

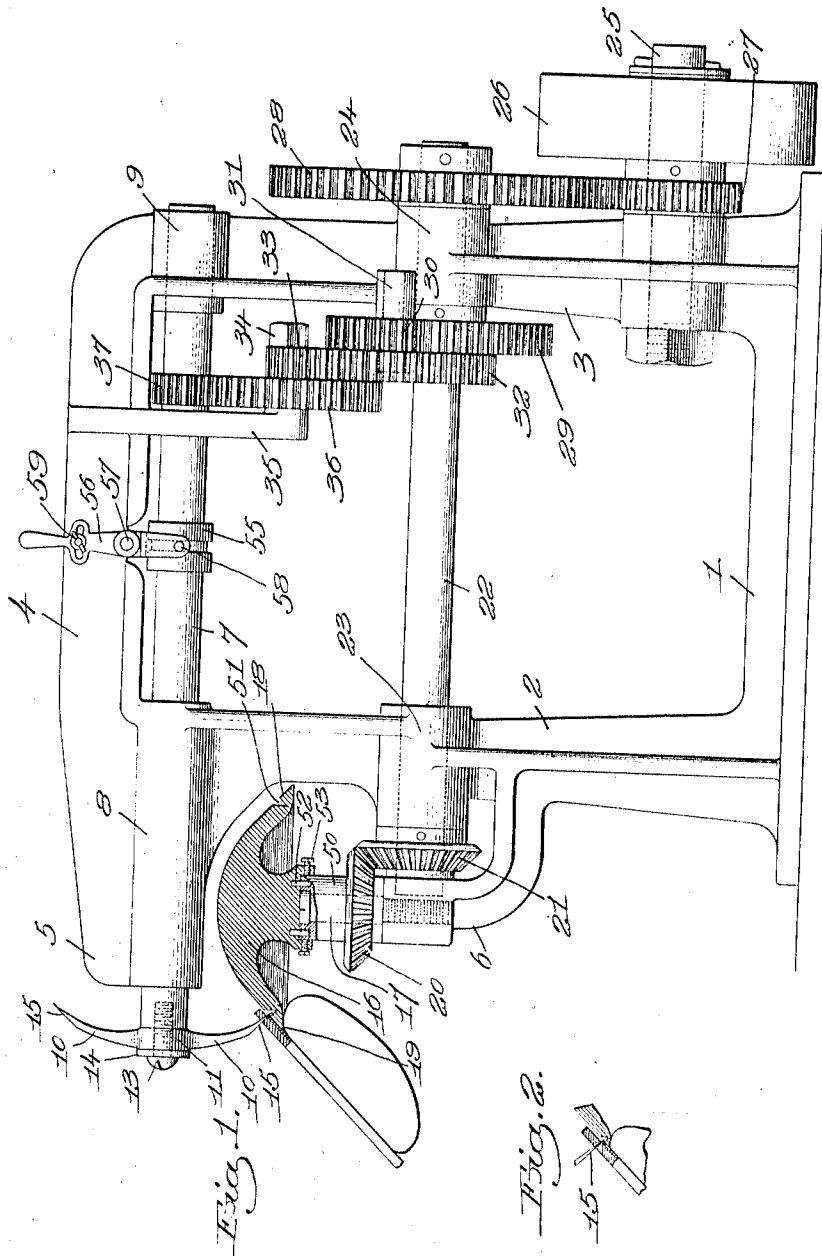
G. W. CARTER.
SOLE ROUNDING MACHINE.

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1,061,356.

Patented May 13, 1913.

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UNITED STATES PATENT OFFICE.

GEORGE W. CARTER, OF NORWAY, MAINE.

SOLE-ROUNDING MACHINE.

1,061,356.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed July 31, 1911, Serial No. 641,395. Renewed October 7, 1912. Serial No. 724,438.

To all whom it may concern:

Be it known that I, GEORGE W. CARTER, a citizen of the United States, residing at Norway, county of Oxford, State of Maine, have invented an Improvement in Sole-Rounding Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a machine for rounding the soles of boots and shoes, and is designed to provide a device by means of which all styles of shoes may be speedily and accurately rounded by a continuous process to leave the edge in a smooth and even condition.

An essential feature of the invention resides in the rotary cutter which presents a knife, and preferably a plurality of such knives, projecting radially from the axis of rotation with the effective portion or cutting edge of each knife moving in a conical path having its axis coincident with the axis of rotation. The angle of this conical path is such as to enable the knives, when the sole is supported at right angles to, and exteriorly of, the said conical path at one point, to sever the margin from the sole throughout the entire periphery thereof, and is consequently governed by the degree of curvature of the reëntrant portions of the sole at the shank of the shoe. In practice an angle of about 45 degrees will be found satisfactory.

A novel feature of the invention resides in the rest for sustaining and guiding the margin of the sole to present the sole to the cutting knives at right angles to the cutting edge so that the edge of the sole will be trimmed at right angles to the bottom or surface of the sole. To secure this result a circular and preferably a rotary rest is provided. In order to present a machine of compact design it will be found preferable to form this rest with its supporting portion on the surface of a cone having its axis coincident with the axis of rotation of the rest, and the angle of the cone will prefer-

ably be an angle of 45 degrees when a similar angle is employed in the cutter.

The invention also provides means for adjusting the relation of the cutter and the rest to control the amount of margin cut from the sole.

The nature of the invention will more fully appear from the accompanying description and drawings, and will be particularly pointed out in the claims.

The drawings illustrate a preferred form of machine embodying the invention, but it is obvious that the invention may reside in other forms of structure, and the details may be varied materially without departing from the invention.

In the drawings Figure 1 is a side elevation of the machine with the rotary rest shown in vertical cross section. Fig. 2 is a detail view showing the rest for a closer cut. Fig. 3 is a front end elevation of the machine. Fig. 4 is a plan view of the rest with the sole of the shoe located in relation thereto during the operation of rounding.

The machine illustrated comprises a suitable supporting frame with the rotary cutter and the rotary rest shown as supported on shafts extending from the cutter and the rest relatively toward the base of the conical paths traversed by their effective portions, and with each of the said conical paths having an angle of 45 degrees and arranged at right angles to each other, but it is obvious that the invention is not limited to this arrangement, which is simply shown as the preferred form and presenting the most compact design. The machine illustrated also shows the rest as positively rotated, although this, while preferred, is not essential, and it also shows a system of gearing by means of which the cutter and rest are driven at a desired relative speed, but it is obvious that other means may be employed for securing the desired rotation of these elements, the particular means employed therefor forming no part of the present invention.

In the form illustrated the frame of the machine is shown as comprising a base 1

and extending upward therefrom the up-
rights 2 and 3 connected at the top by the
cross bar 4 extending at its forward end 5
to present an overhanging arm. There is
5 also extended from the upright 2 beneath the
overhanging arm 5 a bracket 6. The cutter
shaft 7 is mounted in alined bearings 8 and
9 formed respectively on the overhanging
arm 5 and the upright 3. The cutter is se-
10 cured to the forward projecting end of the
cutter shaft 7 and comprises preferably a
plurality of knives, two being shown at 10.
These knives project radially from the shaft
7 and are shown as formed integral with a
15 hub 11 secured to the end of the shaft by a
screw 13 and washer 14. The effective por-
tion 15 of these knives on which the cutting
edge is formed lies in the surface of an
imaginary cone having its axis coincident
20 with the axis of the shaft 7, and the angle
of this cone, that is the angle between an
element thereof and its axis, is shown as 45
degrees. It will thus be seen that when the
sole of a shoe is presented to the cutting
25 knives at right angles to the surface of the
conical path in which the effective portions
of the knives travel, or at right angles to
the cutting edges of the knives at a given
point, the sole may be guided past the knives
30 while rotating and enable the knives to sever
the margin of the sole by a cut at right
angles to the bottom or surface of the sole
throughout the entire periphery of the sole
including the reentrant portions of the
35 shank.

In order to support the sole in proper
position with respect to the path of the
knives the supporting portion of the rest
must lie at right angles to the path of the
40 knives. In the form illustrated the rest 16
is shown as an inverted cup-shaped disk
removably secured to a hub 50 which hub
is journaled on a stud 17 secured vertically
in the bracket 6. The effective portion of
45 the rest, that is the annular marginal por-
tion 18 upon which the sole or the margin
of the sole rests, is formed as a conical
surface, the axis of which is coincident with
the axis of rotation of the rest, and the an-
50 gle of which is preferably 45 degrees, or
the same as that of the angle of the rotary
cutter. The central portion of the rest is
rounded or curved preventing interference
with the overhanging arm 5. The extreme
55 outer edge of the rest is finished to an acute
angle 19 and fits in against the line of jun-
cture of the upper with the welt, and serves
to guide the shoe.

An annular recess 51 is formed in the
60 marginal portion of the rest and the outer
wall of this recess is at right angles to the
surface of the portion 18 and the knives
when in operation enter this recess and co-
operate with the vertical wall thereof to
65 cut the sole. The rest 16 is removably se-

cured to the hub 50 so that various sizes of
rests may be used to secure different widths
of margins being removed. A rest for a
closer cut, that is the removal of a wider
margin, is shown in Fig. 2. Any suitable
70 means may be employed for interchange-
ably mounting the rests. Herein dowel pins
52 are employed and set screws 53 passing
through a flange on the rest fitting over the
hub. The hub is shown as provided with a
75 bevel gear 20 driven from a second bevel
gear 21 located at right angles thereto and
mounted upon a shaft 22 journaled in alined
bearings 23 and 24 in the uprights 2 and 3
respectively.

It is preferred that the rest shall rotate
in the direction in which the shoe is being
fed and in the opposite direction to the ro-
tation of the knives as indicated by the ar-
rows in Fig. 4. Each cutter as it revolves
85 into contact with the sole must make but
a small cut in order that the surface of
the sole shall be smooth and even, and hence
the cutter must rotate at a high rate of
speed as compared with the rotation of the
90 rest, the exact amount of relative rotation
being governed by the amount which it is
desired each cutter shall cut. In the con-
struction illustrated the cutter shaft is shown
as revolving 144 times to each revolution
95 of the rest, and this is secured by inter-
mediate gearing between the shaft 22 for
driving the rest and the shaft 7 for driving
the cutters. A stud shaft 25 is mounted
in the base of the upright 3 and carries
100 thereon a pulley 26 driven from any suit-
able source of power. A pinion 27 on the
stud shaft 25 drives directly a gear 28 on
the rest shaft 22. A gear 29 on the rest
shaft drives a pinion 30 on a stud shaft 31
105 supported in a bracket projecting from the
upright 3, and this shaft in turn carries a
gear 32 which drives a pinion 33 on a sec-
ond stud shaft 34 supported in a bracket
35 projecting from the cross bar 4. A gear
36 carried by the stud shaft 34 drives di-
rectly a pinion 37 fast on the cutter shaft 7.

The cutter shaft 7 is longitudinally ad-
justable so that whatever rest may be em-
ployed the knives may be brought into co-
115 operation with the wall of the recess 51
therein. This adjustment may be secured
in any desired manner. In the construction
shown a grooved collar 55 is secured to the
shaft and a lever 56 is fulcrumed at 57 on
120 the cross bar 4 and carries a stud 58 riding
in the groove of the collar 55. This lever
is locked in any desired position by a set
screw 59 passing through a slot in the lever
into the cross bar 4.

The invention having been described, what
is claimed as new and desired to be secured
by Letters Patent, is:

1. A sole rounding machine comprising a
rest for sustaining and guiding the sole 130

margin, a rotatory cutter knife and means for rotating it in a conical path at right angles to, and having its apex on the same side as, the margin sustaining surface of said rest.

2. A sole rounding machine comprising a rotary circular rest for sustaining and guiding the sole margin, said rest being provided near its periphery with an annular recess having its outer wall perpendicular to the surface of the rest, a rotary cutter moving in a conical path at right angles to said rest and cooperating with the perpendicular wall of said recess to round the sole.

3. A sole rounding machine comprising a rotary cutter moving in a conical path, and a rotary rest moving in a conical path, the said paths intersecting at right angles.

4. A sole rounding machine comprising a rotary cutter comprising a plurality of radial knives, the cutting edges of which lie in a cone having the same axis as the axis of rotation of the cutter, and a rest for sustaining and guiding the sole margin having its supporting surface at right angles to the path of said knives and below the conical apex thereof and on the same side of the rest as the conical apex of the knives' path.

5. A sole rounding machine comprising a rotary cutter comprising a plurality of radial knives, the cutting edges of which lie in a cone having the same axis as the axis of rotation of the cutter, a rotary rest for sustaining and guiding the sole margin having its peripheral surface lying in a cone having the same axis as the axis of rotation of the rest, the conical surface of the rest at its point of cooperation with the knives being located at right angles to the path thereof.

6. A sole rounding machine comprising a cutter supporting shaft and a rotary rest support arranged at right angles to each other, and means for rotating said shaft and support, a rotary cutter comprising a plurality of radial knives mounted on said cutter shaft, the cutting edges of said knives lying in a cone having an angle of 45 degrees and having its axis coincident with that of the cutter shaft, a rest for sustaining and guiding the sole margin mounted on the rest support and having its supporting surface formed as a cone having an angle of 45 degrees, and its axis coincident with the axis of rotation of the rest.

7. A sole rounding machine comprising a cutter supporting shaft and a rotary rest support arranged at right angles to each other, and means for rotating said shaft and support, a rotary cutter comprising a plurality of radial knives mounted on said cutter shaft, the cutting edges of said knives lying in a cone having an angle of 45 degrees

and having its axis coincident with that of the cutter shaft, a rest for sustaining and guiding the sole margin mounted on the rest support and having its supporting surface formed as a cone having an angle of 45 degrees and its axis coincident with the axis of rotation of the rest, the said rest being provided near its periphery with an annular recess with the outer wall of said recess perpendicular to the supporting surface of the rest and cooperating with the knives.

8. A sole rounding machine comprising a rotary cutter having a plurality of radial knives, the cutting edges of which lie in a cone having its axis coincident with the axis of rotation of the cutter, and means for supporting the sole margin in the path of said knives with its supporting surface at right angles thereto and on the same side of said supporting means as the apex of the conical path thereof.

9. A sole rounding machine comprising a rotary cutter having a plurality of radial knives, the cutting edges of which lie in a cone having its axis coincident with the axis of rotation of the cutter, and a rotary rest for supporting the sole margin in the path of said knives with its supporting surface at right angles thereto and on the same side of said supporting rest as the apex of the conical path thereof.

10. A sole rounding machine comprising a rotary cutter having a plurality of radial knives, the cutting edges of which lie in a cone having its axis coincident with the axis of rotation of the cutter, and a rotary rest for supporting the sole margin in the path of said knives and at right angles thereto, said rest having near its periphery an annular recess with the outer wall perpendicular to the supporting surface of the rest and cooperating with the knives to round the sole.

11. A sole rounding machine comprising a cutter shaft and means for rotating it, a plurality of radial knives projecting from said shaft, each knife having its cutting portion lying in a cone having the same axis as the axis of rotation of the shaft whereby the knives are adapted to cut the sole around the reentrant curves of the shank, and a rest for supporting and guiding the sole margin with its supporting surface at right angles to the path of the knives and on the same side of said rest as the apex of the conical path of said knives.

12. A sole rounding machine comprising a cutter shaft and means for rotating it, a plurality of radial knives projecting from said shaft, each knife having its cutting portion lying in a cone having the same axis as the axis of rotation of the shaft whereby the knives are adapted to cut the sole around the reentrant curves of the shank, a rest for

supporting and guiding the sole margin with
its supporting surface at right angles to the
path of the knives and on the same side of
said rest as the apex of the conical path of
5 said knives, and means for rotating said
rest in a direction opposite to that of the ro-
tation of the knives.

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

GEORGE W. CARTER.

Witnesses:

FRANK KIMBALL,
ROLAND G. KIMBALL.