

B. H. HADLEY.
Machinery for Bending the Edges of Boot and Shoe
Soles.
 No. 140,035. Patented June 17, 1873.

Fig. 1.

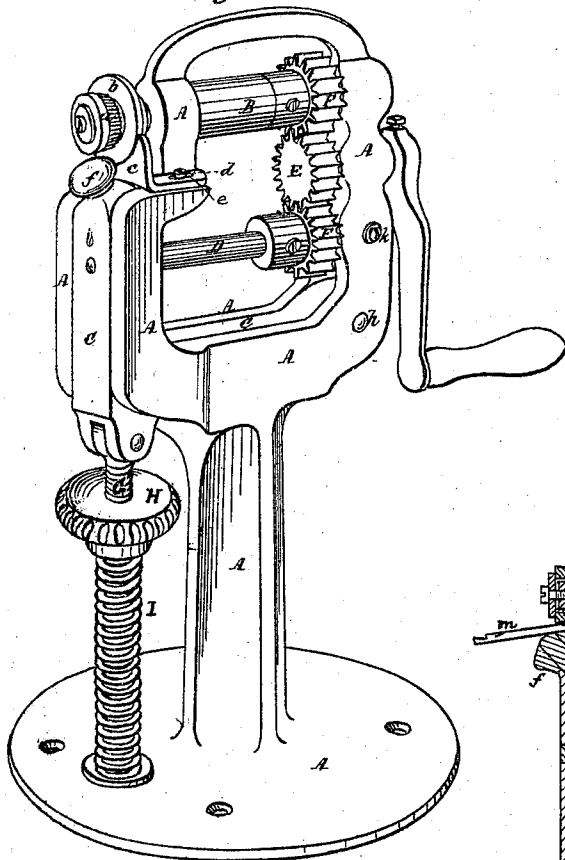
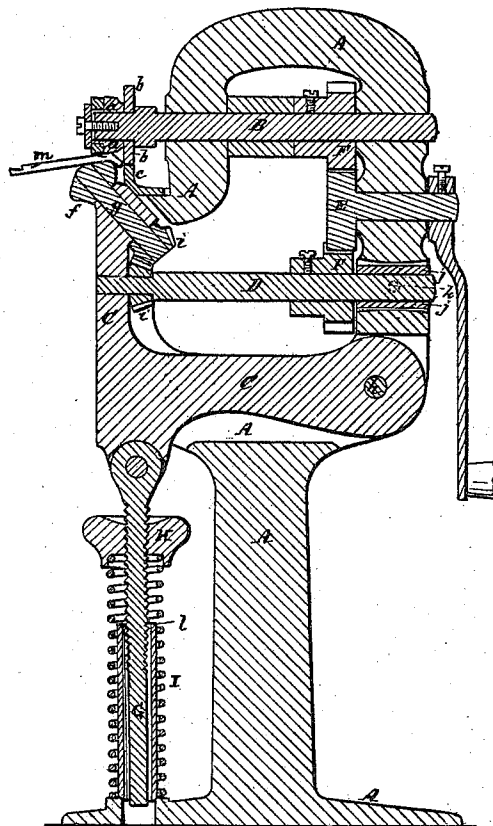


Fig. 2.



Witnesses.
 John Buckley
 W. W. Howard

Inventor.
 Benj. H. Hadley
 by Atty. Hollock

UNITED STATES PATENT OFFICE.

BENJAMIN H. HADLEY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINERY FOR BENDING THE EDGES OF BOOT AND SHOE SOLES.

Specification forming part of Letters Patent No. **140,035**, dated June 17, 1873; application filed June 7, 1873.

To all whom it may concern:

Be it known that I, BENJAMIN H. HADLEY, of Brooklyn, Kings county, New York State, have invented certain new and useful Improvements in Machinery for Molding or Bending the Edges of Boots and Shoes, of which the following is a specification:

This invention consists in an improvement in machinery for bending or molding the edges of shoe-soles for turned shoes preparatory to sewing by machinery. This operation has sometimes been performed by a machine similar to that used by tanners or copper-smiths for bending or forming the edges of sheets of soft metal, consisting of two small rolls, one above the other, driven by geared shafts, said rolls being grooved or formed so as to shut by one another in such a manner that when the edge of a shoe-sole is passed between them under pressure (said soles having been previously properly channeled and dampened) the sole-edge would be formed or shaped by bending, so that the sewing may be more readily performed either with a straight or curved needle-machine. But in a machine such as described, owing to the great variations in the thickness and quality of leather, considerable difficulty is experienced for the want of a proper automatic adjustment of the machine to said variations in the thicknesses of the leather. To overcome this difficulty, instead of arranging the rolls so as to adjust themselves to the varying thicknesses by opening and closing in parallel planes, which merely provides for adjustment in one direction, up and down, without providing for the lateral adjustment between the flanges of the rolls, I arrange one of the rolls so that it may move not only up and down toward and away from the other roll, but also back and forth horizontally, or in an equivalent direction to allow the distance between the two surfaces between which the edge is bent to be automatically increased or decreased, according to the thickness of the stock passing between the same. The roll thus, in reality, is capable of four motions besides its rotary movement, instead of the usual up-and-down movement. To provide for these motions of the roll I prefer to mount it on a pivoted frame capable of vibrating upon a horizontal axis, and held up to the sta-

tionary roll, or the one which revolves in fixed bearings, by a yielding or spring pressure which can be increased or lessened at pleasure, according to the exigencies of the work. This is the arrangement shown in the drawings, to which I shall now refer in order to explain more particularly the nature of my invention, and the manner in which the same is or may be carried into effect.

Figure 1 is a perspective view of the machine. Fig. 2 is a longitudinal vertical central section of the same.

A is the main supporting-frame, which carries the working-parts of the machine, and is designed to be attached at its base to a suitable table or other support. In fixed bearings in the upper part of the frame A is arranged a rotary shaft, B, upon the front end of which is fixed the roll *a*, constituting one of the edge-bending rolls. It is provided with a roughened exterior, as seen in Fig. 1, to assist in feeding along the work, and it also has a vertical flange, *b*, between which and the lower roll the edge of the sole is bent. Embracing the lower half, or thereabout, of the periphery of the flange is an edge-guide, *c*, against which the edge of the sole also presses. This guide is fixed to the frame by set-screws *d* passing into the frame A through slots *e* in the base of the guide. By this arrangement of set-screws and slots the edge-guide is made adjustable, and can be set more or less forward, as desired. The lower edge-bending roll is shown at *f*. It is arranged immediately beneath the upper roll, and is fixed to a shaft, *g*, preferably placed, as represented in Fig. 2, at an angle of about forty-five degrees to the horizontal. This shaft revolves in bearings in an auxiliary frame, C, capable of vibrating in the arc of a circle upon a horizontal axis. The axis of the frame I prefer to place below and in rear of the roll *f*, as seen at *h*, (which is the pivot or bearing pin of this frame,) whereby I am readily enabled to obtain the necessary movements above specified for the lower roll *f*. Movement is imparted to the shaft *g* by means of beveled gears *i i*, one on the lower end of said shaft and the other on a horizontal rotary shaft, D, the front end of which has its bearing in the auxiliary vibratory frame C. The rear end of shaft D is supported, and is

capable of sliding as well as rotating, in a rocking bearing or sleeve, *j*, or its equivalent, located in the main frame A, and rocking upon pivots *k* therein. The main frame A, at the part where it receives the auxiliary vibratory frame, is forked or recessed to receive said frame, in the manner plainly indicated in the drawings, so as to afford all necessary lateral support to the auxiliary frame without interfering with its vibratory motion in a vertical plane. When the vibratory frame moves downward on its axis the shaft D will necessarily be tilted in a like direction. This movement of the shaft is permitted by the rocking bearing *j*, which adapts itself at once to the new position, and at the same time permits the part of the shaft in it to slide outward as far as required. Each of the shafts B D is provided with a gear, F, meshing into an intermediate gear, E, mounted in the frame A and revolved by a crank or other suitable power. The gear-teeth are of such length and proportions as to allow the shaft D to tilt as far as necessary without throwing it out of gear or preventing the proper working of the driving mechanism. The top of the lower roll *f* is preferably beveled off from the center, as shown in Fig. 2, in order to enable it to take a more extended hold upon the sole above it; and the edge of this roll, over which the edge of the sole is bent, is by preference rounded. The auxiliary vibratory frame C is held up by spring power. I provide for this in the present instance by jointing a screw-rod, G, between ears on the lower part of frame C, which rod is provided with a nut, H, between which and the base of frame A there is a compressed spring, I, which, by its expansion, tends to keep the frame C up in its normal position. The lower end of the rod is loose and must have a certain play, and in order to better provide for this, and at the same time to support both rod and spring, I surround the rod for a portion of its length with a sleeve, *l*, interposed between the rod and the spring. The lower end of the sleeve is beveled or rounded, and it rests in a correspondingly-shaped socket in the base A, so that it can tilt out or in as required. The nut H serves to regulate the pressure of the spring, inasmuch as by screwing it up or down the compression of the spring can be increased or decreased as desired. A treadle should be attached to the frame C in order to draw down the frame whenever a sole is to be inserted or withdrawn from between the bending-rolls.

In using the machine the channeled sole, previously properly dampened and prepared, is inserted between the rolls, as indicated in Fig. 2, in which the sole is represented at *m*. The edge of the sole is bent over the edge of the lower roll, passing between this roll on the one side and the flange *b* and edge-guide *c* on

the other side. The rotation of the bending-rolls carries the sole forward; and, under the guidance of the workman, the sole is fed along until the whole of the edge has been properly bent and formed. Pressure is then removed and the sole withdrawn from between the rolls.

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

1. A machine for bending or molding the edges of boot and shoe soles preparatory to the welt or upper being sewed onto them, consisting essentially of the following elements combined: First, a feed-roll, flanged or otherwise formed so as to present two faces at an angle with each other, against which the sole is bent, substantially as shown and set forth; and, secondly, a bending-roll, shaped, located, and actuated so as to press with equal but yielding pressure against both faces or angles of the feed-rolls, substantially as set forth.

2. The combination of the flanged feed-roll revolving in fixed or stationary bearings, with the bending-roll having its bearings in a frame or support pressed toward said flanged roll with spring pressure and capable of an up and down vibratory movement upon a pivot or axis, to allow the said roll to move toward or away from both the body and the flange of the other roll, in order to automatically adjust itself to varying thicknesses of leather, substantially as shown and described.

3. The combination, with the vibratory auxiliary frame, and the bending-roll carried by the same, of the inclined roll-shaft, having its bearings in said frame, and the horizontal driving-shaft for said roll-shaft supported at one end by the said vibratory frame, and at the other end in a rocking bearing in the main frame in which it can slide, as and for the purposes shown and set forth.

4. The combination, with the flanged feed-roll and bending-roll, of the adjustable edge-guide arranged to operate in connection with said rolls, substantially as shown and set forth.

5. The combination, with the vibratory auxiliary frame, of the linked screw-rod, adjusting nut and spring held between said nut and the base of the frame, substantially as herein shown and set forth.

6. In combination with the vibratory auxiliary frame and linked screw-rod, the adjusting nut, spring, and sleeve intermediate between said spring and screw, substantially as shown and described.

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

BENJAMIN H. HADLEY.

Witnesses:

CHAS. GOODYEAR, Jr.,
C. W. BUCKMAN.

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