To all whom it may concern:

Be it known that I, George E. Oathout, a citizen of the United States, and a resident of Watervliet, county of Albany, State of New York, have invented certain new and useful Improvements in Automatic Glove-Stitching Machines, of which the following is a specification.

My invention relates to sewing machines for making gloves, and particularly to such machines when used for placing rows of ornamental stitching upon the backs of gloves, as is usual in their manufacture.

The object of my invention is to provide a mechanism for sewing machines as aforesaid such that the rows of stitching will be of definite and determined length.

A further object of my invention is to so arrange the mechanism that each row of stitches will be preceded by a certain number of dead stitches (i.e., stitches made without advance of the goods) and followed by similar stitches; these dead stitches will, of course, be locked like the usual running stitches.

Still further object of my invention is to provide mechanism as above which shall be automatic in its operation, i.e., which shall only require to have the machine started in order to first form a definite number of dead stitches, then a row, of determined length, of running stitches, then a second set of dead stitches, and then to stop, when the glove may be removed or may be reset upon the machine for the formation of a second row of stitches.

Other features of my invention comprise means for varying or determining the length of the rows of running stitches.

Still other features of my invention will appear as the specification proceeds.

My invention will be better understood by referring to the drawings accompanying in which a preferred embodiment thereof is represented as applied to a sewing machine of the Wheeler and Wilson type.

In the drawings Figure 1 represents a front elevation of the machine; Fig. 2 represents a sectional elevation along the line 2—2 of Fig. 1 showing the driving pulley in locked position; Fig. 3 represents a sectional plan view along the line 3—3 of Fig. 1; Fig. 4 represents the same view as Fig. 2, but on a somewhat larger scale, and with the driving pulley in unlocked position. Fig. 5 is a view similar to Fig. 4 but taken from the reverse side, i.e., it is a sectional elevation taken from the left and along the line 5—5 of Fig. 1; Fig. 6 represents a sectional plan view along the line 6—6 of Fig. 2; Figs. 7, 8, 9 and 10 represent, respectively, sectional elevations taken along the lines 7—7, 8—8, 9—9 and 10—10 of Fig. 3.

Before describing my invention in detail I will say that what I have done in applying my invention to the particular sewing machine here selected may be briefly stated as follows: I have arranged the driving pulleys so as to be normally loose upon the driving shaft but have provided a clutch, operable at will, for locking pulley to shaft. I have also provided a ratchet wheel, actuated by the driving shaft, which carries a cam sector so arranged with reference to the "feed" which advances the glove that, for a certain number of revolutions of the driving shaft after the clutch is thrown in, the feed is inoperative so that only "dead stitches" are formed. As the ratchet wheel revolves the cam sector also revolves and permits the feed to become operative and to remain so until the cam again comes around and throws out the feed. Dead stitches will then be formed until the cam has progressed sufficiently far to engage a trip which unlocks the clutch and simultaneously causes a brake to be clamped upon the driving shaft whereby the latter is instantaneously stopped. The presser foot may then be raised and the glove reset for another row of stitches. The driving pulley is running continuously; all that is necessary to form a row of stitches, preceded and followed by knotted dead stitches, is to clamp down the presser foot upon the glove and to throw the clutch.

Referring now to the drawings, the driving shaft 1 passes through a gear box 2 which is attached, at one end of the machine, to the main frame thereof. To this shaft is fixed, by keying or otherwise, a collar 3 provided with an annular recess 3' and flanged heads 4 and having on the inner side of one of said heads, an eccentric strip 5 and rod 6, the latter provided with a slot which engages a pin 7 fixed to the gear box. The
eccentric rod carries a plurality of pawls 8 which may be separately held in either an upper or lower position by means of springs provided for the purpose; normally but one pawl is down (Fig. 2). A set of ratchet wheels 9 each wheel having a different number of teeth, is pivotally fixed to the wall of the gear box in position such that for each pawl 8 there is a wheel with which said pawl is adapted to be engaged. Pawls 9 permit said wheels to be rotated in but one direction. Carried upon the same axis as the wheels so as to be revolved with said wheels, is a cam sector 10. A shaft 11 is fitted along the periphery of the ratchet wheels 9 is a link 11, the outer end of which is connected through other links 12 and 13 to a shaft 14 supported beneath the bed plate of the machine and extending nearly the entire length thereof. A spring 15 held in compression between said bed plate and an arm 16 fixed to shaft 14 tends to keep the link 11 pressed upwardly and a roller 17 attached to said link in position to be met by the cam sector 10 as it revolves.

A shaft 18 which operates the lock stitch mechanism below the bed plate is connected with the driving shaft in the usual way by a yoke 20 constituting one arm of a bell crank pivoted at 21 in alignment with a rock shaft 22 which carries at its outer end an arm 23. The other arm 24 of the bell crank carries a pin 25 which projects laterally into a slot considerably wider than the pin, formed in an arm 26 fixed to the inner end of shaft 22, while the outer end of shaft 14 carries an arm 27 which has, at its outer end, a slide so engaged with the arm 26 that, when the shaft 14 is rocked, a wedge 28 forming part of said slide is either moved downwardly so as to hold pin 25 firmly against one wall of the slot or upwardly out of the way of said pin. The width of the slot is so determined that, in this last position, rotation of the eccentric 19 and consequent rocking of the bell crank does not affect the shaft 22 carrying the arm 23, whereas when the wedges is down and pin 25 held against the wall of the slot the bell crank is immovably coupled to shaft 22 which is, therefore, rocked as the eccentric 19 revolves, so as to cause the arm 23 to be moved regularly to and from the bed plate through a small angle for each revolution.

The feed 29 and the mechanism by which it is operated from shaft 18 is of the construction usual with the sewing machine to which I have here elected to apply my invention. For each revolution of said shaft the shaft 30, to which the feed is linked, rocks once to and fro, thus pushing the feeder to the rear and again carrying it forward. The outer end of the arm 31, to which the feeder is attached, rests upon the outer end of the arm 23. A strap brake 32 has one end fastened to the wall of the gear box at 33; after passing around the collar 3 the other end of this brake is joined by a link 34 to the shorter arm of a bell crank lever 35 pivoted at 36 to the gear box. The longer end of this bell crank is pulled downwardly by a tension spring 37 and in this position, Fig. 4, it will be seen that the brake is clamped; from this longer arm a lifting link 38 extends downwardly to shaft 14 tends to keep the link 11 pressed upwardly and a roller 17 attached to said link in position to be met by the cam sector 10 as it revolves.

A bell crank 44 has a vertical arm the outer end of which is notched to receive the end of the longer arm of bell crank 35 when the same is pushed upwardly and the brake 32 is released. The other arm 45, of bell crank 44, extends laterally and lies over a pin 46 fixed to the lower end of a vertically slideable release bolt 47.

Pivotedly mounted at 48, a little below and to one side of the ratchet wheels 9, is a bell crank having a shorter arm provided with a wheel 49 adapted to be contacted by the cam sector 10, and a longer arm engaging a pivoting lifting pawl 50 arranged to engage a lug 51 projecting laterally from the release bolt 47. A spring 52 acts upon the lifting pawl to keep it pressed toward the release bolt. A second spring 53 acts upon the longer arm which carries the lifting pawl to keep said arm projected downwardly and the wheel 49 against the cam sector 10, or radially within the outer periphery of the cam sector when the latter is revolved so as to be outside of the arc of engagement with said wheel.

Just inside the front edge of the gear box, and kept constantly pressed inwardly by a small spring, is a pawl releasing bolt 54 provided with a projecting pin 55 so positioned as to have said pin engaged by the wedge 40 as the latter is raised by pressure upon pad 48. Bolt 54 will thereby be pressed inwardly so as to engage a pin 56 carried by the lifting pawl 50 and this will force said pawl out of engagement with lug 51 and allow release bolt 47 to drop.

Pivoted at 57 upon the inner face of the collar 3 (thus revolving with the driving shaft) is a cam 58 one end of which engages a rocker 59 which is fixed a driving wheel 60.
locking pin 66. This locking pin has a cylindrical portion which is inserted into the back of the collar the axis of the pin being coincident with the outer wall of the annular recess 3'. This locking pin extends clear through the entire thickness of the collar and the outer portion 61 of the pin from the bottom of recess 3' to the outer face of the collar, is substantially half round, so that when cam 58 is pushed partially inward to the limit determined by the stop pin 62, no part of the pin will lie within the recess. The other end of rocker 59 is pressed upon by a spring so that when cam 58 is in its outermost position, also determined by stop pin 62, the part 61 will be turned to as to project into said recess.

Fixed to the inner face of the driving wheel 68 is a locking gear 64 arranged to just fit within the recess 3' and provided with circumferentially spaced cones 65 each adapted to just receive the end of locking pin 60 when the latter is revolved to enter the same. Accordingly cam 58 is in or out, therefore, will the driving wheel be unlocked or locked with respect to the driving shaft.

The operation of my invention is as follows: Assume that the parts are as shown in Figs. 4 and 5 with the driving wheel unlocked and revolving idly, the locking pin 60 being suitably turned through the pressure of release bolt 27 upon cam 58 and the release bolt 47 being pushed upwardly by the lifting pawl 50 under the action of cam sector 10 upon the bell crank which supports said pawl; the strap brake 32 clamped upon its collar 8 and preventing the driving shaft 1 from turning; and the cam sector 10 with its contact portion engaging roller 17, thus forcing wedge 28 to its upper position so that arm 26 and, hence, feed 29 are down. The globe being positioned and the presser foot down, the knee pad 43 is pushed to the right. This will raise rod 41 and cause pawl releasing bolt 54 to be moved inwardly through the action of wedge 16 upon pin 55; lifting pawl 50 will be thrown from under lug 31, release bolt 47 will drop, and cam 58 will be pressed outward so as to permit locking pin 60 to rotate and lock driving wheel 68 to driving shaft 1. One of the ratchet wheels 9, carrying the cam sector 10 with it, will now be advanced by one tooth for each revolution of the driving shaft. During this time the feed will remain inactive so that the needles of the machine will be operating always in the same set of holes in the globe. i.e., dead stitches will be made. As soon as cam sector 10 has advanced sufficiently to clear roller 17, the link 11 will be pushed upwardly through the action of spring 15 upon arm 16 thus permitting wedge 28 to be drawn downwardly so as to lock shaft 22 to yoke 20. Arm 22 will thus be raised as feed 29 is pushed rearwardly and the feed 29 operates to move the globe under the presser foot in the usual way. Normal running stitches will now be made. When the ratchet wheels have been advanced sufficiently the cam sector 10 will again engage the roller 17, thereby depressing link 11, 12 and 13 and rocking shaft 14 so as to raise wedge 26 and free shaft 20 from yoke 20. Arm 23 will thus remain permanently down and feed 29 will become inactive. The row of running stitches is now terminated but, since the drive wheel is still locked to the driving shaft, dead stitches will be formed. The cam sector will continue to be advanced until wheel 49 is engaged thereby when the bell crank which carries lifting pawl 50 will be rocked so as to lift said pawl and hence release bolt 47, lug 31 of which is engaged by said pawl; pin 46 of the release bolt will engage arm 45 of bell crank 44 and rock the same so as to disengage 31 from the longer arm of bell crank 33 thus clamping strap brake 32 upon the collar 8 and locking the driving shaft. At the same instant the top of the release bolt will push cam 58 to its innermost position and rotate locking pin 60 so as to free it from the particular cone 65 of locking gear 64 with which it happens to be engaged. The presser foot may now be raised and the globe removed.

By changing from one ratchet wheel 9 and pawl 8 to another ratchet wheel of greater or less number of teeth and corresponding pawl the time during which running stitches are being formed, and therefore the length of the row of said stitches, may be correspondingly increased or decreased.

To vary the length of the individual stitches I may avail myself of the mechanism for such purpose generally a part of sewing machines of the class described.

While I have described a particular embodiment of my invention I do not confine myself to the particular construction disclosed but claim:

1. In a sewing machine, in combination with feed mechanism, a drive wheel, a driving shaft, manually controlled means for locking said drive wheel to said driving shaft, a ratchet wheel intermittently driven by said shaft, means attached to said ratchet wheel for automatically throwing in the feed after a definite number of revolutions of the shaft, means arranged to engage the ratchet wheel after a definite further number of revolutions of the shaft for throwing off the feed, and automatic means for unlocking the drive wheel after the shaft has reolved a still further number of revolutions.

2. In a sewing machine, a drive wheel, a driving shaft, manual means for locking...
said drive wheel and drive shaft together, feed mechanism normally dead, a ratchet wheel arranged to start and stop said feed mechanism, means for driving the ratchet wheel from the driving shaft said ratchet wheel being further arranged to revolve a predetermined amount before it throws in the feed, and automatic means controlled by the ratchet wheel for unlocking the drive pulley after it has revolved a predetermined amount beyond the point where it has thrown off the feed.

3. In a sewing machine, a drive wheel, a driving shaft, feed mechanism normally dead, manual means for locking the drive wheel and driving shaft together, a ratchet wheel driven by said shaft, means actuated by said ratchet wheel after it has revolved through a definite angle to thereby throw on the feed, other means actuated by said ratchet wheel after it has revolved through a further angle to throw off the feed, further means actuated later by the ratchet wheel to unlock the drive wheel from the drive shaft, and an automatically acting brake to stop and hold the driving shaft.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE E. OATHOUT

Witnesses:

E. F. MEHLICK,
E. M. HAHN.