(No Model.)

D. S. SMITH & A. EPPLER, Jr.

SOLE LEVELING OR MOLDING MACHINE.

No. 285,314. Patented Sept. 18, 1883.

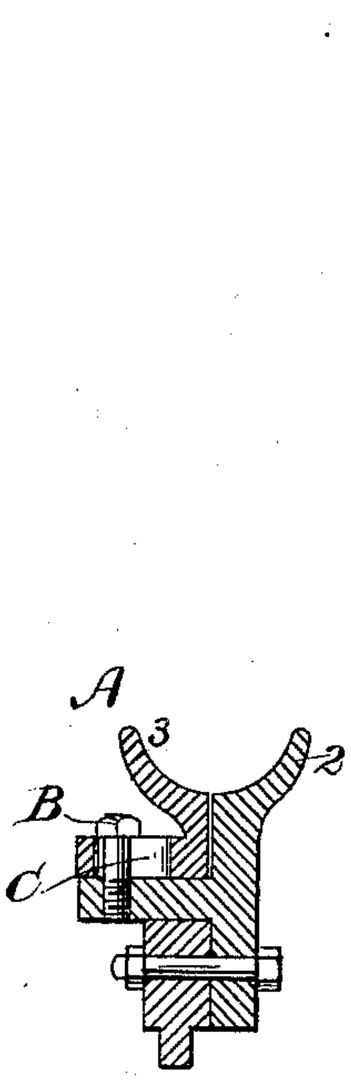

Fig. 4.

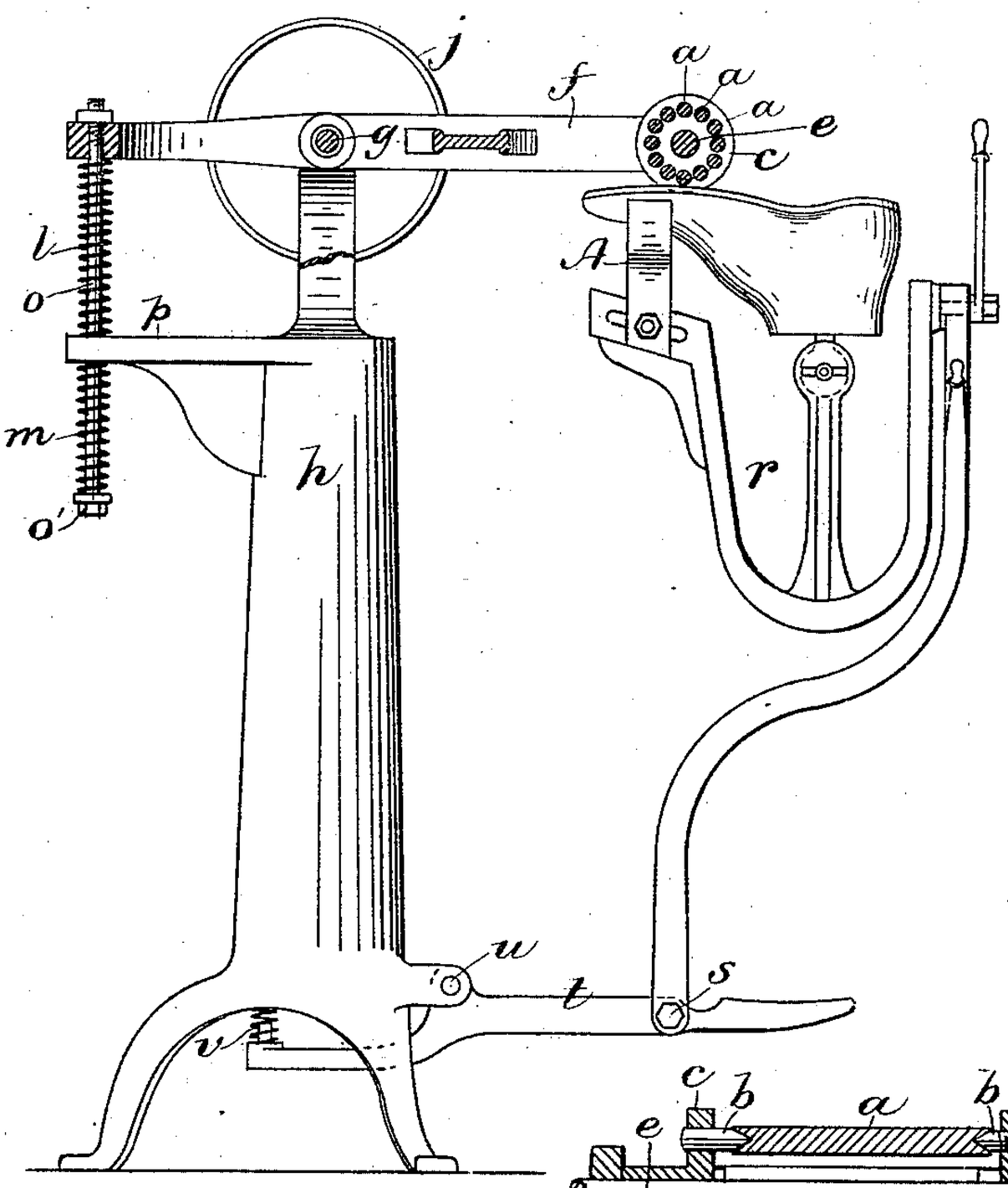

Fig. 1.

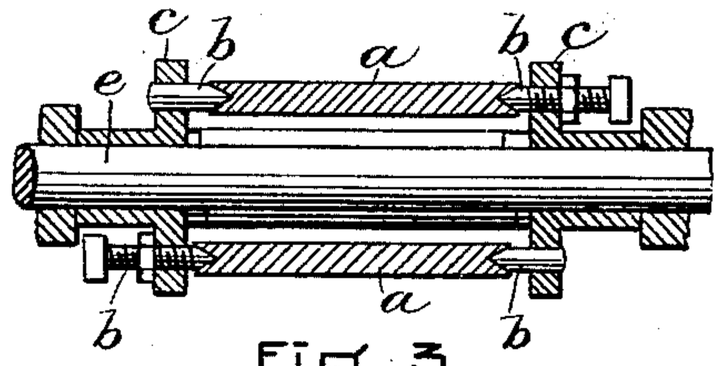

Fig. 3.

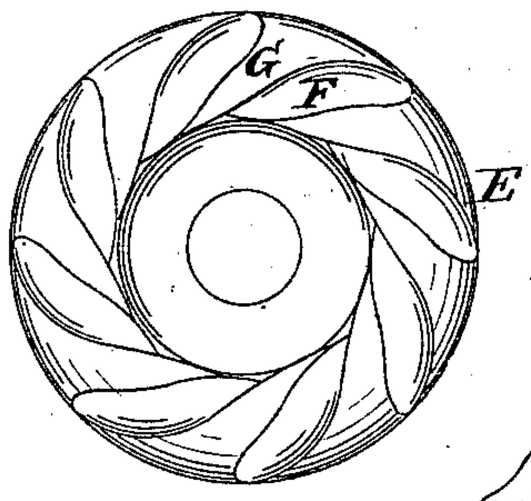

Fig. 5.

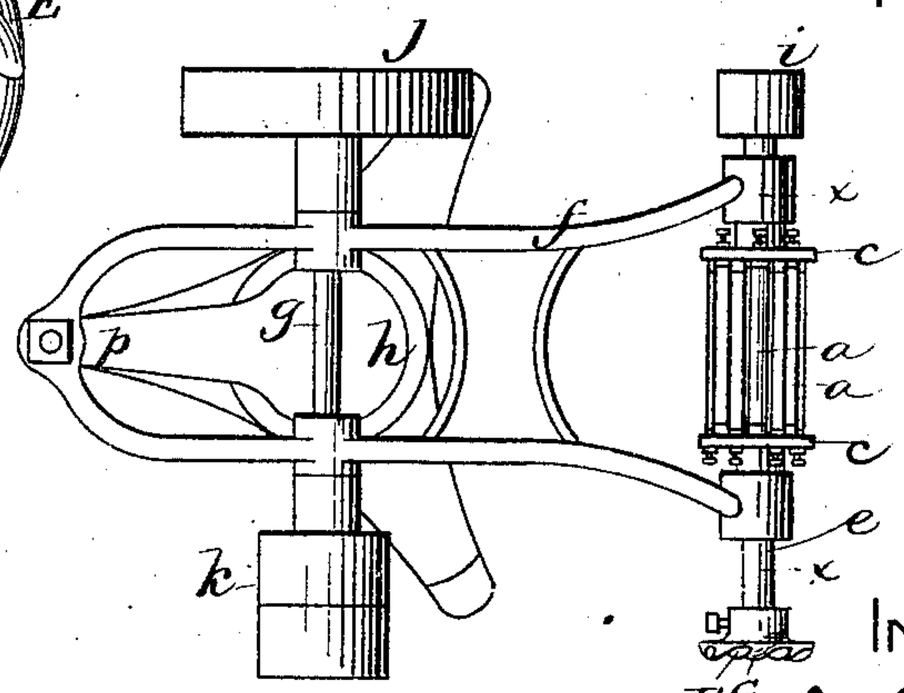

Fig. 2.

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UNITED STATES PATENT OFFICE.

DANIEL S. SMITH, OF ROCKLAND, AND ANDREW EPPLER, JR., OF BOSTON, MASSACHUSETTS; SAID SMITH ASSIGNOR TO SAID EPPLER.

SOLE LEVELING OR MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 285,314, dated September 18, 1883.

Application filed May 29, 1883. (No model.)

To all whom it may concern:

Be it known that we, DANIEL S. SMITH, of Rockland, county of Plymouth, and ANDREW EPPLER, Jr., of Boston, in the county of Suffolk, both in the State of Massachusetts, have invented certain Improvements in Sole Leveling or Molding Machines, of which the following is a specification.

This invention has for its object to provide an improved machine for leveling or molding boot or shoe soles, or, in other words, causing them to conform to the contour of the bottom of the last on which the boot or shoe is made, and giving them smooth and even surfaces.

The invention consists in the improved leveling-tool and the means employed for supporting the same, hereinafter described, and also in the combination of a jack with said tool, an improved channel-closing tool, and an improved toe-rest for the jack, all of which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation and partial section of a machine embodying our invention. Fig. 2 represents a top view of the same. Fig. 3 represents a section on line *x x*, Fig. 2. Fig. 4 represents a transverse section of the toe-rest of the jack. Fig. 5 represents a front view of the channel-closing tool.

The same letters of reference indicate the same parts in all the figures.

In carrying out our invention we provide a rotary sole-leveling tool composed of a series of substantially parallel metal rollers, *a*, arranged in a circular series, as shown in Fig. 1, and mounted on suitable bearings, *b*, supported by flanges *c*, which are rigidly attached to an arbor, *e*. Each roller is adapted to rotate independently on its bearings, being entirely free from contact with anything to impede its free rotation. The arbor *e* is journaled in bearings on a frame, *f*, which is pivoted on a transverse arbor, *g*, the latter being journaled in fixed bearings on a supporting frame or standard, *h*. The arbors *g* and *e* are provided, respectively, with pulleys *j* and *i*, which are connected by a belt, so that the arbor *e* and its tool are rotated by the arbor *g*, which is driven by a driving-belt applied to a pulley, *k*, on its opposite end. The pivotal connection of the frame *f* to the supporting-frame *h* enables the leveling-tool to rise and fall, and thus conform to the inequalities or undulations of the bottom of a sole. We prefer to counterbalance the frame *f* by means of springs *l m*, applied to a rod, *o*, depending from the rear end of said frame and passing freely through an orifice in a fixed arm, *p*, attached to the supporting-frame *h*. The spring *l* is interposed between the frame *f* and the upper side of said arm, and the spring *m* between the under side of said arm and a nut, *o'*, on the rod *o*. The effect of said springs is to support the frame *f* in a normal position and permit its end supporting the leveling-tool to rise and fall from said position.

In the operation of the machine the lasted boot or shoe is presented to the rotating leveling-tool in the position shown in Fig. 1, the boot or shoe being held either by the hands of the operator or on a jack, preferably the former, although by way of illustration we have shown a jack in the drawings. The boot or shoe is pressed upwardly against the leveling-tool, and the rotation of the latter causes its rollers to strike the sole in rapid succession, each roller striking the sole, and then rolling over a portion of its surface. The poise and yielding movement of the frame *f* prevent said blows from being so violent as to batter or indent the sole, the frame *f* rising or yielding to the pressure exerted by each roller *a* on the sole. The rolling-pressure of the rollers *a* on the sole causes the sole to be compacted and hardened, and enables the tool to operate with the minimum of friction. The degree of pressure applied to the sole is regulated by the upward pressure exerted on the boot or shoe. Such pressure raises the tool and tilts the frame *f*, so as to increase the resistance of the spring *l*.

We do not limit ourselves to the employment of the spring *m*, the function of which is to raise the leveling-tool when the outer end of the frame *f* is depressed below its normal position. If preferred, the frame *f* may rest, when in its lowest position, against a rigid bearing.

The rolls *a* may be concave longitudinally, if desired, to adapt them to the lateral convexity of the bottom of the sole. One of the bearings *b b* of each roll *a* is an adjustable screw-bolt, as shown in Fig. 3. The adjustable bearings enable the wear of the rolls to be taken up from time to time.

When a jack, *r*, is employed, it should be adapted to rise and fall to vary the pressure of the sole against the leveling-tool. In the present instance the standard of the jack is pivoted at *s* to a treadle, *t*, which is pivoted at *u* to the standard *h*. A spring, *v*, applied to the lever *t*, presses the jack upwardly, and the operator can depress the jack by pressing downwardly on the outer end of said lever. The jack is of such construction that the boot or shoe supported thereby can oscillate longitudinally and laterally. A represents a toe-rest secured to the jack. Said rest is composed of a part, 2, affixed to the jack, and a part, 3, adjustable thereon, so as to adapt the rest to different widths of boots and shoes. (See Fig. 4.) The adjustable part is positively held in any position to which it may be adjusted by a screw, B, passing through a slot, C, in said adjustable part.

E represents a disk secured to one end of the arbor *e*, that supports the leveling-tool. The outer side of this disk is provided with a central depression and an annular portion surrounding said depression, and provided with radial or diagonal furrows F, between which are protuberances G. These furrows and protuberances form an acting face which is adapted to effectually press down the flap of the channel in the face of the sole, and thus close said channel. When a sole is held against said acting face with the line of the flap substantially at right angles with the portion of the face against which it is pressed, the diagonal protuberances G, moving across the flap, press the latter down more effectually than a series of rubbers arranged in a circular series, as shown in Letters Patent Nos. 109,077 or 248,839, which describe devices for effecting a similar result. Our improved device, it will be observed, is much more simple than those shown in said patents. The central depression prevents the operator from accidentally pressing the flap against a part of the annular face which moves in such direction as to open or raise the flap instead of closing it.

We claim—

1. In a sole-leveling machine, a rotary leveling-tool composed of a series of rolls journaled independently in bearings attached to a common shaft or arbor, combined with a pivoted frame supporting said arbor, whereby the leveling-tool is adapted to bear with a yielding pressure on the surface of a sole, as set forth.

2. In a sole-leveling machine, a rotary leveling-tool composed of a series of rolls journaled independently in bearings attached to a common shaft or arbor, combined with a pivoted frame supporting said arbor, and springs arranged to hold said frame in a normal position and permit the tool to move in opposite directions from said position, as set forth.

3. The improved sole-leveling tool composed of a rotary shaft, collars or flanges rigidly attached to said shaft, and independent rollers journaled on adjustable bearings attached to said collars, as set forth.

4. In a sole-leveling machine, the channel-closing tool composed of a disk having on one side a central depression and an annular portion surrounding said depression, and provided with diagonal furrows and protuberances, arranged substantially as shown.

5. The combination, with a jack, of a concave toe-rest composed of two parts, 2 3, one of which is adjustable relatively to the other, to adapt the rest to boots or shoes of different widths, as set forth.

6. In a sole-leveling machine, the combination of the rotary leveling-tool and its pivoted yielding frame with a jack, as set forth.

7. In a sole-leveling machine, the combination of the rotary leveling-tool, its pivoted yielding frame, and a jack having a vertical movement, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 21st day of May, 1883.

DANIEL S. SMITH.
ANDREW EPPLER, JR.

Witnesses:
C. F. BROWN,
A. L. WHITE.