmentary sectional view taken substantially on the line 11—11 of FIG. 1.

FIGS. 12 and 13 are perspective views of a sample of work illustrating a sewing operation that the present machine is designed to perform, FIG. 12 illustrating the work as loaded into the machine and FIG. 13 illustrating the work as it emerges from the machine.

With reference to the drawings, FIGS. 12 and 13, the illustrated work W is a shirt cuff in an intermediate stage in manufacture. The cuff W comprises a facing 1 and an interlining 2 which are substantially congruent except that the facing 1 is wider than the interlining 2. The facing 1 and interlining 2 are loaded into the machine flat, as illustrated in FIG. 12, with the side edges 3 and 4 and the free edge 5 of the facing 1 aligned respectively with the corresponding edges of the interlining 2, and the rear edge 6 of the facing 1 overhanging the rear edge 7 of the interlining by an amount equal to the difference in the width of the facing and interlining to define a margin portion 8 of the facing. In the operation of the machine the margin portion 8 is underfolded about the rear edge 7 of the interlining and is stitched down by a line of stitches 9. In subsequent sewing operations, a backing is added, the three plies of the cuff are stitched together by a contour sewing operation along the edges 3, 4 and 5, the cuff is inverted and sewed along the same three edges by a second or finish contour sewing operation, and finally it is attached to a shirt.

As illustrated in the drawings, the machine for performing this operation includes a support comprising an L-shaped table top 10 having an elongated first portion 11 and a short second portion 12. In the usual manner the top 10 is preferably wooden and is supported upon a structure including a pair of legs 13 arranged transversely of the long portion 11 of the table top 10 at the free end thereof and two opposed pairs of legs 14 and 15, the pair of legs 14 being arranged longitudinally of the long portion 11 of the table top 10 at the end opposite from the pair of legs 13, and the pair of legs 15 being arranged parallel to the pair of legs 14 at the free end of the short portion 12 of the table top 10.

Mounted on the short portion 12 of the table top 10 is a sewing machine 16 which, as determined by the desired sewing operation, is in the illustrated embodiment a single-needle high-speed industrial lock stitch machine, the illustrated machine being a Singer class 251 machine. Generally, the sewing machine 16 includes a frame comprising a bed, having a bed plate 17, from the one end

of which rises the standard 18 carrying a bracket arm 19 that terminates in a head 20. A needle bar 21, FIG. 2, is mounted in the head 20 for endwise movement and carries a needle 22 at its lower end. At the point of stitch formation, the bed plate 17 has a throat plate 23. The sewing machine 16 is provided with the usual feeding mechanism operating through the throat plate 23 to advance the work past the point of stitch formation. The work is held down against the throat plate 28 and in engagement with the feed mechanism by a presser foot 25 carried upon the lower end of a presser bar 26 mounted in the head 20 and biased downwardly toward the throat plate 23.

The presser bar 26 is adapted to be raised to lift the presser foot 25 from the throat plate in the usual manner by a presser lifter lever 27 pivotally mounted intermediate its ends on a pivot stud 28 at the back of the bracket arm 19. The lever 27 is pivoted to raise the presser foot 25 by means of a pull rod 29 that is adapted to be connected, for example, in the manner shown in United States Patent No. 2,250,992, to a push rod 30, FIG. 4. A rock shaft 31 is journaled in lugs 32 depending from the bottom of the bed reservoir 33 of the sewing machine 16. The rock shaft 31 has a laterally extending crank arm 34 that engages and actuates the push rod 30. For actuating the rock shaft 31, there is mounted thereon a crank arm 35 connected at its free end to one end of a chain 36 that runs over an idler pulley 37 journaled in a bracket 38 that is mounted on the bottom of the portion 12 of the table top 10. The other end of the chain 36 is connected to a solenoid 39 mounted on a cross brace 40 of the pair of legs 15. When the solenoid 39 is energized, the chain 36 is pulled to turn the shaft 31 and to raise the presser foot 25. When the solenoid 39 is deenergized, the parts are spring returned to their normal operative relation. A switch 41 is secured to the bed reservoir 33 and is adapted to be actuated by a switch arm 42 mounted on the rock shaft 31 whereby the switch 41 is actuated when the presser lifter mechanism is actuated.

A double solenoid controlled electric power transmitter 43 is connected by a belt 44 to the sewing machine 16 for driving the same. The transmitter 43 is substantially as disclosed in the United States patent of Turner et al. No. 2,860,748, November 18, 1958. The transmitter is mounted upon a pair of spaced parallel tubular cross braces 45 extending between the pairs of legs 14 and 15. Generally, the transmitter 43 includes an electric motor 46 having a double acting solenoid 47 mounted upon the casing thereof. The solenoid 47 is connected to a lever 48 that controls the clutch and brake mechanism of the transmitter. The solenoid 47 includes a brake solenoid 49 and a clutch solenoid 50. When the clutch solenoid 50 is energized, the lever 48 is pivoted to clutch the driving pulley 51 on the shaft 52 of the transmitter 43 to the fly wheel of the motor 46, thus driving the sewing machine. When the brake solenoid 49 is energized, the lever 48 is pivoted to actuate the brake mechanism, thus bringing the shaft 52 to a stop and stopping the machine. For actuating the sewing machine 16 manually independently of the cycle, there is provided a rod 53 journaled in a bracket 54 mounted on the underside of the portion 12 of the table top 10. On the one end of the rod 53 there is a knob 55 by means of which the operator can easily turn the same and on the other end is a depending bent end 56 that is adapted to engage the lever 48 and to move it in the direction to render the clutch mechanism of the transmitter effective.

To assist in feeding the work past the point of stitch formation of the sewing machine 16 there is a puller feed mechanism 57 mounted on the portion 12 of the table top 10 behind the sewing machine 16. The puller feed mechanism 57 includes an upper feed roller 58 and a lower feed roller 59, the rollers being mounted respec-

tively upon an upper feed roller shaft 60 and a lower feed roller shaft 61. The shafts 60 and 61 are journaled for rotation in a bracket 62 and are connected together by gears 63 for unitary rotation. The upper feed roller shaft 60 is connected by a clutch 64 with the driving shaft 65 of a variable speed ratio control mechanism 66 having a driven shaft 67. A pulley 68 is mounted upon the shaft 67 and is connected by a belt 69 with a pulley 70 on the shaft 52 of the transmitter 43. For appearance as well as safety, a sheet metal cover plate 71 may be placed over the puller feed mechanism, as illustrated in FIG. 1.

Referring more particularly to FIGS. 1 and 5, a mounting plate 72 is secured to the portion 11 of the table top 10 along and overhanging the inside edge 73 thereof and extending from adjacent to the free edge of the portion 11 of the table top 10 to beyond the inside edge 74 of the portion 12. The plate 72 has a slot 75 formed therein and arranged longitudinally of the plate parallel to the edge 73 of the table top 10, the slot 75 being defined by parallel longitudinal edges 76 and 77, an edge 78 adjacent to the free end of the portion 11 of the table top 10 and an edge 79 at the end adjacent to the sewing machine 16. The longitudinal edges 76 and 77 are undercut or rabbeted, FIG. 8, and are provided with underlying strips 80 that define grooves or tracks 81.

There is provided a work carrying element 82, which for brevity is hereinafter designated a trolley, FIGS. 5, 6 and 7, comprising a flat plate having a substantially rectangular portion 83 and a forwardly extending arm 84. The trolley 82 has an undercut 85 in each of the four corners of the portion 83 for accommodating a roller 86 the periphery of which extends beyond the sides of the portion 83. The rollers 86 are journaled in the trolley 82 and run in the tracks 81 for mounting the trolley on the plate 72 for traveling freely along the slot 75.

Mounted on the underside of the mounting plate 72 adjacent to the free end of the portion 11 of the table 10 is a reversible electric motor 87 which, through a reduction unit 88, drives a shaft 89 on which is mounted a drum 90. A driving cord 91 has the ends thereof secured to the drum by a plate 92. The cord 91 is arranged substantially centrally longitudinally of the slot 75 and at the end of the slot is entrained about a pulley 93, FIG. 11, carried by a bracket 94 secured to the underside of the mounting plate 72. An intermediate portion of the upper run of the cord 91 extends loosely through downturned arms 95 of a bracket 96, FIG. 7, secured by screws 97 to the underside of the trolley 82. On opposite sides of and in spaced relation to the arms 95, there are secured on the cord 91 collars 98. Springs 99 are disposed between the collars 98 and the arms 95. A sufficient number of turns of the cord 91 are wound around the drum 90 to provide for turning the drum in one direction to move the trolley 82 from one end of the slot 75 to the other and to reverse the same to move the trolley back to its starting position.

A cover plate 100 is secured to the top of the mounting plate 72 over the drum 90 and the end of the slot 75. The cover plate 100 is adapted to be engaged by the end of the trolley to position the trolley in its loading position. A cushioning material 101 is preferably mounted on that portion of the stop plate 100 that is engaged by the trolley. At the opposite end of the slot 75, the end of the portion 83 of the trolley is adapted to engage the edge 79 which serves as a stop. The mounting plate 72 is at this point provided with a slot 102, FIGS. 1 and 9, parallel to the slot 75 and adapted to accommodate the arm 94 of the trolley which extends forward the point of stitch formation of the sewing machine 16.

Mounted on the top of the trolley 82 is a work supporting plate 103 that is secured to the portion 83 and to the arm 84 by screws 104. Also mounted on the top of the trolley 82 there is provided work securing means

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comprising a bracket 105 having at each end a pair of upstanding ears 106 through each pair of which extends a pivot screw 107. A bar 108 is provided with downturned ends 109 that are pivotally mounted on the screws 107. Adjacent to each end of the bar 108 is a work securing finger 110 which, upon pivotal movement of the bar 108 about the screws 107, is adapted to move down into work clamping engagement with the work supporting plate 103. Springs 111, FIGS. 5 and 6, are coiled about the pivot screws 107 and have the ends thereof engaged with the bracket 105 and the bar 108 to bias the fingers 110 into work clamping position.

For holding the fingers 10 out of work clamping position against the action of the springs 111, there is provided a latch 112, FIG. 8, pivotally mounted by a pivot screw 113 on an arm 114 extending from the bracket 105 and having a catch 115 adapted to engage the bar 108. A spring 112a biases the latch 112 into latching engagement. The latch 112 is released by a link 116 pivotally connected at one end to a lever 117 that is pivotally mounted by a bracket 118 on the underside of the mounting plate 72. The link 116 extends upwardly through a hole 119 in the mounting plate 72 and has a laterally extending end 120 that overlies a rearwardly extending arm 121 on the latch 112 when the trolley is in the loading position, i.e., when against the end of the plate 100. The lever 117 is pivoted by a knee shift device comprising a knee pad 122, FIG. 3, on an angle rod 123 that is mounted on a shaft 124 journaled beneath the table portion 11 by brackets 125, FIG. 8. The shaft 124 also carries an angle rod 126 having an end overlying the lever 117 so that when the shaft 124 is turned by pressure applied against the knee pad 122, the forward portion of the lever 117 is depressed to move the pull rod 116 downwardly, thus releasing the latch 112. The lever 117 is biased into a normal position by a tension spring 127 secured at one end to the lever and at the other end to a bracket 128 mounted on the underside of the table portion 11. The normal position of the lever is determined by the engagement of a bracket 129 on the forward end of the arm against the strip 80. The bracket 129 also carries a pin 130 extending upwardly through an aperture in the mounting plate 72 and serving as a retractable work guide that aids in locating the work and is then withdrawn below the mounting plate when the cycling is initiated. The lever 117 carries a start switch 131 that engages the underside of the mounting plate 72 in the final movement under the action of pressure applied to the knee pad 122, which switch initiates cycling of the machine.

A plate 132 is provided on the mounting plate 72 to support and guide the link 116.

A sheet metal guide 133 is provided which, at the end adjacent to the loading position, is L-shaped and includes a bottom horizontal work supporting flange having an upper or work supporting surface in the plane of the work supporting surface of the plate 103 and a vertical guide flange against which the rear edge of the work abuts. The guide 133 extends from the loading position to and beyond the point of stitch formation of the sewing machine 16. From a point intermediate its ends to the end adjacent to the sewing machine 16, the guide 133 is provided with a top horizontal flange and is thus U-shaped, with the top and bottom horizontal flanges converging toward the end adjacent to the sewing machine 16. At the end adjacent to the loading position, the guide 133 is adjustably supported by a bracket 134 carried by a plate 135 that is secured to the mounting plate 72. At its opposite end, the guide 133 is supported by a bracket 136 secured to the bed 17 of the sewing machine 16 and carrying an extensible arm 137 to which the guide 133 is secured.

Also at the loading position, there is provided a guide plate 138 adjustably secured to the mounting plate 72 and having an upstanding guide flange 139. The guide flange 139, together with the guide 133 and pin 130,

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serves to locate the work when it is loaded onto the trolley 82; the flange 139 and guide 133 position it transversely of the trolley 82 and the pin 130 positions it longitudinally of the trolley. The guide flange 139 and guide 133 are adjustable to vary the distance between them and thereby provide for cuffs of different widths.

At the end of the slot 75 adjacent to the sewing machine 16, there is provided mechanism for raising the work holding fingers 110 and thereby releasing the work from the trolley. This mechanism, which is shown particularly in FIG. 11, comprises a solenoid 140 mounted on the top of the table portion 11 and is connected to a slide bar 141 mounted for endwise sliding in a bracket 142 on the mounting plate 72. The bar 141 is biased to the right as seen in FIG. 11 by a tension spring 143 and is moved to the left upon energization of the solenoid 140. The forward end of the bar 141 is turned down to form a flange 144 that is adapted to engage a finger 145 upstanding from the bar 108. Thus, when the solenoid 140 is energized, the bar 141 is moved to the left and the flange 144 engages the finger 145 to pivot the bar 108 about the axis of the pivot screws 107, thereby raising the work holding fingers 110. As the bar 108 is pivoted, the latch 112 rides over the top thereof until the detent 115 engages over the edge of the bar 108, thus latching the work holding clamp in the open position. The solenoid 140 and the relating mechanism is preferably enclosed by a cover plate 146. The slide bar 141 also carries a switch actuator 147 that engages and closes a switch 148 in the final portion of the stroke under the action of the solenoid 140. The switch 148 controls the presser lifter solenoid 39.

On the underside of the trolley 82, FIG. 7, there is mounted a switch actuator 149 having a first end 150 that is adapted to engage the trip arm of a switch 151 mounted on the underside of the plate 72 near the sewing machine 16 and a second end 152 that is adapted to engage the trip arm of a second switch 153.

For underfolding the margin portion 8 of the cuff facing 1 as it is moved from the loading position to the sewing position by the trolley 82 there is provided a folding guide 154 formed over the front edge of the mounting plate 72 and supported at its opposite ends by brackets 155 and 156. A separator blade 157 is positioned on the top of the plate 72 within the folding guide 154. The folding guide 154, FIGS. 2 and 9, terminates at the edge of the bed plate 17 of the sewing machine 16 and the separator blade 157 continues beyond the same for a short distance to overhang the edge of the bed plate which at this point is tapered as at 158 to form a smooth continuation of the bottom surface of the folding guide 154.

A wire finger 159, FIGS. 9 and 10, overlies the free end of the separator blade 157 to smooth and align the work as it emerges from the folding guide 154 and passes over the free end of the blade 157. To provide for raising the finger 159 when work is presented to the machine by the trolley 82, it is mounted on a lever 160 that is pivotally mounted at its end on a horizontal axis by a pivot screw 161 on a bracket 162 that is secured to the bed plate 17 of the sewing machine. A solenoid 163 is mounted on the underside of the table portion 12 and has an aperture 164 extending upwardly through a bushing 165 received within a bore 166 in the table portion 12 and is connected to an intermediate portion of the lever 160 by one of the screws 167 that secure the finger 159 to the lever 160. A compression spring 168 surrounds the armature 164 between the lever 160 and the top of the bushing 165. A second spring 169 biases the lever downwardly into operative position, the spring 169 being mounted on a stud 170 extending upwardly from the bracket 162 loosely through an aperture in the lever 160. The spring 169 acts between the top of the lever 160 and a nut 171 threaded on the free end of the stud. When the solenoid 163 is energized, the lever 160

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is raised to lift the finger 159 away from the separator plate 157 as seen in FIG. 10. When the solenoid 163 is deenergized, the finger 159 is resiliently held in operative position relatively to the plate 157 by the spring 169.

Also provided on the bed plate 17 of the sewing machine is an edge guide 172 that constitutes a smooth continuation of the edge of the guide 154 for controlling the folded edge of the work. The guide 172 is carried by a rearwardly extending arm 173 adjustably secured by screws 174 to a plate 175 that is in turn secured by screws 176 to the bed plate 17. The guide 172 is arranged parallel to the line of seam formation and has a lower edge, FIG. 2, that conforms to the work supporting surface of the bed plate 17 including the bevel 158. There is further provided a light leaf spring 177 carried by a bracket 178 that is mounted on the arm 173 by one of the screws 174. The spring 177 is parallel to the guide 172 and is disposed between the guide 172 and the presser foot 25 and serves to apply a light pressure to the folded edge of the work for holding it down against the throat plate 23.

The operation of the sewing machine 16 is controlled by an electric eye 178, FIG. 2, comprising a photo electric cell 179 disposed on the underside of the bed plate 17 immediately in front of the point of stitch formation defined by the needle 22. The cell 179 is carried by a support 180 secured by screws 181 on the underside of the bed plate 17. Cooperating with the cell 179 is a source of light comprising a light bulb 182, a socket 183 carried by a bracket 184 that is in turn mounted on the bracket 162. The mounting of the bracket 184 is designed to locate the bulb 182 directly above and focused on the photo electric cell 179 and to provide for swinging the same to a position to render the socket 184 and bulb 182 readily accessible. This mounting comprises a flange 185 pivotally mounted on the bracket 162 by a pivot screw 186. The bracket 184 is held with the light in operative position by a spring 187 secured on the bracket 162 and having a detent portion 188 adapted to seat in a notch in the edge of the flange 185. A stop 189 determines the operative position.

As the work leaves the sewing machine 16, it passes over a plate 190, FIG. 1, having an upstanding edge guiding flange 191 that forms a continuation of the edge guide 172. The puller feed mechanism 57 advances the work across the plate 190 and discharges it into a chute 192, FIGS. 3 and 4, which returns it to a point adjacent to the operator.

A counter 193 is mounted on the plate 72 and is advanced one number upon each cycling of the machine, thus providing a record of the number of articles sewed and thereby indicating when the bobbin of the sewing machine 16 is substantially exhausted and should be replenished.

The electrical components of the machine, other than those heretofore identified and a master on-off switch 194, are disposed in a control box 195 mounted on the underside of the table portion 11.

The operation or cycling of the machine is as follows: The operator is seated facing the table portion 11 with the sewing machine at the right and directly in front of the loading position which is defined by the trolley 82 in the left hand position as in FIGS. 1 and 5. The work pieces are loaded onto the trolley 82 with the front and rear edges thereof positioned by the guide 133 and flange 139 and the leading edge thereof positioned by the pin 130. When the operator is satisfied that the work is properly located on the trolley 82, the knee pad 122 is pressed, thereby tilting the lever 117 to lower the pin 130, to release the work clamping fingers 110, and finally, to actuate the start switch 131. The start switch 131 initiates operation of the motor 87 to advance the trolley 82 from the loading position toward the sewing machine 16. The trolley 82 travels into a positive stop position determined by the engage-

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ment of the end against the edge 79, the unit 88 having built into it an over-running clutch. Toward the end of this operation, the switch 151 is actuated to deenergize the motor 87 and to energize the solenoid 140. Actuation of the solenoid 140 lifts and resets the work-holding fingers 110, thus releasing the work, and in the final movements, closes the switch 148 closing the switch 148 deenergized solenoid 140 and also deenergizes the presser lifter solenoid 39, thereby lowering the presser foot 25 onto the newly presented work. After the presser foot 25 is lowered, the switch 41 is actuated to reverse the motor 87 and thereby return the trolley 82 to the loading position. The trolley 82, upon its return movement, actuates the switch 153 to terminate operation of the motor 87 with the trolley in the loading position. When the work was presented to the sewing machine 16, it passed between the photo electric cell 179 and the light 182 which, through a relay and in series with the presser lifter actuated switch 41, energizes the clutch solenoid 49 and deenergized the brake solenoid 50 of the transmitter 43 to initiate operation of the sewing machine. Upon completion of the sewing operation, the work passes from between the cell 179 and light 182, thereby actuating the solenoids 49 and 50 to terminate the sewing operation and also to energize the solenoid 39 to raise the presser foot 25.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

Having thus described the nature of the invention, what we claim herein is:

1. In combination, a sewing machine having stitch forming mechanism defining a point of stitch formation and feeding mechanism for advancing work past the point of stitch formation, a loading mechanism comprising a work carrying element, means mounting said element for movement between a loading position wherein work to be sewed is loaded onto said element and a work presenting position wherein said element presents the work to said sewing machine, drive means for moving said element forward from said loading position to said work presenting position and for moving said element in reverse from said work presenting position to said loading position, means for releasably securing work to said element, operator actuated means for closing said work securing means and for initiating forward actuation of said drive means, means for automatically terminating forward actuation of said drive means with said element in the work presentation position, for opening said work securing means, and for initiating operation of said sewing machine and reverse actuation of said drive means, means for automatically terminating reverse actuation of said drive means with said element in loading position, and means for automatically terminating operation of said sewing machine at the completion of the sewing operation.

2. The combination of claim 1 in which said work carrying element comprises a plate upon which work is placed and said work securing means comprises a work clamping finger pivotally mounted on said plate, means for biasing said finger into work clamping engagement with said plate, and a releasable latch means for holding said finger out of work clamping engagement.

3. The combination of claim 1 in which said drive means for moving said work carrying element includes a reversible motor and said operator actuated means for closing said work securing means and for initiating forward actuation of said drive means comprises a lever, operator actuated means for pivoting said lever, means

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actuated by said lever for closing said work securing means, and means responsive to the continued movement of said lever after closing of said work securing means for initiating forward actuation of said drive means.

4. The combination of claim 3 having guide means for positioning the work laterally on said work carrying element and a retractable guide means carried by said lever for positioning the work endwise on said work carrying element and adapted to be moved out of the path of said element upon pivotal movement of said lever.

5. In combination, a sewing machine having stitch forming mechanism defining a point of stitch formation, feeding mechanism for advancing work past the point of stitch formation, a presser mechanism for holding work in engagement with said feeding mechanism, and a presser lifter mechanism, a loading mechanism, comprising a work carrying element, means mounting said element for movement between a loading position wherein work to be sewed is loaded into said element and a work presenting position wherein said element presents the work to said sewing machine, drive means for moving said element forward from said loading position to said work presenting position and for moving said element in reverse from said work presenting position to said loading position, means for releasably securing work to said element, operator actuated means for closing said work securing means and for initiating forward actuation of said drive means, means for automatically terminating forward actuation of said drive means with said element in work presenting position and for opening said work securing means, means for automatically actuating said presser lifter mechanism to lower said presser mechanism when said work securing means is opened, means for automatically initiating reverse actuation of said drive means and operation of said sewing machine upon lowering of said presser mechanism, means for automatically terminating reverse actuation of said drive means with said element in loading position, and means for automatically terminating operation of said sewing machine at the completion of the sewing operation.

6. In combination, a sewing machine having stitch forming mechanism defining a point of stitch formation, feeding mechanism for advancing work past the point of stitch formation, a presser mechanism for holding work in engagement with said feeding mechanism, and a presser lifter mechanism, a loading mechanism comprising a work carrying element, means mounting said element for movement between a loading position wherein work to be sewed is loaded onto said element and a work presenting position wherein said element presents the work to said sewing machine, reversible drive means for moving said element forward from said loading position to said work presenting position and for moving said element in reverse from said work presenting position to

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said loading position, means for releasably securing work to said element, operator actuated means for closing said work securing means and for initiating forward actuation of said drive means, means for automatically terminating forward actuation of said drive means with said element in the work presenting position, for opening said work securing means, for actuating said presser lifter mechanism to lower said presser mechanism, and for initiating operation of said sewing machine, and reverse actuation of said drive means, means for automatically terminating reverse actuation of said drive means with said element in loading position, and means for automatically terminating operation of said sewing machine and for actuating said presser lifter mechanism to raise said presser mechanism at the completion of the sewing operation.

7. The combination of claim 6 in which said work carrying element comprises a plate upon which work is placed, said work securing means comprises a work clamping finger pivotally mounted on said plate, means for biasing said finger into work clamping engagement with said plate, releasable latch means for holding said finger out of work clamping engagement, said operator actuated means comprises a lever for releasing said latch for closing said work securing means and thereafter initiating forward actuation of said drive means, and said means for automatically opening said work securing means when said element is in work presenting position automatically resets said latch to hold said work clamping means in open position.

8. The combination of claim 7 in which said drive means for said work carrying element comprises a reversible electric motor, said sewing machine, presser lifter mechanism, and means for opening said work securing means are actuated by solenoids, and said means for initiating and terminating operation of said motor, sewing machine, presser lifter mechanism, and means for opening said work securing means are electrically operated.

9. The combination of claim 8 in which the operation of said sewing machine is controlled by a photo electric cell positioned adjacent to the point of stitch formation of said sewing machine and adapted to effect operation of said sewing machine upon the presence of work at the point of stitch formation.

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