J. N. BUSELL.

FEATHER EDGING MACHINE.

APPLICATION FILED NOV. 22, 1906

1,003,981.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

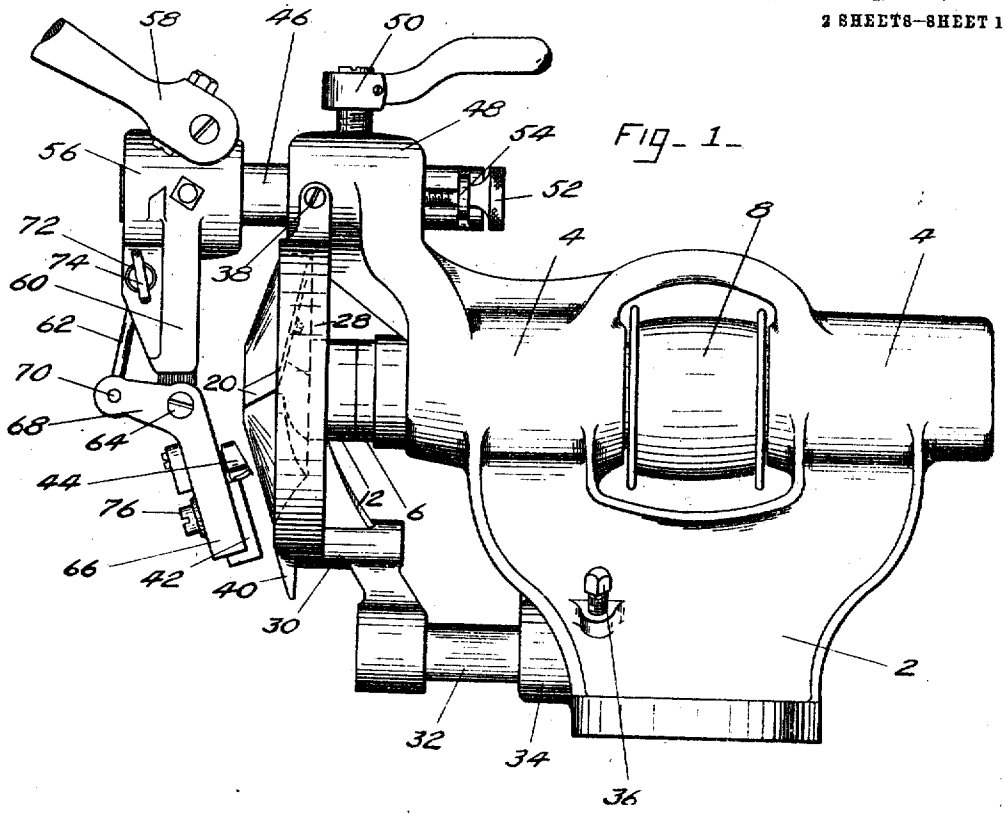

Fig. 1.

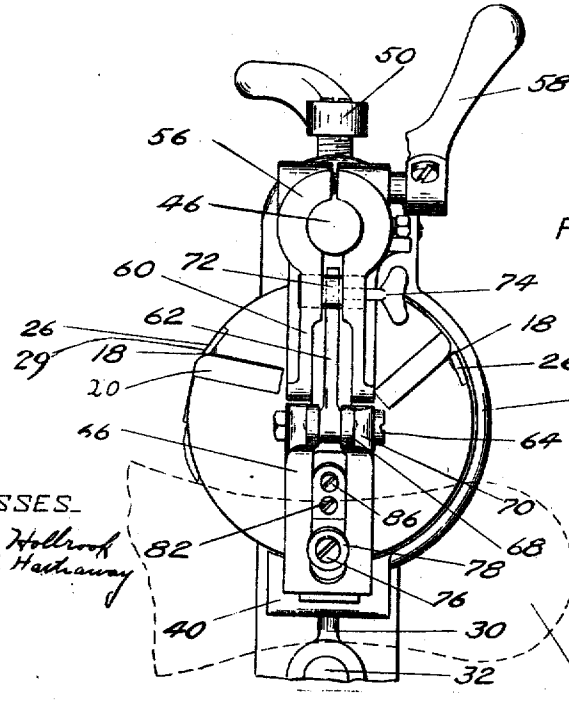

Fig. 2.

WITNESSES.

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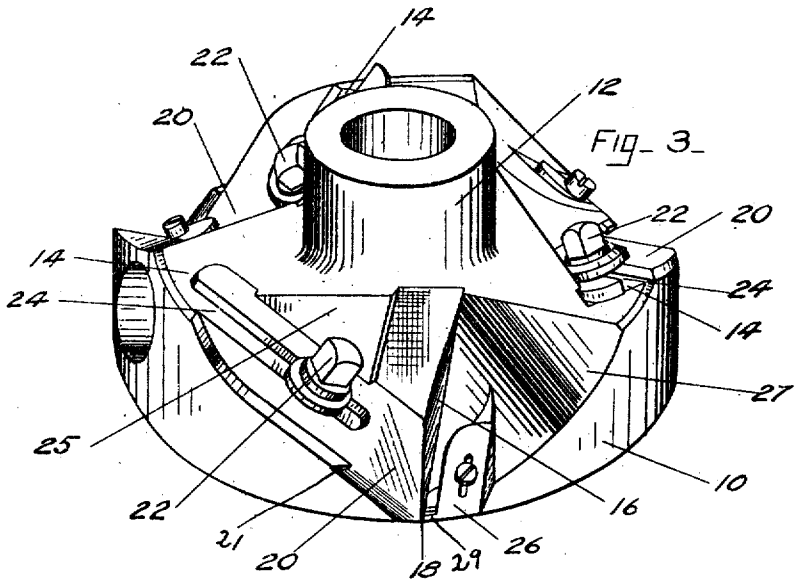

Fig. 3.

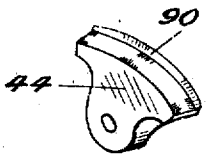

Fig. 4.

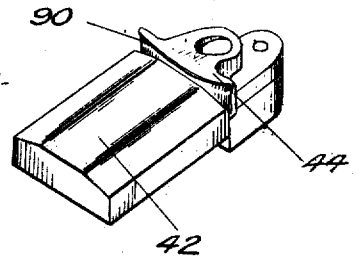

Fig. 5.

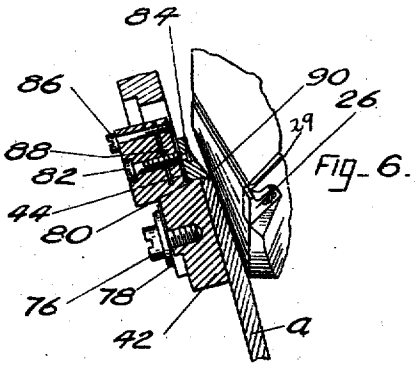

Fig. 6.

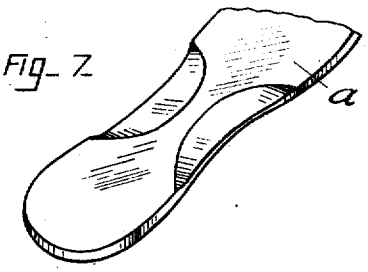

Fig. 7.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN N. BUSELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FEATHER-EDGING MACHINE.

1,003,981. Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed November 22, 1906. Serial No. 344,630.

To all whom it may concern:

Be it known that I, JOHN N. BUSELL, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain Improvements in Feather-Edging Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to feather-edging machines which are used for "fleshing", or beveling the faces of shoe soles.

The invention is designed to provide for effecting various advantageous adjustments which render the machine capable of use for different purposes, and to supply important improvements in the general organization and mode of operation of feather-edging machines.

Different types of machines have been used heretofore which may be classed under the general designation of feather-edging machines. Some of them have been used for "fleshing" soles, *i. e.*, smoothing off the flesh side of a sole in a narrow peripheral area in order to provide a smooth surface and uniform thickness for that portion of the sole which is immediately attached to the upper. In performing this fleshing operation the plane of the smoothed peripheral area is preferably at a very slight angle to the plane of the sole face, and the thickness of the sole edge is usually not materially changed except in so far as is necessary in order to secure uniformity. Machines have also been used for beveling or chamfering a sole edge, or a part thereof, in order to produce a thin edge which shall give the finished shoe an appearance of lightness, or in order to render some portion of the sole more flexible. In such a case it may be preferred that the beveled or chamfered portion be at a considerable angle to the face of the sole. This use of these machines is well exemplified in the operation of "shank-reducing." It is considered desirable that the opposite edges of the shank portion of a shoe sole be materially thinner than the normal thickness of the sole in order to give flexibility, to permit of a superior finish, and to cause a light appearance in the completed shoe. To this end the opposite edges of the shank of a sole are sometimes beveled at a considerable angle. In women's shoes the sole is frequently thus beveled entirely around its periphery to contribute to the imitation of a turn shoe. In fleshing or beveling shoe soles the angle which the fleshed or beveled portion makes with a sole face varies with different systems or factory standards. Also it may be desired to give a sole edge a deep or a shallow bevel, or to make bevels of different widths or depths on different soles.

Machines have been used heretofore which were intended to feather-edge soles according to different requirements as to dimensions of the beveled or fleshed portion, but the intricate adjustments of these machines have consumed a great deal of the operator's time and have been only indifferently successful. The best machines hitherto employed have been susceptible of very limited use only in feather-edging in different dimensions, and it is thought that no means has been supplied heretofore for feather-edging at different angles except by removing certain elements of machines and replacing them by others of different character, an inconvenient and clumsy arrangement which practically resulted in the creation of new and different machines to meet the requirements of beveling at different angles.

The present invention contemplates a machine which is capable of fleshing or beveling a sole to any suitable width or depth, and at any practicable angle to a sole face.

One object of the invention, among several others, is to provide means whereby the machine may be readily arranged for fleshing or beveling at different angles; and to this end an important feature of the invention consists in the combination of a cutter with work-controlling devices constructed and arranged for feather-edging soles at different angles.

Other principal and subordinate features of the invention will be explained in the following description and will be defined in the claims.

The invention will be described herein as embodied in a machine having a rotary cutter and work-controlling devices comprising a face-guide and an edge-gage. A shoe sole held in the hands of the operator is introduced to the action of the machine by

presenting the outer face of the sole against the face-guide and the edge of the sole, adjacent to which the sole is to be fleshed or beveled, against the edge-gage. The sole having been introduced in this manner, the rotary cutter performs its feather-edging function in the manner and with the result determined by the adjusted position of the work-controlling devices.

It is to be understood that nothing herein contained is to be construed as limiting this invention to the specific embodiment here shown and described.

In the accompanying drawings, Figure 1 is a side elevation of the head of the machine; Fig. 2 is an end elevation of the head of the machine showing in dotted lines the position of the shoe sole when its shank portion is being feather-edged; Fig. 3 is a perspective of the rotary cutter; Fig. 4 is a perspective of the edge-gate; Fig. 5 is a perspective of the face-guide with the edge-gage secured thereto; Fig. 6 is a detail in section showing the work in engagement with the edge-gage, the face-guide and the rotary cutter; Fig. 7 is a perspective of a shoe sole having its shank portion feather-edged on both edges.

The frame 2 of the machine has bearings 4, 4 for supporting a shaft 6 which may be turned in any suitable manner as through a pulley 8. The shaft carries a rotary cutter head 10 which may be secured thereto in any suitable manner. The cutter head is preferably constructed as shown in Fig. 3 with a disk portion having an integral hub 12. The inner face of the disk portion is cut away to form a number of inclined surfaces 14 (there being three as shown) and opposite surfaces 16 which are preferably slightly inclined toward the surfaces 14. The surfaces 14 and 16 if extended would intersect in a line somewhat beyond the outer face of the disk portion. Radial slits 18 are therefore produced in the outer face of the cutter head. Cutting blades 20 having shoulders 21 are secured to the inclined surfaces 14 by bolts 22 extending through the slots 24 in the blades and screwing into the cutter head. Washers are preferably placed between the blades and the heads of the bolts. By loosening the bolts the blades may be adjusted readily as they wear away, or they may be removed for sharpening. The shoulders 21 indicate the point to which the blades may be ground away in sharpening them from time to time. Offsets 25 are preferably spaced from the surfaces 14 a distance corresponding to the thickness of the blades in order to assist in holding the latter in place. It will be thus seen that the cutting blades instead of being arranged radially as customary are arranged diagonally on the cutter head. They are held securely upon the inclined surfaces 14 by the bolts 22 and the offsets 25 and are thus prevented from yielding during the cutting operation, a defect which exists in the use of radial blades mounted in slots in the cutter head. The cutting edges of the blades are set to project through the slits 18 slightly beyond the outer face of the disk portion in the same manner that the blade of a wood plane projects beyond the bottom face of the plane. The outer face of the disk portion is preferably slightly beveled in order that the cutting blades may generate the frustum of a cone during rotation. The surfaces 16 are preferably beveled off at their outer corners to form surfaces 27. Guards 26 are secured adjacent to the outer corners of the cutting edges and are preferably located in grooves in the surfaces 27. These guards may be mounted so as to permit of their being adjusted as by means of a slot therein and a screw extending therethrough into the cutter head. The outer corners of the cutting blades are removed or rounded off and into the spaces thus left there extend projecting portions 29 of the guards 26 as shown in Fig. 2. The guards are set so that the projecting portions extend slightly beyond the outer face of the cutter head in order to prevent the cutting edges from cutting into the stock too far at the periphery of the rotary cutter.

A segmental hand guard 28 is placed so as to partially encircle the rotary cutter. This hand guard may be supported in any suitable manner as by a bracket 30 attached to a stud 32 fitting into a socket 34 on the frame. The stud 32 is movable in the socket and may be secured in adjusted position by a set screw 36. The angular adjustment of the hand guard is facilitated by an adjusting screw 38 at the top of said guard. This screw is threaded through the guard and abuts against a stationary part of the frame. By turning said screw the guard may be adjusted to bring it as closely as desired to the rotary cutter. The bracket 30 may also conveniently support a work guard 40 which coöperates with a face-guide 42 to control the work, which during the operation of the machine is positioned between their adjacent faces. An edge-gage 44 is adjustably secured to the face-guide as hereinafter set forth. The primary support for the face-guide and the edge-gage is a stud 46 preferably non-rotatable which is secured by a split sleeve 48 on the frame. Said sleeve may be tightened to hold securely the stud by means of a clamp 50. When said clamp is loosened the stud may be moved axially by means of an adjusting screw 52 which threads into the sleeve and has a collar 54 engaging the slot in the stud. On the outer end of the stud is a split sleeve 56 which constitutes a secondary support for the face-guide 42 and edge-gage 44. Said split sleeve is provided with a clamping device

58 whereby the sleeve may be closed to grip the stud 46. When said clamp is loosened the sleeve 56 may be removed from the stud or it may be adjusted thereon either axially or angularly. It is convenient to adjust the face-guide and edge-gage preliminarily by rocking the sleeve 56 on the stud 46 and effecting approximately the adjustment of said sleeve. When this approximate adjustment has been effected, the final minute adjustment may be accomplished by turning the adjusting screw 52.

Depending from the sleeve 56 is a rigid arm 60 which is bifurcated for a portion of its thickness to provide for the reception of an adjusting pin 62 which serves a purpose, presently to be described. Pivoted to the arm 60 by means of a pivot bolt 64 is a carrier 66 which constitutes the immediate support for the face-guide 42 and the edge-gage 44. This carrier is bifurcated as shown in Fig. 2 and is provided with parallel rabbets on the inner sides of the arms produced by the bifurcation. The face-guide 42 fits upon and between said rabbets and is slidable up and down upon the tracks thus formed. Said carrier has a rigid finger 68 preferably in a plane perpendicular to the axis of the pivot 64. The adjusting pin 62 is pivoted to said finger by a pivot bolt 70 which is preferably parallel to the axis of the pivot 64. It is evident that the adjusting pin 62 may be moved lengthwise to effect angular movement of the carrier 66 about the pivot 64 and the angular adjustment of the face-guide 42 and edge-gage 44 is thereby effected. The upper end of the pin 62 passes through a freely rotatable stud 72. A set screw 74 screws into the end of the stud 72 so as to engage the pin 62 to secure it in adjusted position.

A preferred form of the face-guide and the edge-gage are shown in perspective in Fig. 5 and in section in Fig. 6. The face-guide is movable lengthwise of the bifurcation of the carrier 66, as previously described. A set screw 76 threading into the body portion of the face-guide has a washer 78 which bears against the outer faces of the arms produced by the bifurcation of the carrier. By screwing up said set screw, the face-guide may be secured in adjusted position on the carrier. The edge-gage 44 rests upon and is movable on a seat 80 formed on the upper portion of the face-guide. A screw 82 is threaded into the upper portion of the face-guide and is rotatably connected to the edge-gage by the collar 84. By turning said screw the edge-gage may be moved in and out with relation to the face-guide to accommodate soles of different thicknesses. A screw 86 also extends through the upper portion of the face-guide and is threaded into a relatively thin portion 88 formed by splitting said upper portion. By turning the screw 86 the thin portion 88 may be drawn down so as to pinch the screw 82 and secure the edge-gage in adjusted position. The edge-gage is provided with a projecting lip 90 having a comparatively thin edge which engages the stock, as shown in Fig. 6, to prevent the same from being drawn away from the face-guide by the cutter.

It will be apparent that the above-described device comprises a number of effective adjustments. The cutting blades may be readily adjusted inwardly and outwardly in order to regulate the amount which they project beyond the cutter head by loosening the screws 22. The face-guide and edge-gage may be moved toward and from the cutters in order to determine the depth to which the cutters are to penetrate the sole by moving the split sleeve 56 axially on the stud 46. The edge-gage may be moved lengthwise of the carrier 66 in order to determine the width of the area to be cut by the cutting blades by loosening the screw 76 and moving said edge-gage and face-guide to the desired position. The edge-gage may be moved inwardly or outwardly relatively to the face-guide in order to accommodate soles of different thicknesses by loosening the screw 86 and turning the screw 82. The face-guide and edge-gage may be given any desired angular relation to the cutters in order to determine the angle at which the cutter blades are to act upon the work by loosening the set screw 74 and moving the adjusting pin 62 longitudinally to rock the carrier 66 on its pivot 64 to the desired position. It is obvious that the operation of shank-reducing as illustrated in Fig. 7 is but one of the operations which may be performed with the machine shown in the drawings. For instance, by turning the sole all the way around with its edge in contact with the edge-gage 44 the sole will be feather-edged all the way around, or if desired it may be feather-edged around the toe portion only from one side of the shank to the other.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A feather-edging machine having, in combination, a cutter; work-controlling devices constructed and arranged for presenting soles at different angles to be feather-edged and for supporting the part being feather-edged against the face of the cutter; and means for causing the cutter to act upon the work.

2. A feather-edging machine having, in combination, a cutter; work-controlling devices; means for adjusting the work-controlling devices in different relations to the cutter for independently varying the angle and depth of the feather-edging produced;

and means for causing the cutter to act upon work which is in engagement with the work-controlling devices.

3. A feather-edging machine having, in combination, a cutter; work-controlling devices comprising a face-guide; means for adjusting the face-guide in different angular relations to the cutter for feather-edging at different angles; means for adjusting the face-guide toward or from the cutter to feather edge at different depths without changing the angular relation of said face-guide to the cutter; and means for causing the cutter to act upon the work.

4. A feather-edging machine having, in combination, a cutter; work-controlling devices comprising a face-guide; a pivoted carrier for the face-guide; a gage to determine the width of the area to be cut; means for rocking the carrier on its pivot for adjusting the face-guide in different angular relations to the cutter so as to feather-edge at different angles; and means for causing the cutter to act upon the work.

5. A feather-edging machine having, in combination, a rotary cutter; work-controlling devices including a gage to determine the width of the area to be cut; means for adjusting the work-controlling devices angularly in a plane parallel to the axis of the rotary cutter; and means for causing the cutter to act upon the work.

6. A feather-edging machine having, in combination, a cutter; work-controlling devices constructed and arranged for presenting soles at different angles to be feather-edged; means for adjusting the work-controlling devices to determine the depth to which the cutter shall penetrate the work; and means for causing the cutter to act upon the work.

7. A feather-edging machine having, in combination, a cutter; work-controlling devices comprising a face-guide and an edge-gage; means for moving the face-guide and edge-gage simultaneously toward or from the cutter for feather-edging at different angles; and means for causing the cutter to act upon the work.

8. A feather-edging machine having in combination a cutter, work controlling devices arranged to support the work against the thrust of the cutter and including means for rigidly supporting the work at different angles, a carrier for the work controlling devices, said carrier being bodily movable toward and from the cutter, and means for causing the cutter to act upon the work.

9. A feather-edging machine having, in combination, a cutter; work-controlling devices constructed and arranged for feather-edging at different angles; means for adjusting the work-controlling devices to determine the depth to which the cutter shall penetrate the work; means for adjusting the work-controlling devices to determine the width of the area of the work which shall be acted upon by the cutter; and means for causing the cutter to act upon the work.

10. A feather-edging machine having, in combination, a cutter; means for causing the cutter to act upon the work; work-controlling devices constructed and arranged for feather-edging at different angles; and means for determining the width of the portion to be feather-edged.

11. A feather-edging machine having, in combination, a cutter; work-controlling devices comprising an edge-gage and a face-guide, said edge-gage being arranged for movement independently of the face-guide for accommodating work of different thicknesses, and said edge-gage and face-guide being arranged to be moved together for determining the width of the feather-edged area, the depth to which the cutter shall penetrate and the angle at which the work shall be feather-edged; adjusting devices for effecting the said movements; and means for causing the cutter to act upon the work.

12. A feather-edging machine having, in combination, a cutter; an edge-gage; a face-guide, said edge-gage and face-guide being arranged to be movable concurrently for determining the depth and the angle at which the cutter shall act upon the work; and means for causing the cutter to act upon the work.

13. A feather-edging machine having, in combination, a cutter; work-controlling devices, comprising a face-guide; an edge-gage associated with said face-guide; a pivoted carrier for said guide and gage; an adjusting pin connected to said carrier for adjusting the latter for feather-edging at different angles; a support to which said carrier is pivoted, said support being movable toward and from the cutter, and being rotatable in a plane substantially perpendicular to the plane of movement of the carrier on its pivot; and means for causing the cutter to act upon the work.

14. A feather-edging machine having, in combination, a rotary cutter; work-controlling means for presenting work to the action of the cutter and arranged to support the work against the face of the cutter; a pivotal support for the work-controlling means which permits angular adjustment of the latter relative to the cutter; means for adjusting said pivotal support and means for causing the cutter to act upon the work.

15. A feather-edging machine having, in combination, a cutter-head provided with slits in its outer face; cutting blades diagonally mounted on said cutter-head and having cutting edges extending through said slits; guards on the periphery of said cutter-head adjacent to the outer corners of

the cutting edges; and means for actuating said cutter-head.

16. A feather-edging machine having, in combination, a cutter-head; cutting blades mounted thereon having their outer corners removed; guards on the periphery of said cutter-head having portions extending into the spaces left by removing the corners of said cutting edges; and means for actuating said cutter-head.

17. A feather-edging machine having, in combination, a cutter; a face-guide; an edge-gage; a lip on said edge-gage arranged to prevent the cutter from drawing the work away from the face-guide; and means for actuating said cutter.

18. A feather-edging machine having, in combination, a cutter; work-controlling devices comprising a face-guide and an edge-gage; means for moving the face-guide and edge-gage simultaneously toward or from the cutter for feather-edging at different angles; means for moving the face-guide and edge-gage simultaneously to change the width of the area acted upon by the cutter; and means for causing the cutter to act upon the work.

19. A feather-edging machine having in combination a cutter, work controlling devices constructed and arranged for rigidly supporting the part being feather-edged against the face of the cutter at a given angle, means for varying said angle, and means for causing the cutter to act upon the work.

20. A feather-edging machine having in combination a cutter head comprising a frusto-conical portion provided with slits, cutting blades extending through said slits and having their cutting edges arranged obliquely with respect to the elements of said frusto-conical portion, and means for rotating said cutter head.

21. A machine for feather-edging a sole having in combination a rotary cutter head, a face guide for rigidly supporting the sole, a pivot at right angles to the axis of the cutter head about which the face guide is angularly adjustable, and means for holding said face guide in adjusted position.

22. A machine for feather-edging a sole having in combination a rotary cutter head, a face guide for rigidly supporting the sole, a pivot at right angles to the axis of the cutter head about which the face guide is angularly adjustable, means for holding said face guide in adjusted position, and an edge guide adjustable longitudinally of said face guide.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN N. BUSELL.

Witnesses:

JOHN H. RUCKMAN,

FREDERICK L. EDMONDS.