

J. L. KLEINMAN.
SEWING MACHINE.
APPLICATION FILED OCT. 5, 1910.

999,038.

Patented July 25, 1911.

3 SHEETS—SHEET 1.

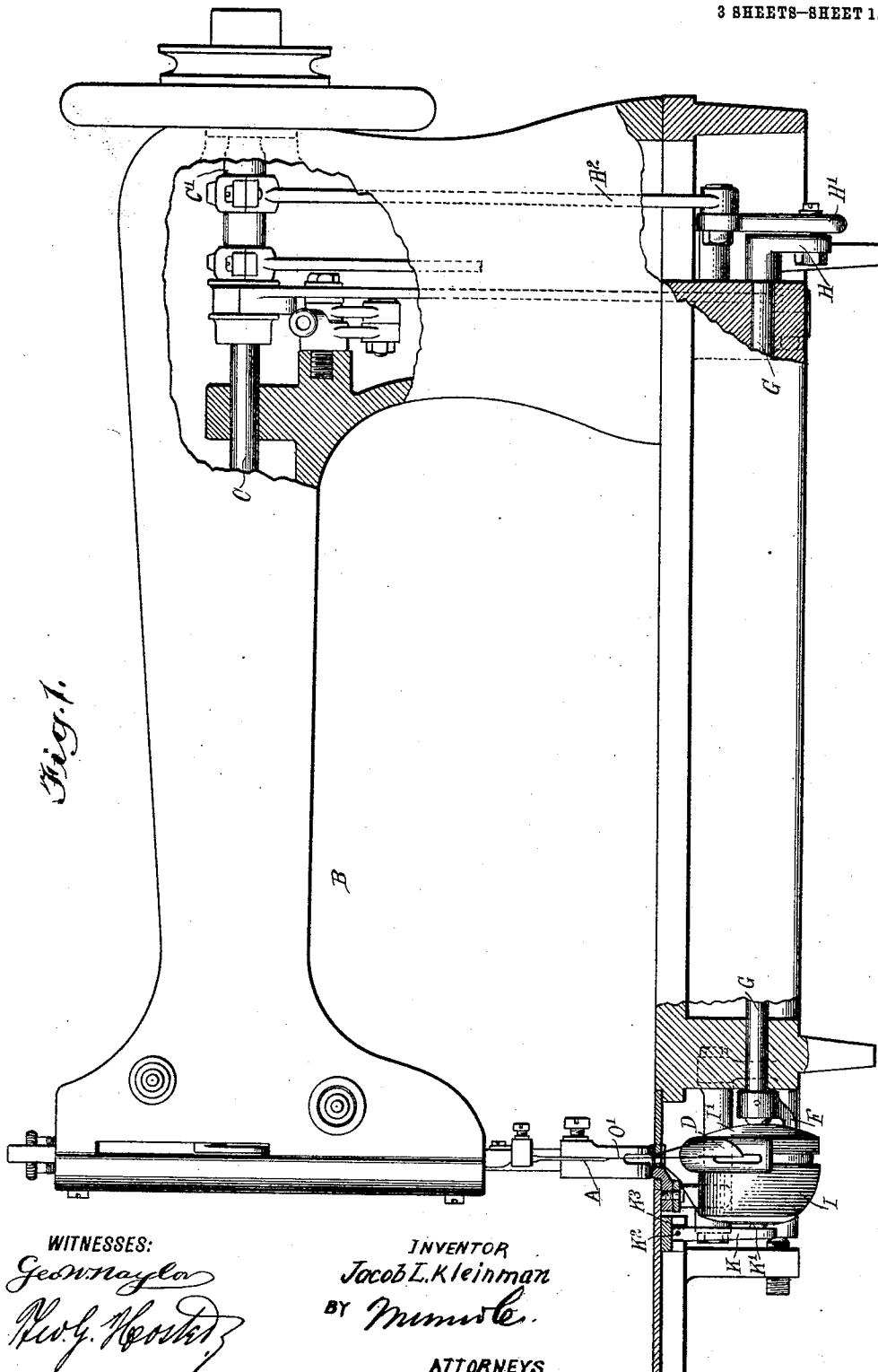


Fig. 1.

WITNESSES:
Geo. W. Taylor
Rev. G. H. Foster

INVENTOR
Jacob L. Kleinman
BY *Mumford*
ATTORNEYS

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3 SHEETS—SHEET 2.

Fig. 2.

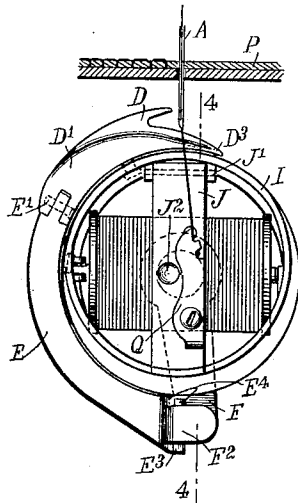


Fig. 3.

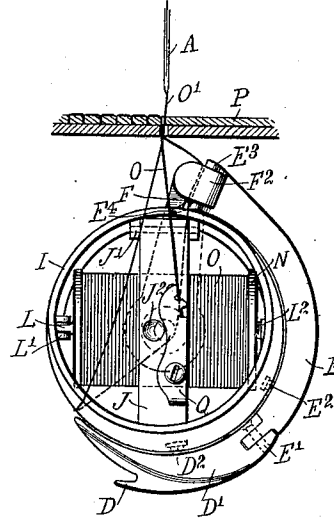


Fig. 4.

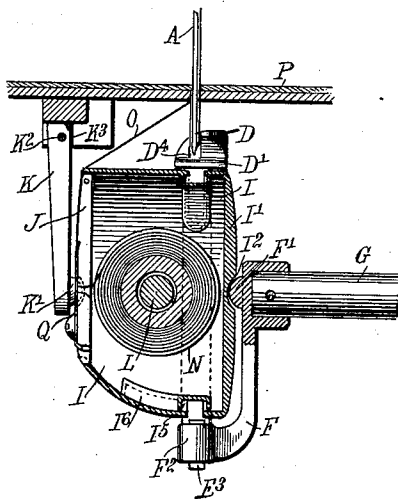
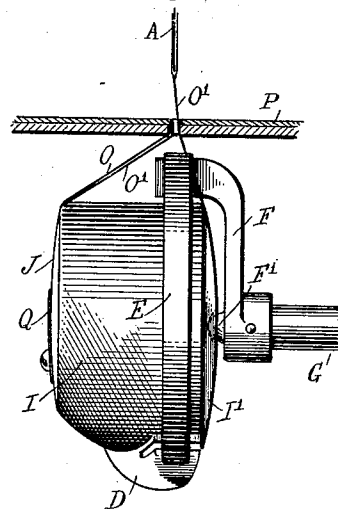


Fig. 5.



WITNESSES

Geo. W. Mayle
Rev. J. H. Foster

INVENTOR

Jacob L. Kleinman

BY *Mum Co.*

ATTORNEYS

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3 SHEETS—SHEET 3.

Fig. 6.

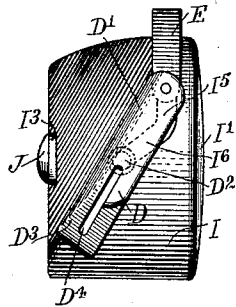


Fig. 7.

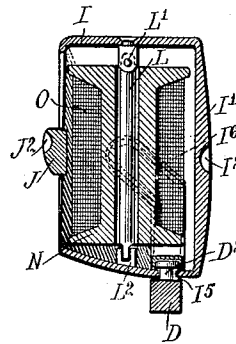


Fig. 8.

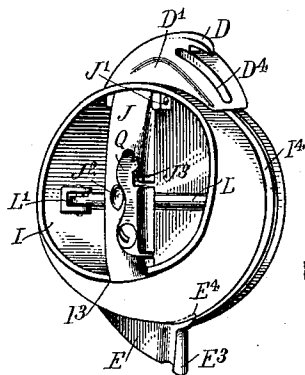
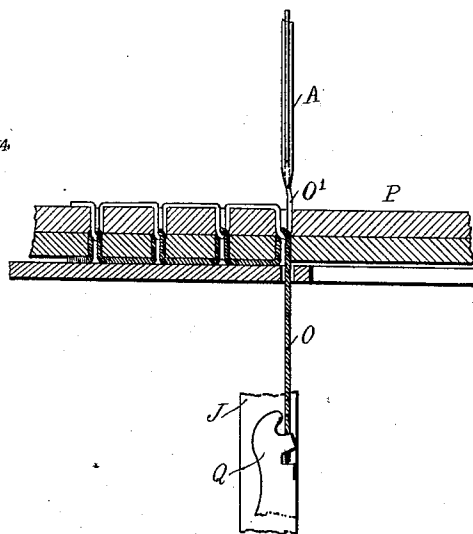


Fig. 9.



WITNESSES

Geo. M. Taylor
Wm. H. Hooten

INVENTOR

Jacob L. Kleinman
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JACOB L. KLEINMAN, OF NEW YORK, N. Y.

SEWING-MACHINE.

999,038.

Specification of Letters Patent. Patented July 25, 1911.

Application filed October 5, 1910. Serial No. 585,351.

To all whom it may concern:

Be it known that I, JACOB L. KLEINMAN, a subject of the Czar of Russia, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Sewing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved sewing machine arranged to permit the use of a spool of sewing thread instead of a bobbin, thus saving the rewinding of thread from the spool to the bobbin.

For the purpose mentioned use is made of a thread case adapted to contain a spool of thread and a loop-taking hook mounted to oscillate on the peripheral face of the thread case to take hold of the needle thread loop and to carry the said loop sufficiently far around the thread case for finally casting off the loop to form a lock stitch in conjunction with the spool thread.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the sewing machine, parts being in section; Fig. 2 is an end view of the stitch-forming mechanism and the cloth on which the stitches are formed, the cloth being shown in section; Fig. 3 is a like view of the same with the loop-taking hook in a cast-off position; Fig. 4 is a sectional side elevation of the same on the line 4—4 of Fig. 2; Fig. 5 is a side elevation of the same and showing the loop-taking hook in cast-off position; Fig. 6 is an inverted plan view of the thread case with the carrier and the loop-taking hook in position; Fig. 7 is a sectional plan view of the same and showing the spool in position in the thread case; Fig. 8 is a perspective view of the thread case, the carrier and the loop-taking hook; and Fig. 9 is an enlarged cross section of the cloth showing the stitches formed, the needle and the tension device on the thread case.

The needle A is mounted to reciprocate in the usual manner on the frame B by suitable mechanism connected with the main shaft C, which latter is also connected with the usual feed mechanism for the cloth and the usual take-up mechanism for the needle thread, but as these devices are all well

known parts, it is not deemed necessary to further describe the same in detail.

The needle A operates in conjunction with a loop-taking hook D, pivotally connected with one end of a carrier E, loosely engaged at the other end by a crank arm F secured to one end of a rock shaft G, arranged lengthwise and journaled in suitable bearings on the frame B, the other end of the shaft G being provided with a crank arm H pivotally connected with the slotted arm of a bell crank lever H' fulcrumed on the frame B and connected by a pitman H² with a crank arm C' arranged on the main shaft C, so that when the latter is rotated a rocking motion is given to the shaft G in unison with the up and down movement of the needle A.

The hook D and the carrier E are mounted to travel on the peripheral face of a thread case I, made approximately cylindrical and having its axis coinciding with the axis of the shaft G, the thread case I being closed at the right-hand side by an integral convex wall I' having an external central recess I² into which fits loosely a spherical projection F' formed on the crank arm F in axial alinement with the shaft G, as plainly indicated in Figs. 1, 2, 3, 4 and 5. The other or left hand side of the thread case I is open, and across the opening extends a vertical arm J pivoted at J' at the top to the thread case I, and engaging with its lower end a recess 13 in the left-hand edge of the thread case I, as indicated in Figs. 6 and 8. The arm J is provided with a recess J² loosely engaged by a spherical projection K' formed on a hanger K, fulcrumed at its upper end at K² on the frame B, the heel of the said hanger K having flat faces pressed on by a spring K³ attached to the frame B. The spring K³ serves to hold the hanger K in either its normal vertical position or in horizontal position, that is, when swung upward for removal of the thread case I. The recess J² is arranged eccentrically relative to the recess I², so that the thread case I is loosely supported on the projections F', K' at the same time the thread case I is held against rotation as will be hereinafter explained.

Within the thread case I is arranged a spindle L, on which is loosely held the spool N carrying the spool thread O, adapted to form with the needle thread O' the lock stitch on the cloth P, as hereinafter more

fully explained. The spindle L is pivoted at one end at L' inside of the thread case I, and the spindle engages at its free end a keeper L² for normally holding the spindle in a horizontal position to rotatably support the spool N. The spool thread O after unwinding from the spool N passes through a slot J³ formed in the arm J and then passes under a tension device Q attached to the outer face of the arm J, as plainly indicated in Figs. 2, 3, 4, 5 and 8.

The hook D is formed on a base D' having its inner surface curved to conform to the peripheral face of the thread case I, and the said case D' is provided with an inwardly-extending stud D² engaging a slot I⁵ formed in the peripheral face of the thread case I, the said slot I⁵ extending transversely and terminating at one end in a diagonal extension I⁶ leading from the right to the left, as plainly indicated in Fig. 6.

The base D' of the hook D is provided with an extension D³, projecting beyond the hook D and having in its upper surface an elongated groove D⁴ to accommodate the point of the needle A when the latter moves into its lowermost position to the left-hand side of the hook D, as plainly indicated in Fig. 4. The carrier E is pivotally connected at E' with the rear end of the base D' of the hook D, and the said carrier E has its inner surface curved to correspond to the peripheral face of the thread case I, and the said carrier E is provided with an inwardly-extending stud E² engaging the transverse slot I⁵ so that when a rocking motion is given to the shaft G then the crank arm F causes the carrier E to oscillate to move the hook D around the peripheral face of the thread case I, the stud D² of the hook D first traveling in the transverse portion of the slot I⁵ to finally pass into the oblique terminal I⁶ so that the hook D is swung over from the right to the left into cast-off position, as indicated in Figs. 3, 5 and 6, and when the crank arm F rocks backward the carrier E and the hook D are returned to normal position, that is, the hook D again assumes a transverse position after its stud D² passes out of the oblique terminal portion I⁶ of the slot I⁵ back into the latter. A portion of the thread case I at the left-hand side and adjacent the oblique terminal I⁶ of the slot I⁵ is beveled inwardly to facilitate the sliding of the loop around the case after the loop is cast off by the hook D. The connection between the crank arm F and the rear end of the carrier E is by the use of a fork F² formed on the free end of the crank arm F and loosely engaging a pin E³ formed on the rear end of the carrier E. The connection between the pin E³ and the fork F² is sufficiently loose to permit the right-hand side of the loop of the

needle thread O' to pass through the said connection at the time the loop is drawn taut by the action of the take-up of the sewing machine.

In order to prevent the thread from passing between the rear end of the carrier E and the peripheral face of the thread case I, use is made of a rearwardly-extending projection E⁴ formed on the rear end of the carrier E, as plainly indicated in Figs. 2 and 3, which projection extends into the slot I⁵. The eccentric arrangement of the recess J² and projection K' relative to the recess I² and projection F' holds the thread case against rotating, as the thread case cannot turn on an axis connecting the bearing points owing to the engagement of the stud E² and projection E⁴ of the carrier with the peripheral slot I⁵ of the thread case. It is also understood that the connection between the thread case I and the supporting lugs F', K' is sufficiently loose to permit the loop thread to pass between the said connection at the time the loop is cast off, as indicated in Figs. 3 and 5.

The operation is as follows: When the several parts are in the position shown in Fig. 2 then the needle A after having passed through the cloth P has moved into a lowermost position to one side of the hook D and somewhat in front thereof and when the needle A now begins to rise then the rock shaft G by the crank arm F and carrier E imparts a forward movement to the hook D so that the latter engages the needle thread loop formed on the rising of the needle A, and this loop is carried along by the hook D around the thread case I during a little more than a half revolution of the shaft G, whereby the parts assume the position shown in Figs. 3, 5 and 6, that is, the hook D is switched or swung over to the left into an oblique cast-off position, the loop extending on the sides of the thread casing and across the peripheral face thereof and in engagement with the thread O passing from the spool N and the tension device Q to the fabric P, as indicated in Fig. 3. The take-up mechanism now pulls the needle thread O' taut, thereby forcing the loop past the projections F', K' and the recesses I², J² and also through the connection between the pin E³ and the fork F² to complete the stitch at the fabric, as will be readily understood by reference to Fig. 9. After the stitch is formed, the rock shaft G is rocked in an opposite direction to return the carrier E and the hook D to the forward starting position indicated in Fig. 2, and during this time the cloth P is fed rearwardly and the needle A is caused to descend, after which the above described operation is repeated for forming the next stitch. When the thread O of the spool N has run out, the operator swings the hanger K upwardly to allow of

swinging the arm J upward with a view to permit the operator to disconnect the spindle L from the keeper L² and to swing the said spindle outwardly with the empty spool N
 5 for removal of the same from the spindle and replacing it by a new spool filled with sewing thread O. The spindle L is then returned to its normal position, after which the arm J and the hanger K are returned
 10 and then the thread O is passed through the recess J³ and under the tension spring Q, to be in position for forming a loop with the needle thread O', as above explained.

From the foregoing it will be seen that by
 15 the arrangement described no bobbin is required, and the spool filled with thread can be readily placed in position in the thread case I to permit of using the thread on the spool in conjunction with the needle thread
 20 for forming a lock stitch, as previously explained: thus winding of the thread from a spool onto a bobbin and placing the latter in the thread case is entirely dispensed with and the filled spool can be used directly in
 25 the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a sewing machine, in combination
 30 with the needle and its operating mechanism, a thread case adapted to contain a spool of thread, a loop-taking hook mounted to oscillate on the peripheral face of the thread case, means connected with the hook
 35 for oscillating the same, and means for swinging the hook into and out of cast-off position, said hook being adapted to take hold of the needle thread loop and to carry the loop sufficiently far around the thread
 40 case for casting off the loop to form in conjunction with the spool thread a lock stitch.

2. In a sewing machine, in combination with the take-up and the needle and its operating mechanism, a cylindrical thread
 45 case having interior means for supporting a thread spool, supporting means loosely supporting the thread case at the ends thereof, and a pivoted loop-taking hook mounted to oscillate on the peripheral face of the said
 50 thread case and guiding means for said hook to swing the same into and out of cast-off position during the oscillation, the said hook being adapted to take hold of the needle thread loop and carry the loop suf-
 55 ficiently far around the thread case for casting off the loop to be drawn up by the said take-up to form a stitch in conjunction with the spool thread.

3. In a sewing machine, in combination
 60 with the take-up and the needle and its operating mechanism, a cylindrical thread case having interior means for supporting a thread spool, supporting means for loosely supporting the thread case at the ends there-
 65 of, a tension device at one end of the said

thread case for the passage of the spool thread, a loop-taking hook mounted to oscillate on the peripheral face of the said thread case, means pivotally connected with the hook for oscillating the same, and means
 70 for swinging the hook into and out of cast-off position, the said hook being adapted to take hold of the needle thread loop and carry the loop sufficiently far around the thread case for casting off the loop to be
 75 drawn up by the said take-up to form the stitch in conjunction with the spool thread.

4. In a sewing machine, the combination with a take-up, needle and operating mechanism for the same, a cylindrical thread case
 80 having a fixed and a movable end, and a peripheral groove having a diagonally-extending terminal, a spool support inside of the thread case for carrying a thread spool, supports loosely engaging the ends of the
 85 thread case, a tension device on the outer end of the thread case for the passage of the spool thread, a carrier mounted on the peripheral face of the thread case and guided in the said groove, a loop-taking
 90 hook pivotally connected with one end of the said carrier and guided in the said groove, and a crank arm connected with the other end of the said carrier.

5. In a sewing machine, the combination
 95 with a take-up, needle and operating mechanism for the same, a cylindrical thread case having a fixed and a movable end and a peripheral groove having a diagonally-extending terminal, a spool support inside
 100 of the thread case for carrying a thread spool, supports loosely engaging the ends of the thread case, a tension device on the outer end of the thread case for the passage of the spool thread, a carrier mounted on
 105 the peripheral face of the thread case and guided in the said groove, a loop-taking hook pivotally connected with one end of the said carrier and guided in the said groove, and a crank arm connected with the
 110 other end of the said carrier, the connection between the said crank arm and carrier being loose for the passage of the loop thread.

6. In a sewing machine, the combination
 115 with a take-up, needle and operating mechanism for the same, a cylindrical thread case having a fixed and a movable end and a peripheral groove having a diagonally-extending terminal, a spool support inside
 120 of the thread case for carrying a thread spool, supports loosely engaging the ends of the thread case, a tension device on the outer end of the thread case for the passage of the spool thread, a carrier mounted on the peripheral face of the thread case and
 125 guided in the said groove, a loop-taking hook pivotally connected with one end of the said carrier and guided in the said groove, the hook having a base extending forwardly beyond the point of the hook and
 130

the said projecting base having a groove for the passage of the needle point, and a crank arm connected with the other end of the said carrier.

- 5 7. In a sewing machine, the combination with a take-up, needle and operating mechanism for the same, a cylindrical thread case having a fixed and a movable end and a peripheral groove having a diagonally-extending terminal, a spool support inside of the thread case for carrying a thread spool, supports loosely engaging the ends of the thread case, a tension device on the outer end of the thread case for the passage of the
10 spool thread, a carrier mounted on the peripheral face of the thread case and guided in the said groove, a loop-taking hook pivotally connected with one end of the said carrier and guided in the said groove, a crank arm connected with the other end of the said carrier, and a support for the said thread case formed of a projection central on the inner fixed end of the thread case, and a
15 spring-pressed pivoted arm having a projection engaging a recess on the outer movable end of the said thread case.

8. In a sewing machine, the combination with the needle and its operating mechanism, of a thread case adapted to contain a spool of thread, a loop-taking hook and a carrier for the same mounted to oscillate on the peripheral face of the thread case, the

hook being pivoted to the carrier, and means for swinging the hook.

9. In a sewing machine, the combination with the needle and its operating mechanism, of a thread case adapted to contain a spool of thread, a loop-taking hook mounted to oscillate on the peripheral face of the thread case, means pivotally connected with the hook for oscillating the same, and means for swinging the hook into cast-off position when moved in one direction and for returning it to normal position to take hold of the needle thread loop, when moved in the other direction.

10. In a sewing machine, the combination with the needle and its operating mechanism, of a thread case adapted to contain a spool of thread, the thread case being provided with a peripheral groove having a diagonally extending terminal, a carrier having guided movement on the peripheral face of the thread case, a loop-taking hook pivotally connected with one end of the said carrier and guided in the said groove, and means connected with the other end of the carrier for oscillating the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB L. KLEINMAN.

Witnesses:

THEO. G. HOSTER,
PHILIP D. ROLLHAUS.