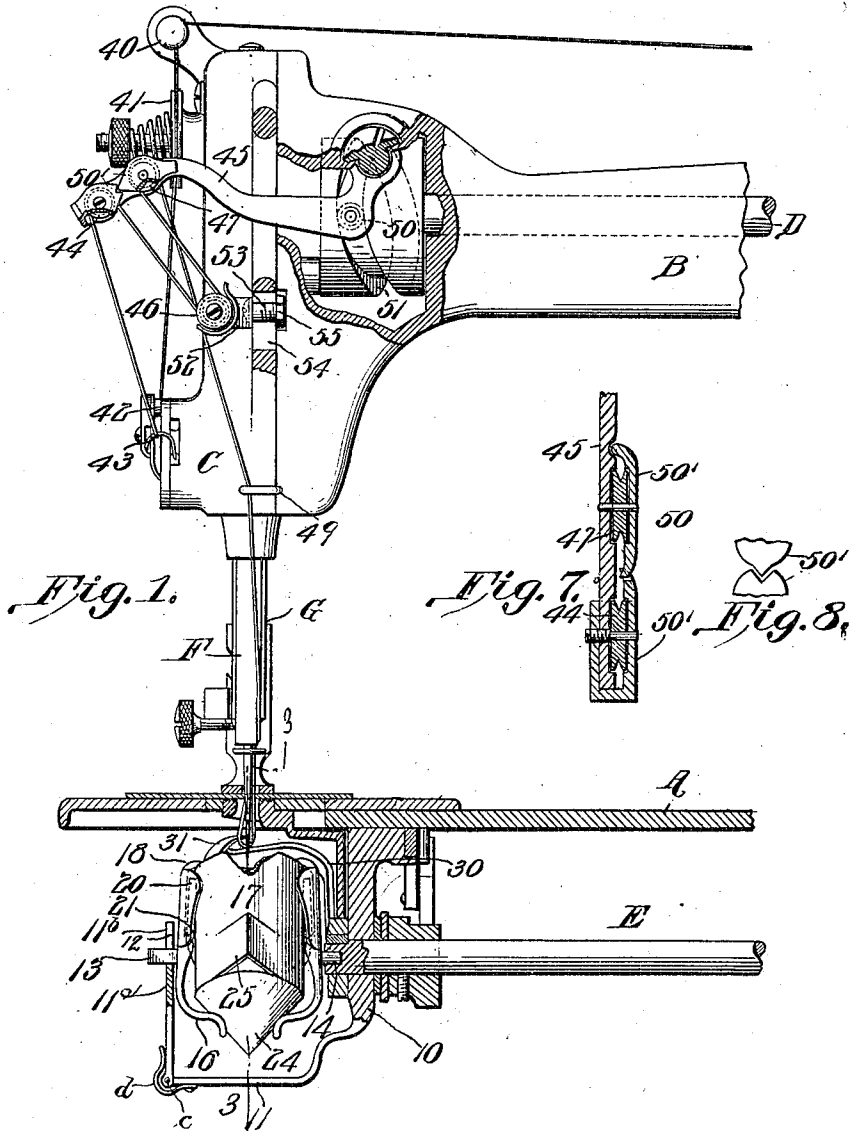


No. 837,269.

PATENTED NOV. 27, 1906.

E. C. IVES.
SEWING MACHINE.
APPLICATION FILED AUG. 17, 1905.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 5.

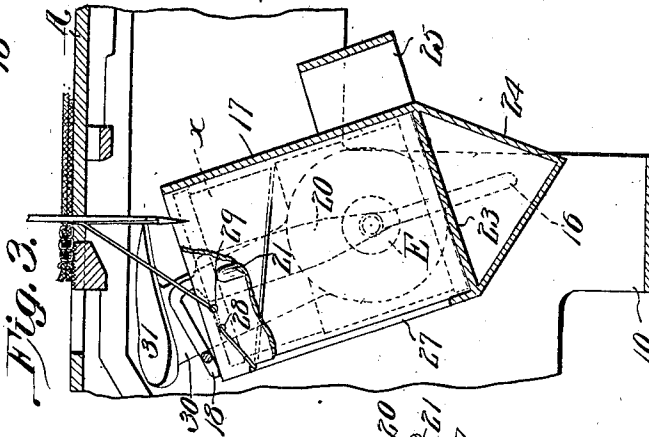
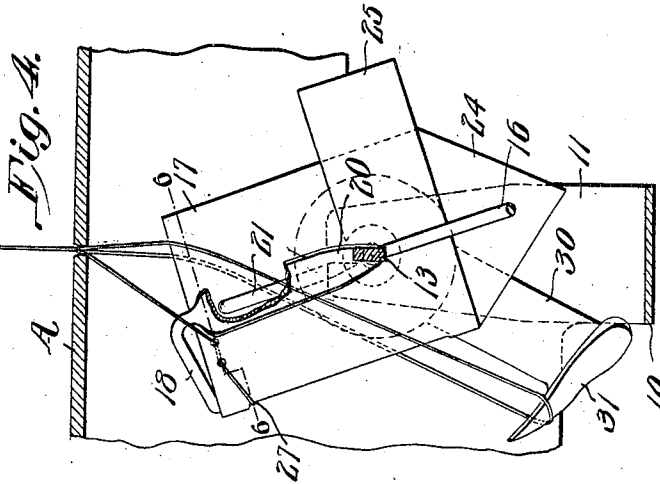
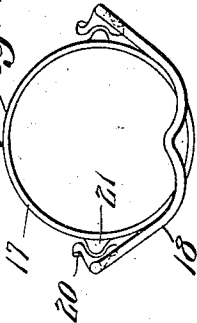


Fig. 2.

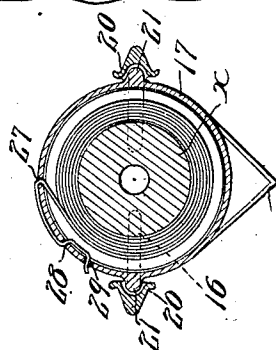
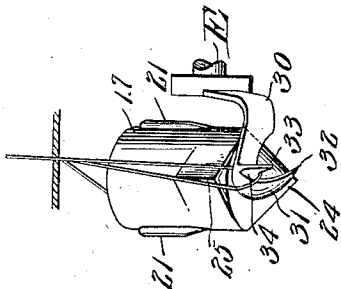


Fig. 6.

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UNITED STATES PATENT OFFICE.

ERNEST CHARLES IVES, OF WARREN, PENNSYLVANIA.

SEWING-MACHINE.

No. 837,269.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed August 17, 1905. Serial No. 274,601.

To all whom it may concern:

Be it known that I, ERNEST CHARLES IVES, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented a new and useful Sewing-Machine, of which the following is a specification.

This invention relates to sewing-machines, and has for its principal object to construct a novel machine of that general type in which a bobbin or reel carrier is arranged for the reception of a very large reel—such, for instance, as an ordinary spool of cotton.

A further object of the invention is to provide a machine of this type in which the bobbin-carrier is so arranged and is of such construction as to permit the stitch-forming operation with a loop of considerably less size than is usual with machines of the same class.

A still further object of the invention is to provide a novel form of bobbin carrier and supporting frame that will permit the ready passage of the loop without displacing the carrier and which at the same time is of such construction as to permit the ready renewal of the spool or reel.

A still further object of the invention is to provide a novel form of looper so arranged as to free the loop at the time most suitable for the operation of the take-up, so that the loop can be drawn up to form the stitch in advance of the taking up of a second loop from the reel.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a front elevation, partly in section, of the front portion of a sewing-machine constructed in accordance with the invention. Fig. 2 is a front elevation of the spool carrier and looper, illustrating the operation of the loop-opening finger or rib of the spool-carrier. Fig. 3 is a transverse sectional view of a portion of the machine of the line 3 3 of Fig. 1, the view being on an enlarged

scale and showing the position on the parts with the looper starting to take the thread from the needle. Fig. 4 is a view in elevation looking in the same direction and showing the position of the looper as the loop is pulled therefrom. Fig. 5 is a plan view of the spool-carrier and its supporting-frame. Fig. 6 is a sectional plan view of the same on the line 6 6 of Fig. 4. Fig. 7 is a transverse section of the outer end of the take-up arm, the view being on an enlarged scale. Fig. 8 is a detail of a portion of the take-up arm.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The bed-plate A, gooseneck B, and head C may be of the construction ordinarily employed, and in the gooseneck are bearings for the reception of the main shaft D, which is driven in any suitable manner and is connected to the looper-shaft E. In the head are arranged guides for the reception of a needle-bar F and presser-bar G, these being of the ordinary construction.

Hung from the lower front portion of the bed-plate is a casting 10, constituting a bearing for the looper-shaft, and hung from this bearing is a substantially horizontal bracket 11, which projects in advance of the looper-shaft below and in substantial parallelism therewith. From the outer end of the bracket 11 there rises a post 11^a, which is provided in its upper end with a longitudinal slot or bifurcation 12 for the reception of a non-circular lug 13, projecting from one side of a carrying-frame for the bobbin or spool case. The post 11^a has a pivotal or hinged connection *c* with the outer end of the bracket 11, and a leaf-spring *d* is secured to the under side of the bracket and bows around the joint between the latter and the post and bears against the outer side of said post to yieldably maintain the same in its normal upright position. The bobbin-frame may be formed of wire and is approximately U-shaped in general contour, the lug 13 projecting from one of its arms, and a second lug 14 projecting from the opposite arm and entering a suitable recess formed in the extreme end of the looper-shaft. The lower ends of the arms of the frame are bent inward, forming supporting-fingers 16 for the lower end of the bobbin or spool casing 17, and the extreme end portions of the fingers are flared outward in order to permit the con-

venient passage of the thread between the arms of the frame and the casing. The upper ends of the frame-arms are connected by a cross-bar 18 of such construction as to prevent the withdrawal of the bobbin or spool x during the sewing operation. The two arms of the frame are provided with widened strips 20, bent to form a pair of parallel grooves for the reception of correspondingly-arranged ribs 21, that are formed at the opposite sides of the bobbin or spool casing 17, and the lower ends of these grooves taper down and merge into the peripheral wall of the casing in order to permit the convenient introduction of the casing into the frame.

The casing 17 is of generally cylindrical form and of sufficient diameter and length to permit the reception of an ordinary spool of cotton. The cylinder is provided with a lower partition 23 for the support of the lower end of the spool, and said cylinder has a conical bottom 24 to assist in dividing the loop. At the front of the cylinder is a forwardly-projecting loop-dividing finger 25, so arranged with respect to the looper and needle that when the looper passes slightly below the finger the latter will be directly to the rear of the slightly-open loop, and on further movement of the looper as it advances toward the rear of the spool-casing this finger will divide the loop, and the latter will pass over the spool-casing and will enter between the conical bottom of the casing and the fingers 16 and thence will be drawn up over the ribs 21 and completely over the top of the spool-casing, carrying with it the thread from the spool and binding the latter into the lower face of the fabric to form the well-known lock-stitch.

The thread from the spool passes through a vertically-elongated slot 27, formed in the casing, the slot being preferably as long as the reeling-surface of the spool, and thence over the outer portion of the casing and inward through an opening 28 and thence outward through a second opening 29 and up to the fabric, a strand of thread being thus held in position to be engaged by the successive loops.

The looper comprises an arm 30, rigidly secured to the looper-shaft E and extending in a radial line therefrom, the outer end of the arm being bent substantially at a right angle to cross the vertical plane of the needle and being provided at its end with a looper-head 31. The looper-head is provided with a pointed end 32, which enters the loop immediately above that of the needle, and at the base of the head is an enlarged shoulder 33, between which and the head proper is a well-defined groove 34, into which the thread enters at one stage of the loop-carrying operation. The looper is arranged to revolve continuously around the spool-carrier, and the latter is so disposed that its longitu-

dinal axis is arranged in a plane approximately fifteen degrees from the vertical, this angular position being found best adapted for the formation of the loop in that it permits of material reduction in the length of the loop necessary to pass around the spool-casing. The operation of this portion of the mechanism will be readily understood. In Fig. 1 the needle is shown down, with the point of the looper about entering the loop immediately above the eye of the needle. This loop is carried around in front of the spool-casing, and as the parts approach the position shown in Fig. 2 the loop will be spread to such an extent that portions of the latter lie on opposite sides of the loop-spreading finger 25. As the looper moves farther downward and rearward the loop will be divided by the finger and by the point or conical end 24 of the casing, passing under the bottom of the casing to the position shown in Fig. 4, and during this movement the thread of which the loop is formed passes between the ribs 21 of the casing and the grooved guiding-plates 20 of the casing-carrying frame. At this stage of the operation the take-up starts to draw the loop upward and operates rapidly to take up the thread and pull the latter up under the spool-thread, the latter being drawn into the lower portion of the fabric to form a lock-stitch.

The needle-thread passes from the spool, carried by any suitable support, to a guide at the top of the head, and passes around a tension 41, passing thence around a guide and under a small spring take-up 43 of a type commonly used. From thence the thread passes over a grooved wheel 44, arranged at the outer end of a take-up arm 45, thence over the adjustable pulley 46, carried by the head, thence around a second grooved wheel 47, carried by the take-up arm, and thence down through a guiding-eye 49 to the needle.

The take-up arm 45 is in the form of a bell-crank lever having one end pivoted within the head and provided with a pin or anti-friction-roller 50, which enters a cam-groove 51, formed in a revoluble cam carried by the needle-shaft B, and said take-up arm has an extensive movement, which in connection with the multiplying-wheels over which the thread passes will quickly take up the large loop necessarily formed in this type of machine. The outer end of the arm 45 is provided with circular depressions or recesses for the reception of the sides of the wheels 44 and 47, and the opposite sides of said wheels are received in recesses formed in guard-plates 50', that are secured to the arm and are slightly separated from each other by an approximately V-shaped slot to permit the passage of the thread.

The take-up arm is in the fullest depressed position when the needle is at the highest

point and moves upward as the needle moves down and the looper moves up, reaching its highest point just as the needle is about to enter the fabric, while the looper-head is in the horizontal position to the rear of the spool-carrier. During the next stage of the movement—that is to say, while the needle is passing through the fabric and the looper is advancing to engage the needle-thread—the take-up arm moves downward and continues to move down, reaching its full down-stroke by the time the needle has moved to the full up position and the looper has about reached the position shown in Fig. 4. The take-up then commences to move upward, the movement being comparatively rapid to take up the loop and complete the stitch-forming operation before the looper can advance to a position to take a second loop from the needle.

It is preferred to have the guide-pulley adjustable vertically, and therefore it is carried by a bracket 52, having a threaded stem 53 passing through an upright slot 54 in a portion of the head C, there being a nut 55 provided upon the rear end of the stem for adjustably holding the bracket at any desired elevation. It will here be explained that it is not necessary to occasionally shift or adjust the bracket 52, as it is merely necessary to once set the bracket to the satisfaction of the user of the machine, after which the bracket does not require further adjustment.

Having thus described the invention, what is claimed is—

1. In a sewing-machine, the combination with a spool, a reel-casing having a conical bottom and provided with an open top for the reception of the reel or spool, a frame having a pair of spaced arms provided with grooved inner faces, and having pendent in-turned fingers against which the conical bottom of the casing rests, said fingers having outwardly-flared lower ends to facilitate the passage of the thread, a cross-bar forming a permanent connection between the upper ends of the arms and curved to follow a portion of the contour of the top of the casing,

said cross-bar having an inwardly-extended portion to prevent the withdrawal of the reel or spool, and ribs projecting from the opposite sides of said casing and fitting within the grooves, the lower ends of the ribs being tapered and merging into the periphery of the casing to facilitate the passage of the thread.

2. In a sewing-machine, a spool or reel casing having a conical lower end and provided with an open top for the reception of the reel or spool, a frame in which said casing is loosely supported, lugs projecting from the opposite sides of said frame, one of said lugs being non-circular in form, and supporting devices recessed for the reception of said lugs.

3. In a sewing-machine, a spool or reel casing having a conical lower end and provided with an open top for the reception of the spool or reel, a frame in which said casing is loosely supported, said frame having a pair of projecting lugs, one of which is non-circular in cross-section, a looper, a looper-shaft recessed to receive one of the lugs, and an auxiliary frame member or arm having a non-circular slot for receiving the non-circular lug.

4. In a sewing-machine, the combination of a spool or reel casing having a conical bottom and provided with an open top for the reception of the reel or spool, a frame in which said casing is loosely supported, said frame having a pair of projecting lugs, one of which is non-circular in cross-section, a looper-shaft recessed to receive one of the lugs, a looper actuated by the shaft, and an auxiliary frame member having a pivotal spring-pressed post provided with a non-circular slot for the reception of a non-circular lug.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ERNEST CHARLES IVES.

Witnesses:

W. BOYD HECK,
JOSEPH A. SCHOFIELD.