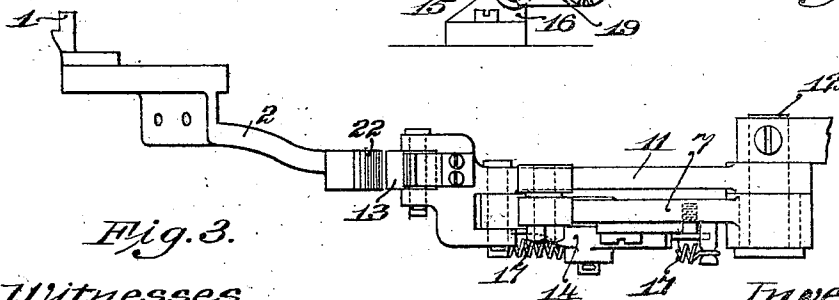
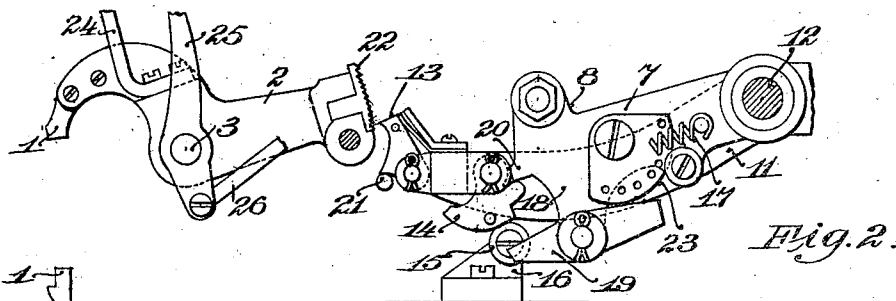
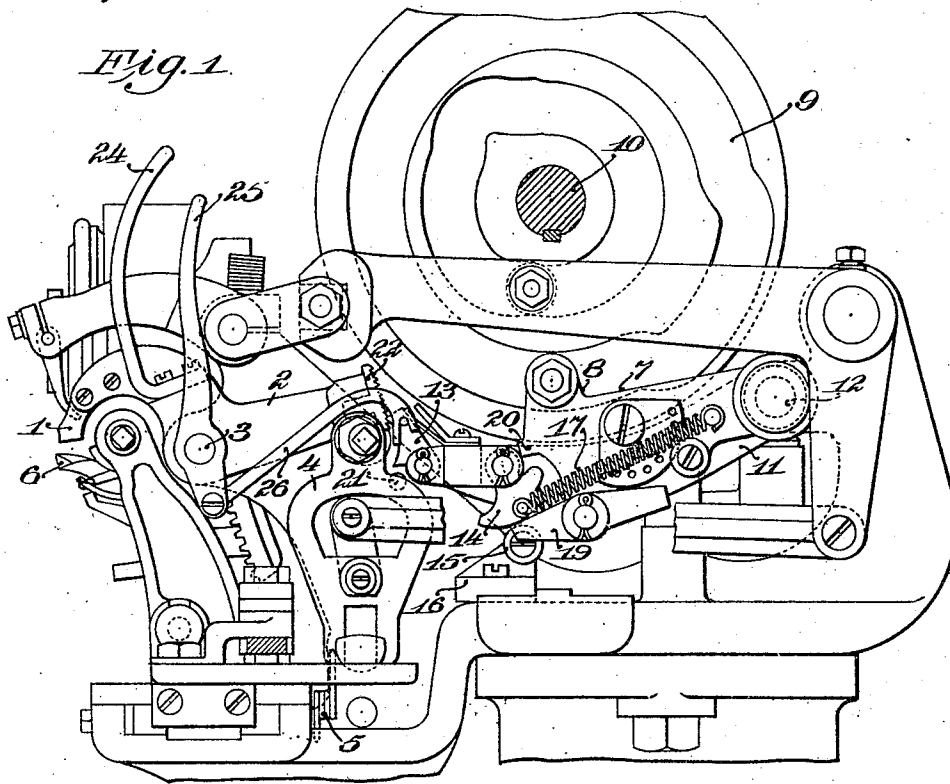


E. E. WINKLEY.
PRESSER FOOT MECHANISM.
APPLICATION FILED JAN. 14, 1905.

980,726.

Patented Jan. 3, 1911



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UNITED STATES PATENT OFFICE.

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PRESSER-FOOT MECHANISM.

980,726.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Presser-Foot Mechanisms; 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.

The present invention relates to presser foot mechanism for shoe sewing machines and particularly to presser foot mechanism for sole sewing machines of the lock stitch type, which are commonly used to unite the welt and outsole of a welted shoe.

The present invention is intended primarily as an improvement on the presser foot mechanism disclosed in the patent to Z. T. French and W. C. Meyer, No. 473,870, dated April 26, 1892. Certain features of the invention are, however, applicable to other forms of presser foot mechanism as will hereinafter appear.

In the presser foot mechanism disclosed in the patent to French and Meyer above referred to the presser foot is moved to clamp the work by means of cam-actuated mechanism, which, in order to allow the presser foot to accommodate itself to variations in the thickness of stock, is disconnected from the presser foot at certain times during the operation of the machine, the presser foot at these times being held lightly against the work by spring pressure. The mechanism for actuating the presser foot comprises a cam-actuated lever provided with a pawl which engages a ratchet connected with the presser foot. The pawl is moved out of engagement with the ratchet in order to allow the presser foot to move independently of its actuating mechanism in accommodating itself to stock of different thickness. During such movement of the presser foot the ratchet moves with relation to the pawl, so that when the pawl again engages the ratchet there is more or less lost motion and the movement imparted to the ratchet by the pawl consequently varies. To obviate the effect of this lost motion on the presser foot, a yielding connection is provided between the ratchet and the presser foot so that a longer throw can be imparted to the pawl than would otherwise be pos-

sible, and thereby a sufficient pressure put upon the presser foot through the yielding connection to clamp the work notwithstanding the lost motion between the pawl and ratchet. The provision of a yielding connection between the ratchet and the presser foot however necessitates the provision of a separate locking device for locking the presser foot against back pressure exerted thereon during the puncturing movement of the awl and the formation and setting of the stitch. This locking device consists of a pawl which is moved into and out of engagement with a ratchet mounted to move with the presser foot. This ratchet assumes different positions with relation to the locking pawl as the stock varies in thickness, so that there is more or less lost motion between the pawl and ratchet and the presser foot is not always held rigidly in position but is allowed to yield during the sewing operation so that a loose seam results.

The principal object of the present invention is to provide a presser foot mechanism by which the presser foot is actuated to exert a uniform clamping pressure on the work to press the layers of the work together regardless of variations in the thickness of the stock, and by which the presser foot is securely locked in clamping position.

A further object of the invention is to provide a presser foot mechanism comprising a comparatively small number of parts arranged in a simple and compact manner and having an improved mode of operation, and in general to improve the construction, arrangement and mode of operation of the various parts of presser foot mechanisms.

With these objects in view the present invention contemplates the provision of a presser foot actuating mechanism constructed and arranged to alternately engage and disengage the presser foot and means for automatically adjusting said mechanism to take up lost motion.

In the illustrated embodiment of the invention hereinafter specifically described the mechanism for actuating the presser foot comprises a cam actuated lever and automatically adjustable connections between the lever and the presser foot. The automatically adjustable connections comprise a pawl arranged to engage a ratchet mounted to move with the presser foot, and yielding or spring-actuated means for

moving the pawl, when in engagement with the ratchet, independently of the cam-actuated lever and for locking the pawl against backward movement. This movement of the pawl takes up all lost motion between the cam-actuated lever and the presser foot and thereafter the pawl is moved by the cam-actuated lever a certain predetermined distance, the same uniform throw being imparted to the presser foot regardless of the position which it has assumed in accommodating itself to the stock. As the pawl is locked against backward movement the presser foot exerts a positive pressure upon the work and is held securely against back pressure exerted thereon during the puncturing movement of the awl and the forming and setting of the stitch, no additional locking devices for holding the presser foot in position being necessary.

The mechanism above referred to embodies the present invention in the best form that has yet been devised but it is to be understood that except as defined in the claims the invention is not limited thereto but that broadly considered it may be embodied in any mechanism for actuating the presser foot which is automatically adjusted to take up lost motion.

It is believed that the pawl and the means above referred to for actuating the pawl to take up lost motion and for locking the pawl against backward movement are new, and it is accordingly considered that this pawl and its actuating and locking means constitute a feature of the invention whether they are utilized as connections in a mechanism which imparts a positive clamping movement to the presser foot or merely as a locking means for preventing backward movement of the presser foot after having been forced into contact with the work.

The present invention will be clearly understood from an inspection of the accompanying drawing in which is illustrated a presser foot mechanism embodying the same in its preferred form.

Referring to the drawing, Figure 1 is a view in side elevation of a lock stitch sole sewing machine, provided with a presser foot mechanism embodying the preferred form of the present invention, a portion of the frame of the machine being broken away and the cam shaft being shown in section; Fig. 2 is a view in side elevation of the presser foot mechanism detached from the machine, the parts being shown in the positions which they assume while the presser foot is accommodating itself to variations in the thickness of stock; and Fig. 3 is a plan view of the mechanism illustrated in Fig. 2.

The machine illustrated in Fig. 1 of the drawing, with the exception of the presser foot mechanism, is the same in construction and mode of operation as the machine dis-

closed in the patent to French and Meyer hereinbefore referred to, reference to which is made for a complete disclosure thereof.

The presser foot is indicated at 1 and is secured to the forward end of a lever 2 pivoted at 3 upon the frame of the machine. To the rear end of the presser foot lever 2 is pivotally connected the frame 4 which forms the means for adjusting the pull-off mechanism as the thickness of the stock beneath the presser foot varies, as fully illustrated and described in the patent to French and Meyer above referred to. A light spring 5 secured at one end of the frame of the machine and at the other end bearing against the frame 4 acts to hold the presser foot lightly in contact with the work when released from its actuating mechanism, the presser foot at this time moving toward and from the work support 6 independently of the actuating mechanism to accommodate itself to variations in the thickness of the stock.

The mechanism for actuating the presser foot to compress and clamp the work comprises a cam-actuated lever 7 and connections between the lever 7 and the presser foot lever 2. The lever 7 is pivoted at its rear end upon the hub of a lever 11 hereinafter referred to, and intermediate its ends is provided with an upwardly extending projection 8 in which is journaled a cam roll which engages a cam groove 9 in a cam disk secured to the cam shaft 10 of the machine. The connections between the cam actuated lever 7 and the presser foot lever 2 consist of a lever 11 pivotally mounted upon a stud 12 secured in the frame of the machine, a spring pressed pawl 13 mounted in the forward end of the lever 11, and a rotatable cam 14 also mounted upon the lever 11 near its forward end. The cam 14 is arranged to bear upon a roll 15 supported in a bracket 16 secured to the frame of the machine, and is acted upon by a light coiled spring 17 one end of which is attached to the cam and the other end to the lever 7. The lever 7 is provided near its forward end with a downwardly extending projection 18 upon which is mounted an arm 19 extending beneath the cam 14 in position to contact therewith during the upward movement of the lever 7. The lever 7 is also provided with a projection 20 which during the downward movement of the lever is arranged to engage a projection on the cam 14 and rotate the cam forward against the force of the spring 17. The upward movement of the lever 7 thus brings the arm 19 into contact with the cam 14 and raises the cam and the lever 11, upon which the cam and the pawl 13 are mounted, while the downward movement of the lever 7 by the engagement of the projection 20 with the projection on the cam 14 depresses the lever 11 until the cam rests on the roll 15

and then rotates the cam to allow the lever 11 to be still further depressed. During the last portion of the downward movement of the lever 11 a projection on the pawl 13 is brought into contact with a fixed pin 21 and thereby the pawl is moved out of engagement with a ratchet 22 upon the rear end of the presser foot lever. The presser foot is thus disconnected from its actuating mechanism and is free to move with relation thereto so as to accommodate variations in the thickness of the stock, the presser foot at this time being pressed lightly against the work by the spring 5. During the first portion of the upward movement of the lever 7 the cam 14 is allowed to rotate under the force of the spring 17, the cam being rotated by the spring until the lever 11 is raised a sufficient distance to bring the pawl 13 into engagement with the ratchet and seat it firmly against one of the ratchet teeth.

The extent of the upward movement imparted to the lever 11 by the cam 14 varies with the position of the presser foot lever so that all lost motion between the pawl 13 and the ratchet 22 is taken up before the arm 19 is brought into contact with the cam. It will be seen that the arm 19 engages the cam 14 at a certain predetermined point in the movement of the lever 7 so that the presser foot is always moved positively a uniform distance from any position which it assumes on account of variations in the thickness of the stock and the layers of the work are firmly pressed together. It will also be seen that the shape and arrangement of the cam 14 is such that the pawl is locked against backward movement so that the presser foot is positively held in the position to which it is moved by its actuating mechanism. In order to vary the extent of the movement imparted to the presser foot to compress and clamp the work, the arm 19 is pivotally mounted upon the projection 18 of the lever 7 and is provided with a rearward projection which is engaged by an adjustable stop cam 23 mounted upon the lever. The spring 17 acts to a greater or less extent, depending on the strength of the spring, to force the presser foot toward the work with a yielding pressure after the pawl 13 is seated against a tooth of the ratchet 22. It will be obvious that this movement of the presser foot may be relied upon to bring the layers of the work together and the stop cam 23 may be adjusted to cause the arm 19 to merely engage the cam 14 without raising it to any appreciable extent from the roll 15 so that no final positive clamping movement is imparted to the presser foot, but the presser foot is simply locked against backward movement.

To enable the presser foot to be raised by the operator when it is desired to insert work between the presser foot and the work

support the machine illustrated in Fig. 1 is provided with two hand levers 24 and 25, the lever 24 being rigidly secured to the presser foot lever and the lever 25 being pivotally mounted concentrically with the presser foot lever and connected by a link 26 with the pawl 13. One end of the link 26 is pivotally connected to the lower end of the lever 25 and the other end of the link is provided with a fork which engages a pin projecting laterally from the pawl 13. The levers 24 and 25 are arranged so as to be conveniently grasped by the operator, a movement of the lever 25 toward the lever 24 serving to disengage the pawl 13 from the ratchet 22 so as to allow the presser foot to be raised by means of the lever 24.

The operation of the illustrated embodiment of the invention has been indicated in the description given above of the construction and arrangement of the various parts and will be readily understood by those skilled in the art.

The nature and scope of the invention having been indicated and a preferred form of the invention having been specifically described, what is claimed is:—

1. A sole sewing machine, having, in combination, a presser foot, mechanism for actuating the presser foot to clamp the work arranged to alternately engage and disengage the presser foot, and means for automatically adjusting said mechanism after engagement with the presser foot to take up lost motion and cause the presser foot to exert the same predetermined clamping action on the work regardless of its thickness, substantially as described.

2. A sole sewing machine, having, in combination, a presser foot, mechanism for actuating the presser foot, comprising a pawl, means for moving the pawl varying distances to cause it to engage the presser foot in any position which it assumes in accommodating itself to stock of varying thickness and for thereafter positively moving the pawl uniform distances to actuate the presser foot to clamp the work, substantially as described.

3. A sole sewing machine, having, in combination, a presser foot, a ratchet connected to the presser foot and constrained to move therewith, a pawl, means for moving the pawl into and out of engagement with the ratchet, and means for actuating the pawl to take up lost motion while in engagement with the ratchet and for locking the pawl against backward movement, substantially as described.

4. A sole sewing machine, having, in combination, a presser foot, a cam actuated actuating lever therefor, connections between said lever and presser foot, means for actuating said connections to release the presser foot and allow it to accommodate itself to stock of

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varying thickness, and means for actuating
said connections to engage the presser foot
and for moving said connections with rela-
tion to the lever to take up lost motion be-
5 tween the presser foot and its actuating le-
ver, substantially as described.

5. A sole sewing machine, having, in com-
bination, a presser foot, a cam actuated ac-
tuating lever therefor, a ratchet mounted
10 to move with the presser foot, a pawl actu-
ated by the lever, means for moving the
pawl independently of the lever when in en-

gagement with the ratchet to take up lost
motion and for locking the pawl against
backward movement, and means for moving 15
the pawl into and out of engagement with
the ratchet, substantially as described.

In testimony whereof I affix my signa-
ture, in presence of two witnesses.

ERASTUS E. WINKLEY.

Witnesses:

GRACE C. MOONEY,
FARNUM F. DORSEY.