(No Model.) 3 Sheets—Sheet 1.

H. T. CROSBY.

SOLE ROUGH ROUNDING MACHINE.

No. 600,668. Patented Mar. 15, 1898.

Fig. 5.

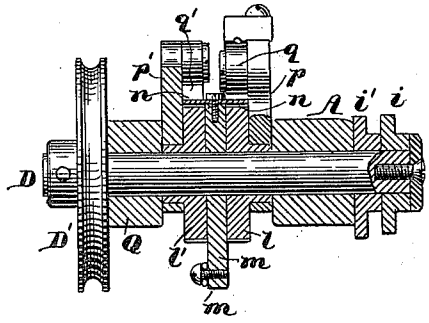


Fig. 4.

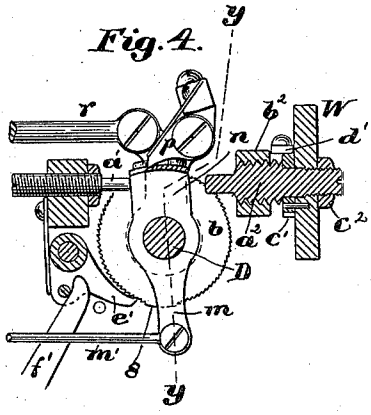
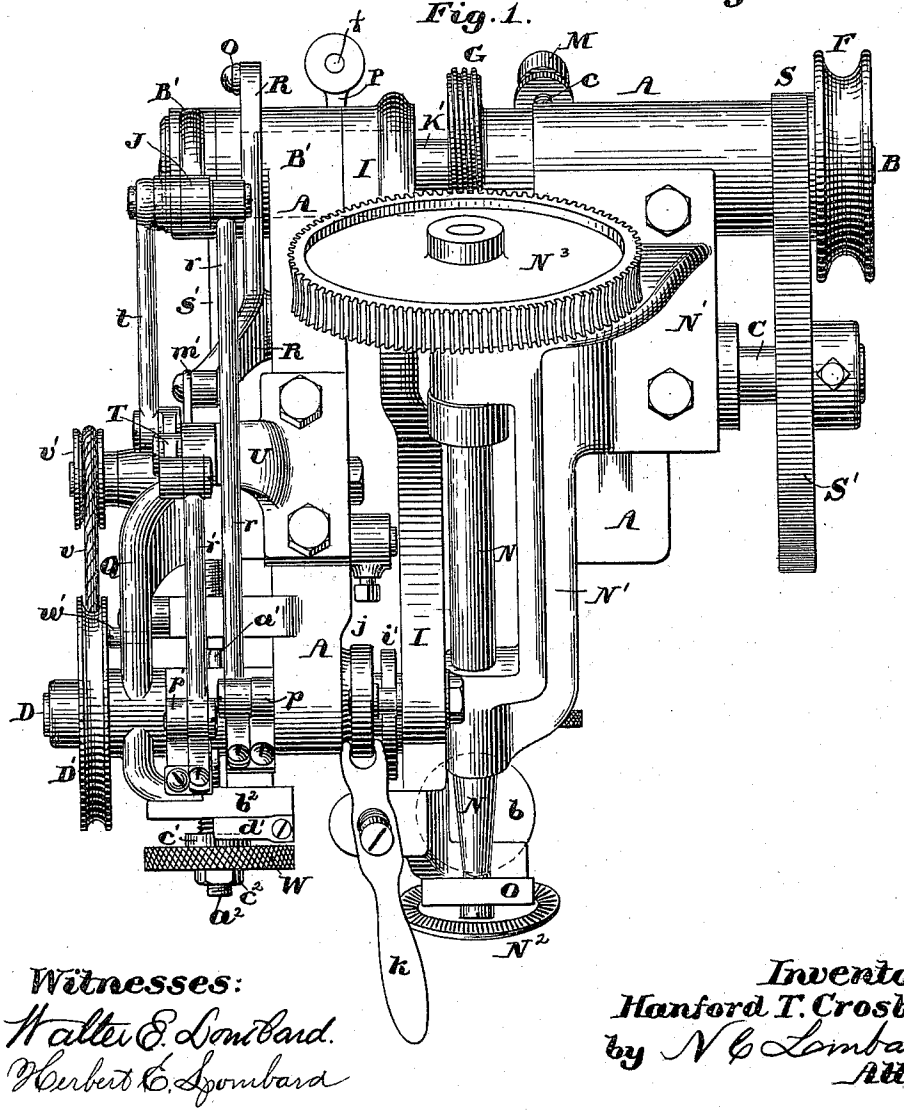


Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

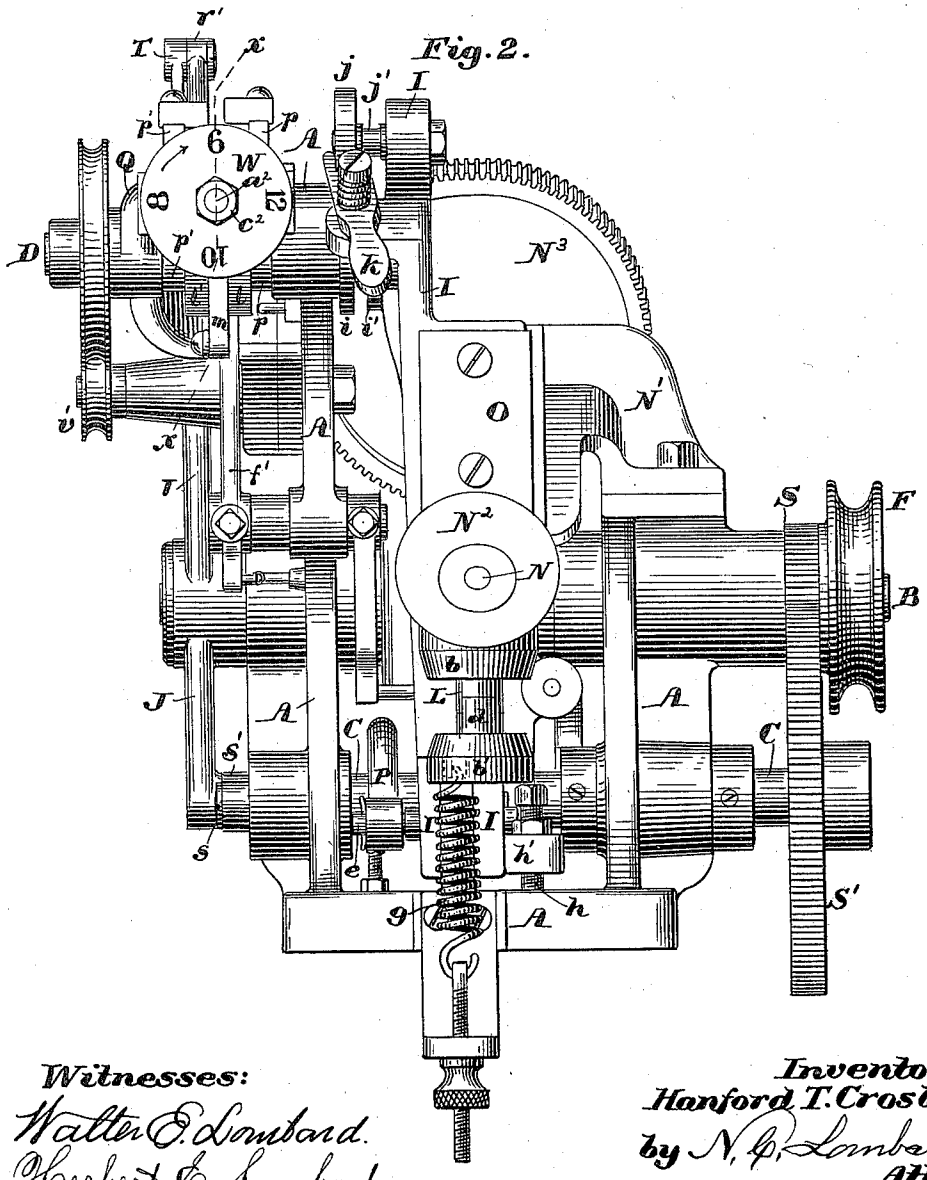

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Fig. 6

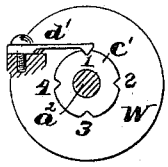


Fig. 7. Fig. 8.

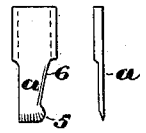
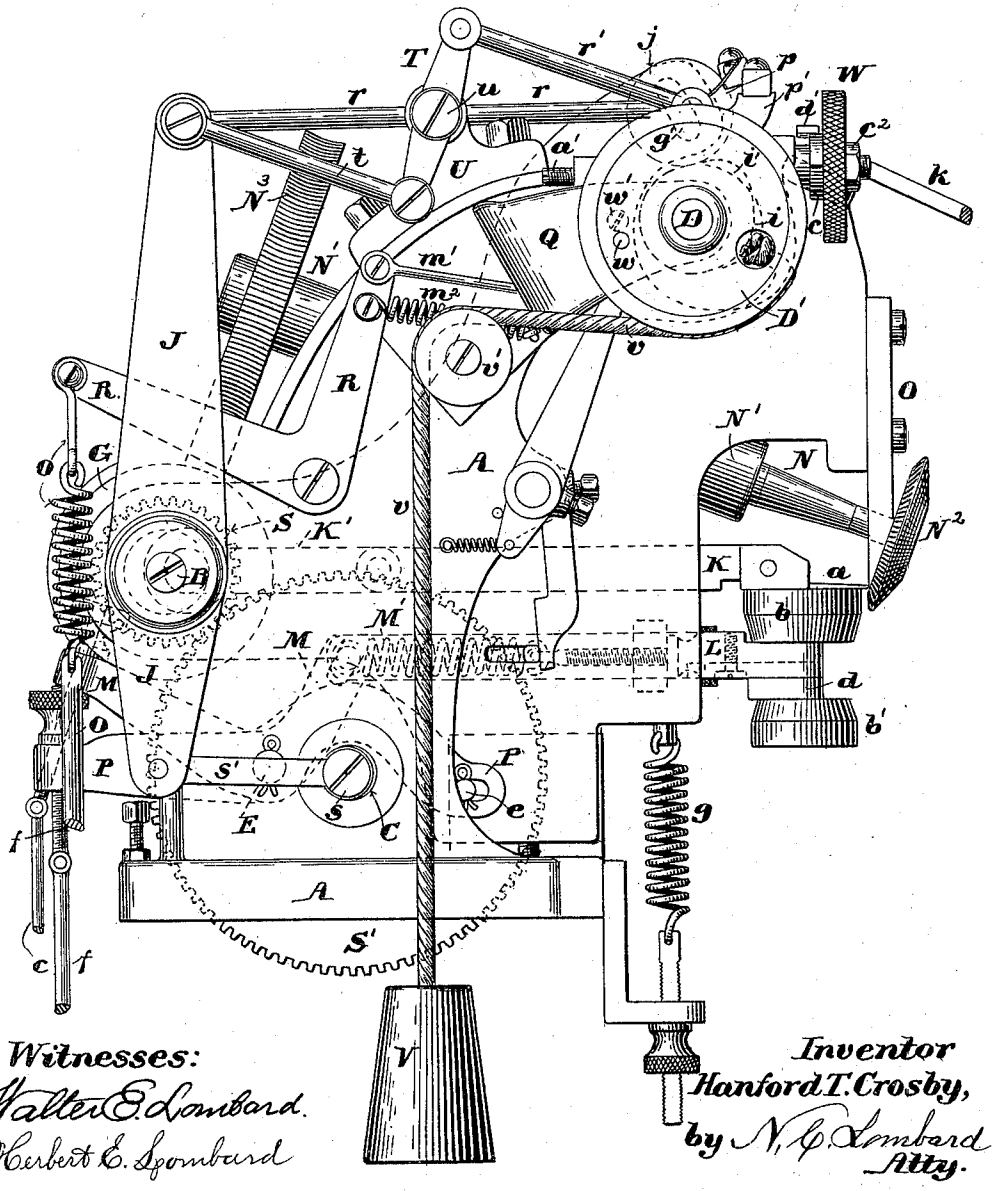


Fig. 3.



UNITED STATES PATENT OFFICE.

HANFORD T. CROSBY, OF BOSTON, MASSACHUSETTS.

SOLE-ROUGH-ROUNDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 600,668, dated March 15, 1898.

Application filed September 10, 1897. Serial No. 651,197. (No model.)

To all whom it may concern:

Be it known that I, HANFORD T. CROSBY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sole-Rough-Rounding Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sole-rough-rounding machines, is an improvement upon the invention described in another application of mine, filed July 17, 1897, Serial No. 644,892, and it consists in certain novel features of construction, arrangement, and combination of parts which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of the head of a machine embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation. Fig. 4 is a partial sectional elevation, the cutting plane being on line *x x* on Fig. 2 and looking toward the right of said figure. Fig. 5 is a vertical section on line *y y* on Fig. 4, looking toward the right of said figure. Fig. 6 is a rear elevation of the regulating-index and detent-wheels and the detent-spring. Figs. 7 and 8 are respectively a plane and an edge view of the cutter.

In the drawings, A is the frame of the head of the machine, comprising a base and two upwardly-projecting arms, in suitable bearings in which are mounted the driving-shaft B, a fixed journal-pin B′ in axial line with said driving-shaft, the crank-shaft C, the cam-shaft D, and a fixed fulcrum-pin E.

The driving-shaft B has firmly secured upon its outer end the driving-pulley F and near its inner end the worm G and has formed upon its inner end a crank-pin for operating the cutter-bar K.

The fixed journal-pin B′ has mounted upon its inner end the rear end of the arm or head I in such a manner that said arm may be oscillated to a limited extent about said journal-pin, and said pin has loosely mounted upon its outer end the lever J.

The head or arm I has formed therein two horizontal guideways, in which are mounted, so as to be movable endwise therein, the bars K and L.

The bar K has pivoted to its rear end one end of the link K′, the other end of which is mounted upon the crank-pin formed on the inner end of the shaft B, and the front end of said bar has secured thereto the cutter *a*.

The bar L has mounted on a vertical stud set in its front end the pressure-roll *b* and is connected at its rear end to the movable end of the short arm of the elbow-lever M, the long arm of which is connected by the rod *c* to a treadle (not shown) mounted upon the floor in such a manner that a pressure upon the front end of the treadle will move the bar and roll toward the rear against the tension of the spring M′. (Shown only in dotted lines in Fig. 3.)

N is the feed-shaft, mounted in bearings in the stand N′ in an inclined position, and has secured to its front end the feed-disk N^2, and to its rear end the worm-wheel N^3, which engages with and has motion imparted to it by the worm G.

O is the anvil-plate, against which the cutter *a* abuts after piercing the sole, said plate being firmly bolted to the front end of the head I.

So far the parts described are constructed, arranged, and operate substantially as in my prior application before cited, in which two pressure-rolls were carried by the front end of the bar L, both rolls being mounted upon a single pin or pins in axial line with each other. I have found it desirable in practice to have the lower roll carried by said bar adjustable toward and from the front, and therefore in this application I fit the block *d* to a groove in the under side of the bar L, so that it can be moved endwise therein, and secure it in adjusted position by a clamping-screw passing through a slot therein, and mount the lower pressure and guide roll *b′* on a stud set in said block.

The rolls *b* and *b′* are made partly frusto-conical, as shown, so as to the better fit against the tread-surface of a sole on the last that has considerable convexity or curve transversely.

The arm or head I has set in its side near its lower end the stud *e*, which is engaged by one end of the lever P, which is fulcrumed

upon the pin E and has connected to its other end the rod or wire *f*, the lower end of which is connected to a treadle (not shown) in such a manner that if pressure is applied to the front end of the treadle the front end of the head I, the cutter *a*, and the anvil-plate O will be raised to permit the free backward rotation of the cam-shaft after it has been partially rotated by the ratchets, said parts being returned to their normal or lowest positions when the pressure is removed from the treadle by the combined action of gravity and the tension of the spring *g*, said normal or lowest position being controlled and regulated by the screw-stop *h*, set in the ear *h'* on said head I and bearing upon the base-plate of the frame A, as shown in Fig. 2, substantially as in my prior application.

In operating upon a shoe-sole to rough-round it the sole edge is inserted between the pressure-rolls *b* and *b'* on one side and the anvil-plate O and the feed-disk N^2 on the other side, with the tread-surface of the sole toward said rolls and the lower edge of the feed-disk in contact with the inseam, as in my prior application.

If it is desired to rough-round a sole having a "Baltimore edge," so called—that is, a sole that on the outside of the shoe projects a constantly-varying distance from the inseam—I automatically raise and lower the head I and the cutter *a*. This is accomplished as follows:

The shaft D is mounted in a bearing in the frame A and a bearing in the stand Q and has mounted on one end thereof at the right of said frame two cams *i* and *i'*, one or the other of which when the shaft D is rotated acts upon the roll *j* to raise the front end of the head I and allow it to be drawn down again by the combined action of gravity and the tension of the spring *g*. The roll or truck *j* is mounted upon the stud *j'*, set in the head I, and is movable endwise of said stud to transfer it from a position above the cam *i* to a position above the cam *i'*, or vice versa, by means of the shipper-lever *k*, the inner end of which is forked and embraces the edge of the truck *j*, as shown in Figs. 1 and 2. The roll or truck *j* is located above the cams, and the weight of the head I and the tension of the spring *g* will keep said roll in contact with one or the other of said cams unless prevented from such contact by the adjustment of the screw-stop *h*. In my prior application cited these two cams and adjustable roll were used; but the roll was below the cams, and the head I had to be held up to keep the truck in contact with the cams by the operator keeping his foot upon a treadle during the whole time that that portion of the sole which has a varying projection is being trimmed or rough-rounded, and in said prior application the shaft upon which the cams were mounted was intermittently rotated by a single ratchet-and-pawl mechanism, which was operated by a face-cam secured to the back of the worm-wheel N^3 and provided with a series of throws to impart a series of vibrations to a lever connected to said ratchet mechanism, said cam moving said lever in one direction and a spring moving it in the opposite direction.

In my present application the shaft has firmly secured thereon between its two bearings two ratchet-wheels *l* and *l'*, separated from each other, and between them is loosely mounted upon the shaft D the lever *m*, the upper end of which has secured thereto a thin curved metal plate *n*, which projects laterally over both ratchet-wheels, so as to cover a portion of the teeth of each ratchet, the lower end of said lever *m* having pivoted thereto one end of the link *m'*, the opposite end of which is pivoted to one arm of the elbow-lever R, the other arm of which is connected by the elastic connection *o* to a treadle upon the floor, but not shown. The shaft D also has loosely mounted thereon, one at the right and the other at the left of said cams, the two pawl-levers *p* and *p'*, carrying the pawls *q* and *q'*, respectively, and having pivoted thereto the rods *r* and *r'*, respectively, as shown.

The driving-shaft B has firmly secured thereon just inside the driving-pulley F the spur gear-wheel S, the teeth of which engage the teeth of the larger spur gear-wheel S', mounted upon the shaft C, so as to be movable endwise thereof to disengage it from the gear S, but when in engagement with said gear S clamped to said shaft, so that said shaft will be revolved with said gear-wheel S'. The opposite end of the shaft C has formed thereon the crank-pin *s* (shown in dotted lines in Fig. 3) only slightly eccentric to the axis of said shaft, to which is fitted one end of the link *s'*, the opposite end of which is pivoted to the short arm of the lever J, to the movable end of the long arm of which are pivoted upon a common pin the links *r* and *l*. The rear end of the link *r'* is connected to the upper end of the equal-armed lever T, fulcrumed upon the stud *u*, set in the stand U, secured to or formed in one piece with the frame A, all as shown in Figs. 1 and 3.

The cam-shaft D has firmly secured thereon the grooved pulley D', to which is attached one end of a cord *v*, which after passing partially around said pulley and over the sheave *v'* has attached to its other end the weight V, which when the truck *j* is raised by the upward movement of the front end of the head I, caused by the action thereon of the lever P when operated by the operator, will rotate the cam-shaft in the opposite direction to that imparted to it by the ratchet mechanisms, the extent of said backward rotation being limited by a stop-pin *w*, set in said pulley D', coming in contact with a stop-pin *w'*, set in the stand Q, as shown in Figs. 1 and 3.

The shield *n*, when in its normal position or with its carrying-arm in contact with the adjustable screw-stop *a'*, with which it is normally held in contact by the spring m^2, will so cover the teeth of the ratchet-wheels that

the pawls will not engage said ratchets, and consequently no motion will be imparted to the cams i and i', even though the pawl-levers are vibrated, and if the machine be operated under these conditions without the long arm of the lever R being depressed the sole will be trimmed all around at a uniform distance from the inseam.

If a sole is to be trimmed with a Baltimore edge, the shield must be moved toward the front of the machine a sufficient distance to uncover one or more additional teeth of the ratchet at its back edge, according as to whether the sole to be rough-rounded is a short or a long one. This forward movement is obtained by a downward movement of the elastic connection o, caused by the operator placing his foot upon the treadle connected therewith and depressing it. To limit said forward movement of the shield to any desired point, I provide the screw-stop pin a^2, threaded in the bracket or ear b^2, and having secured thereon the hand index-wheel W and detent-collar c', by means of clamping-nut c^2, said collar c' having four detent-notches 1, 2, 3, and 4 formed in its periphery at equal distances from each other, with one of which notches the detent-spring d' is engaged whenever the machine is in operation.

The index-wheel W has stamped or otherwise fixed upon its front face the numbers "6," "8, "10," and "12" around its outer edge and at equal distances from each other, the numbers "6" and "10" being in the same vertical plane as the detent-notches 1 and 3, and the numbers "8" and "12" being in the same horizontal plane as the detent-notches 2 and 4.

When the index-wheel W is in the position shown in Fig. 2, with the index-figure "6" at the top, the screw-stop a^2 will be in the position indicated in Fig. 4 and the machine is adjusted for rough-rounding a No. 5 to No. $6\frac{1}{2}$ sole with a Baltimore edge; but if said index-wheel be turned one-quarter of a revolution in the direction indicated by the arrow on said wheel the stop-screw will be moved toward the stop a' a distance equal to one-half a tooth of the ratchet and the machine will be in condition to rough-round a No. 7 to No. $8\frac{1}{2}$ sole, and so on, each one-quarter of a revolution of the index-wheel in the same direction advancing the screw-stop a distance equal to one-half a tooth of the ratchet, until the index-figure "12" is uppermost, which is the limit of movement in that direction.

The cams i and i' are designed to be moved about their axes of motion by the action of the pawls upon the ratchet-wheels only one-half of a revolution, and in order to prevent a greater movement, even if the operator should neglect to remove his foot from the treadle at the proper time, each of the ratchet-wheels l and l' has a section of its periphery left smooth or without teeth, as shown at 8 on Fig. 4, substantially as in my prior application.

Two stop-pawls e' are pivoted to a portion of the frame A, are pressed into engagement with the teeth of the ratchet-wheels by springs, and retracted therefrom by the action thereon of the lever f', which is operated substantially as in my prior application before cited.

The stud j' is adjustably set in the slot g', formed in the head I, as shown in dotted lines in Fig. 3, so that the truck j may be raised or lowered to bring it into contact with the portion of the cam having the smallest radius when the stop-screw h rests upon the base-plate of the frame A.

The cutter a is made of the form shown in plan in Fig. 7 and has a cutting edge across its forward end around the projection 5 and along the right-hand edge to 6, as shown in Fig. 7.

The advantage of a cutter formed as shown is that some portion of the cutting will be done during the backward movement of said cutter.

It will be observed that the cams i and i' are right and left cams, being otherwise exactly alike, and impart the same motion to the head I, but in the reverse order.

The springs g and M' are provided with screw-adjusting devices for regulating the tensions thereof in a well-known manner, as shown in Figs. 1, 2, and 3. The operation of my invention will be readily understood from the foregoing without further explanation.

Another application of mine, filed July 17, 1897, and serially numbered 644,892, shows, describes, and claims the obliquely-arranged feed-disk, the reciprocating cutter, and the anvil-plate, the vibrating arm carrying said cutter, and cams for vibrating said arm, which are not claimed herein except in essentially-different combinations; and in another application of mine, filed December 18, 1897, and serially numbered 662,365, are shown and described, but not claimed, the double ratchet-and-pawl mechanism for rotating the cams for controlling the elevation of the reciprocating cutter and the system of levers and links for operating said ratchets alternately which are claimed herein.

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

1. A cutter for sole-rough-rounding machines having a cutting edge across its front end and along one side and having a rounded or curved lateral projection at the junction of said cutting end and side.

2. In a sole-rough-rounding machine the combination of a feed-shaft mounted in fixed bearings in an inclined position; a feed-disk carried by said shaft; an oscillating cutter-head; a cutter carried by said head; means for reciprocating said cutter in a direction at right angles to the line of feed; a cam-shaft mounted in fixed bearings; a pair of right and left pattern-cams carried by said shaft; means for rotating said cams through a half-revolution; an antifriction-truck mounted

upon a stud adjustably set in said cutter-head above said cams and movable endwise of said stud for the purposes specified.

3. In a sole-rough-rounding machine the combination with a rotary feed-disk; of an oscillating cutter-head; a reciprocating cutter carried by said head; a gage-bar fitted to a bearing in said head and movable endwise toward and from said feed-disk; a pressure-roll mounted on a fixed stud set in said bar; and a second pressure-roll mounted upon a stud adjustably connected to said bar and movable thereon in the direction of the length of said bar.

4. In a sole-rough-rounding machine the combination of a feed-shaft mounted in fixed bearings; a feed-disk carried by said shaft; means for revolving said disk; a pivoted cutter-head; pressure-rolls and a cutter carried by said head; means for moving said cutter and rolls toward and from said feed-disk; a cam-shaft mounted in fixed bearings; a pair of right and left pattern-cams mounted on said shaft; an antifriction-truck mounted upon a stud, adjustably set in said cutter-head, and movable endwise thereon from a position over one cam to a position over the other cam; a pair of ratchet-wheels mounted on said cam-shaft in fixed positions; an adjustable shield covering portions of the teeth of each ratchet; a pair of levers each carrying a pawl to act upon one of said ratchets and means for vibrating said pawl-levers in opposite directions, or so that when one pawl is advancing the other is receding, as set forth.

5. In a sole-rough-rounding machine the combination of the shafts B and C; the gears S and S'; the vibratory head I; the antifriction-truck *j* carried by said head; the cam-shaft D mounted in fixed bearings; the right and left pattern-cams *i* and *i'* and the ratchet-wheels *l* and *l'* carried by the shaft D; the shield *n*; means for controlling the position of said shield; the pawl-levers *p* and *p'*; the pawls *q* and *q'*; the links *r r'* and *t*; the levers J and T; the crank-pin *s* on the shaft C; and link *s'* all constructed, arranged and operating substantially as described.

6. In a sole-rough-rounding machine the combination with work-feeding mechanism, of a vibratory cutter-head; a reciprocating cutter and an antifriction-truck carried by said head; a cam-shaft mounted in fixed bearings; a pair of right and left pattern-cams fixed upon said cam-shaft and arranged to act upon said truck to raise said cutter-head; a ratchet-wheel mounted upon said cam-shaft; a pawl and pawl-lever for moving said shaft about its axis; a lever provided with a shield to cover a portion of the teeth of said ratchet; an adjustable stop to limit the movement of said shield in one direction; a spring to normally hold said shield-lever in contact with said stop; a second adjustable stop-screw to limit the movement of said shield-lever in the opposite direction; an index-wheel and a detent-collar secured upon said screw-stop; and a detent-spring to lock said screw-stop in adjusted position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of September, A. D. 1897.

HANFORD T. CROSBY.

Witnesses:
N. C. LOMBARD,
ROBT. GILMAN.