

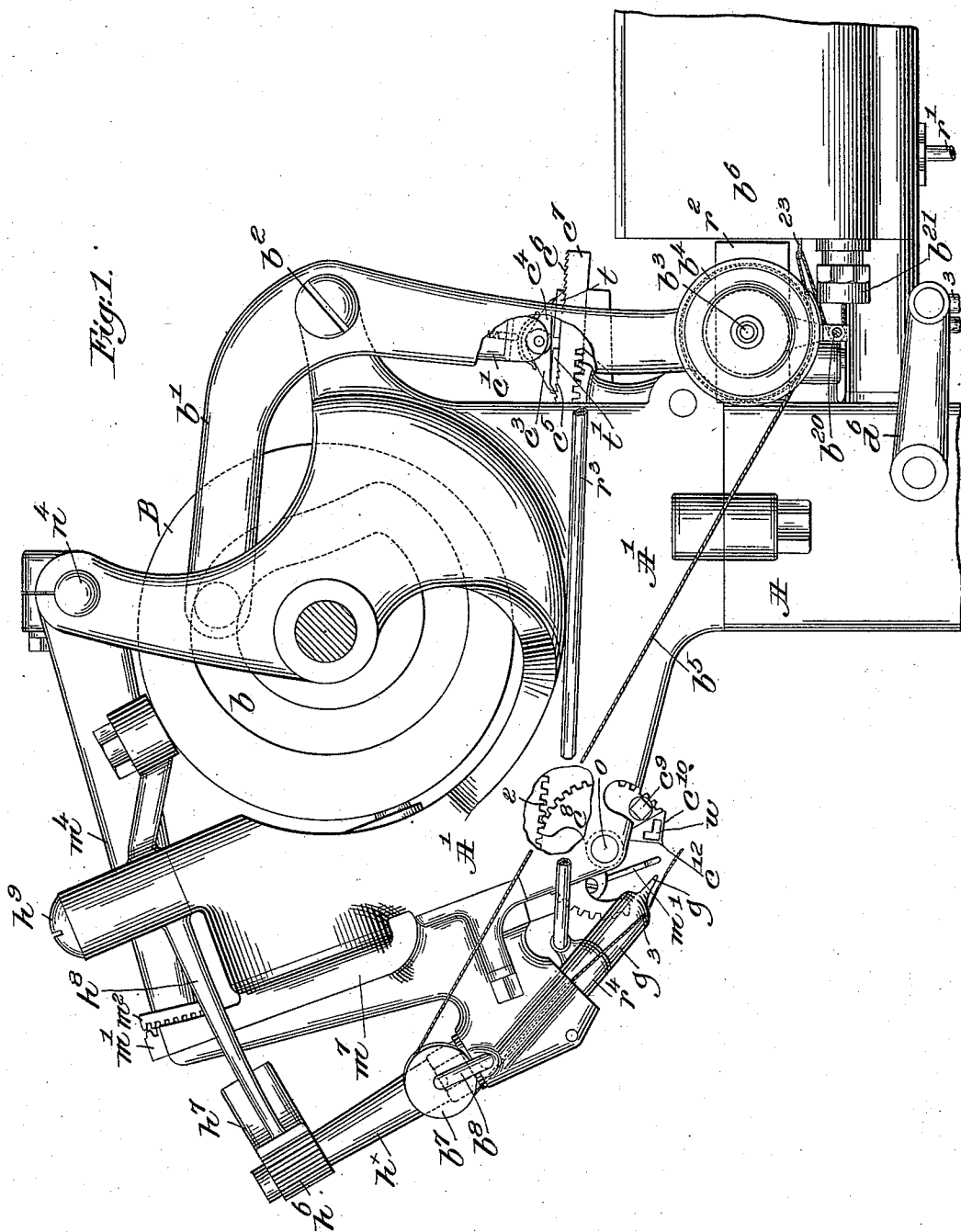
(No Model.)

3 Sheets—Sheet 1.

L. GODDU.
SHOE SEWING MACHINE.

No. 578,559.

Patented Mar. 9, 1897.



Witnesses.
Fred S. Gunkel.
Thomas J. Drummond.

Inventor
Louis Goddu.
by Crosby Gregory
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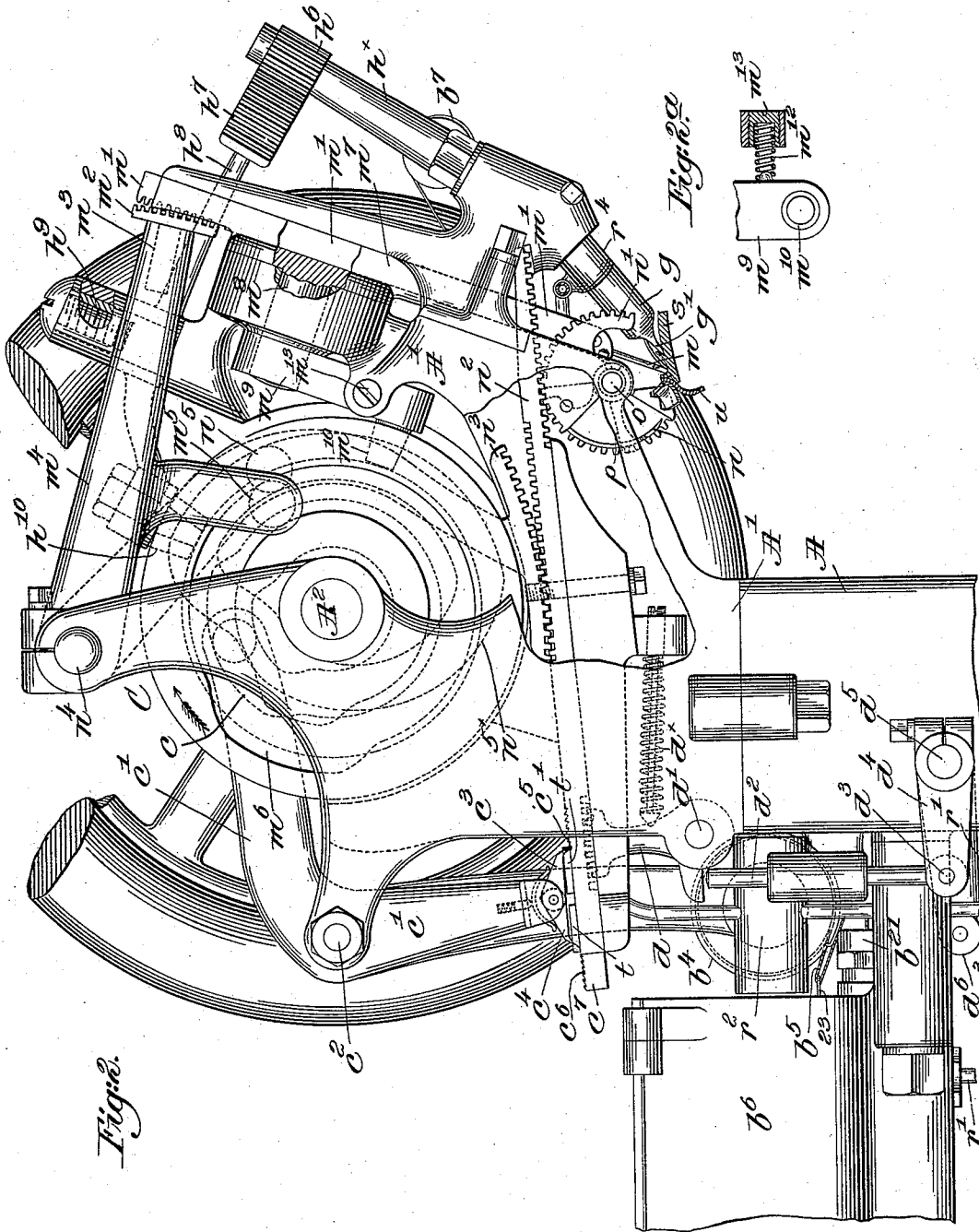
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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Fig. 3.

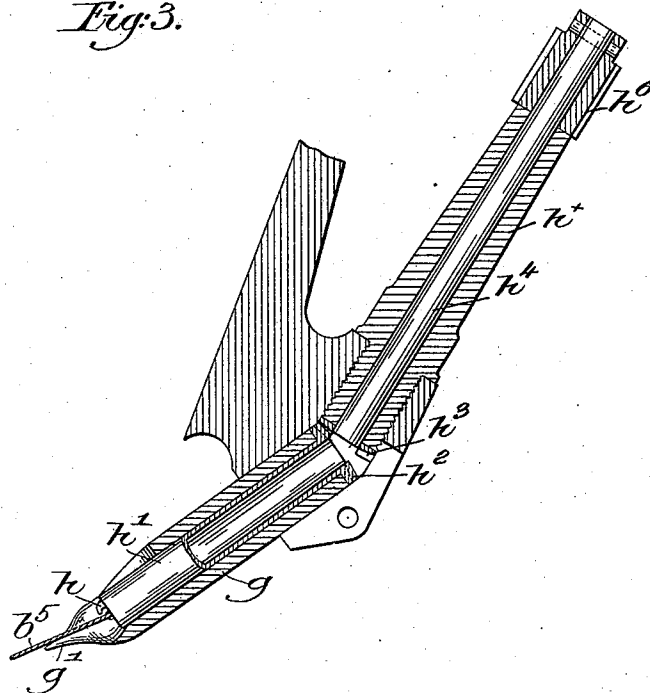
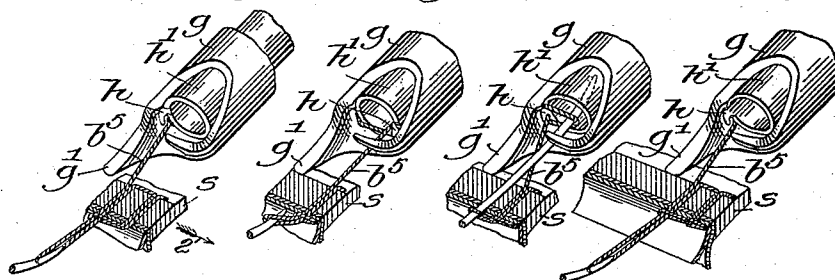


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE, OF PETERSHAM, MASSACHUSETTS.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,559, dated March 9, 1897.

Application filed January 4, 1896. Serial No. 574,299. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GODDU, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention has for its object the production of a novel sewing-machine more especially adapted to stitch the welt to the upper and to the inner sole. The inner sole will preferably have a channel cut into its face a short distance back from its edge, while the edge of the inner sole will be split and bent, one part up and the other down, and the upper will be pressed into this part of the inner sole.

20 In my invention I employ a curved hooked needle which enters the welt and upper and emerges from a channel cut in the face of the inner sole, where it is provided with thread by a peculiar thread-presenting device having a movement of rotation about the end of the needle close to the end of the channel-gage, which also acts as a work-rest to support the work against the thrust of the needle, the stitch being that known as the "chain," the loop or enchain part of the stitch lying on the welt.

30 The welt is presented to the upper and needle by a peculiar welt-guide having an outwardly-extended lip which acts on the upper close to the stitch-making point and forces it closely into the channel or corner left by cutting or splitting the edge of the inner sole preparatory to the action of the needle, the said welt-guide being shown as attached to a segment located close to and having its center of motion coincident with the center of motion of the needle-segment, the said segment deriving its motion from a toothed bar which is moved by a segment under the control of a foot-operated lever when the shoe is put into the machine, the said bar during the operation of stitching the welt to the upper and sole being moved forwardly after each stitch by mechanism to be described to unclamp the work and permit it to be fed by a feed-point, and just before the needle is to en-

ter the welt the said bar is moved backwardly to cause the welt-guide to press on the upper and clamp it to the sole and force the sole against the channel-gage, the bar being automatically moved forward and locked as the welt-guide reaches its forward position, its position varying according to the thickness of the material being acted upon, and when the bar is moved forwardly to release the work for feeding the movement is for a uniform distance from the surface of the work. This bar is moved as described by the action upon ratcheted portions thereof of oppositely-pointing pawls carried by a lever and having a uniform motion for each stitch.

The particular manner of carrying out my invention will be hereinafter more particularly described, and the features in which my invention particularly consist will be further set forth in the claims at the end of this specification.

The feeding of the material is effected by a feed-point carried by a straight reciprocating feed-bar, the feed-point entering only the between substance of the sole or that part of the sole lying between the two channels made therein, the said feed-point entering the face of the between substance and working in a line crossing the arc in which the needle works.

Figure 1 is a right-hand side elevation of a sufficient portion of my invention to enable it to be understood, the main shaft having been cut in section and the balance-wheel omitted; Fig. 2, a left-hand side elevation of the said machine, some of the parts being partially broken out, the said figure showing part of the driving-wheel and part of a shoe in position; Fig. 2^a, a detail to be described; Fig. 3, an enlarged detail showing the channel-gage and work-rest with the rotatable thread-presenter; and Figs. 4 to 7, inclusive, are details showing the action of the parts in the formation of the stitch.

In the drawings, A represents a column on which is mounted the machine-head A', it having suitable bearings for the working parts.

The main shaft A² has applied to it a balance-wheel having a conical friction-face adapted to be engaged by the friction-face of a pulley loose on said shaft and driven by a

belt, as well known in sole-sewing machines and substantially as in my application, Serial No. 574,042, filed January 2, 1896. The main shaft has fast on it two cam hubs or blocks B and C.

The hub C has a cam-groove c (shown by dotted lines, Fig. 2) to receive a roller or other stud on and to actuate a lever or pawl carrier c' , having its fulcrum at c^2 , and provided with two oppositely directed or pointed spring-pressed pawls c^3 c^4 , adapted to engage at times, respectively, ratchet-teeth c^5 c^6 of a bar c^7 , having at its under side suitable rack-teeth 2 to engage teeth of a segment c^8 , to which is connected in suitable manner, as by a bolt c^9 , a welt-guide c^{10} , having a lip or edge c^{12} to bear against the upper u of the shoe (see Fig. 2) and press it firmly and snugly against the sole and, as shown, into the channel made in the edge of the sole s close to the point where the needle, to be described, is to enter the upper.

The bar c^7 , as shown, has at its under side, near its outer end, rack-teeth which are engaged by the teeth of a sector d , having its fulcrum at d' and provided with a lug or finger which is adapted to be acted upon by a guide-rod d^2 , jointed at d^3 to an arm d^4 , fast on a rock-shaft d^5 , having a second arm d^6 jointed to a rod 3, attached in practice to the rear end of a treadle, (not shown, but of usual construction,) it being pivoted between its ends on a stand attached to the base of the machine, the front end of the treadle being normally kept elevated by a suitable spring, all as usual. A spring d^x , supported at one end against a lug extended from the framework and acting at its other end upon a headed pin, causes said pin to be brought against the sector d , said spring normally acting to move the sector in the direction to move the bar c^7 in the direction to keep the welt-guide pressed against the upper with a yielding pressure, so that the said welt-guide may readily adapt itself to any variation in thickness of the upper. The sector d is designated in the claims as the "bar-sliding" sector.

The welt-guide is removed from the upper preparatory to feeding the shoe, and said guide is always moved away from the upper for a definite distance by the pawl l' , no matter what the thickness of the upper.

The hub B has a groove b , which receives a roller or other stud on a lever b' , pivoted at b^2 and carrying at its other end a stud b^3 , on which is mounted a tension and take-up wheel b^4 , about which the thread b^5 , taken from a suitable wax-pot b^6 , is led, the said thread going from the said tension-wheel over a sheave b^7 , mounted on a stand b^8 , the thread being then led through a hole bored in the framework, as shown by dotted lines, Fig. 1, down outside the channel-gage g , and into the same through a hole 3, where it is presented to be taken by the point h of the thread-presenter h' .

The thread-presenter h' is shown as a hol-

low tube fitted to be turned about within the shank of the channel-gage, made also as a tube g , with a finger-like extension g' to enter the channel and to also constitute a rest for the sole against the thrust of the needle n .

The upper end of the presenter h' has a bevel-pinion h^2 , engaged by a like pinion h^3 at the end of a rod h^4 , having its bearing in a stand h^x , the rod having attached to its upper end a pinion h^5 , which is engaged by the teeth of a toothed sector h^7 , forming part of a lever h^8 , having its hub pivoted at h^9 , and provided with a roller or other stud h^{10} , which enters a suitable groove made in the periphery of the hub B.

The needle n is secured to a needle-segment n' , which derives its movement from teeth at the under side of a rack-bar n^2 , actuated by the teeth of a toothed sector n^3 , having its fulcrum at n^4 , and having a roller or other stud n^5 , which enters a cam-groove n^{5x} , (see dotted lines, Fig. 2,) cut in the side of the hub C, the teeth of the said sector engaging the teeth at the upper side of said rack-bar, and in action the sector presses on said bar in a direction to always maintain the teeth at the under side of said rack-bar in engagement with the teeth of the needle-segment.

The shoe is fed by means of a feed-point m , attached to the lower end of a straight bar m' , provided at its upper end with teeth which are engaged by the teeth of a block m^2 , having a segmental series of teeth and provided with a shank m^3 , which enters loosely a hole in one end of a lever m^4 , having its fulcrum at n^4 , and provided with an extension carrying a roller or other stud m^5 , which enters a cam-groove m^6 (shown by full lines, Fig. 2) in cam C.

The bar m' is fitted to slide vertically in a guiding block or way m^7 , having at its rear side a pivot m^8 , which takes a suitable bearing in a fixed part of the head A' , the said pivot having attached to it an arm m^9 , provided with a roller or other stud m^{10} , which bears against a cam-face made at one side of the hub B, the said roll being kept against said cam by a suitable spring m^{12} , (see Fig. 2^a,) acted upon by a screw m^{13} , the said feed-point working in a path which crosses the arc in which the needle works and entering the between substance.

The segmental arm d is acted upon by a spring-pressed pin d^x , said pin restoring the arm and bar c^7 into their normal position after the foot of the operator has been removed from the treadle referred to, the operator having introduced the shoe into position to be stitched.

The two segments c^8 and n' have a common fulcrum o , and in practice the needle has a steadying device or guide p , (shown by dotted lines, Fig. 2,) provided with a hole through which the needle works, said guide being commonly used with curved needles, the said guide steadying the needle as it enters the

work and while it is coming out, all in usual manner, or substantially as provided for in my said application.

The wax-pot is heated by steam led into it from a suitable pipe, (not shown,) and a steam-pipe r' is then led therefrom through a block r^2 , which it heats, the tension device bearing against and being heated thereby, the pipe continuing above said block and over to the opposite side of the machine, (see Fig. 1, where said pipe is marked r^3 .) said pipe heating a collar r^4 , surrounding the channel-gage g , the pipe being then led back to the steam-box, heating the same.

I have not shown the pipe so led back in Fig. 2, as it may be led back in any suitable path to be out of the way of the working parts and the operator.

The pawl c^3 is lifted from the ratchet-teeth c^5 by acting against the wedge t' and the pawl c^4 by acting against the wedge t .

In the operation of my machine the operator, holding the lasted shoe in his hand and with the feed-point in its highest position and the needle retracted, will depress the treadle referred to and move forwardly the toothed bar c^7 , withdrawing the welt-guide with its lip c^{12} away from the lower end g' of the channel-gage, and will insert the work in the position shown in Fig. 2, after which he will remove his foot from the treadle and permit the bar c^7 to be moved backwardly by or through the spring d^x acting on the sector d , thus enabling the work to be held between the welt-guide and the channel-gage.

A welt having been put into the opening w (shown in Fig. 1) in the welt-guide, the machine will be started and the needle n will be thrust through the welt and upper, will enter the edge of the sole, preferably at the bottom of a channel made by turning up a portion of the sole edge, and will emerge from the sole at the bottom of a second channel formed in the sole farther in toward its longitudinal center.

After the needle has fully entered the material the feed-point will descend and enter the material preparatory to feeding the material after the needle shall have been withdrawn from the material.

Viewing Figs. 4 to 7, it will be seen in Fig. 4 that the needle has been retracted and is yet in engagement with the loop of thread which has just been drawn by it through the sole, upper, and welt, and that the hook h of the thread-presenter h' is in its normal or starting position.

The needle having been substantially fully retracted, and the welt-guide moved to release the shoe, the feeding-point occupying the position, Fig. 2, is vibrated to feed the work in the direction of the arrow 2, Fig. 4, the needle yet holding its loop, and during this feeding movement, or prior to the needle being again thrust into the work, the thread-presenter is moved from its normal position, Fig. 4, into substantially the position, Fig.

5, thus drawing the thread out of the path of the needle.

The feed-point having acted and been withdrawn from the shoe and put into its normal position and the welt-guide having been moved to clamp the shoe, the needle is again thrust through the material, and its point crosses the thread and enters the open lower end of the thread-presenter, substantially as in Fig. 6, and the feed-point again enters the shoe, and the needle is then started backwardly, and as soon as the hook of the needle gets firm hold of the thread and the hook of the needle has substantially reached the material the thread-presenter is turned backwardly, so as to give up its thread to the needle, so that the latter as it is drawn back through the material may have one side of the loop measured off, and the other half of the loop will be readily taken from the take-up, which then comes forward, and as the needle draws the loop fully out to set the stitch the take-up is moved backwardly to aid the needle in shortening the loop in case there is more thread than is required for the loop, the action of the machine being such as to pull out enough thread at each operation of the needle for the material of greatest thickness.

After the feed-point enters the between substance of the sole the work must be released in order that it may be properly fed, and to do this the pawl c^3 in the movement of the lever c' acts upon the ratchet-teeth c^5 and pushes the bar c^7 forward sufficiently to turn the segment c^8 and withdraw the lip c^{12} of the welt-guide sufficiently away from the end of the channel-gage, so that the work may be moved freely, the needle being out of the material. The feed having been effected by a rocking movement of the guide m^7 , in which the bar m' slides, the loosely-held block permitting this movement, the lever c' will be moved in the opposite direction, and the pawl c^3 will be removed from the ratchet-teeth c^5 by the wedge t' , and the pawl c^4 will pass the point of its wedge t and will engage with one of the ratchet-teeth c^5 , then immediately located at the end of the said wedge.

One or the other of the ratchet-teeth c^5 will be presented to the pawl, according to the thickness of the upper, and having engaged the tooth of the said ratchet c^5 the pawl will move the bar c^7 backwardly, and in so doing will turn the segment c^8 and force the lip c^{12} of the welt-guide firmly against the upper, and the bar will be locked in such position, the welt-guide crowding the upper firmly into the notch or shoulder of the sole at or close to the point where the needle at the next thrust is to pass through the welt and upper in the act of uniting the welt and upper to the between substance of the sole.

When the needle has hold of the thread and is drawing it through the material to form a loop, the tension device b^4 is moved forward toward the needle-fulcrum sufficiently

to aid in supplying the proper amount of thread, as stated, and at the same movement the roller b^{20} , at the lower end of the take-up and about which the thread passes from the stripper b^{21} of the wax-box on its way about the tension-wheel b^4 , acts to pull an additional amount of thread from the wax-box, and the amount of thread so pulled out is increased by carrying the thread through an eye 23, shown as fixed to the wax-pot.

The extra thread between the take-up and tension-roll and the wax-pot is delivered by the roll only as the necessity of the sewing requires, and after the needle shall have again reentered the welt on its way into the upper and sole to again be supplied with thread the backward or reverse motion of the tension device b^4 aids in taking up any slack thread and holding it ready to be again given up to the requirements of the needle.

In the machine herein shown and described I have taken great pains to simplify the mechanism and to arrange the same compactly in the smallest space possible.

The feed-point to feed the shoe enters, it will be seen, the between substance of the sole substantially centrally between the outer and inner channel, and said point enters close to the right side of the needle, then in the between substance, it being understood that the material is fed from the right to the left, as herein shown.

Feeding the work by the feed-point in this way obviates puncturing the welt and produces the least injury possible to the between substance, and while sewing toes the feed-point acts as a pivot about which the shoe is turned between one and the next stitch, and the channel-guide always remains in a fixed position and in the channel.

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

1. In a sewing-machine, a needle-segment, its attached needle and a straight bar toothed at its under side to engage the teeth of said needle-segment and toothed also at its upper side, combined with a toothed sector to engage the teeth at the upper side of the said bar and means to actuate said toothed sector, the action of a toothed sector on one edge of said bar tending to always keep the teeth at the lower edge thereof in correct engagement with the teeth of the segment, substantially as described.

2. The welt-guide segment, its attached welt-guide, and a bar-sliding toothed sector, combined with a sliding bar having two sets of rack-teeth, one of which is engaged by the bar-sliding toothed sector, while the other of said sets engages the welt-guide segment, a spring to cause said bar to keep the welt-guide against the upper, and means to actuate the said bar-sliding toothed sector to cause the sliding bar to remove the welt-guide from the work, when the latter is to be taken from the machine, substantially as described.

3. A sewing-machine containing the following instrumentalities, viz: a hooked needle, a stationary inwardly-inclined channel-gage to enter the channel in the face of the sole and sustain the material in opposition to the thrust of the needle, said gage having a hollow shank, a rotatable thread-presenter located in said hollow shank, and a welt-guide having a lip extended from it at its side in contact with the upper, the said lip acting to bend the upper closely into the channel or shoulder made at the edge of the said sole at or near the stitch-making point, a segment to which said welt-guide is attached, and means to move said segment to operate substantially as described.

4. A sewing-machine containing the following instrumentalities, viz: a curved hooked needle, a stationary inwardly-inclined channel-gage to enter a channel cut in the face of the innersole and sustain it in opposition to the thrust of said needle, a straight slide-bar having a feeding-point, and means to actuate the said point to cross the arc in which the needle works, said point entering the top of the between substance of the sole to feed the same, combined with an independent welt-guide to act upon the upper and press it firmly in contact with the channel or corner made in the edge of the sole, and with mechanism to automatically release the pressure of said welt-guide from the upper preparatory to the feeding operation, substantially as described.

5. In a sewing-machine, a welt-guide a toothed segment upon which said welt-guide is mounted, and a bar having teeth in engagement with the teeth of the said segment, and two sets of ratchet-teeth, combined with a movable carrier and two oppositely directed or pointed pawls adapted to engage each with the ratchet-teeth of the said bar to move and lock the same alternately, as and for the purposes set forth.

6. In a sewing-machine the following instrumentalities viz: a channel-gage composed of a tube having a finger or extension to enter the channel, a thread-presenter made hollow at its lower end and provided with a hook, and a hooked needle adapted to enter the hollow lower end of the said thread-presenter, combined with means to move the said thread-presenter to carry the thread across and about the needle in order that the hook thereof may take the said thread when the needle is retracted, substantially as described.

7. The tube-like channel-guide having an extension or finger and provided with a hole for the passage of the thread, combined with a thread-presenter made hollow at its lower end and provided with a hook h , a bevel-gear h^2 , a bevel-gear h^3 , a rod to move the bevel-gear h^3 , and means to rotate said rod backward and forward, substantially as and for the purpose described.

8. In a sewing-machine, a guideway pivotally mounted upon the frame, means to oscillate the said guideway, and a toothed bar

placed in said guideway and provided with a feed-point, combined with a lever, means to move it, and a pivoted toothed block mounted upon the end of said lever and in engagement with the said bar, to operate, substantially as described.

9. In a sewing-machine, a rigid stationary channel-gage to enter the channel in the face of the inner sole, a welt-guide segment, its attached welt-guide, a sliding rack-bar having teeth to engage the teeth of the said segment, and a bar-sliding toothed sector, combined with a spring to act on said bar and normally keep said welt-guide pressed toward the upper, thereby permitting the said guide to adapt itself to variations in the thickness of the upper, substantially as described.

10. The combination with an inwardly-inclined stationary channel-gage to enter the channel in the face of the inner sole, a hooked needle, its toothed segment, and means to move the same, of a welt-guide, a toothed segment to which it is attached, a toothed sliding bar engaging said segment, means to normally press the said bar with a yielding pressure in a direction to keep the welt-guide against the upper, feeding mechanism containing a straight feed-point to enter the between substance of the sole, and means to act on said sliding bar to remove the welt-guide from the work for a uniform distance after each stitch preparatory to feeding the shoe, no matter what the thickness of the upper, substantially as described.

11. In a sewing-machine, a guideway pivoted between its ends, a toothed bar free to slide in said guideway, a feeding-point attached to said bar, a lever having a segmental toothed block pivotally mounted thereon and engaging the teeth of the said bar, and means to move said lever, combined with means to oscillate said guideway with its contained bar, whereby the said bar is moved laterally while the feeding-point is in the work to thus feed the same, substantially as described.

12. The hooked needle, the channel-gage,

the thread-presenter carried thereby to present the thread to the needle, and a take-up acting directly on the thread between the channel-gage and the wax-box, and means to operate it to give up and pull off thread and to hold the same until needed by the requirements of the needle, substantially as described.

13. The combination with the hooked needle, its toothed segment, and means to move the same, of a welt-guide, a toothed segment to which it is attached, a toothed bar engaging said segment, means to normally press the said bar with a yielding pressure in a direction to keep the welt-guide against the upper, and means to move the said bar in the direction to increase the normal pressure of the welt-guide on the upper and lock the said guide in place while the needle enters the work, substantially as described.

14. A stationary channel-gage or work-support, having a hollow shank, and a hooked needle to enter the material and present its hook at one side of the shank of said channel-gage, combined with a circularly-movable thread-presenter, lying in the said hollow shank, and means to move said thread-presenter to wrap the thread about said needle, substantially as described.

15. In a sewing-machine, the guideway having a pivot or stud m^8 , an arm attached to said stud and provided with a roller or other stud, a cam to engage said roller-stud to oscillate said guideway, a toothed feeding-bar fitted to slide in the said guideway and provided with a feeding-point, combined with a lever having a segmental toothed block pivotally mounted upon its end to engage the teeth of said feeding-bar, to operate substantially as described.

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

LOUIS GODDU.

Witnesses:

GEO. W. GREGORY,
EMMA J. BENNETT.