

J. E. JACKSON.
SEWING MACHINE FOR LASTING BOOTS AND SHOES.
APPLICATION FILED MAR. 31, 1897.

985,347.

Patented Feb. 28, 1911.

8 SHEETS—SHEET 1.

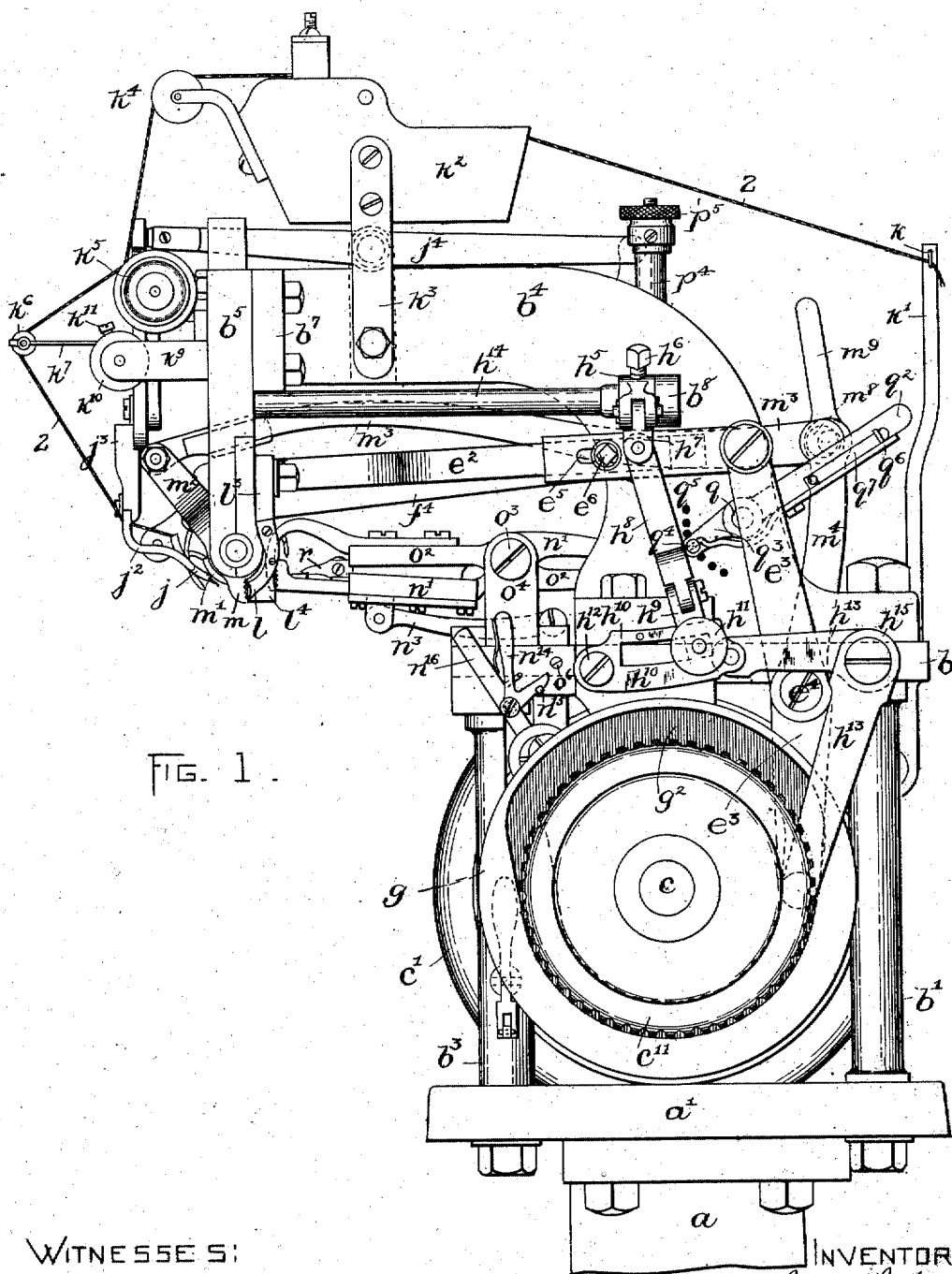


FIG. 1.

WITNESSES:

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P. W. Pizzette.

INVENTOR:

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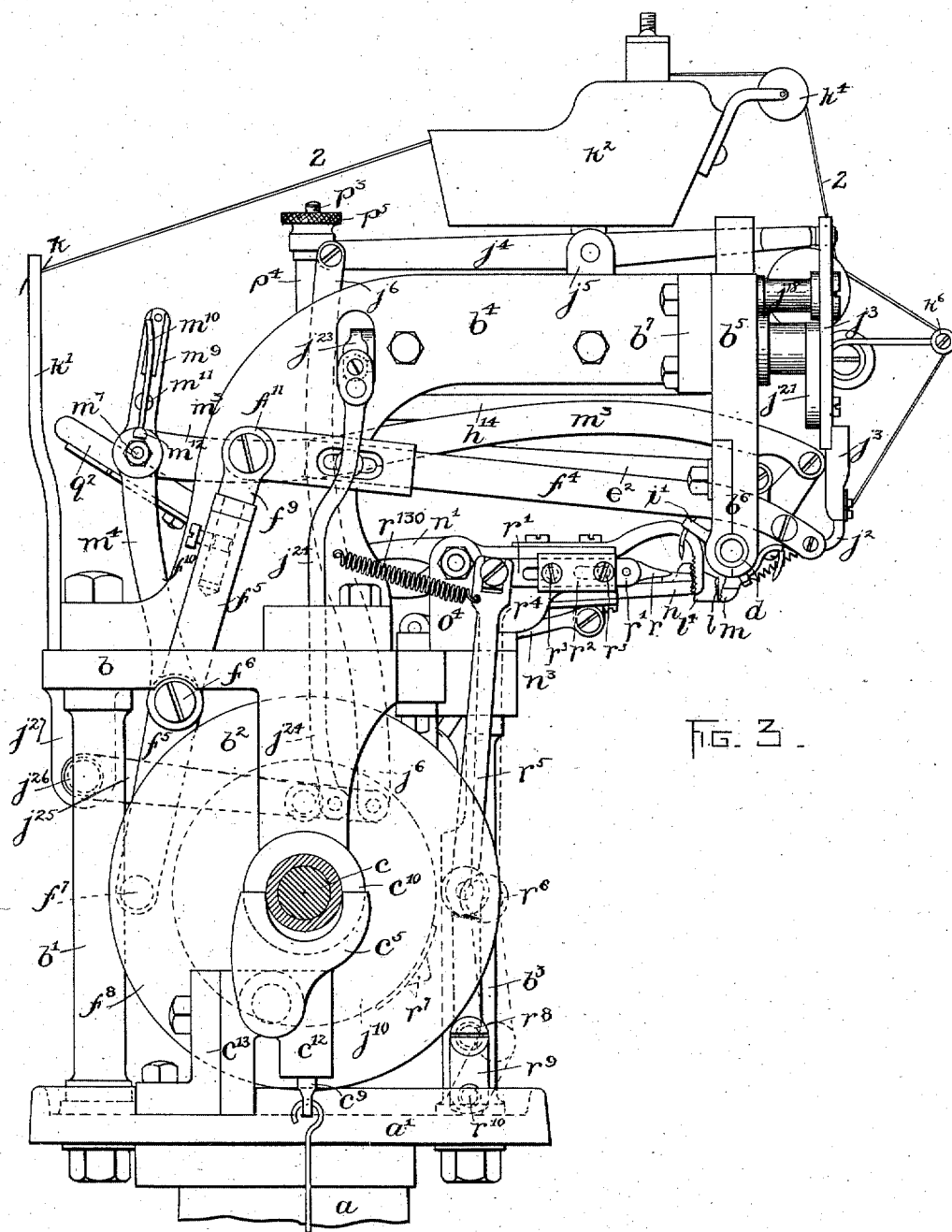


FIG. 3.

WITNESSES:

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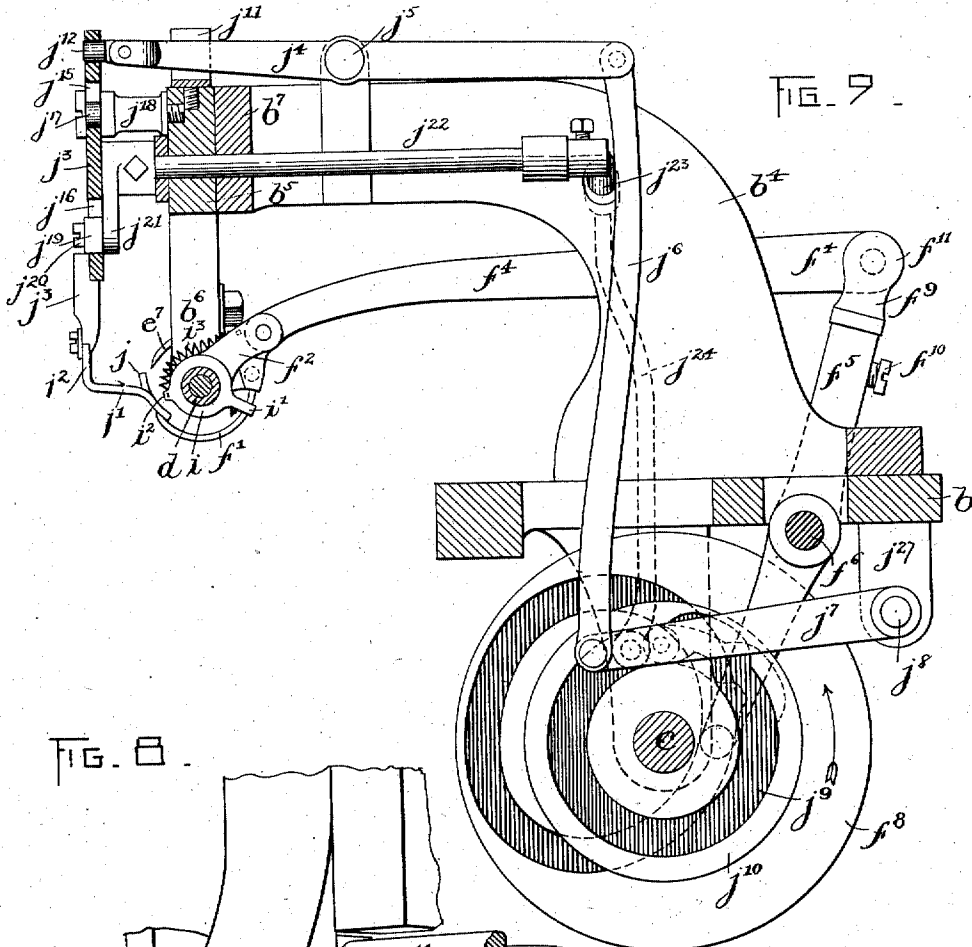
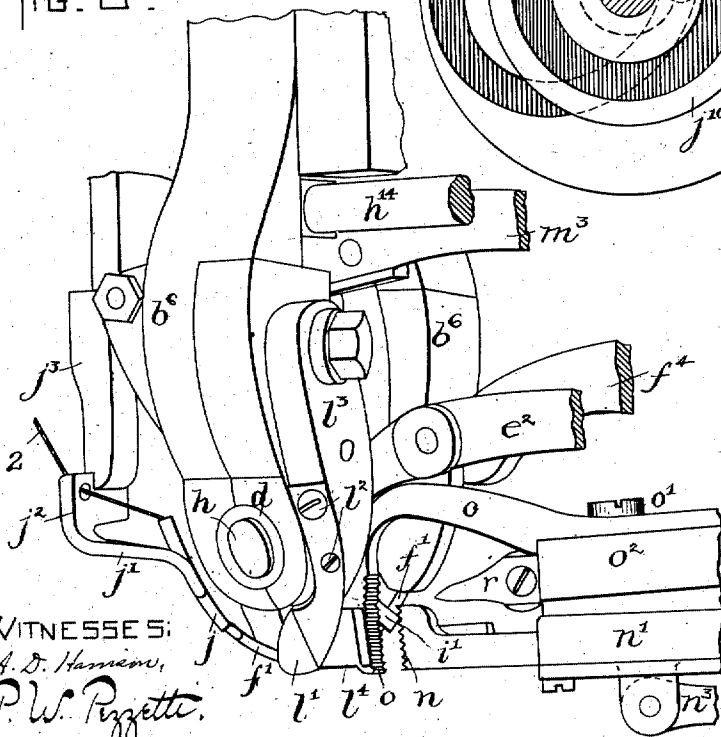


FIG. 8.



WITNESSES:

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INVENTOR:

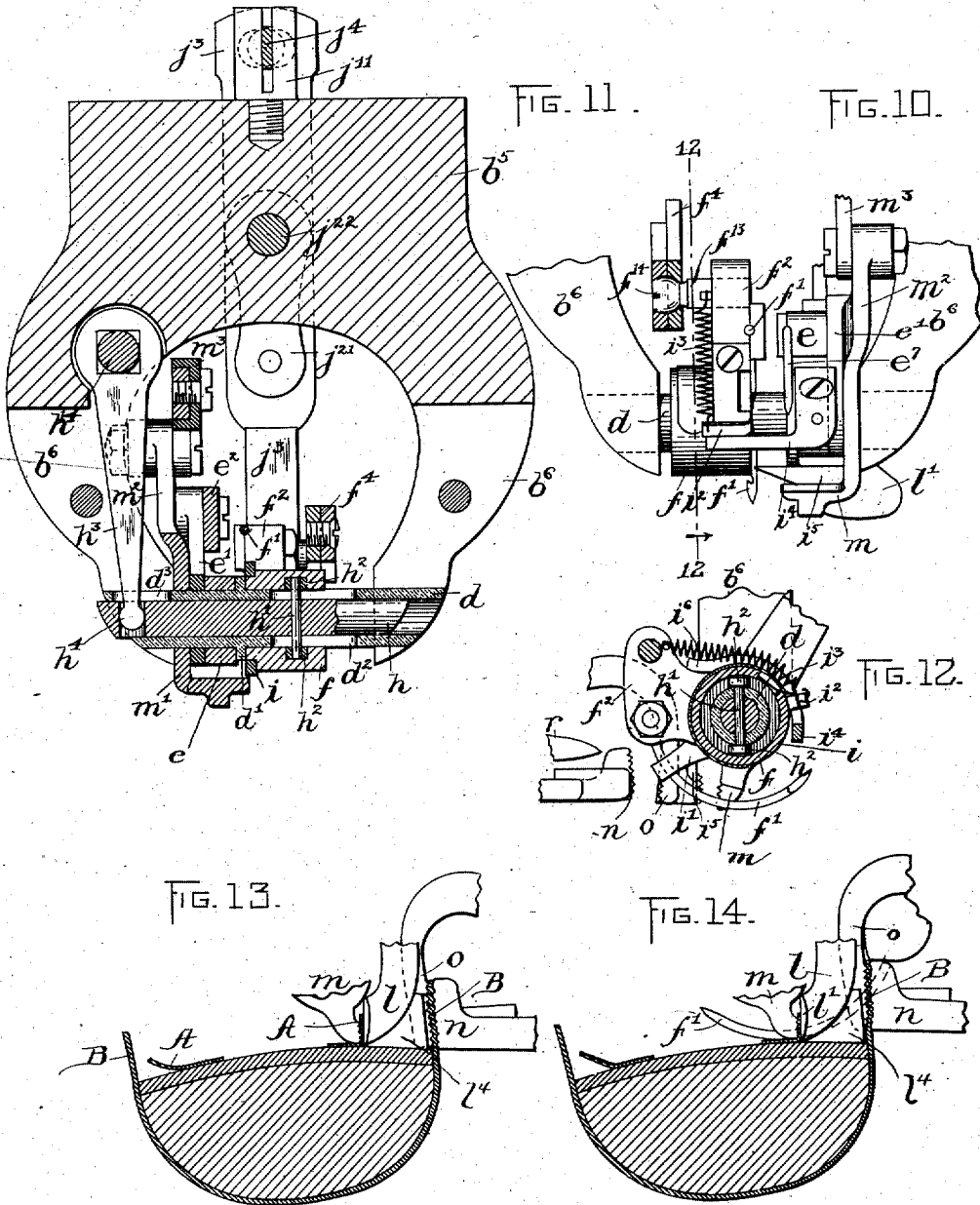
James E. Jackson
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8 SHEETS—SHEET 7.



WITNESSES:

A. D. Harrison:

P. W. Pizzetti.

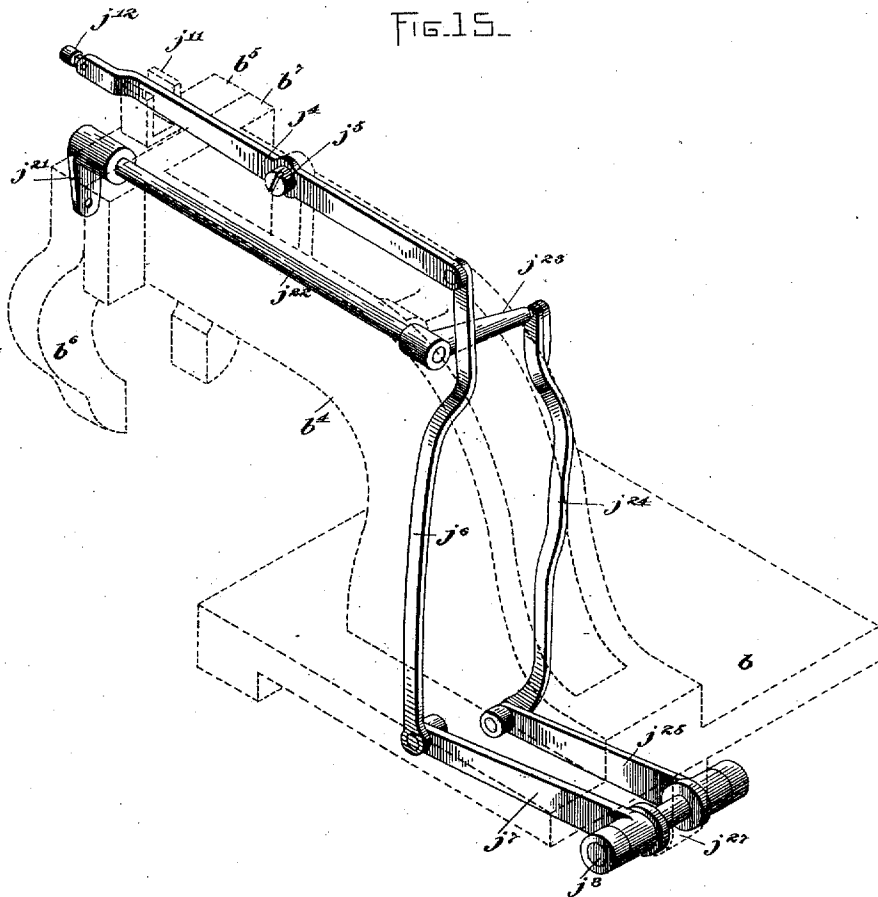
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8 SHEETS—SHEET 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES E. JACKSON, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO UNITED SHOE MACHINERY COMPANY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE FOR LASTING BOOTS AND SHOES.

985,347.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed March 31, 1897. Serial No. 630,153.

To all whom it may concern:

Be it known that I, JAMES E. JACKSON, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines for Lasting Boots and Shoes, of which the following is a specification.

This invention relates to machines for lasting boots and shoes, and especially to machines of that type employing sewing mechanism, although many of the features thereof are obviously useful in lasting machines employing other forms of securing mechanism.

15 An important object of my invention is to provide the pincers which are arranged to pull the upper with yielding means whereby the upper is held under yielding tension while the sewing mechanism operates to secure the upper to the innersole, it being found in practice that the upper, when so held, presents the successively pulled portions to the stitching mechanism under substantially equal tension, which materially improves the quality of the work, and is a feature of practical importance in machines of this type. In the machine selected for illustration, a pair of grippers is provided which grip the channel lip, or a tape secured to the surface of the innersole, and pincers which are arranged to seize the upstanding edge of the upper to pull the upper and hold it under tension while the stitching mechanism operates to unite it to the lip or tape on the innersole. One of the gripper members is provided with a guiding device which serves to properly position the shoe relatively to the securing mechanism and the pincers, and also effectively directs the lip or tape between the gripper jaws. Operatively located with relation to these parts is an abutment whose purpose is to hold the shoe against the strain exerted by the pincers in pulling the upper, said abutment having its extremity extending substantially to the edge of the innersole, whereby such edge is held against the upward strain of the upper and is prevented from rising and turning inwardly upon the sole. While I preferably support the abutment upon one of the gripper members, it may be supported upon any other convenient portion of the machine.

The grippers and the pincers both have

their gripping members operatively connected by suitable mechanisms with the main shaft of the machine, and are arranged to be automatically actuated to grip and release the innersole and the upper at the proper times in the machine's operation, and, in addition, said grippers and pincers are each provided with suitable adjusting devices whereby they may be manually operated to variably grip and release the innersole and upper, such manual means being entirely independent of the automatic means for operating the grippers and pincers, and being wholly subject to the will of the operator. Among the advantages following from this arrangement are the capacity for so adjusting the closing movements of the grippers and pincers that either of these instrumentalities may be caused to seize with the proper amount of gripping pressure, stock of varying degrees of thickness; and also, when desired, the adjustment may be carried so far as to prevent entirely the closing action in order that the operation of the grippers or pincers may be suspended without interfering with the operation of other parts of the machine. I regard this as a very important feature of my invention.

The pincers are preferably, but not necessarily, pivotally mounted for vertical movement, and suitable means are provided whereby they are given upward movements at the proper times to pull the upper, and alternately therewith, downward movements to seize the upper, the shoe being moved by the operator between such movements whereby successive portions are pulled and presented to the securing mechanism, such upward and downward movements of the pincers both being effected by yielding means. In order that the extent of the vertical movements of the pincers may be varied to draw the edge of the upper a greater or less distance past the edge of the innersole, I have provided an adjustable stop, shown for purposes of illustration in the form of a cam, together with means for manually operating the same, this stop being located in the path of a portion of the pincers, and serving to adjustably limit their extent of movements. This stop may also be so positioned as to prevent any downward movement of the pincers, and so suspend their operation entirely.

Another important feature of my invention consists in the provision of a yielding means for closing the jaws of the pincers, whereby great amplitude of movement of such jaws is given, to enable them to grip stock of varying thickness without danger of injury to the pincers. The pincers are, furthermore, provided with means for adjusting their jaws in the plane of their gripping surfaces, to properly position such surfaces relatively to the stock operated upon.

Still another important feature of my invention resides in providing means whereby the pincers may be adjusted relatively to the gripping means and the securing mechanism, as this enables the operator to always be able to so locate the pincers that their jaws will be in vertical alinement with the upstanding edge of the upper, irrespective of the distance of such edge from the lip or tape on the innersole. This feature is essential to accurate work in a machine of this type. I preferably secure such adjustment by supporting the pincer mechanism upon a slide mounted for movement upon the machine frame, but it will be apparent that this is only one of many ways in which this adjustment could be accomplished.

In connection with the means for pulling the upper, previous to the operation of the securing mechanism, I preferably employ a slashing device which is operated through suitable connections from the main shaft of the machine, said connections being so arranged for operation that the slasher may be caused to make slits in the upper at those portions of the shoe where it is desired to plait the upper, and may be thrown out of operation at those portions where it is not resired to plait the upper. An important feature of my invention in this connection is the arrangement of the slasher relative to the awl, whereby their actuating mechanisms cause them to pass through the stock simultaneously from opposite sides thereof, so that one of said parts resists the thrust of the other. The slasher is also arranged for adjustment toward and from the positioning devices for the shoe, and toward and from the securing mechanism, and, as shown, it is mounted upon the slide with the pincers, for simultaneous adjustment therewith, but my invention is not limited to this arrangement.

Still another important feature of my invention consists in the provision of a strengthening device for the needle of the stitching mechanism, said strengthening device being herein shown in the form of a hub mounted upon the needle carrier, and having an arm provided with an aperture for the passage of the needle, and suitable means, operated from the needle carrier, for moving the arm of the strengthening device along the needle to a point adjacent the work to prevent the needle from bending or

twisting as it presses against the work to feed it between successive securing operations. The movements of the strengthening device are limited by suitable stops located on the awl carrier and one of the gripper members, respectively.

Other features of the invention, including important combinations of parts and details of construction, will be hereinafter more specifically described and claimed.

Reference is to be had to the accompanying drawings and to the letters and figures marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings—Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is an elevation from the other side of the machine. Fig. 4 is a rear end view of the same. Fig. 5 is a side elevation of the machine, partially in section, so as to show the grippers, the pincers and the devices for operating them. Fig. 6 represents a sectional view of the pincers for the upper, and their actuating devices. Fig. 7 is a sectional view on the line 7—7 of Fig. 6 of the device for opening the pincers for the upper to remove the work therefrom. Fig. 8 is a perspective view of both pairs of pincers or grippers, the slasher, and their adjacent parts. Fig. 9 represents a sectional view of the machine for the purpose of illustrating the operation of a looper. Fig. 10 is a front elevation of the awl, the needle and the devices adjacent thereto. Fig. 11 represents a vertical transverse sectional view of the same, looking from the rear of the machine. Fig. 12 represents a section on the line 12—12 of Fig. 10, looking in the direction of the arrow. Figs. 13 and 14 illustrate the pincers or grippers in the act of drawing the upper taut over a last prior to the needle being inserted into the work. Fig. 15 is a perspective view of parts of the operating mechanism, portions of the frame of the machine being indicated by dotted lines.

The machine is supported upon a standard *a*, a portion only of which is shown, and which may be of any approved pattern or shape, and the bed *b* of the main frame rests upon standards *b'* *b'* *b'* extending upward from a plate *a'* at the top of the standard *a*. There are preferably three of these standards *b'* *b'* *b'*, but there may be as many more as desired, or necessary.

Depending from a base-plate *b* of the main frame are two brackets *b²* *b²* in which is journaled the main driving shaft *c*, on which shaft are mounted the several cams by means of which power is transmitted to the various movable parts of the machine. Upon one end of the said power-shaft *c* is secured a hand-wheel *c''*, and on the other

end thereof is loosely placed a belt wheel c' having a clutch member c^2 which, when the said wheel is moved longitudinally along the shaft c will engage the clutch member c^3 rigidly secured upon said shaft. To throw the clutch member c^2 into engagement with the clutch member c^3 , I employ a sliding bar c^4 having a yoked arm c^5 entering into a peripheral groove in the hub of the wheel c' (see Figs. 2 and 3), said bar being mounted in a tubular bearing c^6 and having a pin c^7 projecting out from said bearing to be engaged by a cam c^8 attached to a spring held rod c^9 adapted to be drawn downward by a treadle (not shown), said rod c^9 being mounted in a tubular bearing c^{12} supported upon a bracket c^{13} bolted to the plate d' . When the treadle is depressed the cam c^8 forces the pin c^7 along the slot in the slide-way and through the medium of the bar c^4 forces the clutch member c^2 into engagement with the member c^3 . The said cam c^8 , when pressure is not put upon the treadle, is forced upward by the spring to bear against a collar c^{10} on the shaft to act as a friction brake therefor. A spring is placed in the bearing c^6 to force the bar c^4 outward when the foot is not placed upon the treadle.

Placed upon the bed b of the frame is an overhanging arm b^4 formed of two similar parallel bars having a common solid base, upon the outer end of which the needle, the awl, the feeding devices, and the grippers for the insole, as well as the other mechanism necessary for forming the stitches are mounted. To the end b^7 of the said overhanging arm b^4 is secured a bracket b^5 which is in the shape of a horse-shoe, it having two depending arms b^6 in the lower ends of which is rigidly clamped a sleeve d , as shown in Fig. 11. Upon the sleeve d are placed the awl carrier e and the needle carrier f .

The awl carrier e having the awl e^7 is adapted to oscillate about the said sleeve and is provided for the purpose with an arm e' connected by an adjustable rod e^2 with a lever e^3 (Fig. 1) pivoted upon a stud e^4 projecting out from the bed-plate b , and having on its lower end a roller extending into a cam groove on the inner face of the cam disk g , said cam disk being secured upon the main power shaft c . The connecting rod e^2 is formed in two parts, one of which has a groove to receive the other part, and which is provided with slots e^5 to receive screws e^6 for securing the said parts together. Hence by adjusting the said parts with relation to each other, the throw of the awl may be varied as desired. The awl carrier e is held against longitudinal movement on the sleeve by a collar or flange d' which is clearly shown in Fig. 11.

The needle f' is clamped on the arm f^2 of the needle carrier f which is likewise oscillated about the sleeve d and which is also

capable of movement longitudinally of the same, for the purpose of feeding the work laterally. The oscillatory motion is imparted to the needle carrier f by a rod f^4 connected with the arm f^2 and with a lever f^5 journaled on a stud f^6 projecting out from a bracket secured to the bed b of the machine. The said lever passes through an aperture in the bed and has on its lower end a roller f^7 projecting into a cam groove in the disk f^8 secured upon the main power shaft c . The upper end of the lever f^5 is tubular to receive a pin f^9 swiveled thereto and held therein by a screw f^{10} projecting into a groove in the said pin, as shown in Fig. 3. The rod f^4 is pivoted to ears f^{11} in said pin and is formed in two parts, so that it may be adjusted longitudinally. Thus, while the connecting rod is reciprocated by means of the lever f^5 , it is so connected thereto as to have a universal motion whereby it will impart power to the needle carrier, though the latter be reciprocated transversely of the said connecting rod f^4 . The needle carrier arm f^2 has a stud f^{13} projecting out laterally therefrom and formed on its end with a ball f^{14} which lies in a socket in the end of the rod f^4 , this being particularly shown in Fig. 10.

The needle carrier is moved longitudinally of the sleeve d by means of the following devices. In the said sleeve is loosely placed a cylindrical bar h through which extends a pin h' having on its ends anti-friction rollers h^2 as shown in Figs. 11 and 12, so that although the needle carrier is movable transversely of the bar h , yet it is secured against longitudinal movement relatively thereto, and the bar is held against rotation in the sleeve, said sleeve d being slotted at d^2 to permit the pin to pass through it into the groove in the carrier f . The bar h is reciprocated longitudinally by an arm h^3 having a ball-like end h^4 passing through a slot d^3 in the sleeve and extending into an aperture in the said bar h , said arm being secured upon the end of a rock-shaft h^{14} arranged longitudinally of the over-hanging arm b^4 and journaled in the bracket b^5 and a bracket b^8 , projecting out from the said overhanging arm b^4 . The said shaft h^{14} is rocked by an arm h^5 secured thereto by a set screw h^6 and projecting outward therefrom, as shown in Figs. 1 and 2.

A coupling block h^7 is pivoted in ears in the end of the arm h^5 and pivoted to the said block so as to move transversely of the arm h^5 is a connecting rod h^8 pivoted at its lower end to another coupling block h^9 , apertured to receive a bushing (not shown) extending out from the sliding block (shown in dotted lines in Fig. 1) placed in a slot in a lever h^{10} . The coupling block h^9 is secured to the sliding block by a set screw h^{11} which also serves to secure the sliding block temporarily in

place on the lever h^{10} , the said lever h^{10} being pivoted at h^{12} to the bed of the frame of the machine.

The lever h^{10} is reciprocated by a bell-crank-lever h^{13} fulcrumed at h^{15} on the bed and having an arm provided with a roller extending into a cam groove g^2 on the outer face of the disk g .

Now it will be seen that when the power shaft c is rotated through the parts thus described, the needle carrier will be oscillated about the sleeve d and will be moved longitudinally thereof intermittently by the bell-crank-lever h^{13} and the devices which transmit motion therefrom to the sliding bar h . By unscrewing the nut h^{11} and adjusting the coupling block h^9 , and the sliding block secured thereto along the slot in the lever h^{10} , the longitudinal movement of the sliding bar h may be varied as described.

Upon the reduced end of the needle carrier f is placed the hub i of what I term the "needle strengthener", it having an arm i' projecting out from said hub, as shown in Figs. 9, 11, and 12, and having an aperture to receive the needle f' which needle is, of course, concentric with the sleeve d .

There is a small pin i^2 extending out from the hub i and connected by a spring i^3 with the arm f^2 of the needle carrier, as shown in Figs. 10 and 12.

The strengthener is so arranged and operated that when the needle is in the work and is in the act of feeding the work forward, as I shall hereinafter explain, the arm i' is moved along the needle to a point adjacent the work to prevent the needle from becoming twisted or bent, as it presses against the work. The said pin i^2 projects over the hub of the needle carrier f and is limited in its movements in one direction by an arm i^4 projecting out from the awl carrier e as shown in Fig. 10, and in its movement in the other direction by a projection i^5 extending laterally from the stationary gripper l to be afterward described, see also Fig. 5.

The hub i of the needle strengthener is moved in one direction by a finger i^6 secured on the needle carrier and engaging the said pin i^2 and in the other direction by a spring i^3 . The needle and the awl are arranged in such relation to each other that after the awl has been driven into the work and begins to recede, the needle will follow it into the apertures made in the work until the awl is entirely withdrawn, whereupon the needle will be moved laterally, carrying with it the work, so that when the awl next operates, the work will have been carried forward one step or one stitch.

I shall now proceed to describe the looper for looping the thread around the needle when it is in the work and before it is moved laterally. The said looper consists of a small tube-like finger j secured on the end of

a projection j' , formed on a bar j^2 , as shown in Fig. 1, which bar is in turn adjustably secured upon a sliding bar j^3 reciprocated vertically by a lever j^4 fulcrumed at j^5 to the overhanging arm b^4 . The lever is oscillated by a connecting rod j^6 , pivoted to a lever j^7 fulcrumed on a stud j^8 projecting out from a bracket j^{27} , as shown in Figs. 4, 5, 9, and 15, said lever j^7 being provided with a roller extending into a cam groove j^9 in the disk j^{10} secured upon the shaft c , as shown most clearly in Fig. 9. The cam groove is arranged to give the lever j^7 a sharp jog to raise it for a brief interval and then lower it so as to cause a corresponding movement of the vertical sliding bar j^3 in reverse directions. The forward end of the lever j^4 is guided in its movements by a slotted guide j^{11} threaded onto the top of the plate b^5 , while the extreme end of the said lever is provided with a roller j^{12} which projects into a transverse slot in the said vertical bar j^3 , the pin j^{13} on which said roller j^{12} is journaled being held in place by set screws j^{14} , see Fig. 5. The said bar j^3 is provided with two slots j^{15} and j^{16} , as shown in said Figs. 2, 5, and 9. A screw pin j^{17} is passed through the slot j^{15} and is threaded into a spool j^{18} , threaded into the bracket b^5 , and into the slot j^{16} projects a roller j^{19} on a screw pin j^{20} threaded into the end of an arm j^{21} rigidly secured upon the end of a rock-shaft j^{22} suitably journaled upon the overhanging arm b^4 , between the parallel bars thereof, and extending through the bracket b^5 on the end thereof. The said rock-shaft j^{22} is rocked by an arm j^{23} extending out therefrom (see Figs. 2, 3, and 15) to the end of which is secured a connecting rod j^{24} having its lower end pivoted to a lever j^{25} fulcrumed on a stud j^{26} projecting out from the bracket j^{27} depending from the bed. The lever j^{25} is provided with a roller extending into a cam slot in the said disk j^{10} on the face opposite to that in which the cam groove j^9 is formed.

The two cam slots are so formed and so timed that when the needle is in the work, the looper j is moved vertically downward to a point slightly below the needle, then laterally under the needle, then vertically upward, and then laterally again in the opposite direction to the point from whence it first started, the vertical movement being imparted to it by the lever j^4 and its power device, and the lateral movement being given to it by the rock shaft j^{22} and its arm j^{21} . The said looper thus moves positively in a path which is in the form of a square, no springs being depended upon to return it to its original position after it has been moved down and under the needle. In this way the thread is wrapped around the needle, just beyond the hook on the same. The thread 2 (see Figs. 1, 2, and 3) is conveyed from a spool which is suitably mounted, and

which is not shown, through the eye k on a bar k' extending up from the base b at the rear of the machine to a gum-pot k^2 supported upon a standard k^3 rising from the overhanging arm b^4 , where it is suitably gummed or waxed. From thence the thread passes over a roller k^4 journaled on an arm extending from the pot down to a tension wheel k^5 of any suitable character, over a roller k^6 on the end of a spring "take-up" k^7 , and from thence through a hole in the bar j^2 to the tubular looper j . The spring take-up is wound at its rear end about a stud k^8 projecting out from a bar k^9 secured to the bracket b^5 , and has its end secured to a collar k^{10} adjustably secured to said stud by a set screw k^{11} . By releasing the set screw k^{11} , the collar k^{10} may be adjusted about the stud to adjust the position of the spring take-up as will be readily understood.

Thus having described a stitch-forming mechanism, which is adapted for use with my lasting mechanism, although it will be understood that other suitable mechanism for securing the upper in overworked position may be substituted therefor I shall now proceed to describe the pincers for grasping the upper, and drawing it over the last, and the grippers for gripping the insole, whether it be by the channel lip in a welt shoe, or by a tape or a line of stitches secured along the insole just inside the edge of the same.

Referring to Figs. 1, 3, 5, and 8, the stationary toothed jaw or member l of the grippers is formed on the end of a curved bar l^2 secured on the rear face of one of the arms b^6 of the bracket b^5 . It is provided with a suitable guiding lip l' attached thereto by screws l^2 and with an abutment l^4 to resist the thrust of the pincers on the upper. The movable jaw m is formed on a hub m' journaled on the sleeve d , as shown in Figs. 5 and 11, the jaw m being formed with teeth corresponding to the teeth on the jaw l so as to be able to grip the work positively between them. Extending upward from the hub is an arm m^2 , by means of which the movable jaw may be moved toward and from the stationary jaw. The said arm m^2 is connected to a rod m^3 pivoted at m^1 , see Fig. 6 to a lever m^4 at the rear of the machine which is journaled upon a stud m^5 extending out from a bracket formed on or attached to the bed plate. The lower end of this lever m^4 is provided with a roller m^6 , pressed by a flat spring m^{30} , see Figs. 4 and 5 against a cam m^{71} secured to the power shaft c . The cam is so formed that the jaws are gripped together except for a short interval when the movable jaw moves away from the stationary jaw to release the work while it is being fed, after which the jaws immediately grip the insole again, and hold it stationary while the needle moves back to its normal position,

ready to take another stitch, as I shall afterward explain.

The rod m^3 is connected to the lever m^4 in such way that even when the jaws are gripped together, the work may be removed from them by moving the connecting rod relatively to the lever through the medium of the following devices: The pin m^7 which extends through the cylindrical aperture in the lever m^4 is formed with an eccentric m^8 (see dotted lines, Fig. 6) which extends into the aperture in the rod m^3 . Also secured to the pin m^7 is a handle m^9 by means of which it may be turned so as to throw the connecting rod rearwardly to open the jaws. On the handle is fulcrumed a spring-held lever m^{10} pivoted in the stud m^{11} and having its end extending into the head of a pin m^{12} which when the machine is in operation projects through the lever m^9 into an aperture in the end of the lever m^3 . By pressing upon the end of said lever m^{10} , the pin is withdrawn from its aperture and the handle may then be swung rearward so as to cause the eccentric to move the connecting rod m^3 likewise in the same direction.

The pincers for the upper are arranged to grip the edge thereof and to draw it upward so as to stretch the upper over the last. Referring to Figs. 1, 3, 6, and 8, the two jaws of the pincers are designated by n and o , the former being movable horizontally and vertically, and the latter being stationary horizontally but movable vertically.

The jaw o is secured by screws o' to a lever o^2 which is pivoted upon the stud o^3 secured in standards o^4 projecting up from the slide o^5 , placed in a dove-tailed groove in the bed b , see Figs. 2 and 6. The slide (see Fig. 1) may be adjusted in the groove and secured in place after adjustment by screws o^6 . The jaw n is mounted on the lever n' which is pivoted upon the stud o^3 and which crosses the lever o^2 , as shown in Fig. 6. The said jaw is placed in a slide-way n^2 in the lever n' and is reciprocated therein by a connecting rod n^3 and a lever n^4 . The hub n^5 of the lever is journaled upon an eccentric sleeve n^6 which in turn is journaled upon a stud n^7 secured to a bracket n^8 depending from the base b (see Fig. 7) said bracket being held in place by a screw pin n^9 . Secured upon the eccentric sleeve on which the hub n^5 is loosely mounted is the hub of a lever n^{10} having a roller n^{11} extending into a cam groove in the cam m^{71} . Likewise secured to the hub of the lever n^{10} is an arm n^{12} having its outer end bent around the lever n^4 and between the said bent end and the said lever n^4 is a spiral spring n^{13} . Hence the movement of the lever n^{10} is imparted to the spring n^{13} which is inserted between the arm n^{12} and the said lever n^4 so that the jaw n grips the work between it and the jaw o with a yielding

pressure. This is necessary in order that the jaws may accommodate themselves to work of different thicknesses.

For the purpose of moving the jaw n back from the jaw o , even though the jaws be clamped together, I secure a handle n^{10} to the eccentric sleeve n^8 and provide it with a spring-held catch n^{14} which under normal conditions engages a pin n^{15} extending out from the bed b . By releasing the catch from the pin n^{15} , the lever n^{10} may be swung to partially rotate the eccentric sleeve n^8 and withdraw the jaw n from the jaw o . The operator is thus enabled to adjust the extent to which the pincer jaws are closed in order to provide for variations in the thickness of the stock which is engaged thereby. It will also be seen that the eccentric may be so adjusted that the jaw n will be prevented from approaching the jaw o sufficiently close to engage the stock at all, in order that the closing action of the pincers may be suspended by the operator, when desired, without interrupting the operation of the other elements of the machine.

After the jaws n and o have clamped the edge of the upper between them, they are moved bodily upward. The lever n' has a set screw n^{17} projecting through its end and bearing against the lever o^2 so that by depressing the lever n' , the lever o^2 will be moved with it. The said lever o^2 is held upward by a spring o^7 arranged in a socket in the bed b and having its upper end encircling a stud projecting downward from said lever o^2 . The cam m^{11} is provided with a cam groove p in its face to receive a roller p' on the end of a slotted connecting bar p^2 through the slot in which the power shaft c extends to guide the said rod in its vertical movements.

The bar p^2 is connected to a rod p^3 extending through apertures in the levers o^2 n' and having its upper end threaded through the end of a sleeve p^4 which surrounds the rod, the said sleeve being held in adjustment by a lock-nut p^5 . p^6 is a sleeve also surrounding the rod p^3 projecting into the sleeve p^4 , there being a spring p^7 coiled about the rod p^3 , and having its ends bearing against the closed end of the sleeve p^4 and the end of the sleeve p^6 . The lower end of said sleeve p^6 bears against the top of the lever n' so that when in the revolution of the cam m^{11} , the roller p' is depressed, the levers n' and o^2 are rocked bodily about their fulcrum with a spring pressure. Thus it will be seen that the jaws n and o will first clamp the upper between them with a yielding pressure and will then draw the said upper taut over the last, the drawing action being yielding so as not to injure the leather. The levers for the pincers and the rod and its sleeves for operating them are arranged

between the side bars of the overhanging arm, as shown in Fig. 3.

It is particularly desirable to vary the vertical movement of the pincers in order to draw the edges of the upper a greater or less distance past the edge of the inscle, and hence I provide means for accomplishing this result, as I shall now describe. On a shaft q which is journaled in the side bars of the overhanging arm b^4 is placed a cam q' of the shape shown in Fig. 6, and adapted to bear against a block o^8 secured upon the projecting end of the pincer lever o^2 . The projecting end of the shaft q is provided with a handle q^2 having in its extended end q^3 a movable pin q^4 which is adapted to take into any one of a series of holes q^5 in the base of the overhanging arm b^4 , (see Fig. 1). The pin may be moved in and out by a small thumb lever q^6 against which a spring q^7 bears to normally hold the pin q^4 in place. Thus by adjusting the position of the handle q^2 the cam q' may be varied as to its position whereby different portions of the cam will be presented to determine the extent of movement of the levers, as will be readily understood. When the cam is out of the path of the levers they may complete their full stroke, but when the cam is moved downward the pincers may be stopped before they have completed a quarter of the stroke, or be prevented from moving at all, if desired. In addition to these features which I have already described, I provide an automatically operated knife or slasher which may be thrown into action at will for cutting the upper at desired points to permit the edges thereof to be shingled or to overlap, as is necessary at the toe, or to conform to the last at the shank.

Referring to Figs. 1, 3, and 8, r indicates the slasher blade which is secured to a lateral extension on a slide bar r' which slide is provided with slots through which screws r^3 r^5 extend, there being a plate r^2 through which the screws are passed to hold the slide bar in place. The screws r^3 extend into a support r^4 secured to one of the standards o^4 in which the pincers are fulcrumed. The slide bar r' is reciprocated by means of a lever r^5 having a roller r^6 which is adapted to be thrust outward by a cam projection r^7 on the disk j^{10} . When the machine is in operation, the cam projection r^7 strikes against the roller r^6 and drives it sharply forward so as to cause the knife r to make a quick forward movement after which it is returned immediately by the spring r^{10} .

As it is necessary to use the slasher only at times and for certain parts of the work, the lever r^5 is pivoted by the screw pin r^8 to a link r^9 pivoted at r^{10} to the front standard b^3 , as shown in Fig. 2, the said link being provided with a boss r^{11} to receive the

pin r^8 . The standard b^3 is apertured to receive a spring-held pin r^{12} which, when the link is upright, enters an aperture in the link so as to lock it against movement. The pin may be withdrawn by a lever r^{13} pivoted in ears r^{14} extending out from the standard b^3 . When it is desired to throw the slasher out of operation, the end of the lever r^{13} is depressed so as to withdraw the spring pin r^{12} and the next time the cam projection r^7 strikes the roller r^6 it will force it and the link r^5 into the inoperative position shown in dotted lines in Fig. 3. When it is desired to throw the slasher into operation again, the operator forces the link r^5 into an upright position, and the spring pin r^{12} slides into place and locks it against movement. The cam projection r^7 operates to drive the slasher forward, and hence to return it, I employ the strong spring r^{130} above referred to having one end attached to the base of the arm b^4 and the other end attached to the upper end of the lever r^6 .

The operation of the machine is as follows: The thread being properly passed through the various eyes and tension devices to the looper, the operator opens the jaws of the grippers and of the pincers which are at their highest point by throwing the lever m^9 rearward, and after disengaging the spring catch n^{14} , throwing the lever n^{16} downward. Then the last being held in front of the machine with the toe to the right, the edge B of the upper is placed between the jaws n and o of the pincers and the channel lip or the tape A (see Fig. 13) is placed between the jaws m l of the grippers; after which the levers m^9 and n^{16} are thrown back to their original positions to lock the jaws of the pincers and the gripper onto the work. Then the belt-wheel is clutched to the power shaft, by the operator depressing the treadle. The first movement of the shaft causes the needle carrier and the awl carrier to swing about the sleeve d to force the awl into the work, and as the awl enters it, the slasher (if it is in operation) is driven forward rapidly to slash the edge of the upper, the awl supporting the upper against the thrust of the slasher at one side of the path of the slasher and the pincers supporting the upper at the other side of said path. As the awl is moved into the work, the rock-shaft h^{14} through the lever h^3 and the slide bar h carries the needle along the sleeve d and into alinement with the awl. Then the further movement of the power shaft causes the awl to be retracted and the needle, whose point is now very close to that of the awl, to swing down through the work and as soon as the needle is passed entirely through both the edge of the upper and the tape or the channel lip, the pincers and the grippers release the work. As the needle completes the very

last part of its stroke forward, the looper is passed around the needle so as to place a loop of the thread thereon.

As the looper is returned to its original position, the sliding bar h and the needle carrier are moved to the left (in Fig. 10) to feed the work forward, the needle strengthener sliding along the projection i^5 . Then as soon as the needle has reached the end of its lateral movement, the grippers grasp the tape between them and the jaw n of the pincers is slid forward against the jaw o . As the needle is being withdrawn from the work, the jaws n o of the pincers are rapidly raised to stretch the upper over the last and firmly against the edge of the insole, the last resting against the abutment l^4 formed on or secured to the stationary jaw of the grippers. This completes the revolution of the power shaft, and one cycle of operations and as the said shaft begins its next revolution, it withdraws the needle with the loop of thread from the work, forces the awl thereinto, and causes the slasher to operate. Then, as the shaft completes its revolution the looper places another loop on the needle, the work is fed laterally another step, and the needle is returned to its normal position, and so on until the upper is sewed from the starting point to the toe and along the other side of the shoe.

It is not ordinarily desirable to use the slasher except at the shank and at the toe although it may be used at the ball if so desired.

By means of my machine, I am enabled to sew the upper to the insole of a welt shoe or to the insole of a shoe in which a tape is employed, as shown in Figs. 13 and 14. By employing a slasher blade for slitting the edges of the upper I am enabled to sew the upper to the insole in such way that when the operation is completed, the upper is smooth and unwrinkled, since the cut edges will be shingled or overlapped at the toe and along the outward curves of the insole, and will gap or stretch along the inward curves, as at the shank, so as to permit the upper to adapt itself to the peculiar shape of the last on which the shoe is being formed. In rounding the toe, the overlapping of the cut edges is accomplished automatically, and they form a neat plait.

The grippers act as an abutment, in addition to the part l^4 to hold the last, and resist the thrust of the pincers as they draw the edge of the upper above the edge of the insole. The work is held in the hands of the operator and is thus guided to the pincers and grippers, the lip l' holding the channel flap or lip or the tape in position to pass between the jaws of the gripper.

Of course it will be understood that I have no intention of limiting myself to the details of construction which I have illus-

trated and described, nor to combining all the novel parts on a single machine. It is not essential that the same feeding mechanism should be employed in connection with the pincers and grippers, as it can easily be replaced by some other feeding device.

One of the novel features of the present invention is that the throw of the pincers may be regulated while the machine is at work, and that the slasher may be thrown into and out of operation without the necessity of stopping the machine.

What I claim is:

1. In a sewing machine for lasting boots and shoes, the combination, with suitable stitching mechanism, of a pincer for gripping the upper, and means for yieldingly operating said pincer to stretch the upper over the last and hold the upper under yielding tension while it is secured by the stitching mechanism.

2. In a sewing machine for lasting boots and shoes, the combination, with suitable stitching mechanism including an awl, of a pincer for gripping the upper, means for yieldingly operating said pincer to stretch the upper and hold it yieldingly under tension until it is entered by the awl, and means for actuating the stitching mechanism.

3. In a sewing machine for lasting boots and shoes, the combination, with suitable stitching mechanism, of a pincer for gripping the upper, means for yieldingly operating said pincer to stretch the upper over the last, and independent means for varying the movement of said pincer.

4. In a machine for working an upper over a last step-by-step and securing the upper by stitches, the combination with stitching mechanism and a pincer, of means constructed and arranged for yieldingly actuating the pincer to pull the upper over the last and to hold the successively pulled portions of the upper under approximately uniform tension for the action of the stitching mechanism, and means for actuating the stitching mechanism.

5. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of an abutment for the insole, an automatic pincer for the upper, said pincer having two carriers each with a jaw on the end, means for yieldingly clamping one jaw against the other jaw, and yielding means for moving said jaws bodily.

6. In a sewing machine for lasting boots and shoes, an automatically operated pivoted pincer for the upper, and manually operable means for releasing the work from the jaws of said pivoted pincer, without moving said pincer about its pivot.

7. In a sewing machine for lasting boots and shoes, a pincer for the upper having two levers each with a jaw on the end, means for moving one jaw longitudinally relative to

the other to grip the upper, and auxiliary means to release said jaw from operative relation to the other jaw.

8. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a pivoted pincer for the upper, means for operating said pincer, and manually operable means independent of the operating means, for moving one jaw of the pincer relatively to the other jaw thereof to release the work, without swinging either jaw around its pivot.

9. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a pivoted pincer for the upper, and a manually operable lever for separating the jaws of said pincer when the work is gripped thereby, without swinging either jaw on its pivot.

10. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a pivoted pincer for the upper, automatic power devices for clamping the jaws of the pincer together, and manually operable means inserted in said devices for releasing the work from said jaws, without swinging either of said jaws about its pivot.

11. In a sewing machine for lasting boots and shoes, a pincer for drawing the upper over the last having two jaws, means for moving one jaw relatively to the other, comprising a crank connected to said jaw, means to oscillate said crank, and means to move its center of oscillation to release the pincer from the work.

12. In a sewing machine for lasting boots and shoes, a pincer for drawing the upper over the last, said pincer having two jaws, means for moving one jaw relatively to the other, comprising a crank connected to said jaw, a lever pivoted concentrically with relation to the crank and yieldingly engaging said crank, and means for oscillating the lever to cause the pincer to grip the upper.

13. In a sewing machine for lasting boots and shoes, the combination with a suitable stitching mechanism, of a movable pincer having two co-acting jaws to grip on both sides of the edge of an upper, means independent of said stitching mechanism for causing the pincer to grip the upper and stretch it over the last, and means independent of said stitching mechanism for varying the movements of the pincer.

14. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a pivoted pincer, automatically operating devices for moving said pincer about its pivot, and manually operable means for limiting the movements of said pincer.

15. In a sewing machine for lasting boots and shoes, the combination with suitable

stitching mechanism, of a reciprocatory pincer, automatically operating devices for moving said pincer, and a hand-lever having a stop for limiting the movements of said pincer.

16. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a reciprocatory pincer, automatically operating devices for moving said pincer, a hand lever having a stop for limiting the movements of said pincer, and means for holding said hand-lever at any desired adjustment.

17. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a gripper for the insole, automatically acting devices for clamping the jaws of said gripper together, and manually operated means for releasing the work when said jaws are clamped.

18. In a sewing machine for lasting boots and shoes, the combination with suitable stitching mechanism, of a gripper for the insole, automatically acting devices for clamping the jaws of said gripper together, and a hand lever for separating said jaws to release the work while the jaws remain operatively connected with said automatically acting devices.

19. In a machine for lasting boots and shoes, a pair of jaws to grip the work, means to move one jaw relatively to the other, comprising a series of levers pivoted together and connected to the movable jaw, means to oscillate one of said levers, and an adjustable pivot connecting two of said levers, whereby the movable jaw may be independently retracted to release the work.

20. In a sewing machine for lasting boots and shoes, in combination, a stitching mechanism, an automatically movable knife for slashing the edges of the upper, an automatically acting pincer for the upper relatively to which the knife moves, and an adjustable slide upon which the pincer and the knife are supported.

21. In a sewing machine for lasting boots and shoes, suitable stitching mechanism, a pincer for drawing the upper over the last, said pincer being adjustable with relation to the stitching mechanism in a direction across the sole of the last, means for securing the pincers in adjusted position and means for operating said pincer.

22. In a sewing machine for lasting boots and shoes, suitable stitching mechanism an abutment for the last, a pincer for drawing the upper over the last, means for operating said pincer, and a slide independent of said operating means for permitting adjustment of said pincer in a direction across the sole of the last.

23. In a machine of the class described, the combination with grippers and means for actuating them, of means connected with

the grippers for guiding the stock into the grippers.

24. In a machine for working an upper over a last progressively by repeated operations, the combination with grippers and means for actuating them, of a stock guide extended laterally from one of the gripper members to position the stock to be gripped.

25. In a machine of the class described, the combination with means for pulling an upper over a last and means for securing the upper to a lip or the like on the insole, of means for intermittently engaging said lip to lift and hold it in position during the securing operation, and an abutment carried by said last-named means for engaging the insole approximately at its edge to prevent the edge portion of the insole being raised.

26. In a machine of the class described, the combination with means for drawing an upper over a last and securing it to a lip or the like of an insole, of an abutment for engaging the insole between its edge and said lip, said abutment being constructed and arranged to extend substantially from the lip to the edge of the insole to hold the edge of the insole in position during the overdrawing operation.

27. In a machine comprising means for working an upper over a last and securing it to a lip or the like of an insole, the combination with means for holding the lip in position during the securing operation, a needle, means for operating the needle to engage and feed the work, a needle strengthener, and operating means for said strengthener comprising a member supported by said lip holding means.

28. In a machine of the class described, the combination with grippers and means for automatically actuating the grippers to engage and pull the stock, of manually actuated means for opening and closing the grippers independently of the first mentioned means.

29. In a machine of the class described, the combination with grippers, an actuator, and connections between the actuator and the grippers for automatically operating the grippers, of manually movable means included in said connections for opening and closing the grippers independently of said actuator.

30. In a machine of the class described, the combination with grippers, an actuator, and connections between the actuator and the grippers for automatically opening and closing the grippers, of independent means for manually opening and closing the grippers without interrupting said connections.

31. In a machine of the class described, the combination with gripping means and means, comprising pivotally connected members, for automatically operating the grip-

ping means, of an eccentric comprised in said pivotal connections, and manually controlled means for actuating said eccentric to open and close the gripping means independently of their automatic operation.

32. In a machine for working an upper over a last and securing the upper in overworked position, the combination with grippers and operating mechanism therefor constructed and arranged to cause them to pull the upper and to hold the grippers closed on the work between successive securing operations, of manually controlled means for opening the grippers to insert and withdraw the stock.

33. In a machine of the class described, the combination with grippers and automatically operating means for opening and closing the grippers and moving them with relation to a last to pull the upper, of manually controlled means for closing the grippers on the upper before the machine is started.

34. In a machine of the class described, the combination with gripping means and automatically operating means for closing the gripping means, of manually controlled means for positively varying the extent to which the grippers are closed while the machine is running.

35. In a machine of the class described, the combination with gripping means and automatically operating mechanism for opening and closing the gripping means, of manually controlled means for opening and closing the gripping means before the machine is started, and means for locking the grippers closed.

36. In a machine of the class described, the combination with gripping means for engaging a lip or the like on an insole, and pincers for engaging the upper, of supports for the gripping means and pincers arranged to permit relative adjustment of the gripping means and pincers.

37. In a machine for working an upper over a last, the combination with gripping means for pulling the upper, and an abutment for the last, of a support for the gripping means arranged to permit the gripping means to be adjusted toward and from the abutment.

38. In a machine for working an upper over a last, the combination with gripping means for pulling the upper, and a guide for controlling the position of the last with relation to the gripping means, of a support for the gripping means arranged to permit said means to be adjusted toward and from the guide.

39. In a machine for working an upper over a last, the combination with gripping means for pulling the upper and mechanism for securing the upper in overworked po-

sition, of a support for the gripping means arranged to permit adjustment of said means relatively to the securing mechanism.

40. In a machine for working an upper over a last, a pincers mechanism comprising a member having a gripping face, a co-operating member movable perpendicularly to said gripping face to grip and release the stock, and means for adjusting said members relatively in substantially the plane of said gripping faces.

41. In a machine for working an upper over a last, a pincers mechanism comprising a member having a gripping face, a co-operating member movable perpendicularly to said gripping face to grip and release the stock, manually controlled means for effecting said movements, and means for automatically moving the gripping members in substantially the plane of said gripping face to pull the stock.

42. In a machine of the class described, the combination with gripping means and operating mechanism therefor including a cam, a connecting rod arranged to be actuated by the cam, a sleeve adjustably mounted on said rod, a spring inclosed by said sleeve and interposed between an end portion thereof and the gripping means whereby the gripping means are yieldingly actuated from the cam.

43. In a machine for working an upper over a last, the combination with gripping means, means for opening and closing the same, means for uplifting the gripping means, yielding means for lowering the gripping means, and adjustable means for varying the position to which the gripping means are lowered.

44. In a machine for working an upper over a last, the combination with gripping means, means for opening and closing the same, means for uplifting the gripping means, means for lowering the gripping means into position to engage the upper, and means constructed and arranged to be adjusted while the machine is in operation for varying the position to which the gripping means will be lowered for engaging the upper.

45. In a machine for working an upper over a last, the combination with means for gripping the upper, of yielding means for uplifting the gripping means to pull the upper, and manually controlled unyielding means for uplifting the gripping means.

46. In a machine for working an upper over a last, the combination with positioning means for the shoe, of means for gripping the upper, manually controlled means for determining the position of the gripping means relatively to the shoe, and automatically operating means for uplifting the gripping means to pull the upper.

47. In a machine for working an upper over a last, the combination with positioning means for the shoe, of means for gripping the upper, manually adjustable means
5 for positioning the gripping means vertically, manually controlled means for actuating the gripping means to cause them to engage the upper, and automatically operating means to actuate the gripping means for
10 thereafter pulling and reengaging the upper.

48. In a machine for working an upper over a last, the combination with an abutment for the last, means for gripping the upper, manually controlled means for positioning the gripping means vertically with
15 relation to the abutment, and automatically operating means for actuating the gripping means to grip and pull the upper.

49. In a lasting machine, the combination
20 with pincers, of means for moving the pincers downwardly toward position for gripping the upper, means for moving the pincers upwardly for pulling the upper, and means independent of said last-named means
25 for varying the range of movement of the pincers.

50. In a machine of the class described, gripping means, mechanism for actuating said gripping means to effect a normal, pre-
30 determined movement thereof for pulling the upper, and manually operable means independent of said mechanism for adjustably limiting said movement.

51. In a machine of the class described,
35 the combination with gripping means and mechanism for operating the gripping means to pull an upper relatively to a last, of automatic actuating means connected to said operating mechanism, and manually controlled
40 means for independently actuating said operating mechanism without interrupting the connection between said mechanism and the automatic actuating means.

52. A machine of the class described, comprising gripping means, operating mechanism therefor and automatic means for actuating said mechanism to cause the gripping
45 means to grip and pull the stock, combined with means under control of the operator for actuating said operating mechanism independently of the regular operation of the
50 machine.

53. In a machine for working an upper over a last, the combination with gripping
55 means, a lever therefor, and a cam for actuating said lever, of manually controlled means for actuating said lever independently of said cam to close the gripping means at the will of the operator.

60 54. In a machine for working an upper over a last, the combination with pincers, means for automatically opening and closing the pincers, and means for automatically actuating the pincers to pull the upper,

of manually controlled means for rendering
65 the pincers inoperative while the opening and closing movements continue.

55. In a machine for working an upper over a last, the combination with pincers, means for automatically opening and closing
70 the pincers, and means for automatically moving the pincers downwardly to grip the upper and means for moving the pincers upwardly to pull the upper, of means under control of the operator for suspending the
75 downward movements of the pincers.

56. In a machine for working an upper over a last, the combination with means for positioning the shoe laterally with relation to the machine, means for pulling the upper,
80 and means for slashing the upper, of means whereby the pulling means and the slashing means may be adjusted relatively to the positioning means.

57. In a machine for working an upper
85 over a last and securing it to an insole, the combination with an awl, and a slasher, of mechanism for actuating the awl and the slasher through the upper substantially simultaneously from opposite sides of the
90 upper.

58. In a machine of the class described, the combination with intermittently operating means for securing a shoe upper to an inner sole, of pincers for holding the upper
95 between successive securing operations, means for actuating the pincers to pull the upper and hold it under yielding tension, and means for actuating the securing mechanism.

59. In a machine for working an upper
100 over a last, a pincers for the upper including two carriers each provided with a jaw, means for moving one jaw longitudinally relatively to the other to grip the upper, and manually operated means to release said jaw from
105 gripping relation to the other jaw.

60. In a machine of the class described, the combination with grippers and automatic means to actuate the grippers to engage and pull the stock, of means independent
110 of said automatic means for opening and closing the grippers.

61. In a machine of the class described, the combination with grippers and means for automatically actuating the same to engage and pull the stock, of other means, under
115 the control of the operator, to open and close the grippers irrespective of the position of said first named means.

62. In a machine of the class described,
120 the combination with grippers, of means for guiding the stock between the jaws of the grippers and for resisting the upward pressure of the insole mounted upon a member of said grippers.

63. A lasting machine having grippers comprising pivoted members, one of said
125 members being provided with means for

guiding stock between the jaws of the grippers and additionally with means for resisting the upward pressure of the insole.

64. In a lasting machine, the combination with grippers and actuating means therefor, of a stock guide and an abutment for the insole, said parts being independent of each other and both located on a member of the grippers.

65. In a lasting machine, the combination with grippers and actuating means therefor, of means for guiding the stock into the grippers and means for engaging the insole to resist the strain of the pulled upper, both of said means being located on a single member of the grippers.

66. In a machine for working an upper over a last, the combination of positioning means for the shoe, means for pulling the upper, and slashing means for the upper, said slashing being adjustable relative to the positioning means.

67. In a machine for working an upper over a last, the combination with a guide for positioning the shoe laterally with relation to the machine, means for pulling the upper, and means for slashing the upper, of means permitting adjustment of the slashing means relatively to the guide.

68. In a machine for working an upper over a last, the combination with positioning means for the shoe including a guide and an abutment, means for pulling the upper, and means for slashing the upper, of means permitting adjustment of the slashing means relatively to the positioning means.

69. In a machine for working an upper over a last, the combination with grippers carrying a guide for holding and positioning a shoe laterally with relation to the machine, means for pulling the upper, and means for slashing the upper, of means whereby the slashing means may be adjusted relatively to the grippers and guide.

70. In a machine for working an upper over a last, the combination with means for pulling an upper, and an abutment for the last, of means for slashing the upper and a support for the slashing means arranged to permit adjustment of said slashing means toward and from the abutment.

71. In a machine for working an upper over a last, the combination with means for pulling the upper and mechanism for securing the upper in over-worked position, of means for slashing the upper and a support for the slashing means arranged to permit adjustment of said slashing means relatively to the securing mechanism.

72. In a machine for working an upper over a last and securing it to a lip or the like, the combination with grippers for holding the lip in position during the securing operation, a needle, means for actu-

ating the needle to cause the needle to engage and feed the work, a needle strengthener mounted for movement longitudinally of the needle, and means mounted on the grippers for limiting the movement of the strengthener in one direction.

73. In a machine for working an upper over a last and securing it to a lip or the like, the combination with means for holding the lip in position during the securing operation, a needle, means for actuating the needle to engage and feed the work, an awl and its carrier, a needle strengthener mounted for longitudinal movement relatively to the needle, and limiting means for said strengthener supported by said lip holding means and awl carrier, respectively.

74. In a machine for working an upper over a last and securing it to a lip or the like, the combination with means for holding the lip in position during the securing operation, a needle and its carrier, an awl and its carrier, actuating mechanisms for the needle and awl to cause the awl to pierce the work and the needle to engage and feed the work, a needle strengthener mounted for longitudinal movement relatively to the needle, and means for limiting the movements of said strengthener in opposite directions, said means being mounted upon the lip holding means and the awl carrier, respectively.

75. In a sewing machine for lasting boots and shoes, suitable stitching mechanism, a pincer arranged to lie in a plane substantially parallel with the plane of the shoe bottom and operating to draw the upper over the last, said pincer being adjustable in the direction of its length with relation to the stitching mechanism, and means for operating said pincer.

76. In a sewing machine for lasting boots and shoes, the combination with stitching mechanism, of a pincer having a pivotal support, and means for bodily adjusting the pincer together with its support relatively to said mechanism.

77. In a sewing machine for lasting boots and shoes, the combination with stitching mechanism, of a horizontally arranged pincer, means for pivotally supporting the pincer and means for bodily adjusting the pincer and its support relatively to said mechanism.

78. In a machine of the class described, the combination with a pincer, of means for manually closing the pincer, a last support, means for relatively moving the pincer and the last support to pull the upper, and power operated means to secure the upper under tension.

79. In a machine of the class described, the combination with a last bottom abutment, of a pincer, manually controlled means

for closing the pincer, said machine having also provision for manually controlled movement of the last and the pincer to tension the upper, and power driven means to secure
5 the tensioned upper.

80. In a machine of the class described having a pincer arranged to stand closed at the end of a cycle, the combination with
10 manually controlled means to open the pincer for the insertion of the upper, of power operated means to move the pincer to pull the upper, and means to fasten the upper under tension.

81. In a machine of the class described
15 having a pincer arranged to stand closed at the end of a cycle, the combination with manually controlled means to open the pincer for the insertion of the upper, and to close the pincers for seizing the upper, of an
20 abutment about which the last can be moved to tension the upper, and power mechanism

for further actuating the pincers in working the upper over the last.

82. In a machine of the class described having a pincer arranged to stand closed at
25 the end of a cycle, the combination with manually controlled means to open the pincer for the insertion of the upper, and to close the pincers for seizing the upper, of an abutment about which the last can be
30 moved to tension the upper, power operated means to cause the pincer to pull the upper and power mechanism for securing the tensioned upper.

In testimony whereof I have signed my
35 name to this specification in the presence of two subscribing witnesses, this 1st day of March, A. D. 1897.

JAMES E. JACKSON.

Witnesses:

A. D. HARRISON,
C. F. BROWN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
