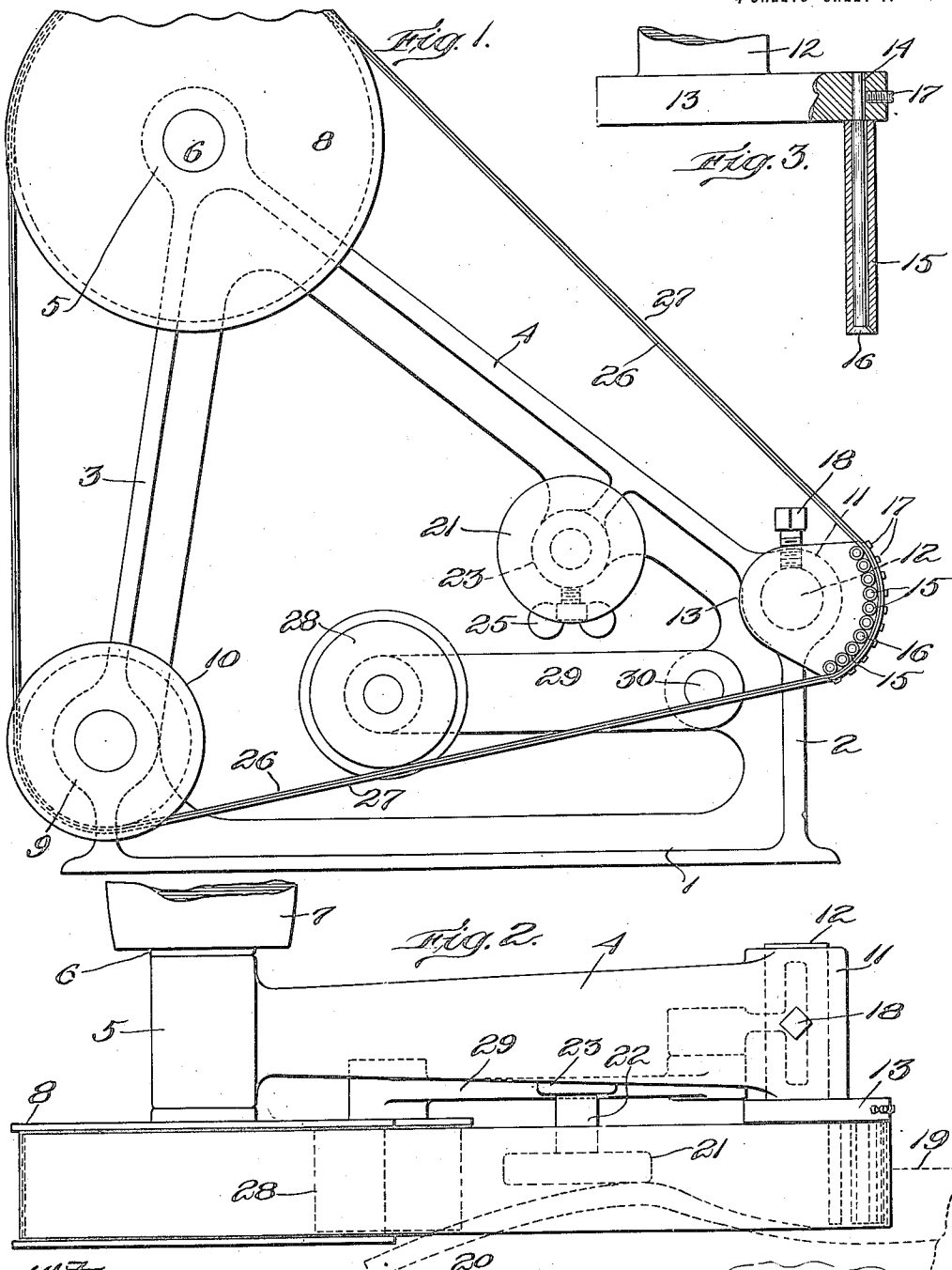


L. G. FREEMAN.
BELT BUFFING OR SCOURING MACHINE.
APPLICATION FILED JUNE 30, 1913.

1,434,334.

Patented Oct. 31, 1922.

4 SHEETS—SHEET 1.



Witnesses:
Edward Maxwell
James R. Holder.

Inventor:
Louis G. Freeman,
by Geo. H. Maxwell atty

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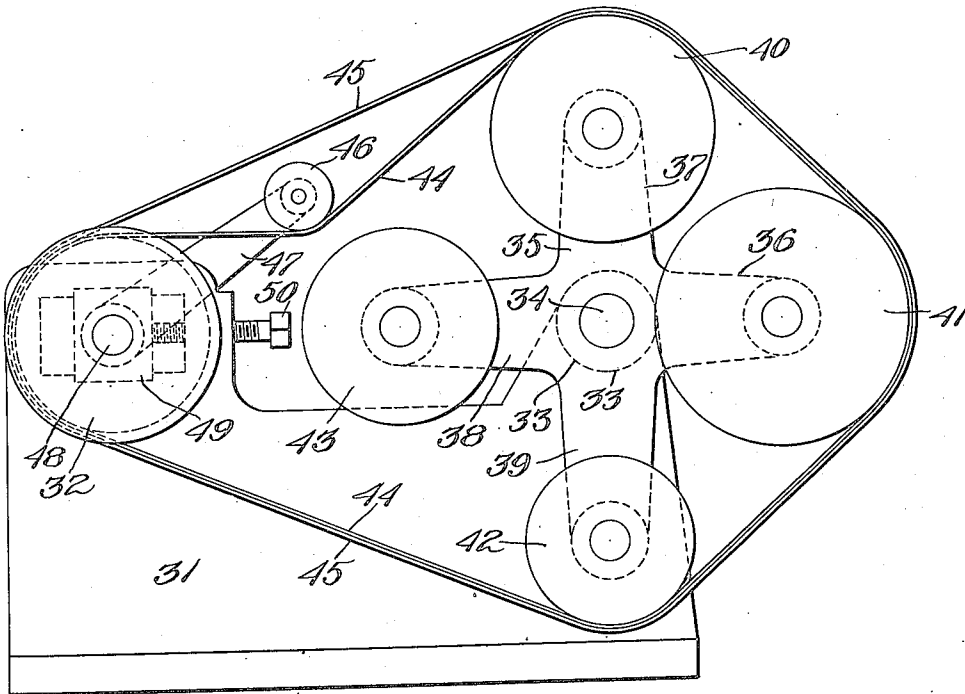


Fig. 4.

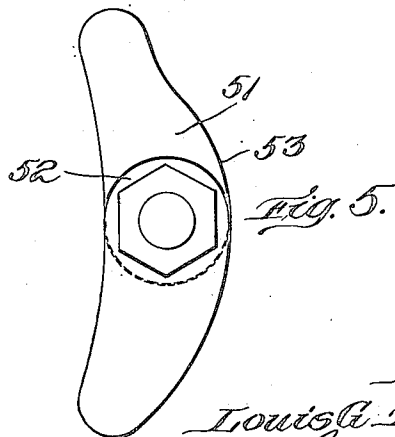


Fig. 5.

Witnesses:

Edward Maxwell

James R. Hodder

Inventor:

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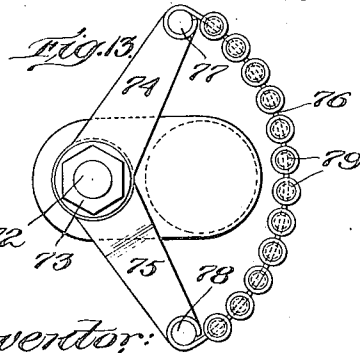
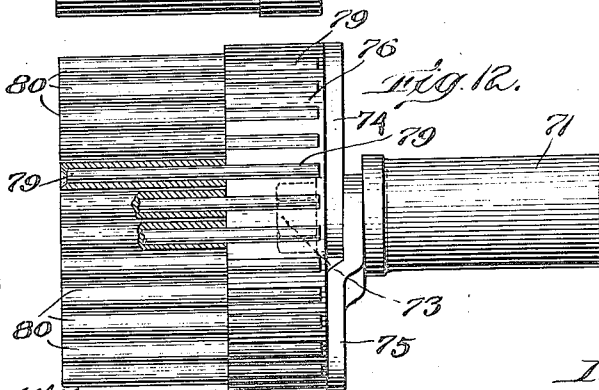
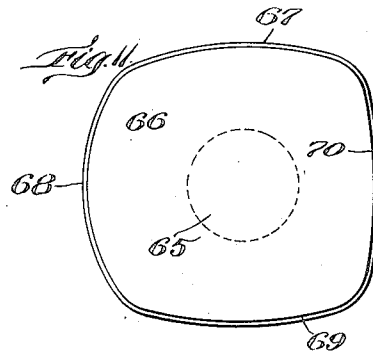
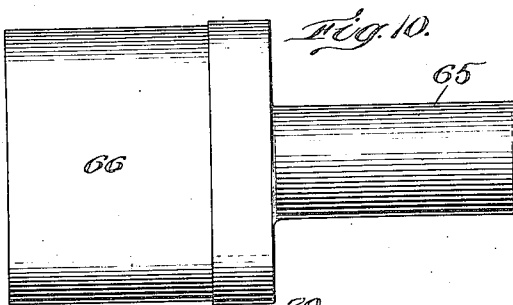
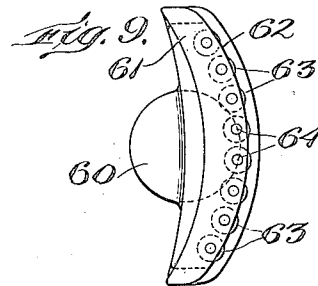
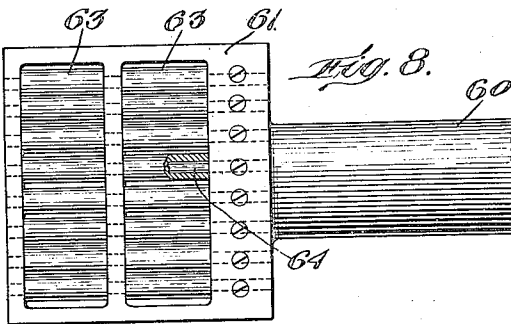
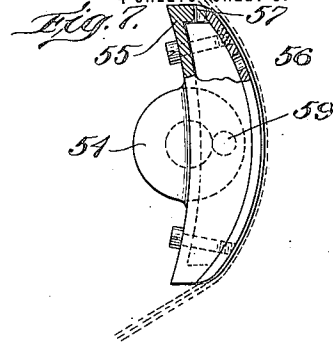
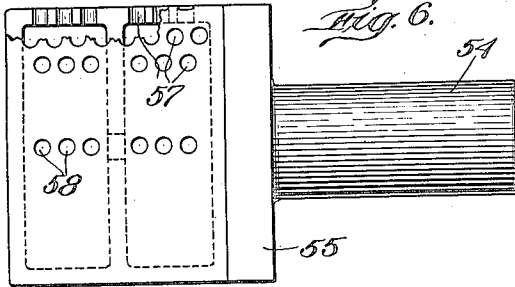
by Geo. H. Maxwell
Att'y.

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4 SHEETS-SHEET 3.



Witnesses:
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James R. Holder.

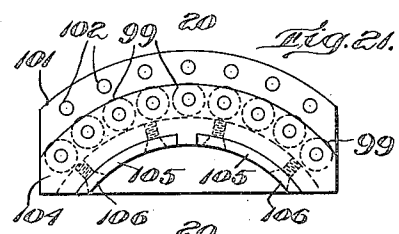
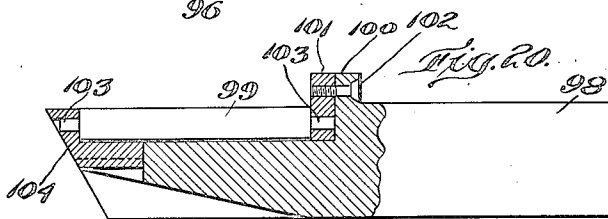
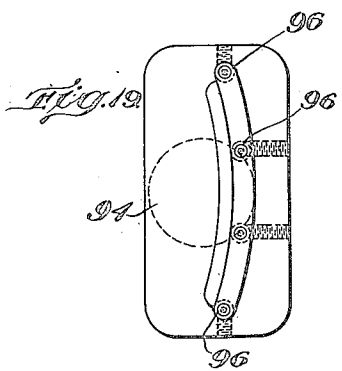
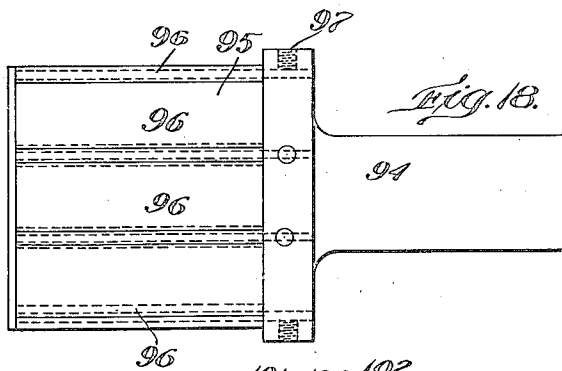
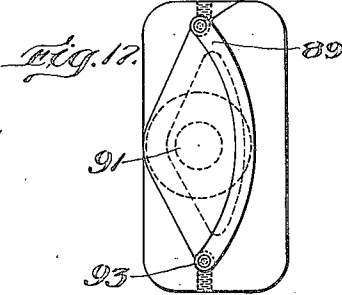
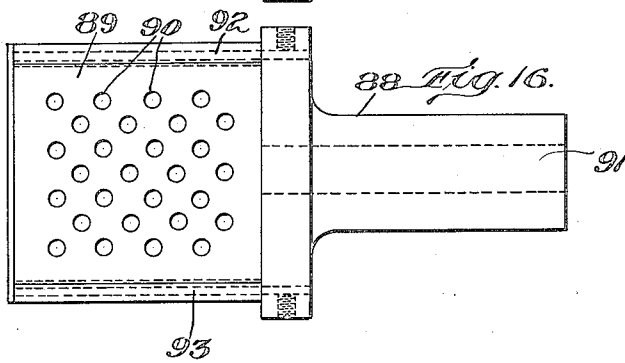
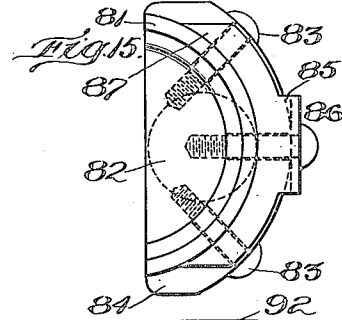
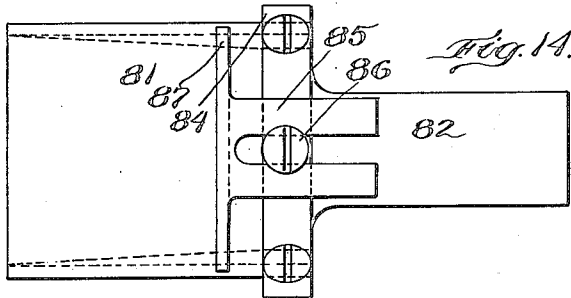
Inventor:
Louis G. Freeman,
by Geo. S. Maxwell, atty.

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4 SHEETS—SHEET 4.



Witnesses:
Edward Maxwell
James R. Hodder

Inventor:
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UNITED STATES PATENT OFFICE.

LOUIS G. FREEMAN, OF CINCINNATI, OHIO, ASSIGNOR TO LOUIS G. FREEMAN AND
CHARLES F. FREEMAN, TRUSTEES, BOTH OF CINCINNATI, OHIO.

BELT BUFFING OR SCOURING MACHINE.

Application filed June 30, 1913. Serial No. 776,520.

To all whom it may concern:

Be it known that I, LOUIS G. FREEMAN, a citizen of the United States, and resident of Cincinnati, county of Hamilton, State of Ohio, have invented an Improvement in Belt Buffing or Scouring Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to buffing, scouring or polishing machines intended for use on boots and shoes, and particularly to a machine employing a continuously operating abrading belt and specially adapted to operate upon the heel breast or inner curved portion of a heel or similar work.

In the manufacture of boots and shoes, it is customary to operate upon the bottom and edge portions of the sole and heel with an abrading or buffing device, to clean or scour the leather and to properly smooth and finish the outer surface thereof. This operation has ordinarily been performed on the bottom of the sole and heel, as well as on the outer edge of the sole and heel, but difficulty has been experienced in scouring, buffing or finishing the heel breast as well as the shank portion of the sole adjacent thereto because of the usual concave formation of this inner edge of the heel. A difficulty in devising a machine for the buffing, scouring or finishing operation just explained, has been in the wide variety of forms of curve in which the heel breast is usually cut.

The object of my present invention is to obviate the difficulties above noted, and to provide a machine which will be peculiarly and specially adapted to scour, buff, polish or finish the heel breast, irrespective of the curve presented by this inner edge of the heel, and to perform this operation without the necessity of manipulation of the shoe by the operator, or at least with a minimum of such hand work, both as to time and character. A still further object of the invention is to provide a machine having a great adaptability to operate on differently formed curves of heel breasts by having means to quickly, rapidly, and effectively adjust the working part of the machine to fit such curves. Preferably I employ a suitable fix-

ture for said working part, which can be easily and quickly adjusted or changed to conform with the style, type or curve of work being operated upon.

It is a further important feature of my present invention to provide means, preferably embodied as a working fixture, or a series of interchangeable working fixtures, or a fixture having capacity for adjustment, so as to conform the working portion of the abrading or buffing belt to fit exactly the curve or arc of the heel breast of a particular type of shoe. My invention, therefore, contemplates means to have the working surface of my fixture fit the arc of any heel breasting knife with substantially the same shape or curve. Still another important and essential feature of the invention is that the fixture carrying the abrading medium may be tapered or narrowed at any desired point, such, for example, as at the outer supporting end, so as to provide suitable clearance for the shank of the shoe and yet will support the extreme outer edge of the abrasive belt, and thereby cause the scouring or buffing of the heel breast right up and into the joint of the heel and sole.

Another object of the invention is to provide a machine utilizing a buffing belt, wherein a belt tightening means is utilized, which will enable the abrading belt to be formed of relatively thin and inexpensive material, and yet will drive said belt under a very considerable tightening strain, without danger of breaking the belt. The machine embodying my present invention, also, is so arranged that the buffing belts are led to and away from the working fixture at appropriate angles to provide ample clearance within the line of travel of the endless belts to permit the forepart of the shoe to be manipulated therein while the heel breast is being operated upon.

While I have described my invention as intended primarily for carrying an abrading or scouring belt, it will of course be understood that a polishing or finishing belt can be utilized in place of the abrading belt for polishing the heel breast in the same manner as the abrading belt operates for scouring and buffing.

Further objects of the invention, details

of construction and novel combinations of parts will be hereinafter more fully pointed out and claimed.

Referring to the drawings, wherein a preferred embodiment of the invention is illustrated,

Fig. 1 is a side view of an abrading machine, showing the double belts, and one form of belt tightener, and a means for determining the operative curve over which the abrading belt runs;

Fig. 2 is a top plan view of the device shown in Fig. 1;

Fig. 3 is an enlarged detail of one of the spindles in the adjustable curved member in the same position as illustrated in Fig. 2;

Fig. 4 is a modified form of my invention, wherein a spider, carrying a plurality of fixtures of different diameters to vary the working curve of the belts, is shown;

Fig. 5 is a view of still another form;

Figs. 6 and 7 show a further modified form of the means to present a working surface over which the belts are drawn;

Figs. 8 and 9, Figs. 10 and 11, and Figs. 12 and 13 show still other modified forms of adjustment for the curved surface over which the belt may be led.

Figs. 14 and 15 show a fixture with an adjustable gage so that buffing belts of different widths may be used; Figs. 16 and 17 illustrate a fixture combining the roller and pneumatic antifriction device; while Figs. 18 and 19 illustrate the combination of rollers and a plain plate; and

Figs. 20 and 21 show a method whereby any fixture may be adapted to operate on inclined or Louis heels.

The machine as illustrated in Fig. 1 is adapted to stand upon a suitable bench or support, being provided with a base 1, carrying standards 2 and 3, preferably formed integrally with said base at either end, and a brace 4 connecting the top portions of the standards 2 and 3, as shown. Formed at the junction of the standard 3 and brace 4 is a journal bearing 5, carrying a shaft 6, having a pulley 7 at one end and a grooved wheel 8 at the other. The pulley 7 is adapted to receive a belt from any suitable source of power to actuate the shaft 6 and wheel 8. Arranged in the lower portion of the standard 3 is a journal bearing 9 in which an idler 10 is mounted in the same vertical plane as the driving wheel 8. At the forward end of the machine, viz, at the right viewing Figs. 1 and 2, is arranged a socket member 11, preferably at the junction of the standard 2 and brace 4, which member is adapted to receive the shank 12 of a plate 13, which plate is herein shown as carrying a plurality of spindles 14, fitted in suitable sockets therefor, arranged in a curved line about the plate 13. Each of these spindles

14 is provided with a loosely rotating sleeve 15 thereon, said sleeve being retained in place by the flaring outer head 16 of the spindles 14. The spindles 14 are each held in the respective socket provided therefor in the plate 13 by means of set screws 17, as clearly shown in Figs. 2 and 3. The entire plate 13 may also be rotated in the socket member 11 as desired, and a set screw 18 threaded through the socket 11 is provided to hold the plate 13 in the desired adjusted position. The sleeves 15 are positioned in the same vertical plane with the driving wheel 8 and the idler 10 (already described) and the abrading belt is led over both idler and driving wheel, and over the series of sleeves 15 constituting the curved working face against which the inner edge of the heel 19 of a shoe 20, as shown in dotted lines in Fig. 2, may be presented by the operator for the scouring, buffing or finishing operation. A guide or sole rest for the shoe 20 is also preferably provided, being shown as a rest 21 secured to a shank 22 which is mounted to slide in a socket 23 carried by the brace 4, a thumb screw 25 being threaded through the socket 23 to hold the shank 22 and rest 21 in any desired position. This guide also enables the operator to use the same as a rest for the forepart of the shoe, enabling the shoe to be held at proper angle and scour the heel breast at practically a single contact.

The construction thus far described constitutes an apparatus on which an abrasive belt may be positioned and run, but I also arrange to use two belts, one 26, of leather, canvas, or thin metal, constituting a conveyor or backing member, and the other 27, of emery paper, sandpaper, or the like, constituting the abrading working surface against which the heel of the shoe is pressed. The advantage incident to utilizing two belts is considerable, as a firm working surface is presented as the belts are run around the spindles 15, enabling the sandpaper to be firmly presented to the work and thus attaining the greatest efficiency during the presentation of the work to the sandpaper. Also the conveyor belt 26 takes the main driving strain, and therefore a high speed can be safely attained by my machine. In order to maintain the belts 26 and 27 under proper tension, I provide a belt tightener 28, in the form of an idler wheel mounted loosely in the end of an arm 29 pivoted at 30 to a portion of the frame suitably formed to receive the same. The weight of the arm 29 and wheel 28 may be of appropriate amount to exert the desired tension on the belts, but of course a spring may be affixed to increase said tension, if desired. The idler 28 is so formed as to bear its weight directly upon the carrying belt 26, and

thereby to put the tension of the belt tightening device upon said carrying belt.

Referring to Fig. 4, a modified form is illustrated, wherein the apparatus is carried by a frame 31, having a driving wheel 32, mounted at the rear of the frame and a journal bearing 33 at the forward end, which bearing carries a shaft 34 on which an arbor or spider 35 is secured. This arbor has a plurality of arms 36, 37, 38, and 39, of varying lengths, each arm carrying at its outer end loosely pivoted fixtures or wheels 40, 41, 42, and 43, respectively, of varying diameters. The carrying and abrading belts 44 and 45 are led around the driving wheel 32, and three of the wheels carried by the arbor 35, all of said wheels being in the same vertical plane with that of the driving pulley 32. Suitable means, as a set screw (not shown) to hold the shaft 34 in any position desired with a wheel, as, for example, 41, in working position, is also provided. The arrangement just described, enables a very quick adjustment, simply by means of rotating the arbor 35, to be made, in order to secure a working surface at the extreme front or right of the machine viewing Fig. 4, which will present a curve suited to the curve of the heel breast to be operated upon, four such curves of different diameters being illustrated by the wheels carried by each of the four arms of the arbor 35. Preferably these arms on the arbor 35 and the wheels carried respectively thereby, are so proportioned, that the same strain is presented to the belt during the partial rotation of the arbor and the adjusting of any one wheel in working position. Therefore the smallest wheel 43 is mounted on the longest arm 38, while the wheel of largest diameter 41, is mounted on the shortest arm 36.

I have also shown in this view a modified form of belt tightener, illustrating the same as an idler 46 pivotally mounted at the outer end of an arm 47, which may be loosely secured on the outer end of the shaft 48 carrying the driving wheel 32. Preferably also the shaft 48 is mounted in a sliding journal box 49, and a thrust screw 50 bearing upon the journal box 49 serves to initially adjust and tighten the entire belts whenever desirable.

Fig. 5 illustrates a plate 51 secured to a shank 52, and presenting a curved working face 53 to fit a heel breast having the ogee curve, such a plate being adapted to be fitted into the socket member 11 of the machine shown in Fig. 1. In some styles of shoes the heel breast is in the form of an ogee curve, and heretofore it has been peculiarly difficult to buff the same, but by means of my machine any desired or special working fixture over which the abrading belt is run, may be utilized, the form shown in

Fig. 5 constituting an example illustrating the wide adaptability of the adjustable feature of my machine.

Figs. 6 and 7 show another form of work member which may be fitted into the socket 11 of the machine shown in Fig. 1, having a shank 54 carrying a hollow member 55 over which the carrying and abrading belts are drawn, the face 56 being in the form of any curve desired. In order to reduce the friction on this type of device I preferably equip the face 56 of the member with a plurality of holes as shown at 57 and 58, and may also supply compressed air through a suitable conduit 59, which air will be forced outwardly through the holes 57 and 58, and thus still further reduce the friction of the belts in their running or sliding across the curved surface 56, thereby forming a thin film of air over which the belts glide. This pneumatic feature is of particular importance, admitting a high speed.

Figs. 8 and 9 show still another form of working member, comprising the shank 60 carrying a frame 61 having a curved outer or working face 62, which framework carries a plurality of rollers 63, each mounted on spindles 64, and having their outer peripheries projecting slightly beyond the curved surface 62, and constituting anti-friction members, as clearly shown in the drawings.

Figs. 10 and 11 illustrate a further modification of work member over which the belt may be drawn, which member is provided with a plurality of different curved surfaces, and which, therefore, may be readily adjusted to present any desired curve as the working surface of the abrading device. This member is also equipped with a shank 65 to be fitted into the socket member 11 of the machine shown in Fig. 1, said shank carrying a bearing portion 66, having a plurality of differently curved parts of its periphery, as illustrated at 67, 68, 69, and 70, either of said peripheral parts being adapted to hold the abrasive belt at a desired working curve to fit the concavity of the particular work in hand.

Figs. 12 and 13 illustrate a still further modified form, wherein a single member is formed in a flexible manner, together with means to adjust said flexible member in any desired curved form. The modification herein shown is also adapted to be fitted to the machine shown in Fig. 1, having a shank 71 to be secured in the socket member 11 there shown. This socket member is formed with an upwardly projecting stud 72, on which is threaded a nut 73. Two arms 74 and 75 are provided with their inner ends bored to fit over the stud 72 and are clamped in any relative radial position desired by tightening the nut 73 threaded on the top of the stud 72. To the outer ends of the

arms 74 and 75 is secured, in any suitable manner, the ends of a flexible metallic strip 76, being here shown as clinched about lugs 77 and 78 formed on the ends of the arms 74 and 75, respectively. This metallic strip 76 is of sufficient strength and thickness, as well as of pliability, to maintain its curved form when the arms 74 and 75 are swung rotatively and fixed in a desired position, thus varying the convexity presented by the outer surface of the strip 76. To the strip 76 are secured a plurality of spindles 79 in any suitable manner, as by riveting, welding, or the like, said spindles being similar to those already described as 16, and best shown in Fig. 3. On the outer ends of these spindles 79 are mounted a plurality of rollers or sleeves 80, over which the belts are led, thus constituting anti-friction members for the curved working surface of the belts.

Still other modifications of work fixtures are illustrated in Figs. 14 to 21, which will be readily understood from the drawings. Figs. 14 and 15 illustrate a plain type of fixture plate 81 carried by a shank 82 by suitable bolts 83, passing through a flange 84. Applied to the fixture here shown, I have illustrated a convenient form of gage 85 with its vertical portion slotted to fit over a set screw or the like, 86, and with a horizontal flange 87 having its inner contour in a similar curve or arc to the plate 81. Loosening the bolt 86 permits the gage 85 to be moved in or out and enables buffing or abrading belts of different widths to be used on the fixture, while at all times maintaining the outer edge of the belt on a line with the outer part of the fixture itself, to thereby facilitate the operation of the machine upon the extreme bottom of the heel or at the joint between the heel and sole. It will be readily understood that a corresponding gage, similar to that illustrated in Figs. 14 and 15 may be applied to any one of the several fixtures herein shown, but for the sake of clearness in the drawings, I have only illustrated same in these two figures.

Figs. 16 and 17 illustrate a combination of roller and pneumatic fixture comprising a shank 88, and a pneumatic plate 89 formed hollow and with a plurality of holes 90 in the working surface, through which air may be supplied by a passage 91 in the shank 88 from any suitable source of air pressure. In addition to the pneumatic, anti-friction means, I provide rollers 92 and 93, shown at either end of the plate.

Figs. 18 and 19 illustrate a combination of rollers and plate, this fixture comprising the shank 94 for attachment to the machine, the plate 95 and a plurality of rollers 96 secured in position by suitable screws 97, or in any other convenient manner.

Figs. 20 and 21 show a type of fixture especially adapted for my machine when the

same is operating upon heels having a pronounced acute angle at the junction of the sole and heel breast, as for example in shoes with the so-called Louis heels, to enable the belt to operate upon the entire height and extent of the heel, and yet to provide proper clearance in the fixture itself so that the fixture will not interfere, scar, or contact with the sole or shank of the shoe. This fixture comprises a shank 98, and as herein shown, is intended to be of the multiple roller type, carrying a plurality of anti-friction rollers 99 arranged in any desirable curve. The shank 1 is provided with a forwardly extending flange 100 to which is secured a plate 101 by means of a plurality of bolts 102. The portion in Fig. 20 which is broken away is on the line 20—20 of Fig. 21. Each roll 92 is turned down at either end, or fitted with an axle 103, one axle entering a corresponding socket in the plate 101, and the other or outer axle fitting in a corresponding socket in a plate 104 which plate has the outer portion formed at an acute angle with the working surface of the fixture, i. e., with the curved contour on which the scouring or buffing belt passes around the fixture. The plate 104 is attached to parts 105 of the shank 98 by means of screws 106, as illustrated in Fig. 21. This particular construction enables the abrading belt to run over the surface of the anti-friction rollers 99 with a small strip of the belt overlapping the front edge of the plate 104 which is correspondingly curved, and which provides a suitable backing, so that the extreme upper part of the heel breast may be acted upon. An adjustable gage, such as that illustrated at 85 in connection with Figs. 14 and 15, may also be applied to the fixture shown in Figs. 20 and 21 with equal facility.

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

A machine for operating upon the curved heel breasts of boots and shoes, comprising an endless abrading belt, a carrier belt, a working fixture over which both said belts are led and constituting a backing for the work engaging portions of said abrading belt, said fixture having a convex outer surface over which said belts are led, which surface is substantially in the same arc as the heel breasting knife used to form the concave contour of the heel breast of the shoe being operated upon, means to rotate said belts, guide pulleys to lead said belts toward and from the fixture to provide clearance between said guide pulleys to receive the forepart of a shoe whose heel is being applied to the belts as they pass over said fixture, means to hold said belts under yielding tension, means to adjust said fixture relatively with the belt to vary the

work engaging arc presented by the fixture
to the belt, and means adjustable toward
and from the plane passing through the
outer edge of the abrading belt for limiting
5 the movement of the forepart of the shoe
within the angle formed by the runs of belt
leading to and from the angularly adjust-
able fixture.

In testimony whereof, I have signed my
name to this specification, in the presence 10
of two subscribing witnesses.

LOUIS G. FREEMAN.

Witnesses:

CHARLES W. HOFFMAN,
HOBART P. DOWLING.