2 Sheets—Sheet 1

J. H. BUSELL.

HEEL AND SOLE TRIMMING-MACHINE.

No. 188,337. Patented March 13, 1877.

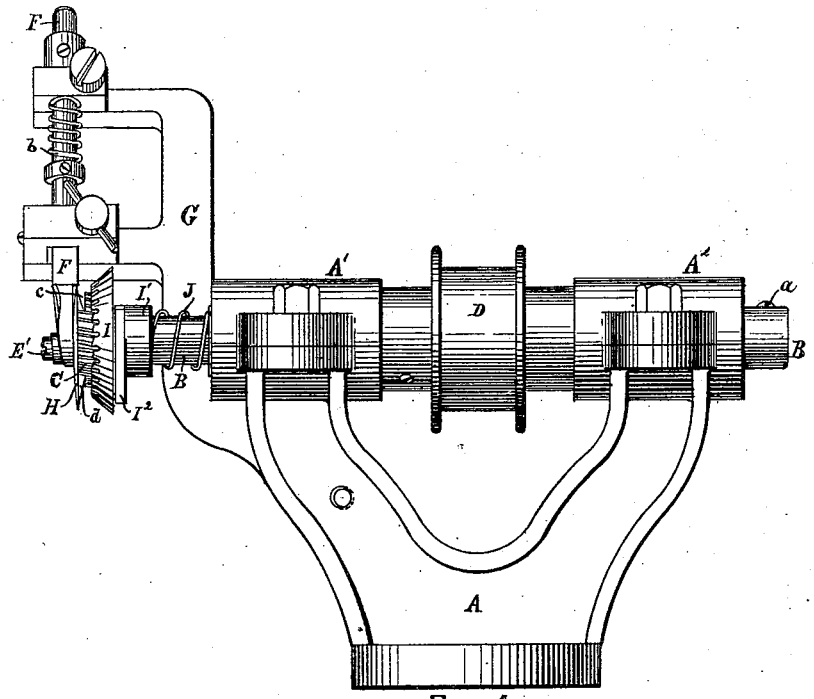

FIG. 1.

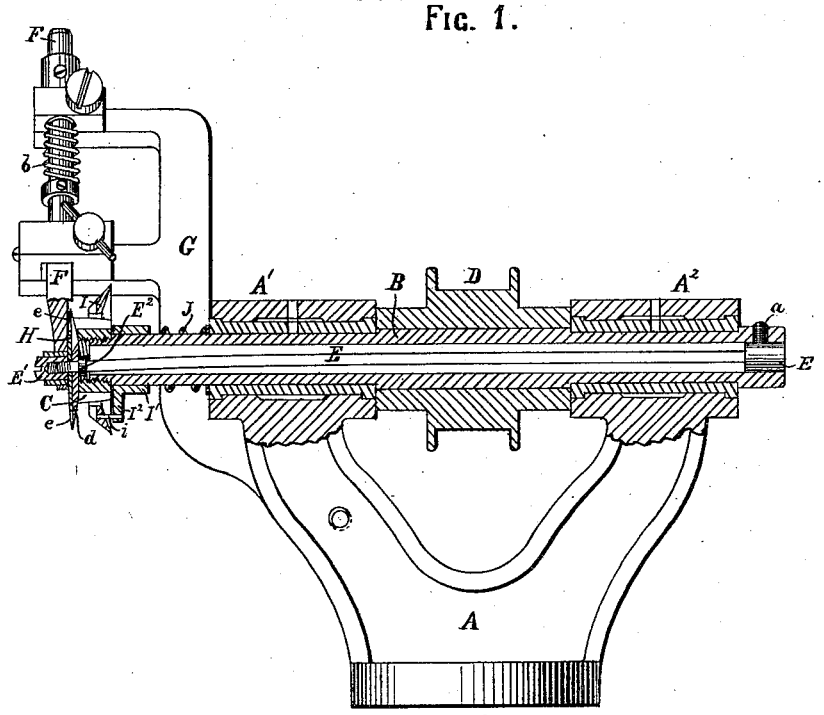

FIG. 2.

WITNESSES.

N. G. Lambard.
E. A. Hemmenway.

INVENTOR.

James H. Busell

2 Sheets—Sheet 2.

J. H. BUSELL.

HEEL AND SOLE TRIMMING-MACHINE.

No. 188,337. Patented March 13, 1877.

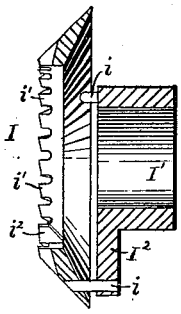

FIG. 5.

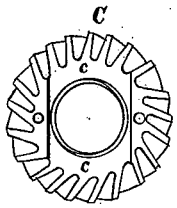

FIG. 6.

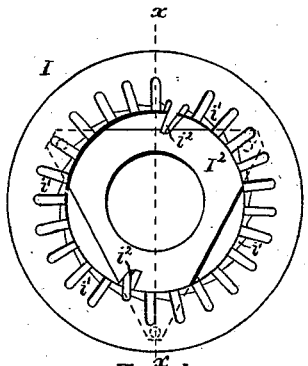

FIG. 4.

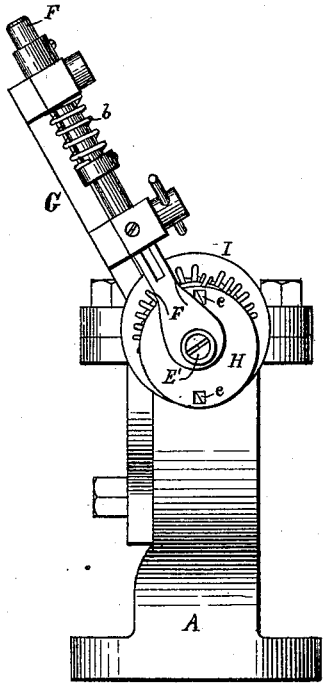

FIG. 3.

WITNESSES.

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E. A. Hemmenway

INVENTOR.

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UNITED STATES PATENT OFFICE.

JAMES H. BUSELL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN HEEL AND SOLE TRIMMING MACHINES.

Specification forming part of Letters Patent No. **188,337**, dated March 13, 1877; application filed February 2, 1877.

To all whom it may concern:

Be it known that I, JAMES H. BUSELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heel and Sole Trimming Machines, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of heel and sole trimming machines in which a rotary cutter is used for reducing the edge of the heel or sole, and is an improvement upon the invention patented to me September 21, 1875, and numbered 167,874.

The first part of my invention relates especially to the construction and arrangement of the rand-guide; and it consists in the use of a circular disk of thin metal, to serve as a rand-guide, in combination with a rotary cutter for reducing the edge of the heel or sole, and a rand-knife arranged to revolve in unison with the edge-trimming cutter, and to be moved transversely of said cutter, or in a direction at right angles to the axis of revolution, so that its path may be either concentric or eccentric to the path of revolution of the edge-trimming cutter when said circular rand-guide is mounted upon and firmly secured to the same spindle with the rand-cutter, and revolves and is moved transversely of its axis of revolution in unison with said rand-cutter, as will be more fully described hereafter.

The second part of my invention relates to a device for removing the feather-edge on the bottom of the sole or heel, and is applicable to other machines for trimming heels or soles in which a rotary cutter is used for reducing the edge of the sole; and it consists in the use of a ring-cutter surrounding a portion of the edge-trimming cutter, and adapted to revolve therewith, but free to be moved in the direction of the length of the axis about which it revolves, said ring-cutter being pressed against the bottom of the sole by a light spring, as will be described.

Figure 1 of the drawings is a side elevation of a machine illustrating my improvements. Fig. 2 is a central vertical longitudinal section. Fig. 3 is a front-end elevation. Fig. 4 is a front-end elevation of the annular cutter for trimming the feather-edge from the bottom of the sole. Fig. 5 is a section on line *x x* on Fig. 4, and Fig. 6 is an end view of edge-trimming cutter.

A is the head of the supporting-frame, designed to be bolted to the top of a column of suitable height to bring the cutters into convenient position for operation, and provided with the two boxes A^1 A^2, in which is mounted the hollow shaft B, having secured to its front end the cutting-tool C, and provided with the pulley D, by means of which and a belt (not shown in the drawings) rotary motion may be imparted to the cutter C. E is a small steel spindle, the rear end of which is enlarged, so as to fill the chamber in the shaft B, to which it is secured by the set-screw *a*, so as to revolve therewith. The spindle E projects through the front end of the shaft B, and has a bearing in the lower end of the inclined rod F, which, in its turn, is mounted in bearings on the stand G, and is forced downward by the spring *b* with sufficient force to throw the front end of the spindle E into a position eccentric to the axis of the shaft B, all substantially as described in my patent before cited. The cutter C is provided with a series of spiral chisel-shaped teeth, and has formed in its front end the recess or groove *c*, extending across the whole diameter thereof, in which plays the rand-knife *d*, secured firmly to the spindle E, as described in my former patent heretofore cited.

H is a circular disk of steel, made slightly convex upon its outer face, and turned out upon its back face, so as to form a shallow recess, within which the rand-knife *d* revolves, its point being prevented from cutting the upper by the slight annular projecting rim around the edge of the disk, the edge of which is rounded over smoothly to prevent the rand-guide from cutting the upper. This disk, with the rand-knife *d*, is secured to the spindle E by means of the nut E^1 and collar E^2, between which they are clamped, as shown in Fig. 2. The disk H has two rectangular openings, *e e*, cut through it directly opposite the two cutting-edges of the rand cutter *d*, for the delivery of the chips or shavings cut thereby.

In my patent of September 21, 1875, the rand-guide formed a part of the bar or rod F, and had no movement except a yielding move-

ment in the direction of the length of the bar F, said movement being in a right line, and as the rand-cutter *d* necessarily moved in the arc of a circle every time that the position of the spindle E changed relative to the axis of shaft B, for the reason that said lateral movement of the rand-cutter was obtained by the spring of the spindle E, it followed that when the rand-guide and rand-knife were in their extreme lower position the lower end of the rand-knife would be drawn away from the guide, and there was danger of its cutting the upper while the upper end of the knife would be grinding hard against the rand-guide. This difficulty I have obviated by the use of the revolving rand-guide, secured to and revolving with the rand-cutter about a movable axis.

To cut away what is known as the feather-edge on the bottom of the sole I use the ring-knife I, so formed as to surround the edge-trimming cutter C, and adapted to revolve therewith, while it is free to be moved endwise on the shaft B, upon which it is loosely fitted by means of the hub I^1 and triangular plate I^2, to which the ring I is attached by the studs *i*. The ring I has its outer surface made conical or inclined toward the front end of the machine, and has formed in its front end a series of teeth or cutters, i^1, as shown in Figs. 4 and 5. J is a spring surrounding the shaft B between the hub I^1 of the ring-cutter and the end of the box A′, and serving to force the ring-cutter along the shaft toward the rand-guide to the position shown in Figs. 1 and 2. The ring-cutter I is provided with two teeth, i^2, projecting inward from the inner periphery of the ring, as shown in Fig. 4, each of which teeth fits between two teeth of the cutter C, thereby compelling the ring-cutter to revolve with the shaft B and the cutter C, while, at the same time, by a slight pressure of the boot or shoe sole against its inclined face, it may be crowded away from the rand-guide and rand-cutter a distance equal to the thickness of the sole being trimmed, the spring J being sufficiently stiff to hold the cutter I up to the sole with just force enough to trim off the feather-edge.

If it is desirable to bevel the outer edge of the tread-surface of the sole, the cutter I is perfectly adapted to produce the desired result by simply giving to its cutting-face the proper shape.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a heel or sole trimming machine, the combination of a rotary edge-trimming cutter adapted to revolve about a fixed axis, and a rand-knife and a rand-guide, both mounted upon and adapted to revolve about a movable axis, substantially as described.

2. In combination with a rotary edge-trimming cutter, the ring-cutter I mounted upon and adapted to revolve with the shaft B, and to be moved endwise on said shaft to adapt it to the varying thicknesses of the sole, substantially as described.

3. The ring-cutter I, provided with one or more teeth, i^2, in combination with an edge-trimming cutter, provided with one or more grooves between its cutting-teeth to receive said teeth i^2, substantially as and for the purposes described.

4. The combination of the cutter C, shaft B, ring-cutter I, and spring J, constructed, arranged, and adapted to operate substantially as and for the purposes described.

5. The combination of a rotary edge-trimming cutter, a rand-knife, and a rand-guide, both mounted upon and adapted to revolve about a movable axis, and the ring-cutter I, all arranged and adapted to operate substantially as and for the purposes described.

Executed at Boston, Massachusetts, this 30th day of January, 1877.

JAMES H. BUSELL.

Witnesses:

N. C. LOMBARD,

E. A. HEMMENWAY.