(No Model.)

W. D. ORCUTT.

ROTARY CUTTER.

No. 283,808. Patented Aug. 28, 1883.

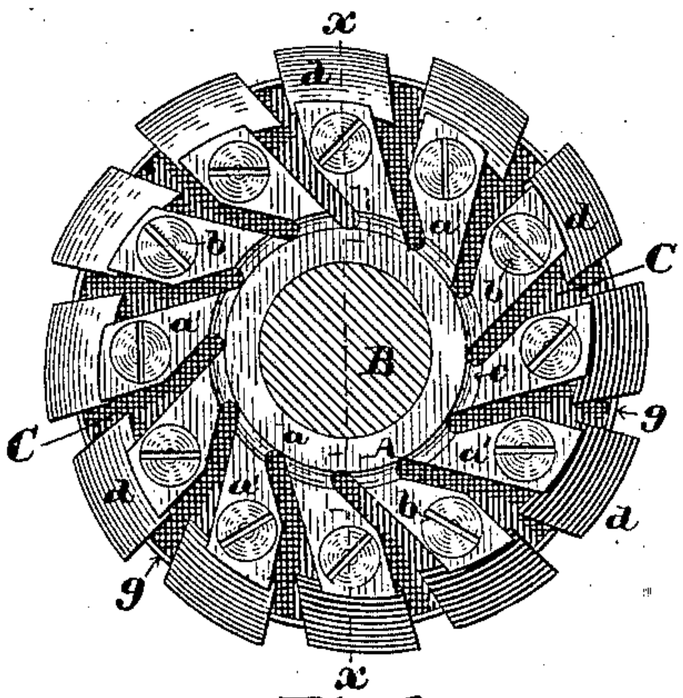

Fig. 2.

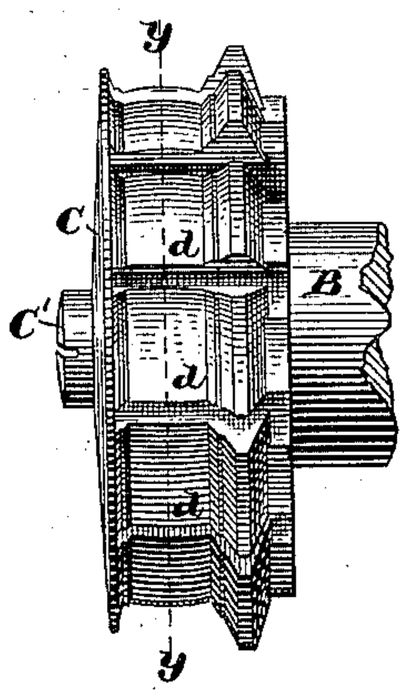

Fig. 1

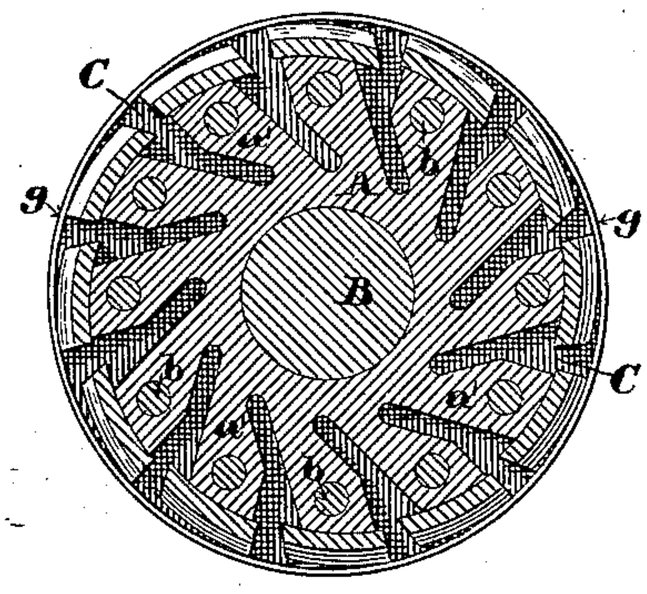

Fig. 4.

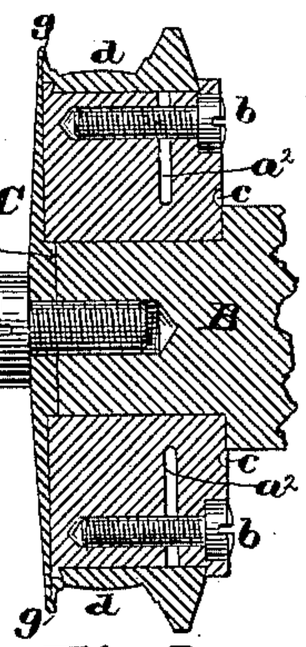

Fig. 3.

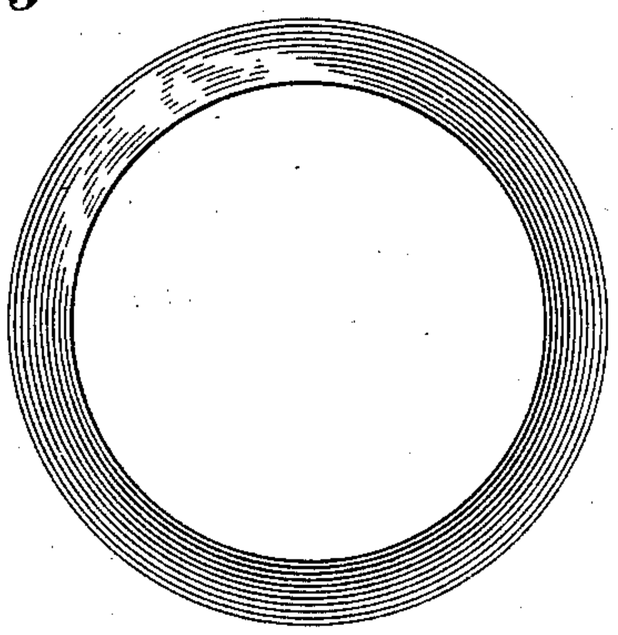

Fig. 5.

Fig. 6.

Fig. 7.

Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM D. ORCUTT, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JAMES H. BUSELL, OF SAME PLACE.

ROTARY CUTTER.

SPECIFICATION forming part of Letters Patent No. 283,808, dated August 28, 1883.

Application filed January 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. ORCUTT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Rotary Cutters, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of rotary cutters for trimming the edges of boot and shoe soles in which a series of cutting-blades are used, arranged about a common hub or axis and molded upon their peripheral surfaces, so as to cut a molded edge upon the boot or shoe sole, and adapted to be sharpened by grinding their front radial or nearly radial faces; and it consists, first, in the combination of a central hub provided with a series of radial or tangential arms projecting therefrom at regular distances, each having formed in its peripheral end a dovetailed circumferential groove, the bottom of which is eccentric to the axis of said hub, said arms being divided into two parts by a circumferential slit, a series of segmental cutter-blades fitted in said dovetailed grooves, one upon each arm of said hub, and having their outer or circumferential surfaces molded to the reverse of the shape that it is desired to impart to the boot or shoe sole to be trimmed, and their front or cutting ends in the form of planes radial or nearly radial to the axis of the hub, and a corresponding series of clamping-screws arranged in said arms and adapted to nip said divided arms upon the cutters to hold them in the desired position thereon.

It further consists in the combination of a cutter-head composed of a central hub and a series of bifurcated arms, each having formed in its peripheral end a dovetailed groove eccentric to the axis of said hub, a series of molded segmental cutter-blades fitted to and adapted to be adjusted endwise in said dovetailed grooves and clamped securely in any desired position therein, and a rand-guard disk having an annular lip projecting laterally from its thin outer edge and adapted to overhang a portion of each of said segmental cutter-blades and serve as a gage to determine the location of said segmental cutter-blades, to insure correspondence of the cutting-edges of said cutters—or, in other words, to enable the said cutters to be removed and ground upon their front radial faces and then replaced and so set that their cutting-edges shall all be equidistant from the axis of the cutter-head, regardless of whether the same amount was ground from each cutter or not.

It is very essential to the performance of good work in trimming boot and shoe soles or heels with rotary cutters that a considerable number of cutting-blades should be used, arranged equidistant from each other around the periphery of the cutter-head, and that the several cutting-edges should be equidistant from the axis of the head and their outer or peripheral surfaces should be slightly eccentric to the axis of motion about which they revolve. Many expedients and changes in the construction and mode of using rotary cutters for such purposes have been resorted to in order to realize the above-named conditions, but with more or less indifferent success. The best result, so far as my knowledge extends, has been attained by the use of a cutter composed of a series of cutting-blades arranged around and made in one piece with a common central hub, the outer or peripheral ends of which blades were first turned concentric with the axis of the cutter, and then had the necessary "backing off" or "clearance" given thereto by bending each blade backward a given distance, or by cutting away a portion of the stock from the cutting corner backward, so as to make the outer surfaces of said blades eccentric to their axis of revolution in an equal degree, said cutters being sharpened by grinding their front radial or nearly radial faces. A careful examination of the subject, however, will show that in order to keep the most perfect cutter of the kind just described in good working condition great care must be taken to grind all the blades precisely alike and to an equal amount. This is a very difficult thing to accomplish, and necessarily an expensive one; and, besides, if an accident happens to break one of the blades, the cutter is spoiled and has to be thrown away and a new one substituted therefor; or, when the blades become so worn as to be unserviceable,

the whole cutter, hub and all, is thrown away. To obviate these objections is the object of my present invention.

Figure 1 of the drawings is an edge elevation of a cutter embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a section on line *x x* on Fig. 2. Fig. 4 is a section on line *y y* on Fig. 1. Fig. 5 is an elevation of the ring of steel from which the several segmental cutters are cut, and Figs. 6 and 7 are respectively a front end elevation of one of the segmental cutters and an elevation of the side of the same opposite to that shown in Fig. 2.

A is the cutter-head, composed of the central hub, *a*, and a series of radiating or tangential arms, *a'*, which are divided by the circumferential slit or thin groove a^2 into two unequal parts, as shown in Fig. 3, each arm being provided with a binding-screw, *b*, which passes freely through the thin portion and is screwed into the thick portion of said arm, the head of said screw bearing upon the thin part of the arm, as shown, whereby the thin portion of said arm may be moved slightly toward the thick portion to clamp the cutter, said thin portion of the arm springing at the point where it joins its hub *a*, it being weakened at that point by cutting across it the groove *c*. (Shown in Figs. 2 and 3.) This cutter-head A is made by first turning a disk of metal to the desired diameter and forming in its periphery a shallow dovetailed groove extending circumferentially around the same, cutting longitudinal slits through the same at stated and equal distances, to form the arms *a'*, then shaping the ends of said arms to give the necessary clearance, in any of the well-known ways, and then dividing said arms into two parts by cutting the circumferential slit a^2, the binding-screws *b* being fitted thereto at any desired time in the progress of the work in a well-known manner. A segmental cutter, *d*, curved to fit the peripheral curve of the arm *a'*, and having its outer surface molded to the desired shape, and having formed upon its inner portion a male dovetail to fit the dovetail grooves in the ends of said arms, is securely clamped to each of said arms by means of the clamping-screws *b* and the pressure of the dovetail lips *e* and *e'*, which form the walls of the dovetail grooves in said arms, said cutters being adapted to be adjusted endwise in said grooves, moving in a path eccentric to the axis of the cutter-head. The cutters *d d* are made by first turning a ring of steel to the desired shape in cross-section and of a diameter such that its inner periphery shall be of the same curve as the curves of the ends of the arms *a'* at the bottom of the dovetail grooves formed therein, and then cutting said ring up into segments, as shown in Fig. 7, and tempering the same. The cutters *d* are so formed as to project over upon the dovetail lips *e* of the arms *a'*, so as to be flush with the radial face of the cutter-head upon that side.

The cutter-head A is fitted tightly upon the shaft B, and is clamped thereto by the rand-guard disk C and the bolt C', screwed into the end of the shaft B, as shown in Fig. 3. The rand-guard disk C has formed upon its inner face a short central hub, *f*, to enter the hole in the cutter-head A to center it thereon, and at its outer edge the inwardly-projecting annular lip *g*, which overhangs a portion of one edge of each of the cutters *d d*, and serves as a gage to set said cutters by when new, or after each grinding of said cutters.

It is obvious that as the inner shoulder of the lip *g* is concentric with the axis of the cutter-head, and the surfaces upon which the several cutters *d d* rest or have their bearings are eccentric to said axis, and said cutters, when adjusted, must be moved in paths eccentric to the axis of said cutter-head, it follows that when said cutters are all set upon their several supporting-arms with those portions of their cutting corners which are in the same radial plane as said lip *g* are in contact therewith their cutting corners are all equidistant from the axis of the cutter-head, and consequently move in the same circular path when the cutter is revolved.

It will also be obvious that if in grinding said cutters more is ground from one cutter than another, it will not injure the practical working of the instrument, as each cutter-blade may be readily adjusted to its proper position and distance from the axis of the cutter-head. The rand-guard effectually prevents the cutter-blades from injuring the "upper" by virtue of the fact that its thin outer edge is inserted between the upper and the projecting edge of the sole, and being larger in diameter than the circle described by those portions of the cutting-blades which are nearest to the upper, it is impossible for the cutting-blades to come in contact with the upper to do it injury.

Another advantage of this construction of rotary cutters is that cutting-blades adapted to form molded edges of different shapes upon boot or shoe soles may be used upon the same cutter-head, and when the cutter-blades are worn out another set may be applied to the same head, or, in other words, only the blades have to be renewed, whereas in the case of the cutter in which the blades are made in one piece with the hub when the blades are worn out the whole thing has to be discarded and an entire new cutter supplied in its place.

I am aware that it is not new to make the outer or peripheral surfaces of cutters eccentric to their axis of revolution, or to make a rand-guard with an inwardly-projecting annular lip; and hence I do not claim, broadly, such construction of said devices.

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

1. The cutter-head A, composed of a central hub, *a*, and a series of arms, *a'*, made in one piece therewith, and each provided with

a circumferential slit, a^2, and having their outer surfaces eccentric to the axis of said cutter-head, and each provided with a dovetailed groove, as set forth, in combination with a series of cutting blades or tools having their outer surfaces molded to a uniform pattern, and adapted to be sharpened by grinding their front radial or nearly radial faces, and fitted one to the dovetailed eccentric groove in each of the arms a', and means of clamping them therein, substantially as described.

2. The cutter-head A, composed of the hub a and a series of arms, a', made in one piece therewith, and each provided with a circumferential slit, a^2, and having their outer surfaces eccentric to their axis of revolution, and provided with dovetailed grooves in their peripheral ends, and with the grooves c at their bases, as set forth, in combination with a series of molded cutting-tools, $d\ d$, fitted to said dovetailed grooves, and the clamping-screws $b\ b$, all arranged and adapted to operate substantially as and for the purposes described.

3. In combination with a rotary cutter-head having a series of adjustable cutting-tools adapted to be sharpened by grinding their front radial faces, the rand-guard disk C, provided with the inwardly-projecting annular lip g, to serve as a gage for setting the adjustable cutting-tools, all arranged and adapted to operate substantially as and for the purposes described.

4. The combination of the cutter-head A, composed of a central hub, a, and a series of arms, a', each provided with a circumferential slit, a^2, and having on its outer or peripheral end an eccentric groove, a series of molded cutting-tools, $d\ d$, fitted one to each of said dovetailed eccentric grooves, means of clamping said cutting-tools in positions upon said arms, and the rand-guard disk C, provided with the gage-lip g, all arranged and adapted to operate substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 9th day of January, A. D. 1883.

WILLIAM D. ORCUTT.

Witnesses:

E. A. HEMMENWAY,

WALTER E. LOMBARD.