Fig. 1

Witness
B. D. Baker

Inventor
William C. Meyer
By his Attorney
Van Ornum, Reed & Hildreth
W. C. MEYER.

SHOE SEWING MACHINE.

APPLICATION FILED JULY 28, 1919.


4 SHEETS—SHEET 3.

Fig 3

Fig. 4

Witness

B.D. Baker

Inventor

Walden C. Meyer

by his attorney

New Cozen, Field & Haldane
UNITED STATES PATENT OFFICE.

WILLIAM C. MEYER, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATENSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHOE-SEWING MACHINE.

Application filed July 26, 1919. Serial No. 313,837.

To all whom it may concern:

Be it known that I, WILLIAM C. MEYER, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Shoe-Sewing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to shoe sewing machines, and more particularly to sole sewing machines provided with a straight hook needle and devices cooperating therewith to form a chain stitch in which the work is supported by a rotatable work support or horn which extends within the shoe, such machines being generally known in the art as machines of the McKay type.

Shoe sewing machines of the McKay type are ordinarily provided with a presser foot which serves to hold the work in engagement with the work support and a feed point for interconnecting the work upon the support. The presser foot is lifted during each cycle of operations to release the work and permit it to be fed. The feed point is projected into engagement with the work and is advanced, in the direction of the seam, to feed the work while the presser foot is lifted. After the seam has been completed, the machine should be brought to rest at a point in its cycle of operations in which the needle is at or near the limit of its retracting stroke, and the presser foot is free to be lifted to permit the removal of the work and the insertion of another piece of work in operating position in the machine. Before removing the work the operator severs the side of the needle loop leading to the work. At this point in a cycle of operations, the feed point is in a position adjacent the needle and therefore interferes with the severing of the thread of the needle loop. Letters Patent No. 1,177,581, granted March 28, 1916, to the present applicant discloses a shoe sewing machine of the McKay type which is provided with a stop mechanism for bringing the machine to rest with the needle retracted from the work and the presser foot free to be lifted therefrom. In the machine of said patent means is also provided for effecting the withdrawal of the feed point from its normal position adjacent the needle upon the stopping of the machine, and in order to permit such withdrawal of the feed point provision is made for disconnecting the feed point from its actuating mechanism upon the stopping of the machine.

The object of the present invention is to provide improved mechanism for disconnecting the feed point from its actuating mechanism upon the stopping of the machine so as to permit the retraction of the feed point from its normal position adjacent the needle.

With this object in view the invention consists in certain novel and improved constructions, combinations and arrangements of parts hereinbefore described and particularly pointed out in the claims the advantages of which will be understood and appreciated by those skilled in the art.

The features of the invention will be readily understood from the accompanying drawings illustrating a machine embodying the invention in its preferred form and the following detailed description of the construction therein shown.

In the drawings, Figure 1 is a view in front elevation, partly in section, of the head of the machine; Fig. 2 is a plan view of a portion of the head of the machine, illustrating particularly the feed point actuating mechanism; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a detail view, partly in section, illustrating particularly the mechanism by which the feed point is connected with its actuating mechanism; Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 3; and Fig. 6 is a detail view in side elevation and on a reduced scale, showing the treadle mechanism.

In the drawings the invention is shown as embodied in a chain stitch sewing machine of the McKay type in which the straight hook needle is indicated at 10, the work support or horn at 12, the presser foot at 14, and the feed point at 16. These parts, together with their actuating mechanism and all other parts illustrated in the draw-
ings and not hereinafter specifically described, are constructed and arranged to operate in substantially the same manner as the corresponding parts of the machine of Patent No. 1,177,551, above referred to. During the sewing operation the main shaft 18 of the machine is driven at relatively high speed by means of a belt pulley 20 and suitable driving mechanism controlled by a foot treadle 22 (Fig. 6) so as to keep the machine connected with the driving power while the treadle is kept depressed and to cause the machine to be disconnected from the driving power upon the release of the treadle. This driving mechanism and the connections between the same and the treadle 22 may have the same construction, arrangement and mode of operation as the corresponding parts of the machine illustrated and described in said patent.

In order to permit the work to be removed when the seam has been completed, and another piece of work to be introduced easily and quickly, the machine is provided with a stop mechanism for automatically arresting the rotation of the main shaft at that point in the cycle of operations when the needle is retracted out of engagement with the work and the presser foot is free to be lifted. When the treadle is released at the end of the sewing operation, the stop mechanism which brings the machine to rest with the parts in proper position for the removal of the shoe is thrown into operation. In the present invention the movement of a part of the stop mechanism is utilized to positively disconnect the feed point from its actuating mechanism so that it may be retracted from its position adjacent the needle upon the stopping of the machine. The stop mechanism includes a friction clutch, one member of which is driven at slow speed, in a forward direction, and which, when the clutch members are disengaged, first acts as a brake to slow the shaft down to the slow speed of the forwardly driven member and then to drive the shaft forward at slow speed until the clutch is automatically disengaged, when the shaft is brought to rest at a predetermined point in a cycle of operations of the machine.

The friction clutch (see Figs. 3 and 5) consists of clutch members 24 and 26, of which the member 24 is loosely mounted on the main shaft 18 of the machine and is constantly driven at slow speed in the same direction as the normal direction of rotation of the shaft 18 by means of a spiral pinion 28 the teeth of which mesh with spiral gear teeth 30 that are formed on the clutch member 24. The pinion 28 is secured to a shaft 32 that is journaled in a bearing 34 in the machine frame and to which is fixed a pulley 35 which may be connected with any suitable source of power. The other member 26 of the clutch is formed on a flange projecting from a sleeve 36 that is loosely mounted on the shaft 18. The sleeve 36 is free to slide longitudinally on the shaft but is caused to rotate with the shaft by connection with the pulley 20. In the construction illustrated, the sleeve 36 is provided with a pair of recesses 38 each of which receives a stud 40 projecting from the pulley 20. The sleeve 36 is normally held 75 in position longitudinally of the shaft, with the clutch members out of engagement, by means of a pair of coiled springs 42 each surrounding a bolt 44 which extends through a hole in the pulley 20 and is secured in the sleeve 36, said spring being seated in a recess in the pulley and acting against the head of the bolt.

To enable the slow speed clutch to be thrown into operation at a predetermined time in a cycle of operations of the machine so that the driving shaft may be surely slowed down to the speed of the low speed clutch before the shaft is stopped, mechanism is provided comprising a timing cam 40 consisting of a cam groove formed in the sleeve 36 which is engaged by a roll 48 mounted on one arm of a bell crank lever 50 that is pivoted at 52 on the machine frame. The other arm of the bell crank lever 50 is provided at its extremity with a recess 54 adapted to receive a projection 56 at the upper end of a lock-bolt or coupling device 58 which is normally held out of engagement with the lever so that during normal operation of the machine, the lever is oscillated idly by the cam. The lock-bolt 58 is mounted to slide vertically in the forward end of a carrier or slide 60 that is mounted to slide horizontally in suitable guides 62 on the frame, and is yieldingly held in forward position by a coiled spring 64. The spring 64 is interposed between a shoulder on the carrier 60 and the end of a screw 66 that is threaded into the frame and by means of which the tension of the spring 64 may be adjusted. The lock-bolt carrier 60 is provided with an extension 68 projecting rearwardly therefrom through an aperture in the portion of the frame in which the slide is mounted, and the forward movement of the slide in its guides is limited by a nut 70 that is threaded onto the extension 68. By adjusting the nut 70 the carrier 60 may be adjusted to bring the lock-bolt 120 into a position such that the projection 56 thereon will register with the recess 54 at the proper time in the rotary movement of the main shaft. The lock-bolt 58 is forced upwardly in the carrier 60 by a coiled spring 72 seated in a recess in the slide and engaging the head of the lock-bolt. Secured to the lower end of the lock-bolt is a block 73 which is connected by means of a stud 74 with a treadle rod 76. The lower end of 130
rod 76 is connected, as shown in Fig. 6, with a lever 78 which is arranged to be actuated by the foot-treadle 22 in the usual manner so that the lock-bolt is held down with the projection 56 out of engagement with the recess 54 while the treadle is depressed and the main driving clutch is engaged to drive the main shaft of the machine. When the treadle is released the spring 72 forces the lock-bolt upwardly against the underside of the bell crank lever, and when the recess 54 in the lever registers with the projection 56 on the lock-bolt the projection snaps up into the recess thus connecting the lever with the carrier 60.

When the projection on the lock-bolt engages the recess in the bell crank lever, the lever is no longer free to oscillate since it is locked to the carrier 60, and by the action of the cam 46 on the roll 48 carried by the arm of said lever, the sleeve 36 will be shifted longitudinally of the shaft 18, toward the right in Fig. 5, bringing the clutch member 26 into engagement with the clutch member 24 when the roll engages a certain point on the cam groove, which occurs at a predetermined time in the cycle of operations of the stitch forming mechanism. After the clutch members have been engaged, the lock-bolt carrier 60 will be moved toward the left in Fig. 3, against the tension of the spring 64, by the action of the cam 46 on the bell crank lever, and the force with which the clutch members are engaged will depend upon the tension of the spring 64. After the speed of rotation of the shaft has been slowed down, the continued rotation of the shaft by the slow-speed clutch causes the cam 46 to shift the sleeve 36 and disengage the clutch members so that the shaft is disconnected from all driving mechanism and immediately comes to rest.

When the machine has been brought to rest the needle is retracted out of engagement with the work and near the limit of its retracting stroke, and the parts of the presser foot lifting mechanism are unlocked. At this point in a cycle of operations of the machine, the feed point is down in work engraving position adjacent the needle loop and interferes with the severing of the thread of the loop. In order to bring the feed point into a position such that it does not interfere with the severing of the thread when the machine is brought to rest, means is provided for automatically disconnecting the feed point from its actuating mechanism and for drawing the feed point back into retracted position immediately upon its being disconnected.

The feed point, as shown in Fig. 1, is actuated through an oscillatory arm 80 with which the feed point is connected by means of links 82. The arm 80 is connected by a link 84 with an arm 86 which is secured to a shaft 88 that is journaled in a bearing in the machine frame. A second arm 90 secured to the shaft 88 carries a cam roll 92 that engages a cam groove in a cam disk 94 on the main shaft 18.

In order that the feed point may be disconnected from its actuating mechanism, the arm 86 is provided with a cylindrical housing 96 (Figs. 2 and 4) in which is arranged a plunger 98 having a tapered head 100 adapted to engage in a suitable tapered hole in the end of the link 84. The head of the plunger is normally held in engagement with the hole in the link by a coiled spring 102 surrounding the plunger and interposed between the head of the plunger and a cap 104 screwed on the inner end of the cylindrical housing. The link 84 is disconnected from the arm 86 by drawing back the plunger 98 against the tension of the spring 103.

In the present construction the plunger 98 is positively actuated, to disconnect the link 84 from the arm 86, by the movement of the slide 60 upon the disengagement of the clutch members 24 and 26 to cause the stopping of the machine. The mechanism for actuating the plunger 98 from the lock-bolt carrier 60 comprises a slide 106 to the forward extremity of which is secured a forked bracket 108 which receives the shank of the plunger 98 and is interposed between the end of the cap 104 and a collar 110 on the plunger, as shown in Fig. 4. The slide 106 extends substantially parallel with the main shaft to the back of the machine and at its rear end is provided with a recess which receives the end of an arm 112 that is fixed on a vertical shaft 114. Another arm 116 fixed on the shaft 114 is arranged to engage one end of a slide 118. The slide 118 extends across the machine and its opposite extremity projects into position to be engaged by the lower end of a lever 120 which is fulcrumed on a stud 122 secured in an arm projecting from the frame of the machine. The lever 120 is actuated from the lock-bolt carrier 60 to withdraw the plunger 98 from the hole in the link 84. To this end a latch 124 is pivotally mounted at the upper extremity of the lever 120 and said latch is adapted to be engaged by an arm 126 rigidly connected with the block 78. The arm 126 engages between lateral guides 128 projecting from the carrier 60, and the latch 124 is acted upon by a spring 130 tending to pull it downwardly. When the machine is running the arm 126 is held in lowered position below the upper ends of the guides 128 and the latch 124 then rests on the upper ends of the guides and overlies the upper end of the arm 126. Upon the release of the treadle and the rise of the lock-bolt, as the projection 56 snaps into the recess 54, the upper end of the arm 126 strikes the free end of the latch 124, raising it slightly
against the tension of the spring 130, and as the movement of the bell crank lever 50 moves the carrier 60 toward the left, Fig. 3, the arm 126 moves out from beneath the latch 124 which is pulled downward by the spring 130 against the upper ends of the guides 128. Upon the return movement of the slide 109 toward the right the arm 126 engages the end of the latch 124 moving the latch so as to rock the lever 129 about its fulcrum into the position shown in Fig. 3. This movement of the lever 130 actuates the arm 116, shaft 114, and arm 112 in a direction to retract the slide 106, and to withdraw the head of the plunger 98 from the hole in the link 84. When the link 84 has thus been disengaged from the arm 86, the feed point is immediately drawn back into retracted position on the presser foot by a spring 136 which engages the end of the link 84.

When the mechanism is started the depression of the treadle rod withdraws the arm 126 from engagement with the end of the latch 124 releasing the slide 118 and the mechanism connecting said slide with the plunger 98 and allowing the forward end of the plunger to be forced against the inner face of the link 84. When the movement of the arm 86 brings the head of the plunger 98 into registration with the hole in the link 84, the head of the plunger snaps forward into the hole in the link owing to the action of the spring 102. Upon starting the mechanism, therefore, the feed point is started into operation in timed relation to other parts of the machine.

While it is preferred to employ the specific construction and arrangement of parts shown and described it will be understood that this construction is not essential except insofar as specified in the claims, and may be changed or modified without departing from the broader features of the invention.

The invention having been described, what is claimed is:

1. A wax thread sewing machine having, in combination, stitch forming devices including a straight hook needle, a feed point, mechanism for actuating the feed point, a main shaft, driving mechanism for the shaft, means for controlling the connection of the driving mechanism with the shaft comprising a cam, a member normally oscillated idly by the cam, a normally stationary member, a coupling device for connecting said members to render said controlling means active, means for disconnecting the feed point from its actuating mechanism comprising a latch arranged to be thrown into operating position during the movement of the latter member in one direction, and to be actuated from said member during its return movement, and means for moving the feed point from its normal position in a direction away from the needle upon its disconnection from its actuating mechanism to allow the thread of the needle loop to be severed.

2. A wax thread sewing machine having, in combination, stitch forming devices including a straight hook needle, a feed point, mechanism for actuating the feed point, a main shaft, driving mechanism for the shaft, means for controlling the connection of the driving mechanism with the shaft comprising a cam, a member normally oscillated idly by the cam, a normally stationary member, a coupling device for connecting said members to render said controlling means active, means for disconnecting the feed point from its actuating mechanism comprising a latch arranged to be thrown into operating position during the movement of the latter member in one direction, and to be actuated from said member during its return movement, and means for moving the feed point from its normal position in a direction away from the needle upon its disconnection from its actuating mechanism to allow the thread of the needle loop to be severed.

3. A wax thread sewing machine having, in combination, stitch forming devices including a straight hook needle, a feed point, mechanism for actuating the feed point, a main shaft, driving mechanism for the shaft, means for controlling the connection of the driving mechanism with the shaft comprising a cam, a member normally oscillated idly by the cam, a normally stationary member, a coupling device for connecting said members to render said controlling means active, and means thrown into operation by the movement of said normally stationary member for automatically moving the feed point from its normal position in a direction away from the needle to allow the thread of the needle loop to be severed upon stopping the machine.

4. A wax thread sewing machine having, in combination, stitch forming devices including a straight hook needle, a feed point, mechanism for actuating the feed point, a main shaft, driving mechanism for the shaft, means for controlling the connection of the driving mechanism with the shaft comprising a cam, a member normally oscillated idly by the cam, a normally stationary member, a coupling device for connecting said members to render said controlling means active, means operated by the movement of the latter member for disconnecting the feed point from its actuating mechanism, and means for moving the feed point from its normal position in a direction away from the needle upon its disconnection from its actuating mechanism to allow the thread of the needle loop to be severed.

5. A wax thread sewing machine having, in combination, stitch forming devices in-
including a straight hook needle, a feed point, mechanism for actuating the feed point, a driving clutch, a sleeve fixed to the shaft and longitudinally movable thereon and carrying the driven member of the clutch, means for controlling the engagement of the clutch comprising a cam carried by the sleeve, a lever normally oscillated idly by the cam, a movable lock bolt carrier, a lock bolt movably mounted in the carrier to lock the carrier to the lever and thereby effect movement of the sleeve longitudinally of the shaft, means for disconnecting the feed point from its actuating mechanism comprising a latch arranged to be thrown into operating position during the movement of the lock bolt carrier in one direction and to be actuated from the carrier during its return movement, a device arranged to be engaged by the latch and movable with the lock bolt into and out of operative position with relation to the latch, and means for controlling the position of the lock bolt.

WILLIAM C. MEYER.