(No Model.) 4 Sheets—Sheet 1.

H. BRIGGS.

ROUGH ROUNDING AND CHANNELING MACHINE.

No. 463,982. Patented Nov. 24, 1891.

Fig. 1.

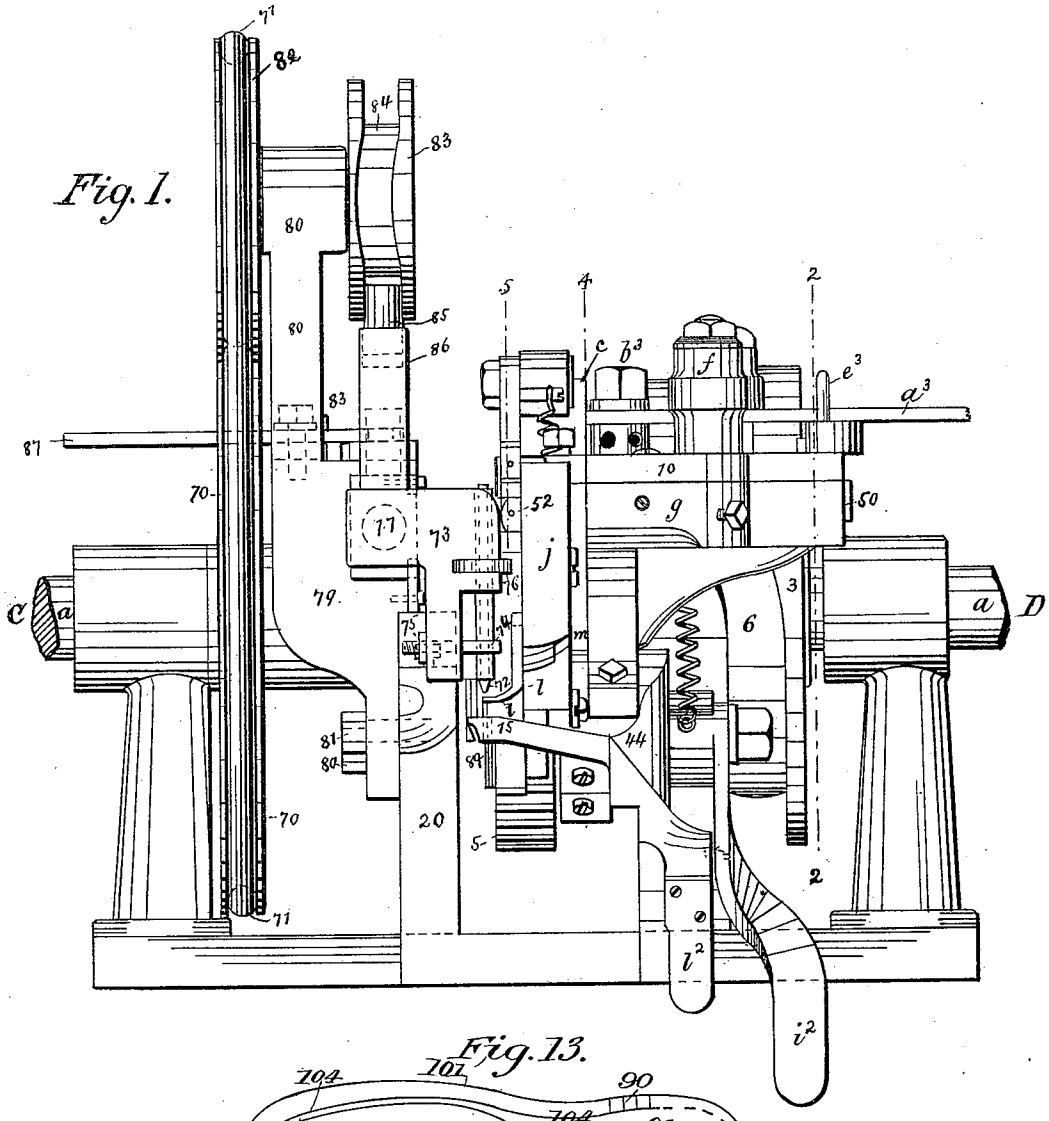
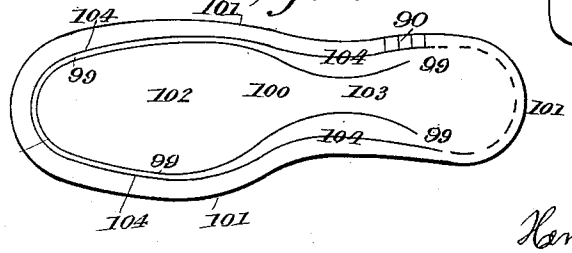


Fig. 13.



Witnesses

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(No Model.) 4 Sheets—Sheet 2.

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ROUGH ROUNDING AND CHANNELING MACHINE.

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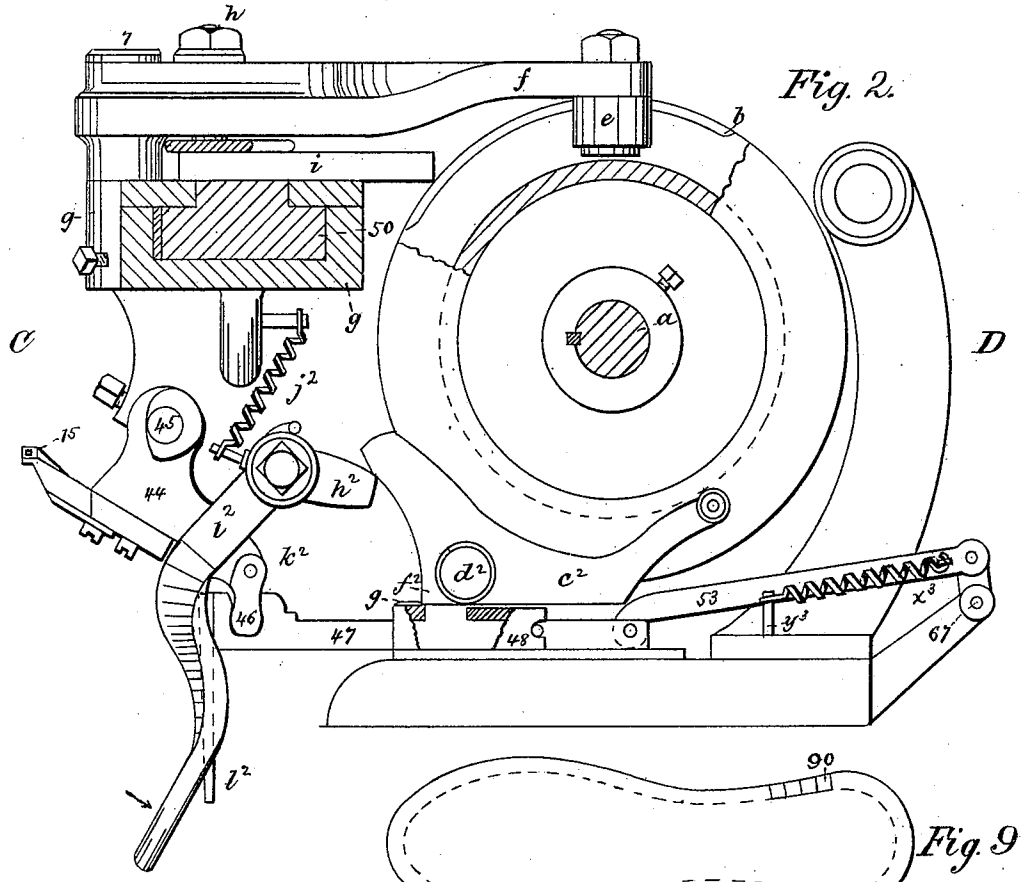

Fig. 2.

Fig. 9

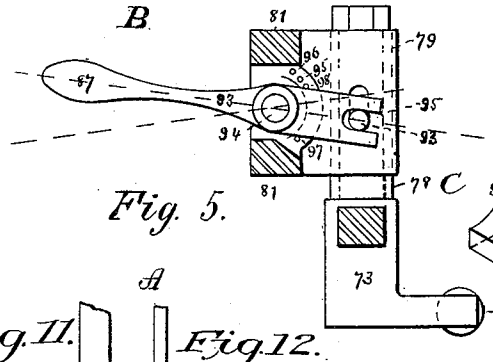

Fig. 5.

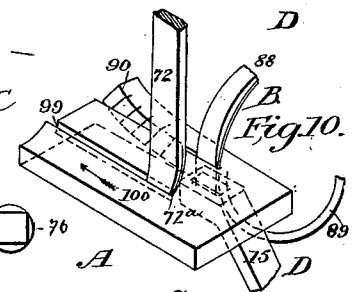

Fig. 10.

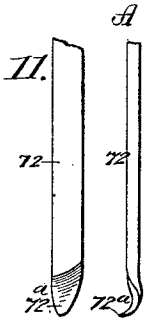

Fig. 11. Fig. 12.

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Fig. 4.

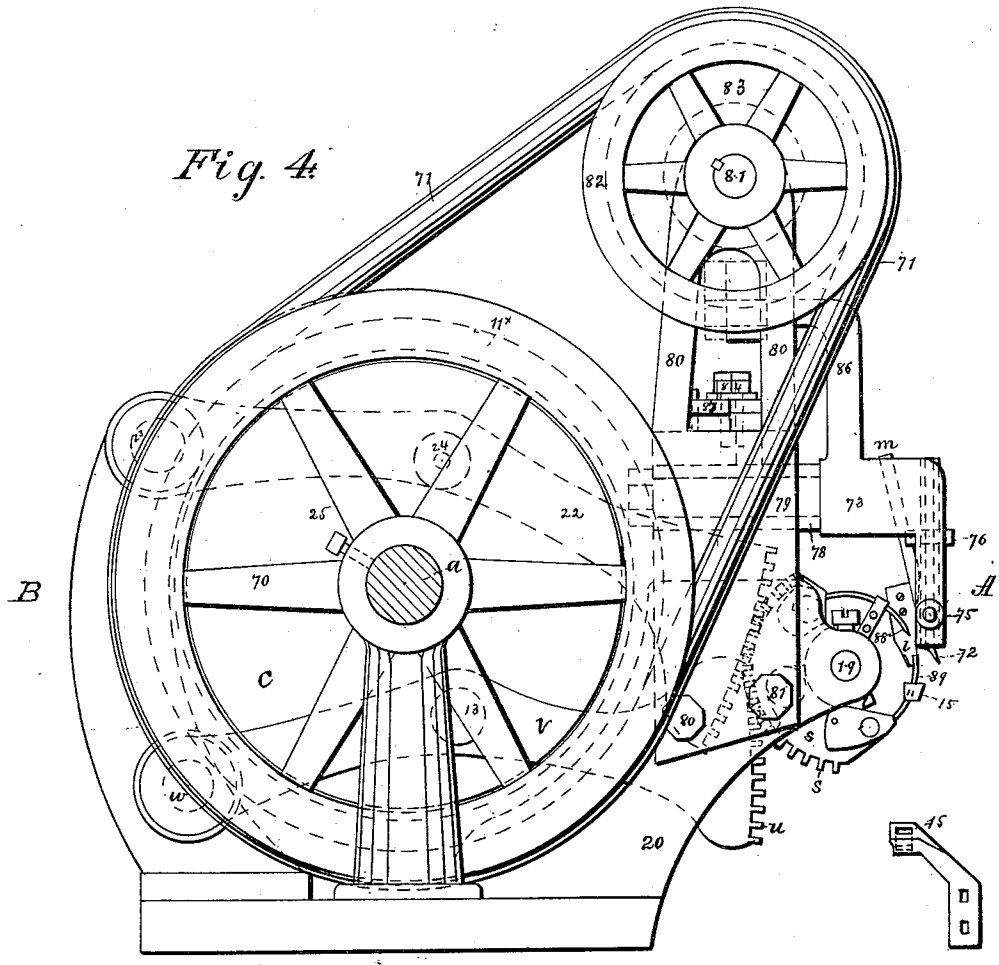

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

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ROUGH ROUNDING AND CHANNELING MACHINE.

No. 463,982. Patented Nov. 24, 1891.

Fig. 6.

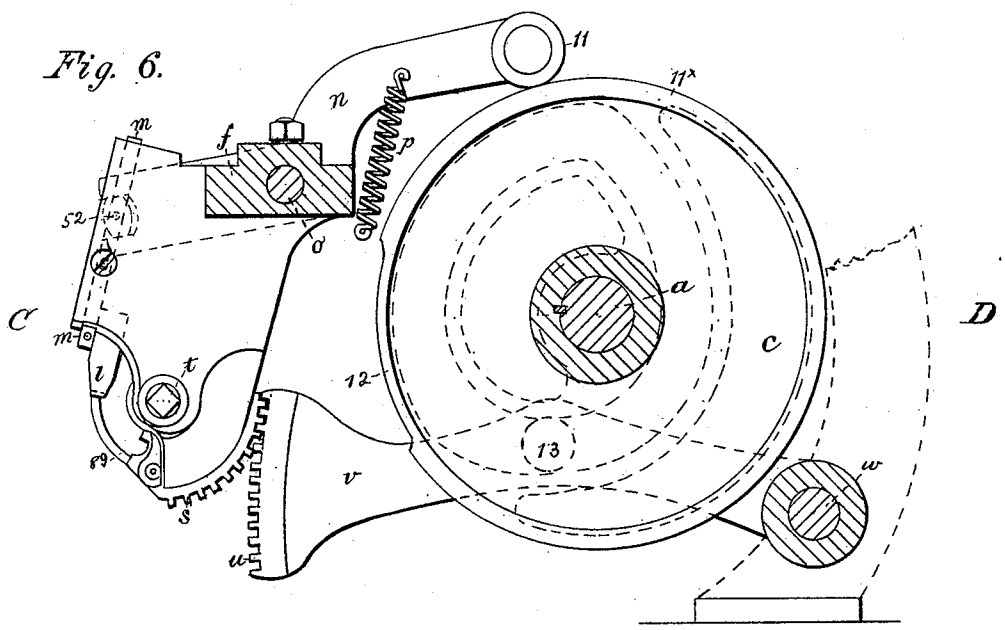

Fig. 7.

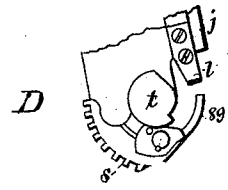

Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

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ROUGH-ROUNDING AND CHANNELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,982, dated November 24, 1891.

Application filed April 4, 1890. Serial No. 346,538. (No model.)

To all whom it may concern:

Be it known that I, HENRY BRIGGS, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rough-Rounding and Channeling Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates, specially, to an improvement in machinery to "rough-round and channel" boot or shoe soles. I attain this object by the combination shown in the accompanying drawings, in which—

Figure 1 is a front elevation of my machine; Fig. 2, a vertical transverse section on line 2 2 of Fig. 1; Fig. 3, a view of work-support in which is made the separating or oscillating cutting-blade throat with its cutting-edge; Fig. 4, an end view of Fig. 1, looking from C toward D of Fig. 1; Fig. 5, a plan view of channel-regulator; Fig. 6, a vertical transverse section on line 4 of Fig. 1; Fig. 7, detail of lower oscillating cutting-blade or four-motion feed-blade 89 and its carrying-segment; Fig. 8, detail of upper oscillating cutting-blade 88 and its carrying-segment; Fig. 9, a plan view of sole, showing cuts made by upper and lower oscillating cutting-blades 88 and 89 during the operation of "rough-rounding;" Fig. 10, isometrical view of channeling-knife "channeling" the sole or "material" while it is being fed and "rough-rounded." Fig. 11 is a front elevation of my channeling-knife. Fig. 12 is a side elevation of my channeling-knife, looking from B toward C of Figs. 1 and 10, and showing the cutting-edge 72^a of vibrating channeling-knife 72. Fig. 13 is a plan view of a boot or shoe sole, showing the variable lateral adjustable distance of channel from edge of sole in the shank and fore part.

The object of my invention herein described is to rough-round and channel boot or shoe soles upon the last, making both the "channeling and rough-rounding" at the same time, to prepare the boot or shoe soles for the hand or machinery used in the subsequent processes required to complete the boot or shoe—namely, hand-stitching or stitching-machines to unite the sole and welt to the shape of the last used and sole desired.

My invention consists of a frame carrying a main rotating shaft *a*, which has upon it a pulley 70, belt 71, and hubs or cams *b c d*, having proper projections, depressions, and grooves to correctly actuate the various parts the of machine to rough-round and channel boot or shoe soles. A vertical adjustable channeling-knife 72, having an oscillating or vibratory motion, supported and operated by the knife holder or carriage 73, is mounted on and supported by the lower part of the vibrating arm 86. This channeling-knife 72 and its holder or carriage 73 and vibrating arm 86 are vertical and supported by the pivot or fulcrum 77 and oscillate or vibrate on this pivot or fulcrum 77 as a center. This vibrating channeling-knife 72 and its holder or carriage 73 are mounted in the vibrating arm 86 by the clamp 74 and binding-nut 75 and are capable of being raised and lowered by the screw-thread and adjusting-nut 76 to cut the channel 99 to the depth required. The vibrating arm 86 is mounted on the slide-block 78 by its pivot or fulcrum 77, extending into the slide-block 78, which extends through the grooved block 79, permitting lateral adjustment of the slide-block 78 and knife 72 to the required distance from the edge of the sole to be channeled. The grooved block 79 is attached to a rigid part 20 of the frame of the machine by bolts 80 and 81 or other suitable fastenings, or it may be an extension of the rigid part 20 of the machine. The slide-block 78 carries a stud 92, which is embraced by the slot 91 in the slotted or forked lever 93, pivoted at 94 to a rigid part or bracket 20 of the machine, so that the slide-block 78, vibrating arm 86, knife holder or carriage 73, and channeling-knife 72 may be moved laterally by the lever 93. The plate 95, Fig. 5, contains holes 98, in which pins 96 and 97 may be placed to regulate the distance to which the lever 93 is to be moved while the machine is in operation to regulate the lateral adjustment of the slide-block 98, vibrating arm 86, knife holder or carriage 73, and vibrating channeling-knife

72. The grooved block 79 also carries a housing 80, which supports a shaft 81, having on one end a pulley 82 and on the other end a cam-wheel 83, into the groove of which latter is geared a cam-roller 85, mounted on the upper end of the vibrating arm 86, the lower end of which supports the knife holder or carriage 73, which carries the channeling-knife 72. The cam-wheel 83 has its groove 84 so constructed as to cause by the revolution of the cam-wheel a lateral vibratory movement of the cam-roller 85 and its supporting or vibrating arm 86 oscillating or vibrating it on its fulcrum or pivot 77 and causing the vibrating channeling-knife holder 73 (to which it is attached) and knife 72 (having its cutting-edge 72^a in the path of the channel 99 to be cut in the sole or material 100 operated on) also to vibrate in the direction C D against the feed of the material or sole operated upon as it is fed in the direction D C, by which means the channeling-knife 72 cuts a channel 99 in the sole or material operated on as it is passed under the knife 72 on the work-support 15 by the operator and the mechanism hereinafter described. The pulley 82 is driven by a belt 71 from the driving-pulley 70, which latter is fastened on the main rotating shaft *a* of the machine, the pulley 82 and cam-wheel 83 being so proportioned in diameters as to give a high speed of rotation to the cam-wheel 83, causing a series of rapid vibrations of the vibrating knife-holder 73 and vibrating channeling-knife 72, oscillating in the direction C D against the feed of the sole or material 100, operated on, which is fed in the direction D C, as shown by the arrow in Fig. 10, by which means the channel 99 is cut in the material 100 as the lower oscillating cutting-blade, also acting as a four-motion feed-blade 89, feeds the material or "work" 100 against the cutting-edge 72^a of the vibrating channeling-knife 72.

The vibrating arm 86, knife-holder 73, and knife 72 have a channel-regulator for the lateral adjustment of the vibrating channeling-knife 72, consisting of the slotted or forked lever 93, pivoted at 94 to a rigid part of the machine 80, the slot 91 in the lever 93 embracing a stud 92, which is attached to the slide 78, so that by moving the handle 87 of the slotted lever 93 forward (toward A) the slide 78, vibrating arm 86, knife-holder 73, and channeling-knife 72 will be moved back or in the opposite direction (toward B) and toward the edge of the boot or shoe sole operated on and resting on the work-support 15; and if the handle of the slotted lever 93 is moved in the reverse direction or backward (toward B) the slide 78, carrying the vibrating arm 86, knife-holder 73, and channeling-knife 72, will be moved forward (toward A) and toward the center of the sole 100, Figs. 10 and 13, thus graduating the distance of the channel 99 from the edge of the sole 100, operated on, this lateral adjustment or graduation of the distance of the channel 99 from the edge of the sole 100 being necessary in different parts of the sole 100 to correspond with the requirements of the stitcher to be used in the subsequent process, as stated above, as in most or all cases the distance of the channel 99 from the edge of the sole is greater in the shank 103 than in the fore part 102.

In Fig. 13 the line 101 shows the outline of the sole 100 before it is rough-rounded. 104 shows its outline after being rough-rounded and 99 the "channel."

In prior channeling-machines the graduation of the distance of the channel from the edge of the sole has been effected by adjusting a guide or guides which rest against the edge of the previously-trimmed sole. In the present machine I have no edge-guide nor any equivalent therefor, as I guide by means of the work-support, which rests against the upper of the boot or shoe as near as practicable to the edge of the bottom of the last. The line of the channel is thus made concentric with the edge of the bottom of the last and at a distance therefrom which can be regulated while the machine is in operation by moving the slotted lever 93, thereby laterally adjusting the channeling-knife 72.

Means for adjusting the length of the vibrating knife will not be necessary unless it is desired to use the machine to produce channels of varying depth.

The part of my machine intended for rough-rounding the sole at the same time that the channel is being cut consists of the upper oscillating cutting-blade 88, having its cutting-edge parallel to its axis of oscillation and operating in connection with the end of the throat of the work-support or shoe-rest 15 to form a scissors-cut, separating the materials between each perforation of the lower oscillating cutting-blade 89, which also acts as a four-motion feed-blade having its cutting or flat edge at right angles to that of the upper oscillating cutting-blade 88, which separates or "rough-rounds" the materials between the feed-blade 89 cuts. My upper oscillating cutting-blade 88 is attached to a carrying-segment 18, pivoted upon a bolt 19, attached to a rigid part 20 of the frame, and is oscillated by the rack 21 at the end of a lever 22, pivoted at 23, a pin or roller 24 entering a cam-groove in the disk *d* similarly to the mechanism of the middle carrying-segment shown in Fig. 10 of machine described in United States Letters Patent No. 240,307, dated April 19, 1881.

My lower oscillating cutting or four-motion feed-blade 89 is attached to a segment *s*, (shown in Figs. 9 and 11 of said Patent No. 240,307, with its accompanying mechanism, and also in Figs. 6 and 7 of accompanying drawings,) which is mounted to turn about the bolt *t*, the head *t* of the bolt acting against one side of the segment *s*. This segment *s* and lower oscillating cutting or four-motion feed-blade 89 are oscillated by the rack *u* at

one end of the lever *v*, pivoted at *w*, the said lever having a rolling pin 13, which enters a cam-groove in the side of the hub *c*, said groove being shown in solid lines. The teeth of the rack *u* are made long enough to remain constantly in engagement with the teeth of the segment *s* as it is moved horizontally toward C with the bracket *j* each time the material is fed, the lower oscillating cutting or four-motion feed-blade 89 being then in the material.

Fig. 6 in the accompanying drawings shows in side elevation the lower oscillating cutting or four-motion feed-blade 89, projecting above the work-support 15, having a long slot for a throat, as it will appear after the lower blade 89 has completed its forward or feeding stroke toward C, this lower blade 89 being supposed to be yet in the sole or material. The elongated throat on the support, as shown in solid lines, permits this lateral or feeding movement of the lower blade 89. This blade 89 then recedes from below the support 15. The point of the upper oscillating cutting-blade 88 approaches it and enters the sole at the front end of the cut just made in the sole by the lower blade 89 and to its right and follows the lower blade edge 89 closely while the latter moves down from the sole, and the upper blade 88 passes through the sole far enough to separate an L-shaped piece of the material of the sole, as shown in Figs. 9 and 10 at 90, the upper blade 88 then remaining at rest. After the lower blade 89 is withdrawn from the sole it is moved laterally backward toward D, the lever then moving the carriage, my presser-foot 1 at the same time being lifted. The lower blade 89 remains stationary while the upper blade 88 is raised, when the lower blade 89 again begins to move about its center of motion *t*, and about as the upper blade 88 commences to emerge from the material the lower blade 89 again penetrates the sole ready to be again moved laterally toward C to act as a feeding device in connection with the presser-foot 1, which is then held down positively on the sole.

The narrow work-support 15, provided with the separating or upper oscillating cutting-blade throat, is made to project from and so as to form part of a bed 44, pivoted at 45 on a pivot in line with the axes, about which turn the upper and lower oscillating cutting-blades 88 and 89 segments or carriers 18 and *s*, the said bed being provided with an arm 46, which is engaged by a slide-bar 47, held or directed in its movements by a guide-bar 48. This slide-bar has a connecting-rod 53 and a strong spring x^3, connected with the rigid stud y^3, and the connecting-rod 53 acts when the bar 47 is released to slide the said bar, turn the bed 44, and force the work-support 15 firmly up against the material or sole. The work-support 15 in contact with the sole is automatically locked in position during the time that the blade 88 penetrates the sole and while the presser-foot 1 is moved backward toward D from its forward position, immediately after which and as the presser-foot 1 is descending upon the material the work-support 15 is unlocked to permit the presser-foot 1, resting on the sole, to place the bottom of the sole always at the same uniform level, the work-support 15 then yielding to compensate for all variations in the thickness of the material. After the presser-foot 1 is depressed the upper blade 88 is raised from the material or sole; but just before it leaves the sole the support is again locked, and is held while the lower blade 89 pierces the sole and until the feed takes place. This locking device to hold the work-support 15 or its bed rigidly in position is herein shown as a lever c^2, pivoted at d^2, depressed twice at each revolution of the main shaft *a* by means of the cam, causing the toe f^2 of the said lever to force a pawl in ratchet-block firmly fastened upon the sliding bar 47 to hold it in place. The short arm of this lever is extended upward and forward in position to be acted upon by a cam h^2, operated in one direction by a hand-lever i^2 and in the other direction by a spring j^3, the movement of the lever i^2 in the direction of the arrow near it actuating the lever c^2 to release the slide-bar, and as the movement of the lever i^2 is continued it strikes the pin k^2, projecting internally from the bed 44, and turns said bed about its pivot 45 to depress the work-support 15 for the insertion or removal of the sole.

To force the end of the work-support 15 up against the material firmly when commencing rough-rounding and channeling, the slide 47 is provided with a handle 1. The work-support 15 has an elongated slot, with a sharp upper edge on the front part of the slot to act, in combination with the upper oscillating cutting-blade 88, as a scissors or cutting device to trim off or separate the edge of the welt and sole operated on or rough-rounded, as previously described.

The cam-groove 6 receives a roll *e* at the end of and vibrates a lever *f*, pivoted at 7 upon a rigid part of the frame-work of the machine. The lever *f* is slotted at or near its central portion, as shown at f^4, to embrace a stud *h*, the lower end of which is extended into a grooved block *i*, (the groove being shown in dotted lines,) rigidly attached to a carriage *j*, having a part 50 fitted into suitable guideways made in the frame *g*. (See Fig. 2, where the said part 50 and guideways are shown in section.) This carriage at the lower end of its vertical portion has attached to it the pivot *t*, which supports the lower blade 89 carrier or segment *s*, so that as the carriage is moved the lower blade 89, being in the sole or material, is made to act as the feeding device.

The presser-foot 1 has its shank or carrying-bar *m* fitted to slide in a groove in the carriage *j*. The bar *m* of the presser-foot has a stud which is embraced by the forked end of a lever *n*, pivoted at *o* and connected with

a spring to depress the rear end of the lever and hold its roll 11 in contact with the cam-shaped periphery of one end of the cam or hub *c*, the said spring acting to depress the rear end of the said arm and lift the channel-gage when the roll 11 comes to the depressed part of the actuating-cam, this lift of the presser-foot taking place while the upper blade 88 is in the sole or material and so as to permit the presser-foot to be moved backward (toward D) over the material after having been moved forward (toward C) to assist in feeding the material. When the roll 11 rests on the highest portions $11^{\times}$ of its actuating-cam, as in Fig. 6, the presser-foot holds the material down to a certain determined level or position with relation to the extreme upward stroke of the upper blade 88, notwithstanding variations in the thickness of the material that is being rough-rounded and channeled.

To be able to quickly change from the maximum to the minimum length of feed and insure like length of cuts on all work of certain sizes, the pin *h* in the slotted lever *f* is placed under the control of the feed-regulator a^3, pivoted at b^3, so that the pin *h* may be caused to traverse the slot f^1 and be placed at a greater or less distance from the fulcrum-pin of lever *f*, according as the feed is to be long or short. Near the regulator a^3 is a plate c^3, provided with holes d^3, in any of which may be placed the adjusting-pins e^3 e^4, two being used a greater or less distance apart, so that if the regulator rests against the pin e^3 or feed-stop the feed will be short, and if against the pin e^4 the feed will be long. The change of feed stroke may be made instantly by throwing the regulator against one or the other stop.

The channel-feed, Fig. 5, may be regulated by the distance apart the pins 96 and 97 are set in the holes 98 in the plate 95.

I do not confine myself to the four-motion feed 89 described, but can use any of the well-known means of feeding, such as are commonly used in sewing-machines.

What I claim, and desire to secure by Letters Patent, is as follows:

1. A channeling-machine provided with a channeling-knife supported by a holder or carriage mounted on a vertically-vibrating arm, mechanism, substantially as described, for supporting and adjusting the holder or carriage vertically, and means for supporting the material operated on and for feeding it against the cutting-edge of the channeling-knife, substantially as shown, and for the purpose described.

2. A channeling-machine provided with a channeling-knife supported by a holder or carriage mounted on a vertically-vibrating arm mechanism, substantially as described, for supporting and adjusting the holder or carriage vertically, means for adjusting the same laterally while the machine is in operation, and means for supporting the material operated on and for feeding it against the cutting-edge of the channeling-knife, substantially as shown, and for the purpose described.

3. In a rough-rounding machine, the oscillating cutting-blade 88, having its cutting-edge parallel with its axis of oscillation, a work-support provided with an elongated slot having a cutting-edge coacting with the edge of blade 88, the oscillating cutting-blade 89, having its cutting or flat edge at right angles to its axis of oscillation and at right angles to the cutting-edge of blade 88, and mechanism for operating the blades and feeding the material, substantially as shown, as and for the purposes described.

4. In a rough-rounding and channeling machine, the combination of a vibrating adjustable channeling-knife having its cutting-edge in the path of the channel to be cut in the material to be operated upon with the oscillating cutting-blade 88, having its cutting-edge parallel to its axis of oscillation, a work-support provided with an elongated slot having a cutting-edge coacting with the edge of blade 88, the oscillating cutting or four-motion feed-blade 89, having its cutting or flat edge at right angles to its axis of oscillation and at right angles to the cutting-edge of blade 88, and mechanism for operating the knife and blades and feeding the material, substantially as shown, as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY BRIGGS. [L. S.]

Witnesses:

C. HENRY RONEY,

ED. V. LANSDALE.