2 Sheets—Sheet 1.

A. BOLLING.

MACHINERY FOR TRIMMING THE SOLE EDGES OF BOOTS AND SHOES.

No. 192,616. Patented July 3, 1877.

Fig 1.

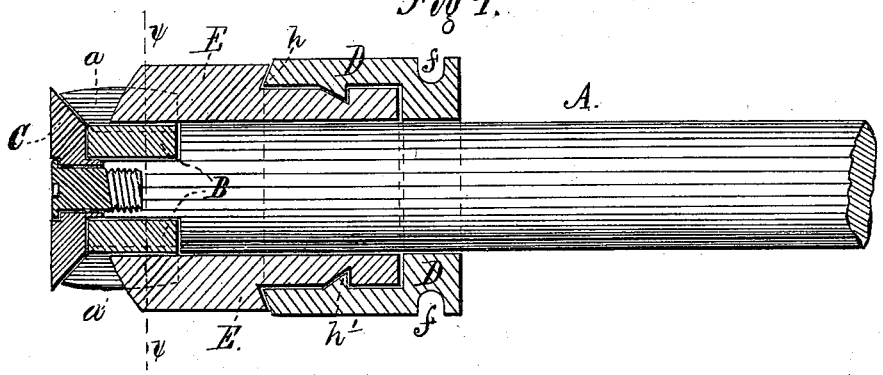


Fig 2.

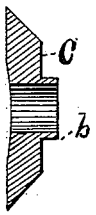


Fig 3.

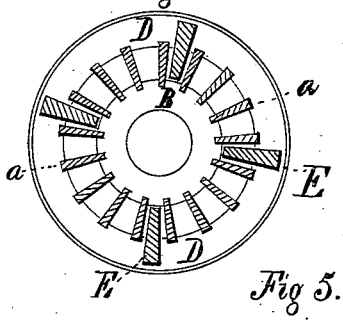
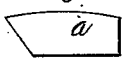


Fig 4.

Fig 5.



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2 Sheets—Sheet 2.

A. BOLLING.

MACHINERY FOR TRIMMING THE SOLE EDGES OF BOOTS AND SHOES.

No. 192,616. Patented July 3, 1877.

Fig 6.

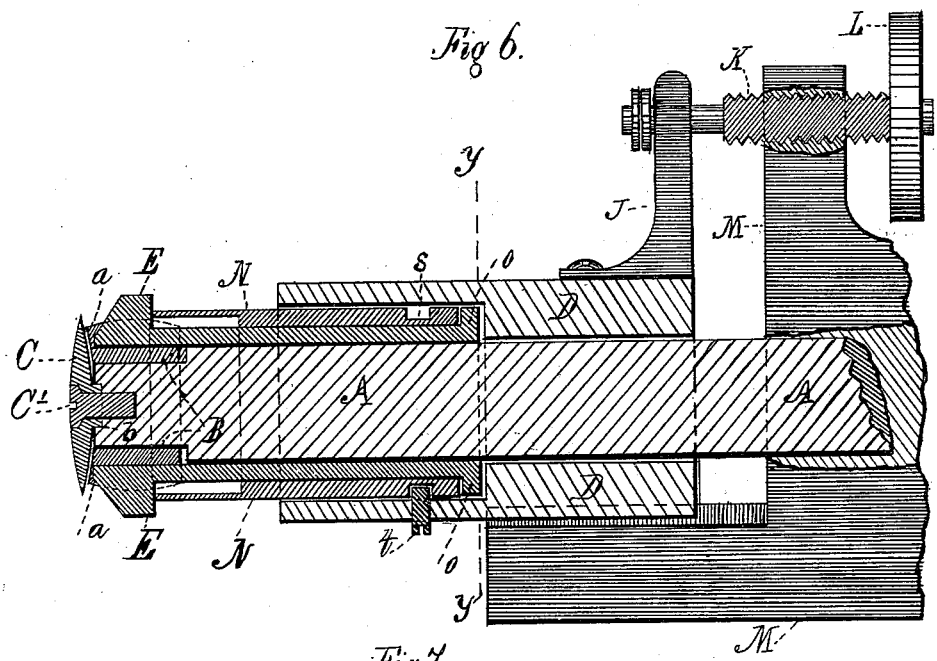


Fig 7.

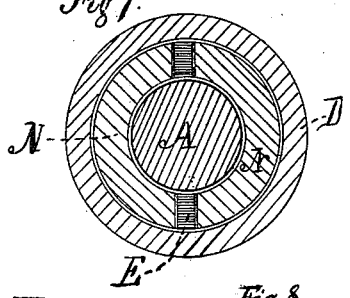
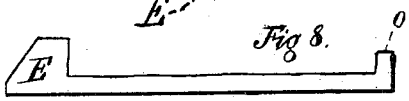


Fig 8.



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UNITED STATES PATENT OFFICE.

AUGUSTUS BOLLING, OF BROCKTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO N. D. MORGAN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINERY FOR TRIMMING THE SOLE-EDGES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. 192,616, dated July 3, 1877; application filed August 29, 1876.

To all whom it may concern:

Be it known that I, AUGUSTUS BOLLING, of Brockton, Plymouth county, State of Massachusetts, have invented certain new and useful Improvements in Machines for Trimming the Sole-Edges of Boots and Shoes, of which improvement the following is a specification:

This invention relates to that class of machines adapted to the finishing of the edges of the soles of boots and shoes; and, in the present instance, it consists in the combination of a cutting-tool or cutter-head, consisting of a series of cutters projecting from the periphery of a central hub or sleeve, also having a guide-disk attached to its face, and projecting above the cutting-edge of said cutters, and a series of adjustable reciprocating cutting-blades, all combined, arranged, and operating as will hereinafter be fully pointed out and described.

In the drawings, which form an essential part of this specification, Figure 1 is a longitudinal sectional view of an apparatus in which is fully embodied my invention. Fig 2 is a detached view of the guide-disk. Fig. 3 is a cross-section taken on line *x x* in Fig. 1, showing the arrangement of the two sets of cutters. Fig. 4 is a detached plan view of one of the reciprocating cutters. Fig. 5 is a detached plan view of one of the small cutters. Fig. 6 is a longitudinal sectional elevation, similar to Fig. 1, with an adjustable gage attached. Fig. 7 is a cross-section taken on line *y y* in Fig. 6; and Fig. 8 is a detached view of the reciprocating cutter shown in Fig. 5.

Similar letters of reference found in the various figures of the drawings will locate and point out corresponding parts.

The object of my invention is to furnish a sole-edge-trimming machine that shall not only do perfect work, but be so constructed that the cutting-blades attached to the cutter-head may be readily removed and replaced, when dull; also, in the peculiar construction of the guide-disk on the face of the cutter-head so applied as to retain the cutters in place; also, in the provision, in combination with such cutters and guide-disk, of a series of reciprocating adjustable knives, arranged to trim off any "feather-lift" by the cutters on the cutter-head.

A represents the shaft of a machine for trimming sole-edges. This shaft may be mounted in suitable bearings in such form of frame as may be found most convenient for the purpose, and driven by power imparted thereto in the usual manner.

B is a hub or sleeve, which slips over the outer end of the shaft A, this portion of the shaft being reduced in size, forming a shoulder against which the rear of the hub is seated when in place. This hub or sleeve B has milled longitudinally on its periphery dove-tailed or other suitably-shaped recesses, into which are inserted a series of cutting-blades, *a*, of the shape shown best in Fig. 5, their tops being concave, and their face retiring at an angle, as shown, while their cutting surface or edges may be of the form usually adopted for such purposes; but the cutter-head B and its cutters *a* may be formed from one piece of metal, if preferred, the forward ends of the cutters *a*, in both cases, being beveled at an angle conforming to the rear face of the guide-disk C, so that the two, when attached to the shaft A, will closely fit.

C is a guide-disk, which, on the face, may be slightly recessed, its rear face being shaped to conform to the angle of the cutters *a*, and also at the center provided with a projecting shoulder, *b*, which fits into the center of the hub B, thus insuring its taking a proper position with respect to both the shaft and cutters. C′ is a set-screw, which is inserted through the guide-disk C, hub B, and enters a cavity in the end of shaft A, said cavity being provided with a suitable screw-thread to correspond with that of the screw C′, the head of the screw entering a recess in the face of the guide-disk, and when tightly screwed into place rigidly secures the cutter-head and guide-disk to the shaft A.

E designates a series of four or more adjustable reciprocating cutting-blades. They are formed as shown in Figs. 4 and 8, their cutting-edges being so shaped as to give a drawing cut when in operation. They are set into place in the recesses between the cutting-

blades *a*, that portion of their base between the cutting-blades *a* resting upon the periphery of the hub B, and that to the rear upon the periphery of the shaft A. Their tops toward the rear, for about one-half their length, are reduced in size, as shown, and provided with two recesses, *d d'*, as shown in Figs. 1 and 4.

Instead of forming them with the recesses *d* and *d'*, the cutters E may, at their rear ends, be formed with a projection or spur, *o*, as shown in Figs. 6 and 8.

D is a sleeve or collar, which encircles the shaft A, the rear portion of its bore fitting the shaft, and upon which it is reciprocated by means of an adjustable gage, of which it also forms a part, having a screw shank or shaft, K, and operating-wheel L, which may be suitably attached to the frame M of the machine, as is usual in such cases.

The form of gage I prefer to use is that shown in patent issued to R. F. Burns, of May 9, 1876, reissue No. 7,101; also shown in Burn's Patent No. 158,569, of January 12, 1875.

It is obvious that the application of the gage-sleeve D, arm J, screw-shank K, and operating-wheel M, as shown in Fig. 6, will produce the same adjustable reciprocating action as shown and set forth in the two patents alluded to, and, in some cases, as shown in Fig. 1, and a projecting forked arm of such a gage may be entered into a recess, *f*, formed on the periphery of the sleeve D, so that any reciprocating movement of the gage is at once communicated to the sleeve or gage D.

Any of the other well-known forms of adjustable gages may be used and connected to the sleeve D; or it in itself alone may and does form such a gage.

An inner sleeve, N, is inserted within the bore of gage-sleeve D, (the bore in the sleeve D being enlarged a portion of its length to receive sleeve N,) and through which the shaft A is passed. (See Fig. 7.) Near its rear end, on its periphery, it is provided with an annular recess, *s*, into which enters and plays a pin, *t*, which is inserted through the gage-sleeve D in such a manner as to be readily removed and adjusted. The function of this pin is to retain the sleeve N in place, and at the same time to permit it to revolve freely within the sleeve D while the latter sleeve remains stationary. This rotary sleeve N receives, retains, and carries the reciprocating cutters E, and it has cut longitudinally on the face of its bore a series of grooves to receive such cutters, (see Fig. 7,) the projecting spurs *o* at the rear of each passing through to its periphery, while the rear of the cutter-projection at the front rests against the face of the sleeve N. Thus, when inserted in the sleeve N, the cutters are firmly held at front and rear, (see Fig. 5,) and when the sleeve is slipped upon the shaft A it is absolutely impossible to disturb or move the cutters from their fixed positions, and their reciprocation with the sleeve N is insured.

In some cases, as shown in Fig. 1, the interior of the bore of the sleeve D toward its face is formed to correspond with the shape of the rear end of the knives E, the recesses *d* and *d'* therein fitting the corresponding projections *h h'* on the interior of the sleeve D—this for the purpose of retaining command of the knives after they are formed in position, and insuring their reciprocation as the sleeve D is moved forward and back.

The cutter-head B with cutters *a* is attached to the shaft after the sleeves D and N and cutters E are placed in position, the cutters E sliding into the channels or spaces between the cutters *a*.

The operation of the apparatus is as follows: Power being applied to the shaft A, the cutter-head B and cutters *a* will revolve. Thus motion is thereby transmitted to the knives E, and thence to the sleeve N, all moving in unison. The gage-sleeve D remains stationary while the rotating parts are in operation.

The operation of the cutters *a* and guide-disk C upon the sole-edge is the same in effect as in all machines of this class.

The adjustment of the reciprocating adjustable cutters E to the various widths of sole-edges is accomplished as follows: The hand-wheel L being the operating medium, the screw-shaft K advancing or retiring the arm J, as may be desired, it is plainly seen that when arm J is retired from the position, as shown in Fig. 5, it will necessarily carry with it the gage-sleeve D, and retires it, which retiring motion is imparted through means of pin *t* to the inner revolving sleeve N and to the cutters E. An advancing movement of the shaft K produces contrary results.

The peculiar shape of the cutting-face of the cutters E and the guide-disk C results in compressing the sole-edge at the edges, hard-curing the leather, so that both sets of cutters produce clean cuts, leaving no feather-edges.

While I prefer the form of construction and method of operation as shown in Fig. 6, that shown in Fig. 1 will produce the same exact results, the sleeve D in that case retaining the knives E in position, and revolving with them, in unison with the shaft A and cutter-head B, its reciprocating motion being accomplished by means of a forked arm entering the recess *f*, or by means of a pin, similar to pin *t*, attached to arm J and entering recess *f*.

The main features of my invention lie in the introduction of the adjustable reciprocating cutting-knives E for conjoint operation with the cutters *a*, and so arranged and applied that they may be adjusted to any desired position by means of an adjustable gage, and these, in connection with the cutters *a*, having beveled faces, as shown in Fig. 5, and a correspondingly-formed guide-disk, effectually overcome all previous defects in the sole-edge trimmers, and insure perfect work.

It is also apparent that these adjustable knives can be applied to any and all forms of

edge-trimming machines in which a cutter-head is used having a series of cutters arranged radially around a central hub or sleeve, no matter whether they be separately attached to said hub or whether the hub and cutters be formed from a single piece of metal. It is also apparent that I am not limited to their use in connection with any specific form of adjusting apparatus.

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

1. In a machine arranged and adapted to the trimming of the sole-edges of boots and shoes, the combination of the following elements, viz., an operating-shaft carrying a cutter-head provided with a set of cutters radiating from its periphery, and a guide-disk attached to its face, a set of adjustable reciprocating cutters, and an adjustable operating gage, the whole arranged, applied, and operating as and for the purposes substantially as herein shown and set forth.

2. The combination, in a machine for trimming the sole-edges of boots and shoes, with a cutter-head provided with a set of cutters radiating from its periphery, of a set of one or more detached auxiliary cutters arranged to be reciprocated between the cutters on the cutter-head, and adjusted to govern the width of the sole-edge to be trimmed, substantially as herein shown and set forth.

3. In a sole-edge-trimming machine, the combination, with shaft A, carrying cutter-head B, provided with cutters *a* beveled on their forward ends, of guide-disk C, reciprocating cutting-blades E, and sleeve-gage D, the whole arranged and operating substantially as and for the purposes as herein shown and set forth.

4. The combination, with the cutter-head B, having cutters *a*, of guide-disks C, reciprocating cutter-blades E, rotating sleeve N, and gage-sleeve D, arranged, applied, and operating substantially as and for the purposes as herein shown and set forth.

5. The reciprocating cutting-blades E, provided with recesses *d* and *d'*, arranged, applied, and operating as and for the purposes herein shown and set forth.

AUGUSTUS BOLLING.

In presence of—

HAMILTON L. GIBBS,

J. R. PERKINS.