

J. N. BUSELL.
 MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.
 APPLICATION FILED JULY 3, 1908.

961,752.

Patented June 21, 1910.

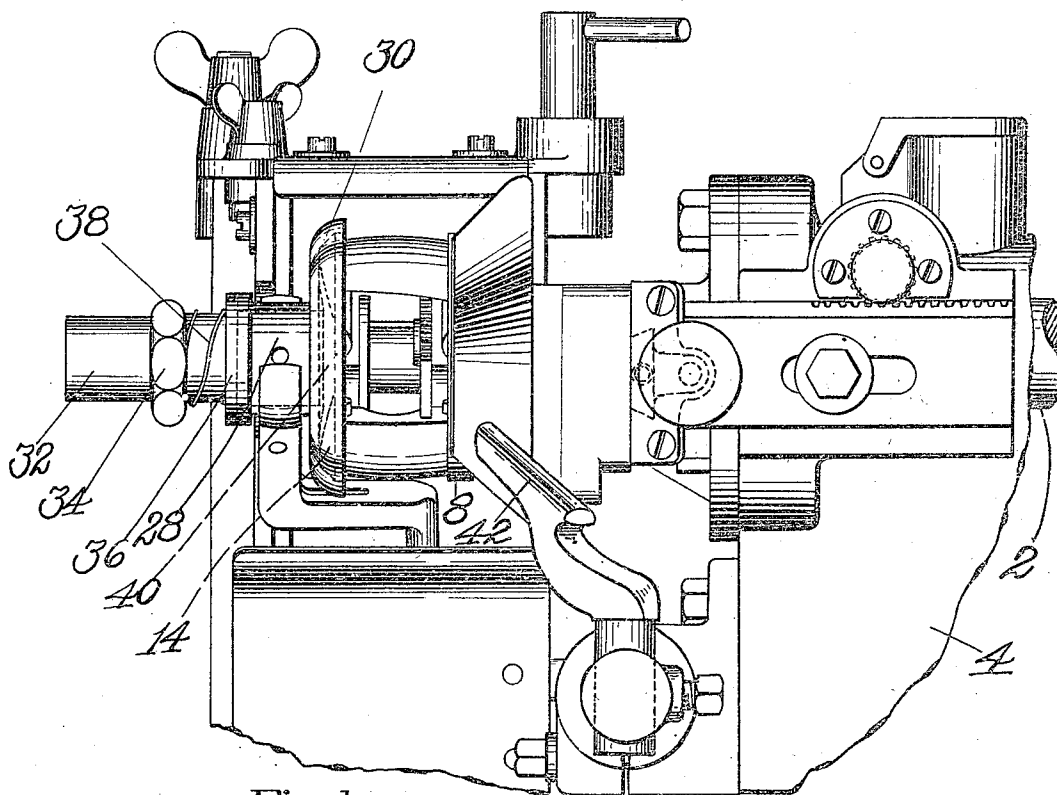


Fig. 1.

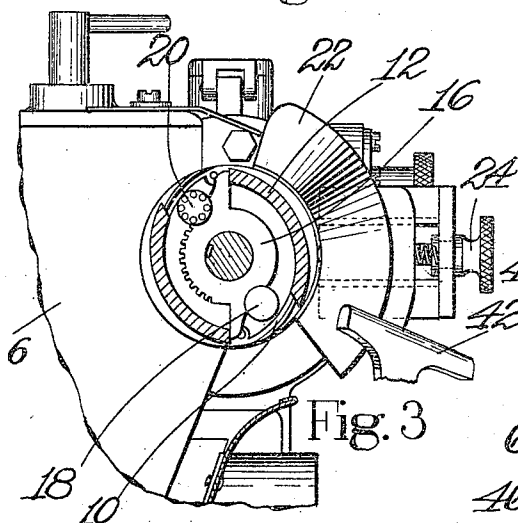


Fig. 3.

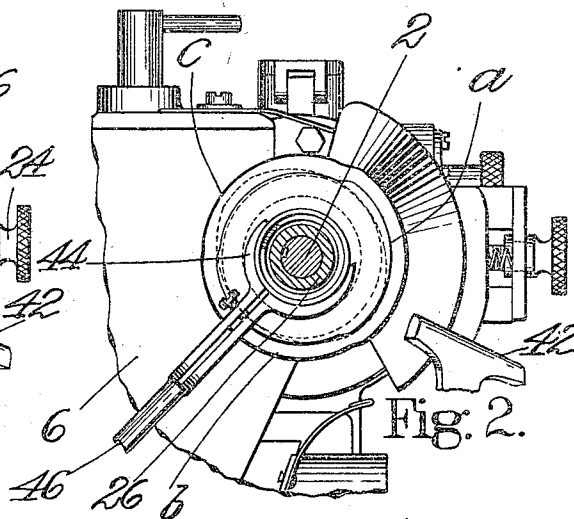


Fig. 2.

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MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.

961,752.

Specification of Letters Patent. Patented June 21, 1910.

Application filed July 3, 1908. Serial No. 441,845.

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 Machines for Use in the Manufacture of Boots and Shoes, 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 machines for trimming boots and shoes, and particularly to heel trimming machines which employ a rotary cutter having at one end a heel rest and at the other end a guard for the counter or upper of the boot or shoe to which the heel to be trimmed is attached.

A heel trimming machine having a rotary cutter of the type just described is illustrated in U. S. Letters Patent to O. L. Noble, No. 543,349, granted July 23, 1895, for improvements in heel trimming machines, and an object of the invention is to improve and simplify the construction of heel trimming machines of the type disclosed in the said patent. Many machines of the type disclosed in said patent which are in commercial use have a rest at one end of the cutter for the top lift of the heel, and a circular guard for the upper or counter at the other end of the cutter, this guard usually fitting close in to the path of the cutter and being held against movement longitudinally of the cutter shaft. Sometimes the counter or upper guard is left somewhat loose, so that the cutter head may adapt itself to heels of varying height in different parts, but this is usually objectionable since it causes "chattering" of the trimming machine when in operation and also causes a rapid wearing out of the parts which tends to increase the chattering.

Another object of the present invention therefore is to provide a cutter head having a counter or upper guard which will adapt itself automatically to the varying heights in different parts of the heel being trimmed and yet which will not be loose and will not chatter or cause wear when the machine is

running at the high speeds at which such machines are usually designed to run.

A further object of the invention is the provision of a cutter head for a heel trimming machine, in which means is provided for varying the depth of the cut without varying the adjustment of the knives with respect to the upper or counter guard. To this end a counter or upper guard is provided having bearing portions at different distances from the center of rotation, each of the bearing portions being concentric with said center, said guard being adjustable about the cutter shaft to bring different bearing portions into operative relation to the work.

With the foregoing and other objects in view, the invention is herein shown as embodied in a cutter head of the general type of that disclosed in the above-identified patent, in which there are outer and inner rib-carrying plates between which the cutters are adjustably confined, the outer rib-carrying plate being provided with a hub upon which the upper or counter guard is mounted. In the illustrated construction the nut which confines the upper or counter guard upon the hub of the outer rib-carrying plate is threaded upon the cutter shaft, as in the construction now in common use, but the polygonal flange used in turning the nut upon the shaft instead of being placed at one end of the nut, as in the present construction, is placed between the ends of the nut, and preferably nearer one end than the other for a purpose hereinafter set forth.

The cylindrical portions of the nut just described are turned to the same diameter as the hub of the outer rib-carrying plate, and the upper or counter guard is confined upon said hub yieldingly in contact with the outer surface of said rib-carrying plate by a spring which bears at one end against the polygonal flange upon said nut, and at its other end is received in an annular socket in the hub of the said guard.

It will be seen that in the just-described construction the guard is free to slide over the cylindrical portion of the nut against the tension of its confining spring and that therefore during the trimming operation it

will readily adjust itself to variations in the height of the heel being trimmed. Furthermore, the spring keeps the parts yieldingly in contact with each other and therefore prevents the objectionable chattering hereinbefore referred to, this tendency of the guard to shake or chatter upon its support being further overcome in the illustrated construction by providing a bulge upon its inner face about the hub-receiving opening which enters a corresponding recess in the outer face of the rib-carrying plate. As above suggested, the cylindrical portions of the guard confining nut which lie outside the polygonal flange are of unequal length and the nut is preferably threaded throughout its length, so that it may be reversed to provide a longer range of movement for the upper or counter guard when operating upon shoes having a great variation in height at different parts, and also to vary the tension of the guard confining spring.

Another feature of the present invention to be found in the illustrated construction is the provision of an outer rib-carrying plate which is turned off back of the cutting edges of the cutters, so that the circumferential surfaces of said plate behind the cutting edges of the cutters are substantially concentric with the cutter holding ribs. This feature of the invention contributes much to the smoothness of operation of this machine, especially when trimming heels which are attached to heel seats that project considerably beyond the counter portion of the shoe. In the earlier constructions in which these outer surfaces of the rib-carrying plate are made concentric with the axis of rotation, these surfaces rub against the projecting sole as it is being trimmed and prevent the operator from holding the work steady during the trimming operation.

In the accompanying drawings,—Figure 1 is a front elevation of a portion of a heel trimming machine showing a cutter head embodying the invention of this application; Fig. 2 is an end view, partly in section, of the cutter head shown in Fig. 1, and Fig. 3 is a transverse section of said cutter head.

The cutter carrying shaft 2 is mounted in suitable bearings formed in the base or standard 4, a blower pipe 6 opening behind the cutter to receive the dust formed during the trimming operation. The cutter head comprises an inner ribbed plate 8 having formed upon it eccentric ribs 10 which enter grooves in the edges of cutters 12 and an outer ribbed plate 14 having ribs similar to those upon the plate 8.

A stop plate 16 held against the rib-carrying plate 8 by the headed pin 18 has portions bearing against the rear ends of the cutters 12 and is provided with a segment gear with which meshes a barrel pinion 20 by which the stop plate may be turned to

adjust the cutters as the cutting edges become worn. A rest 22 for the top lift is adjustable toward and from the axis of the cutter by a screw 24. The parts just described with the exception of certain features of the outer rib-carrying plate 14 are substantially the same as those in machines now in use and form no part of the present invention *per se*.

The outer rib-carrying plate 14 is provided with a hub 26 upon which is mounted a hub 28 of the upper or counter guard 30. The end of the shaft 2 upon which the cutter head is mounted is reduced and threaded, and screwed upon this threaded end of the shaft into engagement with the end of the hub of the outer rib-carrying plate 14 is a nut 32 having between its ends a polygonal flange 34 by which it may be turned when being turned on or off the shaft.

The cylindrical portions of the nut 32, as hereinbefore suggested, are of the same diameter as the hub 26 of the rib-carrying plate 14 and confined between the flange 34 of the nut 32 and an annular socket 36 upon the hub 28 of the guard 30 is a spring 38 which holds the guard 30 yieldingly in contact with the outer face of the plate 14. The outer face of the plate 14 is recessed, and a bulge or boss 40 upon the inner face of the guard 30 enters this recess in the plate 14 and helps to prevent lateral and tipping movements of the guard 30 during the operation of the machine and the chattering incident to such movements.

It will be noted from an inspection of Fig. 1 that the upper or counter engaging surface of the guard 30 projects over the periphery of the rib-carrying plate 14. When, however, the heel being trimmed is of a height between its tread face and rand crease greater than the distance between the top lift rest 22 and the inner edge of the guard plate 30 the guard plate 30 will be forced outwardly against the tension of the spring 38 and permit the cutters to operate upon the heel to their full effective width. If the movement provided for upon the cylindrical portion of the nut 32, shown in engagement with the hub 26 in Fig. 1, is not sufficient to let the guard accommodate itself to the extreme variations in the heights of the heels being trimmed, the nut 32 may be reversed and the longer cylindrical portion brought into engagement with the hub 26, whereby a greater movement longitudinally of the shaft will be permitted to the guard 30.

As hereinbefore pointed out, the cutters 12 may be adjusted by turning the stop plate 16 both to compensate for wear and to vary the depth of cut, but it is sometimes desirable to have means for varying the depth of the cut, especially in the region of the heel seat, in a manner which does not involve adjustment of the cutters and, therefore, the

present invention aims to provide means for readily varying the distance that the upper or counter is held away from the path of the cutters. In its illustrated embodiment this means comprises a counter or upper guard having formed upon it operating surfaces at different distances from the axis of rotation of the cutter head, these surfaces being preferably concentric with said axis of rotation. Inasmuch as the arc of the path of travel of the cutters into which the heel to be trimmed is brought rarely, if ever, exceeds 120° , three operating surfaces at different distances from said path of rotation of the cutters may conveniently be formed upon the upper or counter guard, and three such surfaces are shown at *a*, *b* and *c* in Fig. 2.

To maintain the desired operating surface of the guard 30 in proper relation to the work rest 42, the hub 28 of said guard is provided with three holes, one for each operating surface, and a pin carried upon one of the jaws of a clamp member 44 is arranged to enter one of these holes in accordance with the depth of cut desired, the stem 46 of said clamp member extending back into the blower pipe and by its weight and its position in said pipe holding the guard 30 in its adjusted position.

It will be seen that when the guard 30 is moved outwardly by the work, as a wider portion of the work comes into operative relation to the cutters, it uncovers the peripheral surface of the rib-carrying plate 14 and to prevent rubbing of this surface against the work, especially when operating upon heels attached to shoes having projecting heel seat portions of the soles, the said surface of the plate is cut down until it is substantially concentric with the ribs and with the surface of the cutters. In other words, the surface is backed off behind the cutting edges of the cutters.

It will be noted that the provision of a counter guard having stepped concentric bearing surfaces adjustable about the axis of rotation of the cutter to bring different surfaces into operative relation to the work has an advantage over other constructions intended to effect such an adjustment in that the whole bearing surface against which the work is pressed during the trimming operation is at a uniform distance from the path of travel of the cutting edges of the cutter.

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

1. A machine of the class described, having in combination, a rotary cutter and a concentrically stepped counter guard therefor adjustable about the axis of rotation of said cutter to bring different steps into operative relation to the work.

2. A machine of the class described, having in combination, a rotary cutter and a concentrically stepped counter guard therefor adjustable about the axis of rotation of said cutter to bring different steps into operative relation to the work, and means for holding said guard in adjusted position.

3. A machine of the class described, having in combination, a rotary cutter and a concentrically stepped counter guard therefor adjustable about the axis of rotation of said cutter to bring different steps into operative relation to the work, and yieldingly movable longitudinally of the axis of said cutter to accommodate itself to work of varying width.

4. A machine of the class described, having in combination, a rotary cutter, a concentrically stepped counter guard therefor adjustable about the axis of rotation of said cutter to bring different steps into operative relation to the work, and movable longitudinally of the axis of said cutter to accommodate itself to work of varying width, and means for confining said guard in its adjusted position about the cutter, said means permitting free movement of said guard longitudinally of the axis of said cutter.

5. A machine of the class described, having in combination, a rotary cutter provided with a hub and a concentrically stepped counter guard yieldingly confined upon said hub whereby it may move longitudinally of the axis of rotation of said cutter to accommodate itself to work of varying width.

6. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter provided with a hub to slide longitudinally thereof, a counter guard mounted upon said hub, means for confining said cutter and said guard on said shaft comprising a flanged nut screwed upon said shaft and engaging the end of said hub, and a spring surrounding said nut and confined between the flange of said nut and said counter guard.

7. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter and a counter guard, means for confining said guard and said cutter upon said shaft comprising a flanged nut screwed upon said shaft and having a cylindrical portion over which said guard is adapted to slide and a spring confined between said guard and the flange of said nut.

8. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter and a counter guard, means for confining said cutter and guard upon said shaft comprising a cylindrical nut screwed upon said shaft and having a flange intermediate its ends, said flange being nearer one end of the nut than the other and a spring confined between the flange on said nut and said counter guard, said counter

guard being slidable over the cylindrical portion of said nut longitudinally of said shaft and said nut being reversible to vary both the tension of the spring and the length of movement of said guard.

9. A machine of the class described, having in combination, a cutter head comprising opposed ribbed cutter-carrying plates and eccentric cutters confined between said plates, one of said plates being backed off behind the cutting edges of said cutters.

10. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter and a counter guard, said cutter being provided with a hub over which a similar hub on said counter guard is slipped, said cutter and guard being provided on their adjacent faces with cooperating inclined bearing-increasing surfaces.

11. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter mounted upon said shaft, and a counter guard normally held in contact

with the outer face of said cutter, one of said last-named two parts being provided on its face adjacent to the other with a recess adapted to receive a correspondingly shaped enlargement upon the adjacent face of the other part.

12. A machine of the class described, having in combination, a cutter carrying shaft, a rotary cutter mounted upon said shaft and a counter guard normally held in contact with the outer face of said cutter, one of said last-named two parts being provided on its face adjacent to the other with an inclined walled recess adapted to receive a correspondingly shaped enlargement upon the adjacent face of the other part.

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

JOHN N. BUSELL.

Witnesses:

MARIE L. STEUTERMANN,
EDITH C. HOLBROOK.

It is hereby certified that in Letters Patent No. 961,752, granted June 21, 1910, upon the application of John N. Busell, of Boston, Massachusetts, for "Machines for Use in the Manufacture of Boots and Shoes," an error appears in the printed specification requiring correction, as follows: Page 3, lines 103-104, the words "to slide longitudinally thereof" should be stricken out and inserted after the word "hub," line 105, same page; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of August, A. D., 1910.

[SEAL.]

F. A. TENNANT,

Acting Commissioner of Patents.