G. L. CORCORAN.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED APR. 7, 1911.

1,134,034.

Patented Mar. 30, 1915.

Fig. 1.

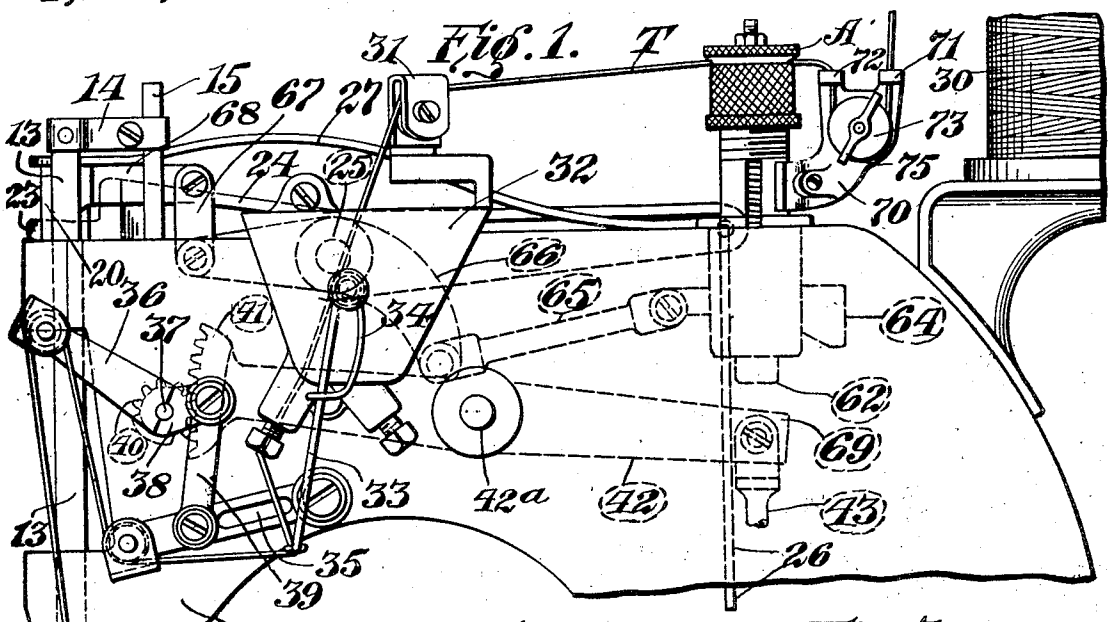


Fig. 2.

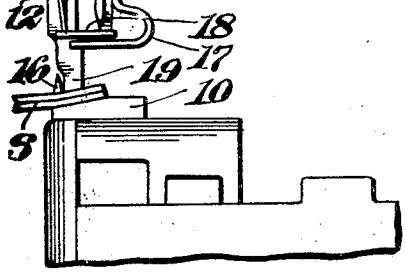


Fig. 3.

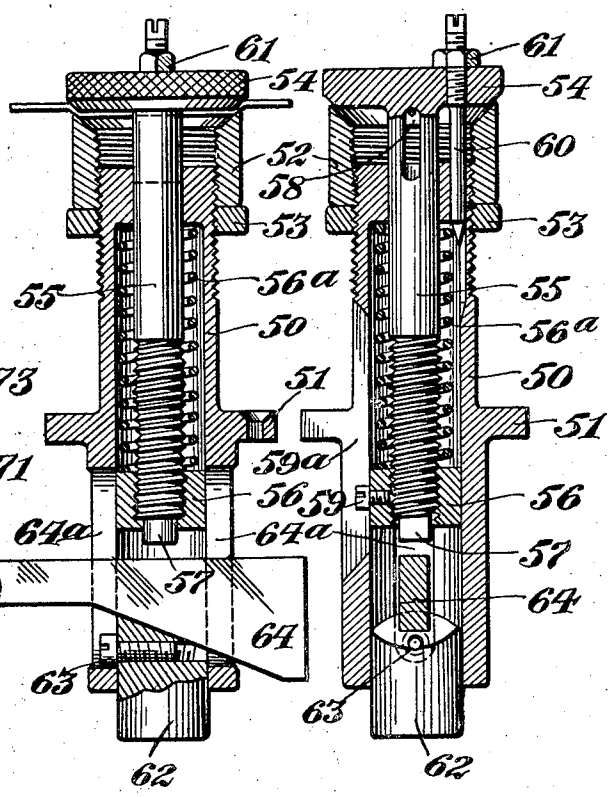
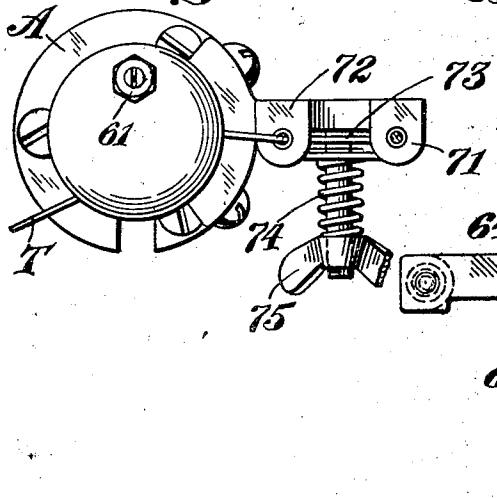


Fig. 4.



Witnesses:

Chas. A. Becker,

H. M. Hertel.

Inventor

George L. Corcoran.

By Attorney John H. Bruninga.

UNITED STATES PATENT OFFICE.

GEORGE L. CORCORAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CHAMPION SHOE MACHINERY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

1,134,034. Specification of Letters Patent. Patented Mar. 30, 1915.

Original application filed December 5, 1910, Serial No. 595,799. Divided and this application filed April 7, 1911. Serial No. 619,612.

To all whom it may concern:

Be it known that I, GEORGE L. CORCORAN, a citizen of the United States, and residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Thread-Controlling Mechanism for Sewing-Machines, of which the following is a specification.

This invention relates to sewing machines of the wax thread type, and more particularly to mechanism for controlling the thread.

This application is a division of my copending application Serial No. 595,799, filed Dec. 5, 1910.

In sewing machines which are adapted for sewing work of different thicknesses, it is desirable and necessary to vary the supply of the measured thread in accordance with the thickness of the work. In accordance with this invention the thread is locked while it is taken up and while the stitch is set, and thereafter it is released and the thread for the next stitch is measured from the supply.

One of the objects of this invention is to construct a thread-lock which is adapted to lock and release the thread and provide means whereby the action of the thread-lock can be controlled and varied, preferably in accordance with the thickness of the work, in order to regulate the setting of the stitches and the measuring of the thread for the stitches.

Another object is to improve the thread-lock as to details so that it will be simple in construction and easy to assemble and disassemble.

Further objects will appear from the detail description taken in connection with the accompanying drawings in which,

Figure 1 is a side elevation of the head and a part of the work support of a sewing machine showing this invention applied thereto, Figs. 2 and 3 are longitudinal sections of the thread-lock taken at right angles, and Fig. 4 is a detail plan view of the thread lock.

Similar reference characters are used as in the application referred to, and reference is had to said application for details of construction there shown.

Referring to the drawings, 10 designates the work support, and 11 the head of a sewing machine, which in this particular instance is of the lock-stitch type. An awl 12 is supported by the awl-bar 13 which reciprocates vertically in the head of the machine and is guided at its upper end by a cross head 14 engaging a guide 15. A hooked needle 16 enters the hole made in the stock S from below. Looper mechanism of well known construction and comprising fingers 17 and 18, is arranged to loop the needle thread around the needle in a manner well known to those skilled in the art. The awl, as well as the needle, shuttle, and looper, are operated by suitable mechanism from a main shaft through suitable links and levers as usual in machines of this type. A presser foot 19 is supported by a presser foot bar 20, which is arranged to be moved vertically in bearings in the head. The upper end of the presser foot bar has secured to it a laterally extending lug or finger, and a toe 23, of a lever 24 pivoted at 25 in the head, extends underneath the lug, and the opposite end of the lever is connected by a treadle rod 26 to a suitable treadle (not shown). The presser foot is normally pressed down on the work by means of a leaf spring 27, and this presser foot can be raised by means of the treadle through the connections shown.

The needle thread T from the main supply 30 passes through a thread lock A, over a guide 31, and through the wax pot 32. An arm 33 is pivoted on the wax pot or to any other suitable part of the machine head, and is under the tension of a spring 34, which normally tends to move the free end of the arm to the right, Fig. 1. Arms 35 and 36 are pivoted to the head of the machine and are provided at their free ends with guides for the thread. The arm 36 is secured to an actuator shaft 37 which has also rigidly secured to it an arm 38 connected by a link 39 to the arm 35. By means of this construction the arms 35 and 36 move toward and from each other. The shaft 37 has rigidly secured thereto a pinion or segmental gear 40 which meshes with a toothed segment or segmental gear 41 on one end of a lever 42 pivoted at 42^a in the head. The other end of the lever is connected by a link 43 to a suitable actuating cam on the main shaft.

The thread-lock comprises a cylindrical body 50 which is bored and provided with a securing flange 51, so that the lock can

be inserted into a hole in the head and secured in position by means of screws passing through the flange. The upper end of the lock body is threaded to receive a knurled sleeve 52 and a knurled lock nut 53. A knurled head 54 is mounted on a shank 55, the end of which is threaded to receive a collar 56 which affords an abutment for one end of a spring 56^a, the other end of which bears against a shoulder formed in the lock body. The shank is provided with a hardened end 57, and its upper end with a slot 58 for the thread. The collar 56 is locked against turning by means of a screw 59 engaging a slot 59^a in the lock body, and the head 54 is provided for a similar purpose with a guide pin 60 engaging a socket in the lock body. This guide pin is screwed into the head 54 and locked in position by means of a lock nut 61. The coöperating faces of the plunger head 54 and sleeve 52 are coned as shown in the drawing for the purpose of gripping the thread. A tappet 62 slides in the bore of the lock body and is prevented from dropping out by means of a screw 63 engaging a slot 64^a. The upper end of this tappet is inclined to correspond with the incline on a sliding wedge 64 which is guided by the slots 64^a. The wedge 64 is connected by a link 65 to one arm of a lever 66 pivoted at 25. The other arm of the lever is connected by a link 67 to an arm 68 secured to and projecting rearwardly from the upper end of the presser foot bar. The tappet 62 is arranged to be engaged by the end 69 of the lever 42.

A tension device is arranged between the lock and the thread supply so as to deliver the thread to the lock under tension. This tension device comprises a bracket 70 secured to the lock body and provided with eyes 71 and 72 for receiving and guiding the thread. The thread is gripped between a pair of tension plates or disks 73 pressed together by means of a spring 74 on a threaded shank secured to the bracket, and the tension of this spring can be regulated by means of a wing nut 75.

The arms 35 and 36 constitute together a take-up mechanism (or take-up members) the function of which is to take up the thread, set the stitch, and give up the thread to the needle and the shuttle in the formation of the stitch. In this case, however, the take-up mechanism performs an additional function, namely that of drawing or measuring the thread for the next stitch. This is accomplished by constructing the take-up mechanism so that it has two actions or movements, one of which is the take-up and stitch setting action, and the other of which is a thread drawing or measuring action. In the preferred form the lock is maintained closed until the stitch is set and then it is opened to permit the take-up mechanism in the last part of its movement to draw or measure the thread for the next stitch. The lock is closed to grip the thread between the plunger head 54 and the collar 52 by means of the spring 56^a, and the thread is released by the engagement of the end 69 of the lever 42 with the tappet 62. The raising of the tappet causes the wedge 64 to be moved upwardly to engage the end 57 of the plunger so as to raise it against the tension of its spring 56^a. Both the lock and the take-up mechanism are operated from the lever 42 so that they are interconnected to operate in timed relation. Assume that the stitch has been formed and that the arms 35 and 36 have moved toward each other so as to give up the thread during the formation of the stitch. As the arms 35 and 36 again move away from each other, the thread will be taken up and the stitch will be set against the tension of the spring 34, the thread being at this time firmly gripped by the thread-lock A. During the latter part of this movement of the arms 35 and 36 the lever 42 will engage the tappet 62 to open the lock A and permit thread for the next stitch to be drawn by the take-up mechanism. Thereafter the lock will be closed and the thread will be again given up by the take-up mechanism during the formation of the next stitch.

It will be evident that the measured supply of thread must be varied in accordance with the thickness of the stock. This is accomplished by providing an adjustable work engaging member which varies in its position in accordance with the thickness of the work, and controls the thread drawing action of the above described mechanism. In the specific embodiment shown, the presser foot is movable and adjustable and is interconnected with the sliding wedge 64. It will be seen that there is a lost motion connection between the tappet 62 and wedge 64, and the end 57 of the plunger. Now by varying the position of the wedge, the amount of such lost motion can be varied as will be obvious by referring to Figs. 2 and 3. Thus if the wedge is moved to the left, Fig. 2, the amount of lost motion will be decreased, and if moved to the right, will be increased. A decrease in the lost motion will cause the lock to be opened earlier in the take-up and lock setting movement of the take-up mechanism, so that the amount of thread drawn or measured is increased, keeping in mind that the take-up mechanism has a fixed stroke. An increase in the lost motion will have the reverse effect. Due to the interconnection of the presser foot and the wedge 64 an upward movement of the presser foot will cause the wedge to move to the left Figs. 1 and 2, and a downward movement will cause the wedge to move to

the right. It will thus be seen that when thicker stock or work is placed in the machine, the presser foot will be raised and the amount of thread measured for the next stitch will be increased. The levers and wedge are so designed that the amount of thread drawn and measured is in accordance with the thickness of the work, so that the correct amount will be automatically drawn and measured for every thickness. This insures that the stitch lock will be set at a uniform distance in the work irrespective of its thickness.

It is sometimes necessary to vary the timing of the opening of the lock independently of the automatic mechanism, for instance, in order to adjust the machine for stitches of different lengths or for preliminary adjustments for the tension of the thread. This can be accomplished by varying the time of the opening of the lock by independently varying the amount of lost motion referred to above. By referring to Fig. 2 it will be seen that if the sleeve 52 is raised the amount of lost motion will be increased, and if lowered decreased. The mechanism can therefore be manually and independently adjusted by adjusting the knurled sleeve 52, this sleeve being locked in adjusted position by means of the lock nut 53.

In order to insure accurate measuring of the thread, a tension device is placed between the lock and the thread supply. In this way the thread is delivered to the lock under tension so that overthrow of thread is prevented. The spring 74 is, however, a comparatively light spring, so that the tension on the thread will only be sufficient to prevent overthrow.

It will therefore be seen that in accordance with this invention the thread is locked during the take-up and stitch setting movement of the take-up members, and is released by opening the lock during the latter part of the take-up stroke of the take-up members. The take-up members have a fixed stroke with a fixed point at the end of the stroke, and by timing the point of opening of the thread-lock, the duration of the releasing action of the lock, and therefore the duration of the thread drawing action or movement of the take-up members, can be varied. By utilizing the take-up members for drawing the thread, the number of parts are reduced to a minimum resulting in simplicity of construction. The lock is so constructed that it can be easily assembled and disassembled, and all its moving parts are locked so as not to become loose.

While only one embodiment of this invention has been shown and described, it will be obvious that the invention may be embodied in different forms. It is also obvious that various changes may be made in details of construction without departing from this invention, and it is therefore to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention what is claimed is:

1. In a sewing machine, a thread-lock comprising a tubular body, a plunger having a plunger head, an adjustable sleeve on said body, said sleeve and head having cooperating thread gripping faces, and a spring for moving said gripping faces together.

2. In a sewing machine, a thread-lock comprising a tubular body, a plunger having a plunger head, said body and head having coöperating thread gripping faces, a spring for moving said gripping faces together, and a tension device mounted on said body.

3. In a sewing machine, a thread-lock comprising a support and a movable member having coöperating gripping faces, an actuator, and an adjustable wedge carried by said support and interposed between said actuator and movable member.

4. In a sewing machine, a thread-lock comprising a tubular body and a plunger having coöperating gripping faces, a stem on said plunger, a tappet carried by said body, and an adjustable wedge between said stem and tappet.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE L. CORCORAN.

Witnesses:
J. H. BRUNINGA,
GERTRUDE HESSING.