T. QUINN.

BEADING MACHINE FOR SHOE MANUFACTURE.

APPLICATION FILED MAR. 1, 1910.

991,368.

Patented May 2, 1911.

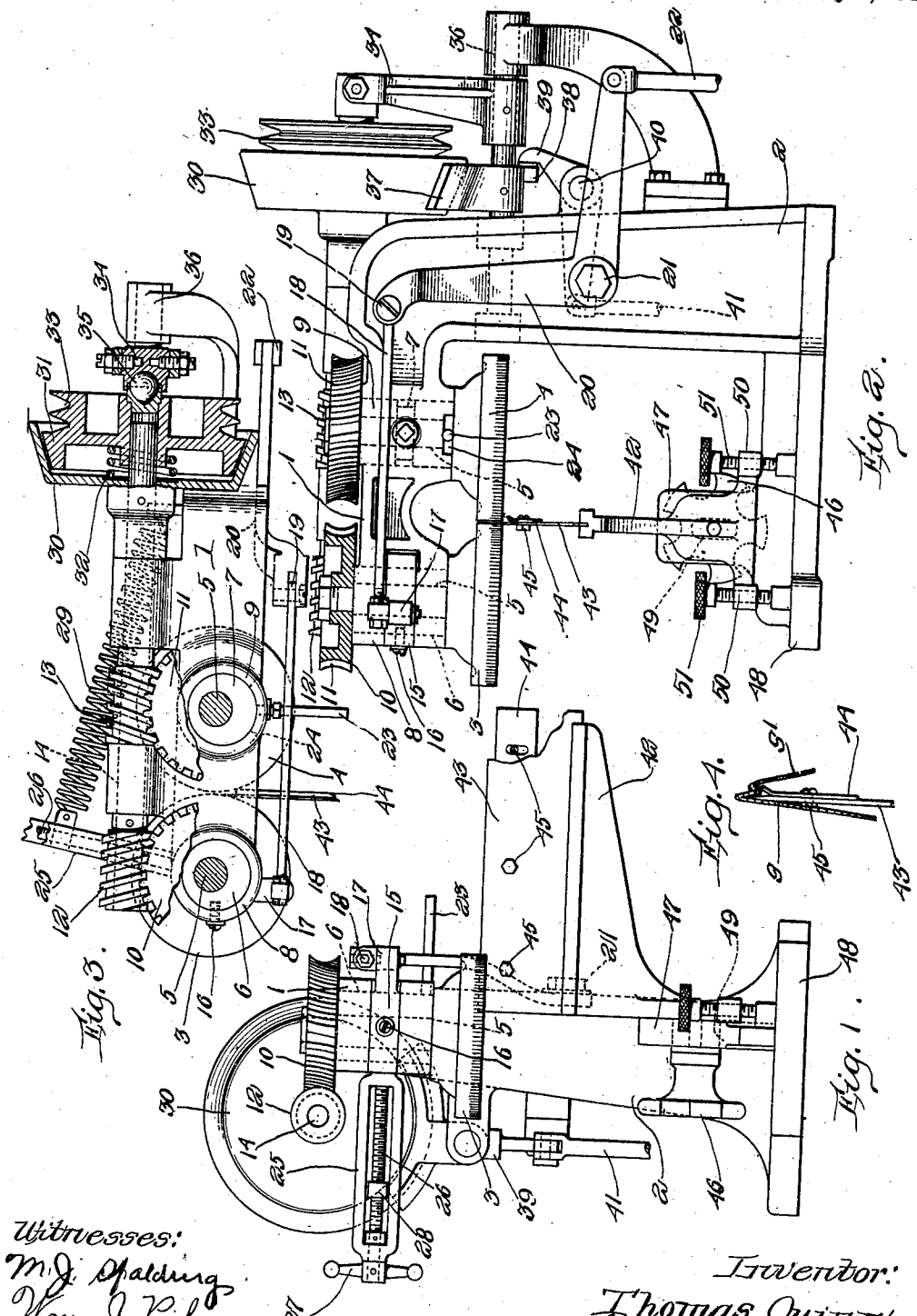

Fig. 3.

Fig. 2.

Fig. 4.

Fig. 1.

Witnesses:
M. J. Spalding
Wm. J. Pike

Inventor:
Thomas Quinn
by Geo. N. Maxwell
Atty.

UNITED STATES PATENT OFFICE.

THOMAS QUINN, OF MILFORD, MASSACHUSETTS, ASSIGNOR TO BOSTON MACHINE WORKS COMPANY, OF LYNN, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

BEADING-MACHINE FOR SHOE MANUFACTURE.

991,368. Specification of Letters Patent. **Patented May 2, 1911.**

Application filed March 1, 1910. Serial No. 546,610.

To all whom it may concern:

Be it known that I, THOMAS QUINN, a citizen of the United States, and resident of Milford, in the county of Worcester and State of Massachusetts, have invented an Improvement in Beading-Machines for Shoe Manufacture, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a machine for creasing the tops of boots and shoes so as to form a neat accurate edge or bead, being an improvement on the machine shown in Patent No. 640,885 of January 9, 1900, whereby better work may be accomplished.

My present invention renders the machine capable of handling either thick or thin stock with equal facility, provides means whereby the machine remains as accurate at the end of a long period of use and repeated truing of the beading wheels as when the machine is new, means enabling the operator to halt the work when partly through the machine, as, for instance, when an error has been made or other defect has been found, or to permit the shoe strap to be fed through more carefully than the rest of the shoe top.

The invention includes various other improvements, among which is means for alining the horn or work support with the beading wheels or rolls, means to give sensitiveness and extreme delicacy to the manually operated beading roll, etc.

In the drawings, Figure 1 represents the machine in right hand end elevation; Fig. 2 shows the same in front elevation, parts being broken away for clearness of illustration; Fig. 3 is a plan view thereof, parts being omitted and others broken away and sectioned; and Fig. 4 is a sectional view of a piece of work in operative position on the horn or work support.

Depending from the lower side of the overhanging arm 1 of the main frame or standard 2 of the machine are usual beading or creasing wheels or rolls 3, 4 in usual position. The shafts 5 of these beading rolls are eccentrically journaled to rotate in cylindrical carriers 6, 7 mounted to turn in vertical bearings 8, 9 provided in the arm 1. Fast on the upper ends of the shafts 5 are worm wheels 10, 11 driven by worms 12, 13 fast on a shaft 14 journaled at the rear side of the arm 1. A ring 15 is secured to the carrier 6 by any suitable means, as a set screw 16, and from said ring a crank arm 17 projects forward actuated by a rod 18 pivoted at 19 to a bell-crank lever 20 pivoted at 21 to the upright 2 of the frame and actuated by a treadle rod or other actuator 22. Thus by depressing said rod, the carrier is rotated so as to move its shaft 5 and the beading roll 3 to the left, the worm wheel 10 simply traveling lengthwise of the worm 12 with a rack and pinion movement. A similar movement is provided for the carrier 7 whereby its shaft and beading wheel may be adjusted whenever desired, a small hand lever 23 projecting from said carrier 7 through a slot 24 in the shell bearing 9 for this purpose, as clearly shown. That portion of the arm 1 which constitutes the bearing 8 is cut away to receive the ring 15 so that said bearing embraces said ring in the form of two ears, one above the ring and the other below the ring, as best shown in Figs. 1 and 2, and projecting rigidly from the rear of the ring to move therewith is an arm 25 in which is swiveled a screw 26 operated by a hand nut or wheel 27, said screw carrying a traveling nut 28 to which is secured a spring 29 whose opposite end is fastened to a convenient stationary portion of the machine. By this means, not only is a relatively long spring permissible, but the effective resistance of said spring may be adjusted or graduated with extreme nicety simply by turning the screw 26 and thereby varying the leverage of the spring or distance of its point of attachment to the lever or arm 25 from the fulcrum or ring 15. Fast on the right hand end of the shaft 14 is one portion 30 of a cone clutch whose other part 31 is normally held out of engagement therewith by a spring 32 and is herein shown as formed integrally with a belt pulley 33 which is constantly running, said pulley and movable clutch member being actuated in opposition to said spring by an arm 34 in axial engagement at 35 with the hub of said pulley and clutch member by means of a ball bearing, part of which is carried by the arm and part by the said hub. The arm 34 is pinned to a reciprocatory rod or shaft 36 which also has pinned

thereto a brake shoe 37 in position to engage the outer conical surface of the member 30 of the clutch and provided with a depending lug 38 engaged by one end 39 of a bell crank pivoted at 40 to the frame 2 and operated by a treadle rod 41, depression of said rod 41 serving to move the rod or shaft 36 to the left in opposition to the spring 32 and thereby release the brake 37 and instantly bring the two clutch members into rotating engagement, starting the shaft 14 and through it the worm and worm wheel driving members of the beading rolls.

Coöperating with the beading rolls is a work support 42 over the upper edge of whose plate 43 the work to be beaded is placed by the operator as shown in Fig. 4, where a shoe top *s* and attached lining *s'* are shown in operative position. The upper edge 43 of the thin plate portion of this work support projects in between the two rolls sufficiently to direct the work therebetween but not sufficiently to be engaged thereby. This is clearly shown in Figs. 1 and 3, where it will be seen that the upper forward end of the plate 43 stops short of alinement with the centers of said rolls. The inner surfaces of the leather at the edge where it is to be creased or beaded are frequently cemented, and the leather is pulled forward by the rolls off from the directing edge of the plate 43, being pinched and creased under heavy pressure by said rolls beyond said plate but not on said plate, the latter being merely for the purpose of forming the fold in the work and directing the work to the creasing rolls. At the right hand side of the plate 43, I provide an edge guide 44 adjustably secured to said plate by bolts 45, the outturned upper edge of this guide receiving the edge of the work as clearly shown in Fig. 4, thereby enabling the operator to position the work more accurately. The work support is adjustably clamped by a hand screw 46 against a rigid bracket 47 extending upwardly from the base 48 of the frame and provided with a slot 49 for vertical and pivotal adjustment of the support. At the lower end of the latter are laterally extending ears 50 each provided with a thumb screw 51 adapted to bear on the base of the machine whereby the work support may be tilted to one side or the other so as to bring the directing edge thereof into accurate alinement with the beading rolls, or, in other words, absolutely tangential to the point where said rolls normally contact with each other.

In use, the operator bends the work *s*, *s'* over the top edge 43 of the work support, with the sewed edge of the work against the guide 44, and then shoves the work ahead, where its forward end is caught by the rapidly rotating beading rolls and quickly moved forward under heavy creasing pressure. If a flaw or error is discovered by the operator, the treadle rod 41 is depressed, and, because of the worm and worm wheel connection between the driving pulley and the beading rolls, the latter stop instantly without any liability of feeding the work the slightest distance farther forward. The operator can then depress the treadle rod 22 so as to relieve the pressure on the work sufficiently to permit the work to be straightened, readjusted or the like, and then the machine can be started again so as to feed the work forward as fast or slow as may be desired. In other words, the work is under the control of the operator at all times, as distinguished from the patented apparatus where the work, if once started, would be whisked through the machine in spite of the operator. Also the long spring 29 and long adjustment thereof on the lever arm 25, taken in connection with the eccentric bearings for the bead roll shafts with their long cylindrical engagement with the vertical bearings 8, 9, afford a smooth, positive and accurate movement of the beading rolls toward and from each other under the action of the treadle rod 22, and the worm and worm wheel driving connection permits this relative movement of the rolls toward and from each other without interfering with the free and uniform rotation of said rolls (as distinguished from the spur gear arrangement of the patented machine, in which anything more than a very slight separation of the rolls would interfere with the proper driving thereof). The driving surfaces of the beading rolls soon get smooth in practice so that they have to be remilled or knurled frequently, thereby reducing their size, and one advantage of the worm and worm wheel connection is that it permits this reduction in size of the beading rolls without interfering in any way with the true running of the machine (not the case in the patented apparatus). If an extra heavy piece of stock is met with, the handle 23 is swung to the left so as to move its roll to the right as required to accommodate this extra thickness of the work. This adjustment is also of service to take up the wear of the rolls, and the eccentric bearing construction of adjustment serves to lock or hold immovably the roll and its shaft in whatever adjustment it is moved by said handle 23. The bracket 47 serves as a positive stop to limit the position of the forward end of the work support with relation to the rolls and also as an alining means for bringing the work-receiving and folding top edge of the plate 43 into true horizontal position when the hand nut 46 is tightened, while the adjustments of the work support permitted by the hand wheel 46 and the thumb screws 51 permit the work support to be raise or lowered to suit any given kinds of work or

special conditions and permit said work support to be swung to one side or the other in accordance with the necessities of the work or the preferences of the operator.

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

1. A leather beading or creasing machine, comprising a pair of positively rotated work feeding and creasing rolls, and manually controlled means for instantly stopping said rolls at any point in the progress of the work therebetween, including a worm and worm wheel driving connection for said rolls having the worm element thereof controllable from said stop means.

2. A leather beading or creasing machine, comprising a pair of positively rotated work feeding and creasing rolls, and manually controlled means for instantly stopping said rolls at any point in the progress of the work therebetween, including a clutch and brake, and a worm and worm wheel connection for each roll having the worm element thereof controllable from said clutch and brake.

3. A leather beading or creasing machine, comprising a pair of rotary work-engaging and creasing rolls, means for bodily and independently adjusting each roll toward and from the other, and means for driving said rolls said means constructed to maintain unaltered driving engagement with the roll in the various positions of adjustment thereof.

4. A leather beading or creasing machine, comprising a pair of rotary work-engaging and creasing rolls, means for bodily and independently adjusting each roll toward and from the other, and a worm and worm wheel drive for said rolls, the worm element thereof being parallel to the plane of adjustment of the rolls.

5. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and means for adjusting and locking in adjustment one of said rolls with relation to said work support and the other roll.

6. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, a manually controlled yielding adjustment for one of said rolls, and a positive, locking adjustment for the other of said rolls, with relation to said work support.

7. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and manually controlled yielding adjusting means for adjusting one of said rolls toward and from said work support and the other roll, including a radially extending lever, and a relatively long spring for applying uniform tension to said lever.

8. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and manually controlled yielding adjusting means for adjusting one of said rolls toward and from said work support and the other roll, including a radially extending lever, and a relatively long spring having one end longitudinally adjustable along said lever.

9. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and manually controlled yielding adjusting means for adjusting one of said rolls toward and from said work support and the other roll, including a radially extending lever, an adjusting screw extending lengthwise of said lever swiveled to turn therein, a nut mounted to travel on said screw, and a relatively long tension spring secured at one end to said nut for applying uniform tension to said lever.

10. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, a cylindrical bearing mounted to turn in the frame of the machine in which the shaft of one of said rolls is eccentrically journaled, and manually controlled means for rotating said cylindrical bearing and thereby adjusting the roll and its shaft carried thereby toward and from the other roll.

11. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, a cylindrical bearing mounted to turn in the frame of the machine in which the shaft of one of said rolls is eccentrically journaled, a worm wheel mounted on said shaft to drive the same, a worm for driving said worm wheel, and means to rotate said bearing for adjusting one roll toward the other.

12. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, a cylindrical bearing mounted to turn in the frame of the machine in which the shaft of one of said rolls is eccentrically journaled, a worm wheel mounted on said shaft to drive the same, a worm for driving said worm wheel, means to rotate said bearing to move the roll carried thereby in a direction away from

the other roll, and a spring-actuated lever for moving said bearing in an opposite direction.

13. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and securing means for securing said work support in position, including a stationary bracket acting as a positive stop for maintaining the work support at an unvarying distance in a horizontal plane from the meeting edges of said rolls.

14. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and adjusting means for swinging the work-folding edge of the work support in the direction of one or the other of said rolls as desired.

15. A leather beading or creasing machine, comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and adjusting means for vertically adjusting said work support, including a fixed bracket and a clamping device for horizontally alining the work-folding edge of said work support.

16. A leather beading or creasing machine comprising a pair of rotary work engaging and creasing rolls, a work support having a top directing edge for directing a fold of the work between said rolls, and a lateral guide vertically adjustable on one side of said work support below said edge.

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

THOMAS QUINN.

Witnesses:
WILLIAM P. DONNELLY,
CLIFFORD A. COOK.