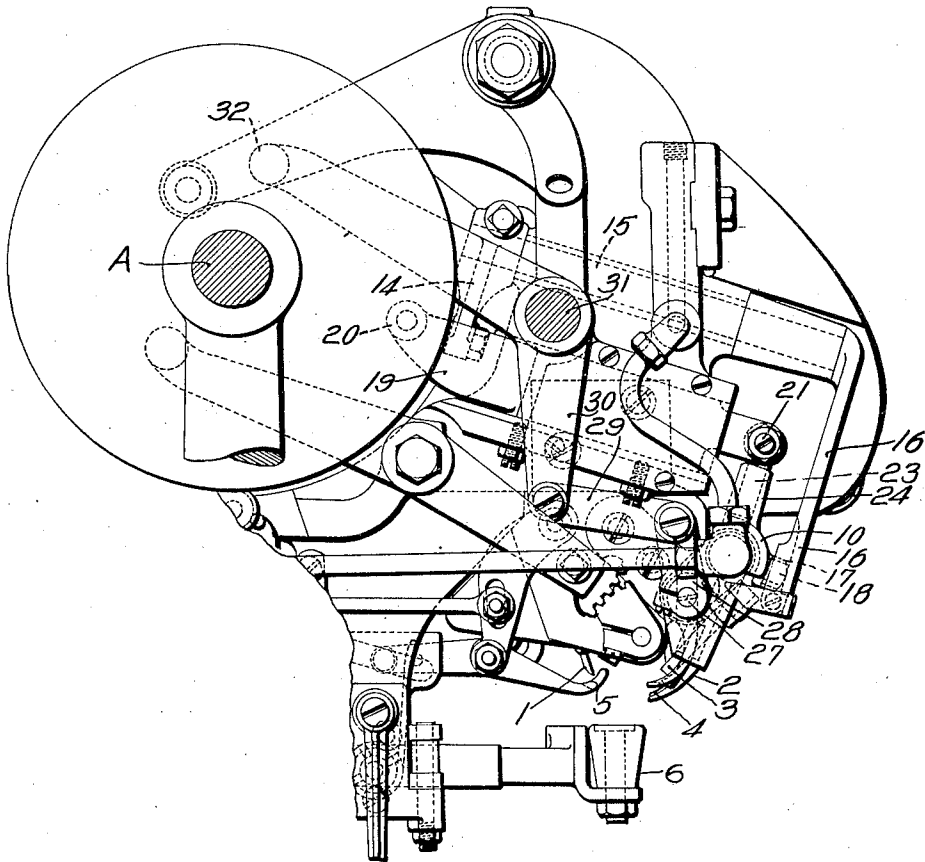


A. EPPLER.
SEWING MACHINE.
APPLICATION FILED JAN. 8, 1918.

1,355,825.

Patented Oct. 19, 1920.
3 SHEETS—SHEET 1.

Fig. 1.



Witness

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Inventor

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by his Attorneys

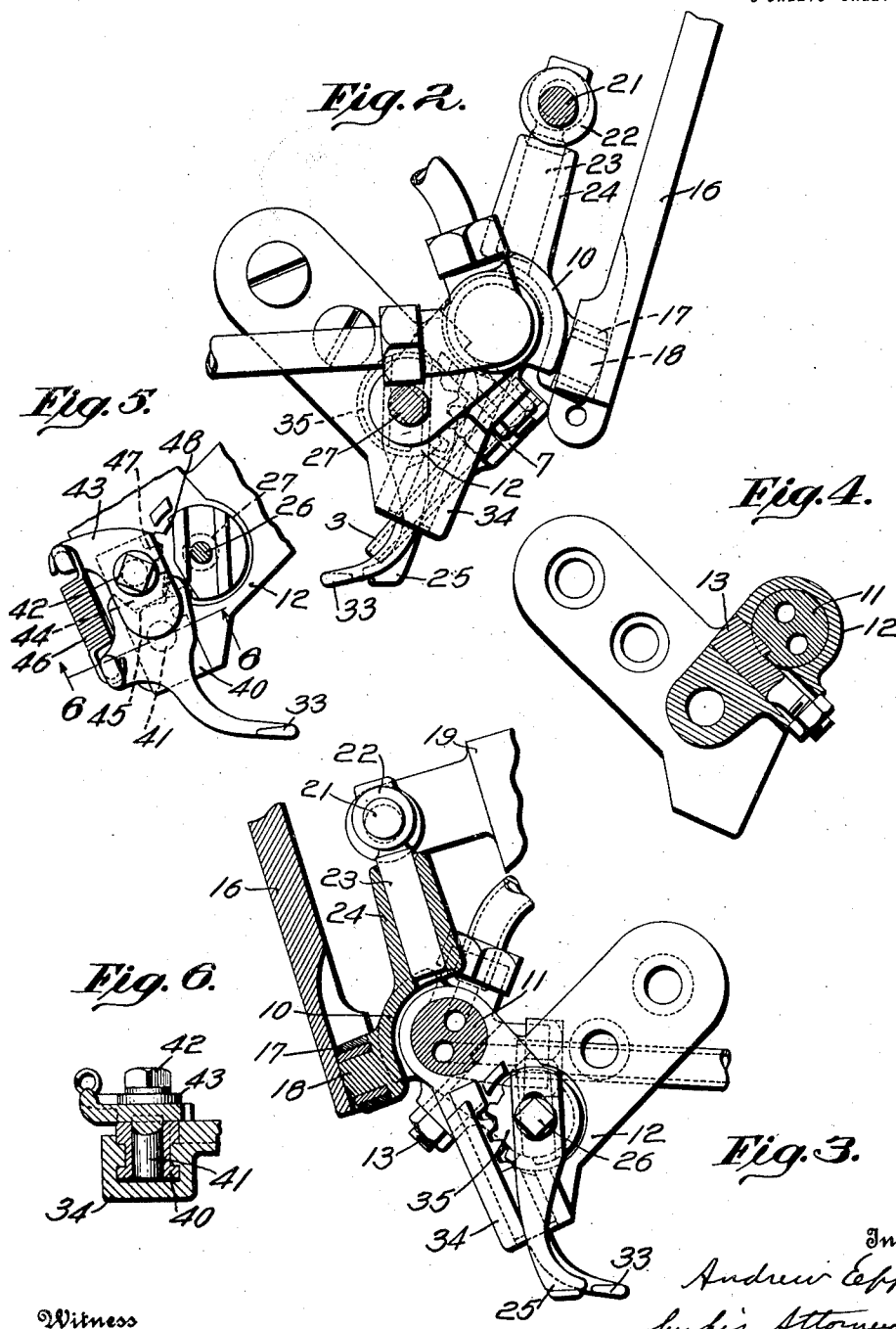
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

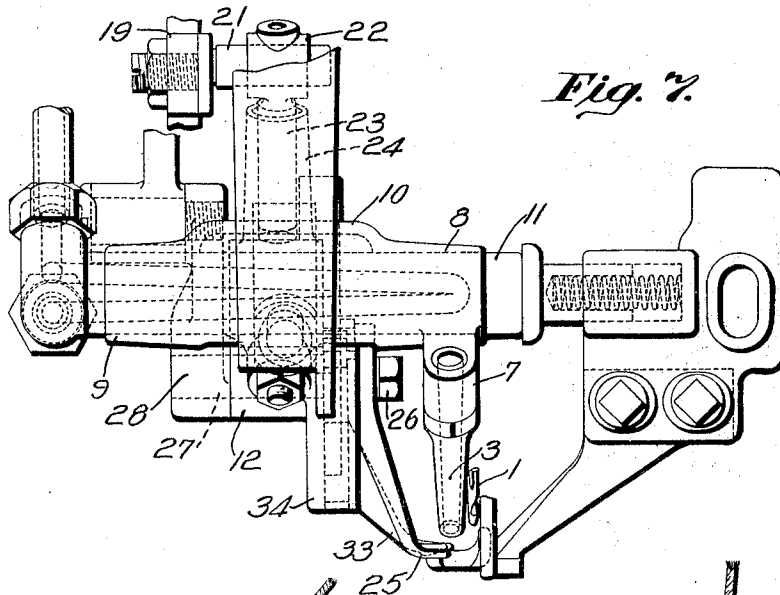


Fig. 7.

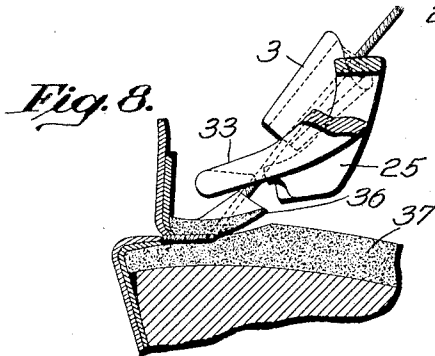


Fig. 8.

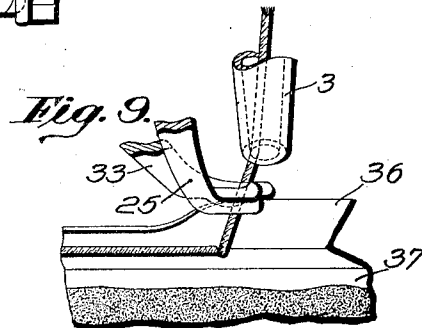


Fig. 9.

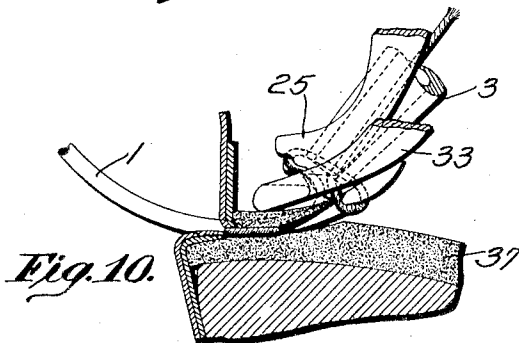


Fig. 10.

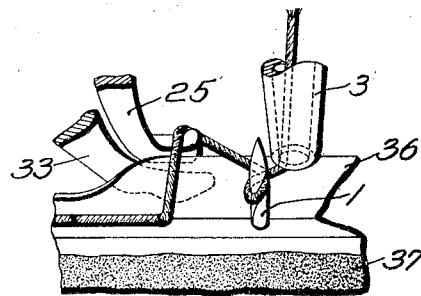


Fig. 11.

Witness

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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE.

1,355,825.

Specification of Letters Patent.

Patented Oct. 19, 1920.

Application filed January 8, 1918. Serial No. 210,849.

To all whom it may concern:

Be it known that I, ANDREW EPPLER, 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 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 particularly to sewing machines of the type employed to sew together the upper and sole of a turned shoe or the upper, insole and welt of a welt shoe, although certain features of the invention may be applicable to sewing machines of other types.

In sewing machines of this character it is customary to employ a mechanism for looping the thread about the barb of a hooked needle when the needle is in its advanced position, comprising a looper and means for giving to such looper simultaneous reciprocatory movements substantially transverse to, and parallel with the plane of the needle, so that the end of the looper is moved about the needle in a substantially circular path.

One object of the present invention is to provide simplified and improved mechanism for actuating the looper to lay the thread about the needle. With this object in view, one feature of the invention consists in the provision of improved means for mounting the looper carrier so that it may slide on the bearing arranged transversely to the path of the needle and may also oscillate about such bearing in a direction parallel to the path of the needle, and of devices positively actuated from the main drive shaft for sliding and oscillating the carrier on its bearing.

In sewing machines of this type as heretofore designed, two thread fingers have been employed, one of which performs the usual function of the thread finger in pulling off a certain amount of thread to be given up to the looper in its looping operation and to the needle during its retracting stroke. The additional or supplementary thread finger has previously been employed to cooperate with the main thread finger in drawing out and holding the thread which is later to be given up to the needle, the function of such

supplementary thread finger being to form a fulcrum about which the thread can be drawn by the main thread finger. Both thread fingers of machines heretofore known have been designed to swing about substantially horizontal axes, and the supplementary thread finger in its swinging movement has also been employed to strike the edge of the channel flap of the insole to press down and close said channel flap after the operation of the stitch setting instrumentalities. The thread fingers of such construction are swung across each other when operated and in their swinging movement are liable to catch the lining or upper of the shoe between them if the materials are not closely trimmed and in such manner damage the materials and interfere with the operation of the machine.

It is accordingly an object of this invention to simplify and improve the mechanism by means of which the thread fingers are actuated. To this end the invention contemplates the provision of two thread fingers, one of which acts to close the channel flap, and which are operated by interconnected gears positively driven by the main cam shaft through the medium of a single actuating device, so that the thread fingers are operated in unison and in properly timed relation. A further feature of the invention resides in the provision of a member carrying the thread finger engaging the channel flap, which member is raised and lowered by the thread finger actuating devices without any swinging movement, so that the finger which engages the channel flap is brought into and out of engaging position without any swinging movement relative to said channel flap. A further feature of the invention resides in the provision of means for so mounting the channel closing thread finger on the member which carries it that the thread finger will yield when it engages the work, so that the finger may accommodate itself to different thicknesses of the work and inequalities of the surface of said work.

Certain other features of the invention relate to improved constructions and arrangements of parts, as hereinafter specifically described and pointed out in the claims.

This application is a continuation in part of application, Serial No. 133,625, filed No-

venber 27, 1916, and the invention is illustrated in the accompanying drawings as embodied in the machine forming the subject matter of said application.

5 The several features of the present invention will be clearly understood from an inspection of the following detailed description and the accompanying drawings, in which—Figure 1 is a side elevation of a sewing machine embodying the present invention looking from the left. Fig. 2 is a detailed view in left-hand side elevation showing particularly the parts of the mechanism for actuating the looper and the thread fingers. Fig. 3 is a detailed view of the same parts in side elevation looking from the right with certain portions in vertical section. Fig. 4 is a detailed view partly in vertical section of a portion of the means for supporting the looper. Figs. 5 and 6 are views illustrating a modification of the supplementary thread finger and the actuating mechanism for said finger, Fig. 5 being a view in side elevation of the modified construction and looking from the right, and Fig. 6 being a detail section, on the line 6—6 of Fig. 5, looking in the direction of the arrows. Fig. 7 is a front elevation of parts of the machine including particularly the mechanism for supporting and guiding the looper. Figs. 8 and 9 are fragmentary views in side elevation and front elevation respectively, illustrating the operation of certain of the stitch forming instrumentalities including the thread finger, these parts being shown in exaggerated size, and Figs. 10 and 11 are similar views showing the parts in different positions.

The machine as shown in the drawings is provided with the usual stitch forming instrumentalities including a curved hooked needle 1, an awl or feed point 2, a looper 3, a channel guide 4, a back gage 5 and a back rest 6. These devices are actuated by means of a cam shaft A bearing the usual disk cams.

The looper mechanism is particularly shown in Figs. 1, 2, 3, 4 and 7. The looper 3 is fixed in a looper carrier 7 which comprises two sleeves 8 and 9 connected integrally by a yoke 10. The sleeves are fitted to slide and rock upon a cylindrical bearing member 11 supported at the front of the machine. This bearing member is supported intermediate its ends in a bracket 12 which is screwed to the frame of the machine. As shown in Fig. 4, the bearing member is fixed in the bracket by means of a cotter pin 13. The yoke 10 spans the bracket 12 so that the looper carrier may be moved both longitudinally and rotatively upon the bearing member, and the substantial distance which separates the points of engagement of the sleeves with the bearing member insures that there shall be a minimum degree of lost motion be-

tween the parts and a corresponding high degree of accuracy in the control of the movements of the looper.

The looper is actuated by a cam mechanism and its traversing movements are produced by a cam lever 14 which carries at its lower end a roller engaging a peripheral groove on one of the cam disks secured to the shaft A. At its upper end the cam lever is fixed to a forwardly extending rock shaft 15. A lever 16 depends from the forward end of the rock shaft and the lower end of this lever is slotted as shown in Fig. 3 and embraces a block 17 which is pivoted on a stud 18 projecting from the yoke 10. Through these connections rocking movements of the cam lever are transmitted to the looper carrier so as to slide the latter longitudinally on the bearing 11 while by the use of the block 17 and the slotted end of the lever 16 interference with the rocking movements of the looper carrier is avoided. The rocking movements of the looper carrier are produced by a slide 19 (Fig. 1) which moves forwardly and rearwardly in a guideway on the frame of the machine. This slide carries at its rear end a roller 20 which engages a groove in the vertical face of one of the cam disks on the shaft A, while the forward end of the slide is provided with a stud or pin 21. This stud slides in a sleeve 22 (Fig. 3) at the upper end of a stem or pin 23, which stem is slidingly mounted in an arm 24 projecting upwardly from the yoke 10. The forward and rearward movements of the slide 19 are thus communicated to the looper carrier and give to the looper carrier rocking movements about the bearing 11. The engagement of the stud 21 in the sleeve 22 is such as not to interfere with the longitudinal movements of the looper carrier and the stud is of such length as to engage the sleeve 22 during all the transverse movements of said looper carrier.

The machine herein illustrated is provided with a thread finger 25 which corresponds in form and mode of operation with the thread finger disclosed in the patent to Eppler, No. 1,108,560, issued August 25, 1914. This thread finger is adjustably secured by means of a screw 26 to a short rock shaft 27 which turns in a bearing in the bracket 12. An arm 28 (Fig. 1) is fixed to the opposite end of the rock shaft and this arm is connected by a link 29 to a cam lever 30. The cam lever is mounted on a stud 31 on the frame of the machine and it carries a roll 32 which engages in a groove in the vertical face of one of the cam disks on the shaft A. By means of these devices the thread finger 25 is positively oscillated by the main shaft A.

In addition to the usual or main thread finger 25, the present machine is provided with a supplementary thread finger 33. It

has been previously proposed to employ such a supplementary thread finger to co-operate with the main thread finger in drawing out and holding the thread which is later to be given up to the needle, the function of this supplementary thread finger being to form a fulcrum around which the thread can be drawn by the main thread finger and to thereby prevent the thread so drawn from pulling the channel flap upwardly and rearwardly to an undue extent while so insuring the drawing out of a definite length of thread. It has always been previously proposed to swing this supplementary thread finger about a substantially horizontal axis in such a path that its end will engage and press down the channel flap of the insole subsequent to the action of the stitch setting devices. In a machine having a thread finger of such construction the supplementary thread finger and the main thread finger are swung through paths so as to cross each other, and in their movement may catch the upper or lining between them unless such materials are trimmed close to the sole, and in so doing may damage the materials or interfere with the proper operation of the machine. In the present construction this supplementary thread finger is arranged to move in a downwardly and rearwardly inclined path and into engagement with the upper surface of the channel flap as shown particularly in Fig. 10, so as to perform its usual thread handling function and also to engage and press the channel flap down and leave it in a depressed position after the stitch has been formed, and to perform these operations without any swinging movement. A feature of the present invention resides in the simple and effective means employed for operating this supplementary thread finger. For this purpose a slide guide 34 is formed in the bracket 12, as shown in Fig. 3, and the shank of the thread finger 33 is arranged to slide in this guide. The shank is also provided with rack teeth which mesh with the teeth of the pinion 35 which is fixed on the rock shaft 27, by means of which the main thread finger 25 is actuated. Accordingly, when the main thread finger is swung inwardly in the performance of its thread drawing function, the supplementary thread finger is moved downwardly and forwardly so as to assist in drawing out the thread and also to press down and hold in such position the channel flap. The above described movement of the thread fingers takes place subsequent to the operation of the stitch setting device and a time when the needle extends through the work.

Figs. 8 to 11 inclusive show two successive positions of the two thread fingers and other stitch forming instrumentalities. In Figs. 8 and 9 the looper has thrown the thread between the ends of the thread fingers, the needle at this time being in its retracted position. In Figs. 10 and 11 the parts are shown in a subsequent position, in which the main thread finger has moved rearwardly and the supplementary thread finger has moved downwardly into engagement with the channel flap 36 of the insole 37. In these latter figures the needle is shown in its advanced position and the looper has cast a loop of thread about the hook of the needle. Upon the subsequent retraction of the needle the movement of the thread fingers is reversed so that the bight of the thread held by them is slackened and given up to the needle, thus in the usual manner preventing a reeving of the thread through the hook of the needle. The above described mechanism is illustrated and fully described in application, Serial No. 133,625, hereinbefore referred to.

In Figs. 5 and 6 a modified form of construction of the supplementary thread finger and actuating device therefor is illustrated. The supplementary thread finger in this modified form of construction is pivoted on a stud 41 secured to a sliding member or carrier 40 for the thread finger. Secured also to the carrier 40 by means of a bolt 42 is a plate 43. This plate has on the lower end of its left-hand face a wedge shaped projection 44 which extends within a recess 45 formed in the upper end of the thread finger 33. The recess in the thread finger is slightly larger than the wedge shaped projection of the plate 43 and permits a limited amount of movement of said thread finger about the pivot 41. Normally, the thread finger is held by a spring 46, secured at one end to the thread finger and at the other end to a projection on the plate 43, so that the end of the thread finger is in a lowered position. The spring, however, permits the lower end of the thread finger to be moved upwardly when it engages the flap of the insole during the downward motion of the thread finger. During part of the cycle of operations, the thread finger occupies a position entirely above the shoe, and to move the thread finger into engagement with the shoe the carrier 40 is provided with rack teeth 47 which are engaged by a pinion 48 secured to the rock shaft 27 of the main thread finger.

The nature and scope of the invention having been indicated and the preferred embodiment of the invention having been specifically described, that which is claimed as new, is:—

1. A sewing-machine having, in combination, a looper; a carrier for the looper, comprising two sleeves connected by a yoke; a bearing-member of cylindrical form, embraced at its end portions by the

sleeves of said carrier; a frame member which embraces and supports the bearing-member at a point intermediate its end-
 5 portions, said frame member being spanned by said yoke; and mechanism for rocking and sliding said carrier on said bearing member.

2. An inseam-sewing machine having, in combination, a looper; a channel-guide; a
 10 hook-needle; a main thread finger pivotally mounted to swing rearwardly; means for actuating the main thread-finger; a supplementary thread-finger mounted to slide downwardly into engagement with the
 15 channel-flap; and means for actuating the supplementary thread-finger, comprising rack teeth on the latter and a pinion meshing with said rack teeth and connected with the main thread finger.

3. An inseam-sewing machine having, in combination, a looper; a channel-guide; a
 20 hook-needle; an oscillatory actuating-member; a sliding actuating-member geared to the oscillatory member; a thread finger mounted on and directly actuated by the
 25 oscillating member; and a supplementary thread finger directly supported and actuated by the sliding member.

4. An inseam-sewing machine having, in combination, a looper; a channel-guide; a
 30 hook-needle; a main thread-finger arranged to swing rearwardly and forwardly above the channel-flap of the shoe which is being sewed; and a supplementary channel
 35 closing thread-finger arranged to move, in a downwardly and rearwardly inclined substantially straight path, into and out of engagement with the channel-flap to close the channel.

5. An inseam-sewing machine having, in combination, a looper; a channel-guide; a
 40 hook-needle; a main thread-finger pivotally mounted to swing rearwardly; a supplementary thread-finger; gearing connecting the thread-fingers to cause simultaneous
 45 movements thereof; and a single cam-mechanism for actuating both thread fingers.

6. A sewing-machine having, in combination, a looper; a looper carrier, comprising
 50 two sleeves connected by a yoke, a bearing member of cylindrical form embraced at its end portions by the sleeves of the carrier, a block pivoted on said yoke, a
 55 rock arm engaging said block, and means for actuating said rock arm to slide the looper carrier on its bearing.

7. A sewing-machine having, in combination, a looper; a looper carrier, comprising
 60 two sleeves connected by a yoke having an upstanding arm formed thereon, a bearing member of cylindrical form embraced at its end portions by the sleeves of the carrier, a block pivoted on said yoke, a rock
 65 arm engaging said block, means for ac-

tuating said rock arm to slide the looper carrier on its bearing, a pin engaging said upstanding arm and means connected to said pin and positively operating said pin
 70 to oscillate the looper carrier on its bearing.

8. A sewing-machine having, in combination, a looper; a looper carrier, comprising
 75 two sleeves connected by a yoke having an upstanding arm formed thereon, a bearing member of cylindrical form embraced at its end portions by the sleeves of the carrier, a pin slidingly mounted in said
 80 upstanding arm and having a sleeve formed on its upper end, a longitudinally movable slide, a pin secured to the slide and engaging in said sleeve, and means for reciprocating said sleeve to oscillate the looper carrier on the bearing.

9. A sewing-machine having, in combination, a looper; a looper carrier, comprising
 85 two sleeves connected by a yoke having an upstanding arm formed thereon, a bearing member of cylindrical form embraced at its end portions by said sleeves, a rock shaft, a rock arm secured thereto and having a
 90 slot engaging said yoke, means for rocking said shaft to slide the looper carrier on its bearing, a pin slidingly mounted in said upstanding arm and having a sleeve formed at its upper end, a longitudinally movable
 95 slide, a pin secured to said slide loosely engaging in said sleeve so that the sleeve may slide thereon when the looper carrier slides on its bearing, and means for reciprocating said longitudinally movable slide to oscillate the looper carrier on its bearing.

10. An inseam-sewing machine having, in combination, stitch forming devices including a looper, a hook-needle, a main thread
 105 finger, means for swinging said main thread finger about a center of oscillation, a supplementary channel closing thread finger and means to slide said supplementary thread finger upwardly and downwardly into and out of engagement with the channel
 110 flap of the shoe being sewed to close the channel.

11. An inseam-sewing machine having, in combination, stitch forming devices including a looper, a hook needle, a main thread
 115 finger, a supplementary thread finger, a carrier for said supplementary thread finger, means for actuating said carrier to move said supplementary thread finger into and out of engagement with the channel-flap of the shoe being sewed, and means for yieldingly mounting said supplementary thread finger on its carrier so as to yield on engagement with the shoe.

12. An inseam-sewing machine having, in combination, stitch forming devices including a looper, a hook needle, a thread finger,
 125 a carrier for said thread finger, means for actuating said carrier to move said thread finger into and out of engagement with the

channel flap of the shoe being sewed, and means for yieldingly mounting said thread finger on its carrier, so that the thread finger will yield on engagement with the shoe.

- 5 13. An inseam-sewing machine having, in combination, stitch forming devices including a looper, a hook needle, a main thread finger, means for swinging said main thread finger about a center of oscillation, a supplementary thread finger, a carrier for said
10 supplementary thread finger, means to reciprocate said carrier in a substantially straight path to move said supplementary thread finger into and out of engagement
15 with the channel flap of the shoe being sewed, and means for yieldingly mounting

said supplementary thread finger on its carrier so as to yield on engagement with the shoe.

14. An inseam-sewing machine having, in 20 combination, stitch forming devices including a looper, a hook needle, a thread finger, a carrier for said thread finger, means for actuating said carrier to move the thread
25 finger into and out of engagement with the channel flap of the shoe being sewed to close said flap, and means for mounting said thread finger on its carrier so that it may move relatively thereto on engagement with the shoe

ANDREW EPPLER.