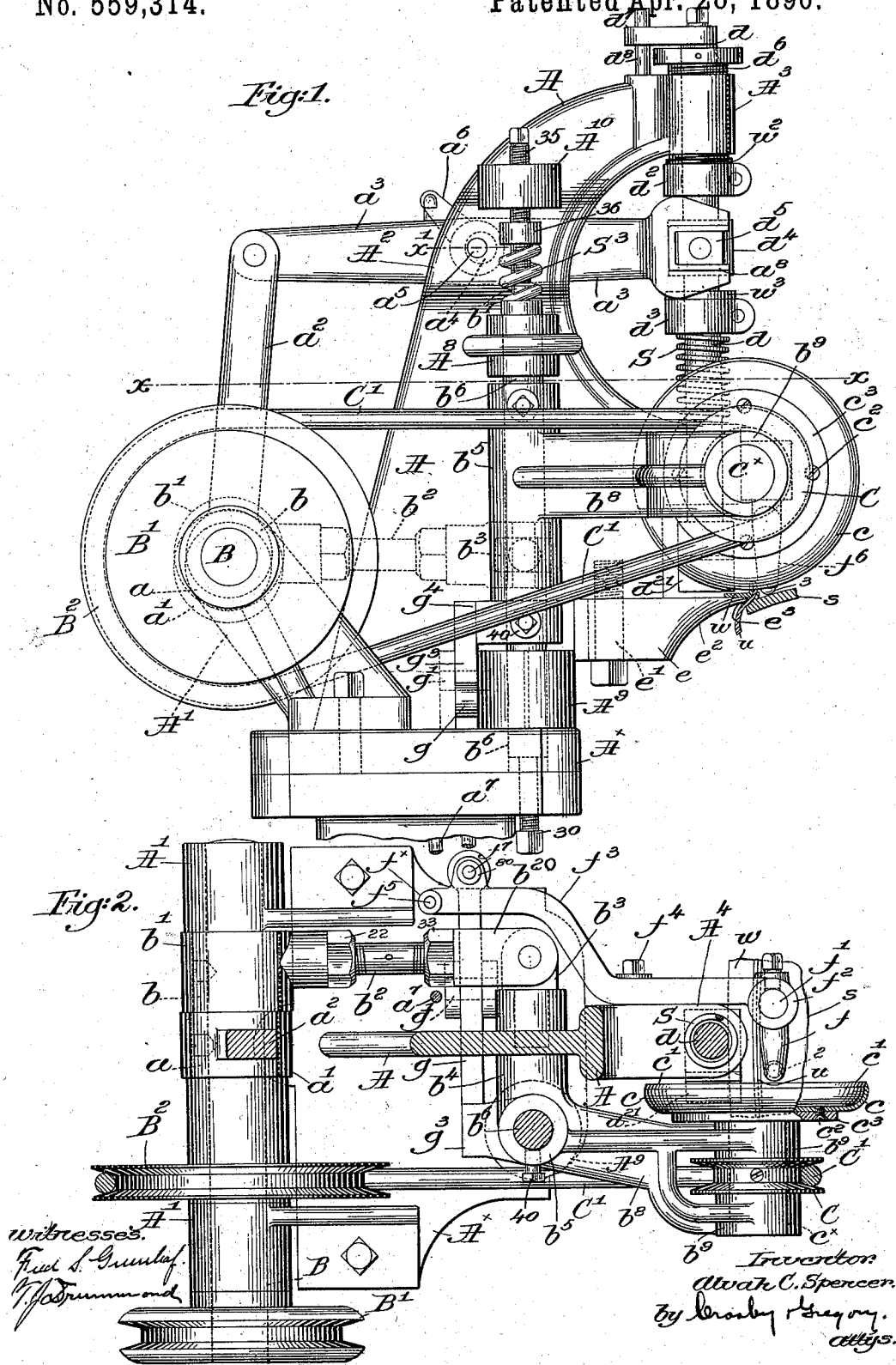


2 Sheets—Sheet 1.

MACHINE FOR INSEAM TRIMMING AND BEATING OUT WELTS.

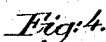
Patented Apr. 28, 1896.



2 Sheets—Sheet 2.

MACHINE FOR INSEAM TRIMMING AND BEATING OUT WELTS.

Patented Apr. 28, 1896.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR INSEAM TRIMMING AND BEATING OUT WELTS.

SPECIFICATION forming part of Letters Patent No. 559,314, dated April 28, 1896.

Application filed January 18, 1896. Serial No. 575,958. (No model.)

To all whom it may concern:

Be it known that I, ALVAH C. SPENCER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Inseam Trimming and Beating Out Welts, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object the production of a machine for beating out the welt and trimming the inseam in the manufacture of welted boots and shoes, an automatically-actuated hammer holding the welt on a suitable support while a rotary cutter is automatically moved into position to trim the inseam at an adjacent point.

Figure 1, in side elevation, represents a machine embodying my present invention, the welt being shown in section ready to be held by the hammer while the rotary cutter trims the inseam. Fig. 2 is a plan view thereof, partly in section, taken below the line $x\ x$, Fig. 1. Fig. 3 is a front elevation of the machine. Fig. 4 is a sectional detail on the line $x'\ x'$, Fig. 1, to be described. Fig. 5 is a perspective view of the hammer detached, and Fig. 6 is a vertical section of the work-gage.

The base A^x has erected thereon an upright head A and bearings A' for a main shaft B, provided with a driving-pulley B' to receive a suitable belt (not shown) and a second pulley B^2 for a purpose to be described.

Eccentric-cams a and b (see dotted lines, Figs. 1 and 2) are secured to the main shaft, the cam a having a strap a' on a link a^2 , jointed to one end of a lever a^3 , fulcrumed on an eccentric a^4 of a rock-shaft a^5 , mounted in a tubular enlargement A^2 of the head.

40 An arm a^6 on the rock-shaft is connected by a link a^7 to a suitable treadle, (not shown,) whereby by depressing the latter the eccentric a^4 will be turned to raise the fulcrum of the lever, so that the hammer (to be described) will not be forced down upon the work, constituting a throw-off.

The head A is curved outwardly at its front and upper portion and is provided with an upper threaded hub A^3 and a lower bearing A^4 for a reciprocable hammer-carrier, shown

as a slide-bar d , to which is secured a hammer d' . (Shown separately in Fig. 5.)

Suitable collars $d^2\ d^3$ are adjustably secured to the bar d between the bearings, and preferably sound-deadening washers $w^3\ w^3$ are mounted on the upper faces of each collar, the washer w^3 to receive the impact of a loose collar d^4 on the slide-bar between the fast collars.

Blocks d^5 , pivoted to the loose collar, enter slidably the slotted cheeks a^8 of the bifurcated end of the lever a^3 , the rocking motion of the latter, due to eccentric a , moving the collar d^4 up and down.

A strong spring S, surrounding the slide-bar d between the bearing A^4 and the fast collar d^3 , acts to normally lift the hammer, depression of the collar d^4 , as described, normally forcing the hammer d' positively down upon the welt, the spring causing the hammer to quickly follow the collar d^4 as the latter is raised, so that the operative can feed the shoe along rapidly when the hammer is lifted.

The washer w^3 abuts against the lower end of a sleeve d^6 , screwed into the hub A^3 , when the collar d^4 is raised, said sleeve being adjustable vertically, to thereby limit the height of the hammer at such time above the work-support.

An arm d^7 , fast on the upper end of the bar d , has extended therethrough a pin d^8 in the head A, preventing rotation of the hammer or its carrier in a simple manner.

A slide-plate e is adjustably held in position on the under side of the projecting part of the head A below the hammer by a bolt e' , passed through a slot in the plate, the outer face of the plate being preferably concaved at e^2 to present a curved lip e^3 to extend beneath the welt w , Fig. 1, and between it and the adjacent part of the upper u .

The hammer d' will, as the operator moves the boot or shoe along, hammer or beat out the welt by a series of rapid blows as the welt rests on the welt-support e .

A work gage or support is shown as a bent arm f , having a shank f' , adjustably secured by a set-screw 5 in a boss f^2 on the outer end of an arm f^3 , (see Fig. 2,) fulcrumed on the head A at f^4 . A vertical rod f^5 on the base

A^x is extended through a lug near the rear end of the arm f^3 and provided with a retaining-nut f^x , a spring S^7 , surrounding the rod between the arm and the base A^x, normally acting to depress the gage or support f against the outer surface of the sole s of the boot or shoe.

The lower end of the gage f is shown in section in Fig. 6 as recessed to receive loosely two balls 2 3, the lower one being held in place by contracting the mouth of the recess at f^6 , while leaving a portion of the ball projecting beyond it. The sole thus has a rolling bearing provided for it, reducing friction and making the boot or shoe easier to handle, the ball 3 rolling on the ball 2 in the recess. By a suitable treadle (not shown) the operator can, by means of a link f^7 , raise the work support or gage f when trimming the insole around the toe of the shoe.

The strap b' of the eccentric b is pivotally connected by a short longitudinally-adjustable link b^2 to a forked block b^{20} , jointed to an ear b^3 , pivotally mounted in the end of an arm b^4 of a cutter or trimmer carrier, shown as provided with a long sleeve b^5 , adapted to rock upon a vertical shaft b^6 . The link b^2 has right and left hand threads at its ends to enter threaded sockets in the strap b' and block b^{20} , check-nuts 22 and 33 serving to hold the link in adjusted position, adjustment of the link by rotating when the nuts are loosened serving to always bring the edge of the cutter to be described into proper operative position. As best shown in Fig. 1, the said shaft is longitudinally movable in bearings A⁸ A⁹ on the head, a set-screw 30 acting as an adjustable end-thrust bearing for and by means of which the shaft may be adjusted vertically to raise or lower the normal path of operation of the cutter. A lug A¹⁰ on the head has extended therethrough a set-screw 35, having an annular enlargement 36 thereon, against which bears the upper end of a spring S^3 , surrounding the set-screw between the enlargement 36 and the top of the shaft b^6 , which is preferably reduced at b^7 to enter the coil of the spring. Said spring maintains the shaft seated upon the end-thrust-bearing screw 30, and the set-screw 35 limits vertical movement of the shaft when raised during the trimming operation, as will be described.

The amount to be cut in trimming the insole varies, and therefore it is desirable to also provide means under control of the operator for instantly changing the elevation of the cutter at particular points. I have here-in effected this adjustment by means of a lever g , pivoted on the base at g' and connected by an adjustable nut 70 to the link f^7 , the toe of said lever projecting beneath the downturned end g^3 of a collar g^4 , held securely on the shaft b^6 by a set-screw 40. By depressing the treadle the toe of lever g is lifted to thereby raise the collar g^4 and the shaft, and as the lower end of the sleeve-bearing b^5 of the

cutter-carrier always rests on the collar the carrier and its cutter will be elevated so that the insole will be trimmed to a less degree. The link f^7 is threaded at its upper end, the threaded portion extending through the lever g and arm f^3 , and nuts 70 and 80 are screwed upon the said threaded portion above the lever and arm, respectively. As shown in Fig. 3, the nut 80 is adjusted close to the arm f^3 , so that depression of the link will immediately act upon the said arm to lift the work support or gage f ; but as only a very slight variation in the height of the cutter is required, and sometimes no variation at all, the nut 70 is set somewhat above the lever g . Consequently the cutter will not be lifted until after the gage has been raised, and then only if the link f^7 is drawn down far enough so that the gage and cutter can be operated together, if desired, or only the gage. On the other hand, if it is desired to raise the cutter only, the nut 70 would only be used and set close to the lever g , and the nut 80 would be turned up on the link far enough to avoid any engagement with the arm f^3 , the gage at such time being stationary.

In operating upon pointed or "razor-toed" boots or shoes the seams run together at such an acute angle at the toe that the work support or gage must be lifted as the insole is trimmed around the toe; but with broader-toed shoes this lifting of the gage is unnecessary.

The sleeve-bearing b^5 has extended laterally therefrom toward the front of the machine and above the hammer an arm b^8 , bifurcated at its outer end, as herein shown, and provided with bearings b^9 for a cutter-shaft c^x , having fast thereon a pulley C, connected by a suitable belt or band C' with the pulley B³ on the driving-shaft, whereby the cutter-shaft is continuously rotated when the machine is in operation. The cutter is shown as a cup-shaped or dished annular blade c , having a continuous cutting edge c' and secured by suitable screws c^2 to a laterally-extended head c^3 of the cutter-shaft c^x .

By means of the eccentric-cam b and its connections described the cutter-carrier is rocked on its vertical axis, the cutter c being thereby moved toward and away from the insole, the forward movement taking place while the hammer is down, holding the welt, the cutter at such time trimming the insole; the operator moving the work along step by step as the machine operates. As the edge c' of the cutter is ground back from time to time it would not trim the insole at the proper point were it not for the adjustment provided for the link b^2 , as by shortening said link the cutting edge c' is always brought forward to the same point. The hammer d (shown separately in Fig. 5) is preferably made of hardened steel, having a flat lower face to rest upon and beat out the welt.

It is desirable to trim the insole at a point as near as possible to the center of the ham-

mer to facilitate manipulation of the shoe, and it is also highly desirable to prevent the cutter from entering the seam while trimming or from cutting into the welt. I have accordingly cut away the side of the hammer nearest the cutter to have a guard d^{21} , which projects over the welt and separates it from the cutter while the latter is trimming the inseam, said guard at the same time serving to hold the seam down and thereby prevent the cutter from running into it.

By cutting away the side of the hammer above the guard the cutter can be moved very near to the center of the hammer, the top of the guard being concaved concentrically to the curvature of the cutter, as shown in Fig. 5, and the inseam is trimmed at a point adjacent the hammer center.

It will be understood that the check-screw 30, upon which the shaft b^6 rests, provides for the trimming of the inseam to the proper depth normally.

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

1. In a machine of the class described, means to intermittently hold the attached welt adjacent the upper, a rotatable cutter having an upturned cutting edge, and means to rotate said cutter and to cause relative lateral movement of said cutter and inseam, to trim the latter, substantially as described.

2. In a machine of the class described, a welt-support to sustain the attached welt adjacent the upper, a reciprocating hammer to beat out the welt, a rotary cutter, mechanism to actuate the hammer and to move the cutter in a path adjacent the hammer, to trim the inseam, and means to rotate the cutter, substantially as described.

3. In a machine of the class described, a support to sustain the attached welt adjacent the upper, means to intermittently hold the welt upon said support, a rotatable concaved cutter having a continuous edge, and means to move the cutter toward and to trim the inseam while the welt is held, substantially as described.

4. In a machine of the class described, means to intermittently hold the attached welt adjacent the upper, a rotary cutter to trim the inseam, and means to rotate said cutter and reciprocate it laterally, substantially as described.

5. In a machine of the class described, a laterally-swinging cutter-carrier, means to swing it, a cutter-shaft on said carrier, a concaved annular cutter on said shaft, having a continuous cutting edge, to trim the inseam, and means to rotate the cutter-shaft and cutter, substantially as described.

6. In a machine of the class described, a welt-beating hammer, means to reciprocate it, a

laterally-movable rotary cutter to trim the inseam, means controlled by the operator to instantly vary the depth of cut, and means to swing the cutter laterally and to rotate it, substantially as described.

7. In a machine of the class described, means to intermittently hold the attached welt adjacent the upper, a cutter-carrier, a cutter carried thereby to trim the inseam, means to swing the cutter-carrier laterally, and an adjustable connection between said means and the cutter-carrier to always bring the edge of the cutter into operative position, substantially as described.

8. In a machine of the class described, a welt-beating hammer, a cutter to trim the inseam, means including a lever, and its variable fulcrum to reciprocate the hammer, and means controlled by the operator to move said fulcrum to alter the throw of the lever and thereby prevent depression of the hammer while the machine is in operation, substantially as described.

9. In a machine of the class described, a hammer-carrier, means to reciprocate it, a hammer having a flat face to beat out the welt and cut away at one side, a rotary cutter, to trim the inseam, and means to swing the cutter in said cut-away part of the hammer while trimming the inseam, substantially as described.

10. In a machine of the class described, means to beat out the welt, a cutter to trim the inseam, a depending work-gage, and means controlled by the operator to positively lift the gage away from the work, substantially as described.

11. In a machine of the class described, a reciprocating hammer to hold the work, a guard thereon to retain the seam in place and protect the welt, and a rotary cutter to trim the inseam, substantially as described.

12. In a machine of the class described, means to beat out the welt, a cutter to trim the inseam, a work-gage, and means under control of the operator to move the gage from the work and to also vary the depth of cut, substantially as described.

13. In a machine of the class described, a reciprocating hammer, a guard thereon to retain the seam in place and protect the welt, said hammer being cut away above the guard, a rotary cutter, and means to move the cutter in said cut-away part of the hammer and above the guard, to trim the inseam, substantially as described.

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

ALVAH C. SPENCER.

Witnesses:

JOHN C. EDWARDS,
THOMAS J. DRUMMOND.