

Aug. 29, 1939.

B. JORGENSEN

2,170,901

BUFFING MACHINE

Filed Jan. 22, 1937

4 Sheets-Sheet 1

Fig. 1.

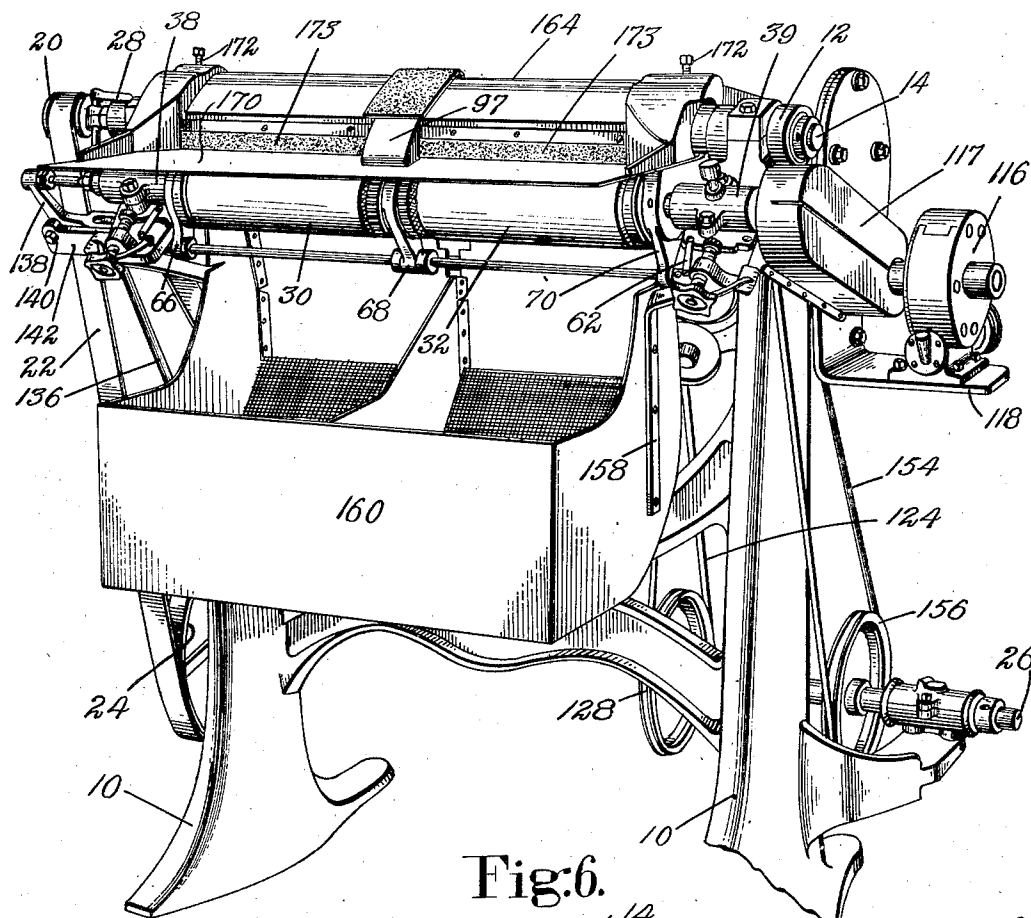


Fig. 6.

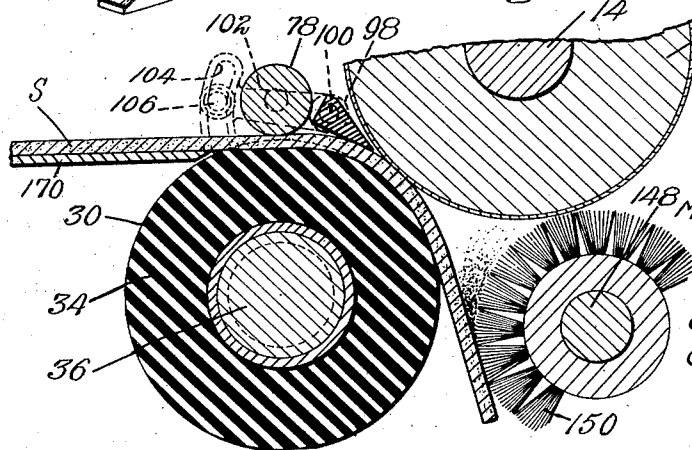
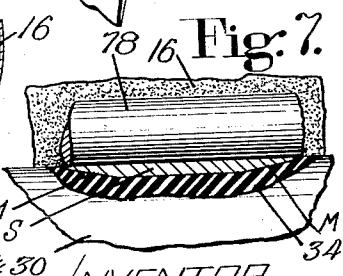


Fig. 7.



INVENTOR
Bernhardt Jorgensen
By his attorney
Victor Gold.

Aug. 29, 1939.

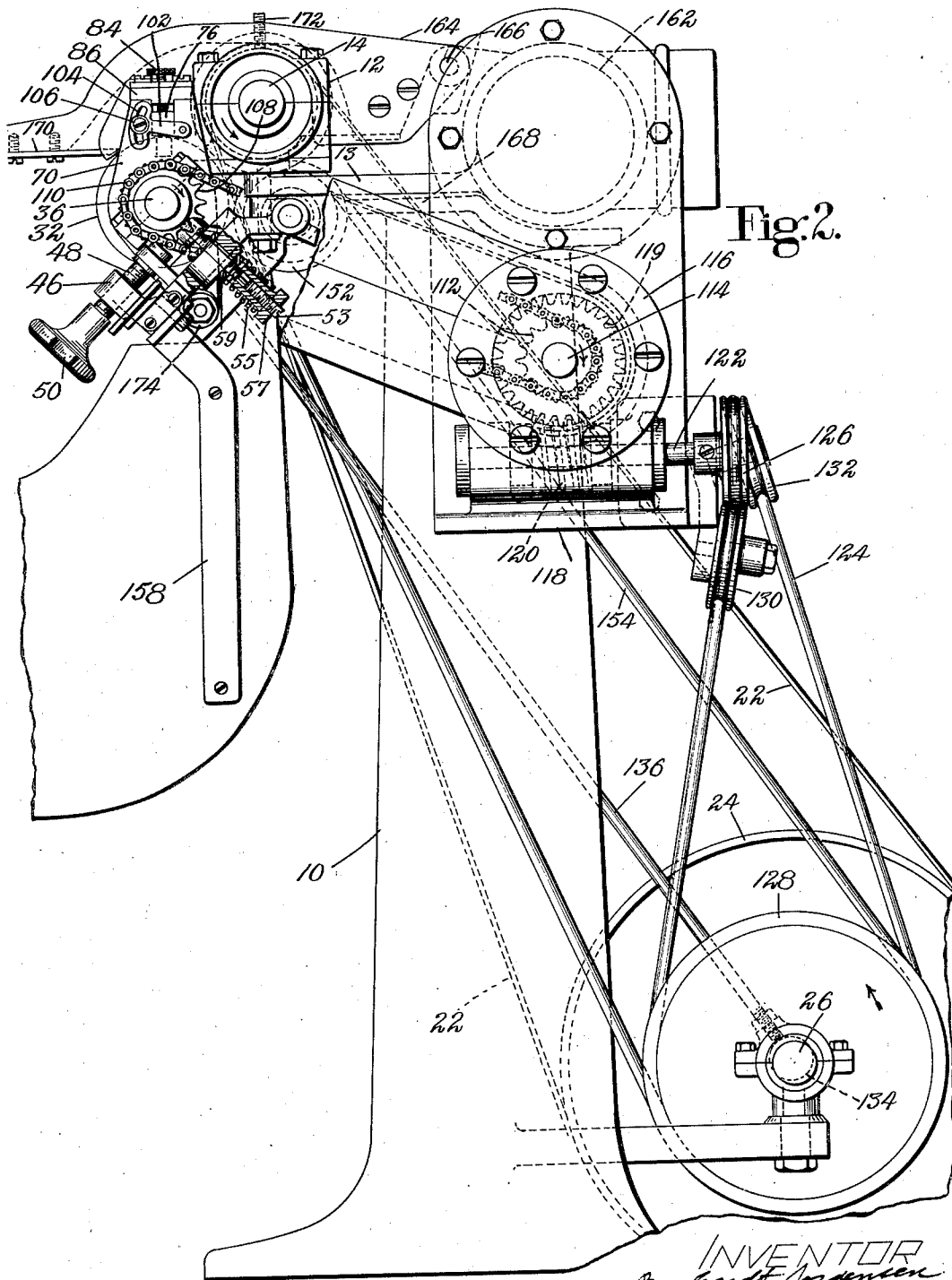
B. JORGENSEN

2,170,901

BUFFING MACHINE

Filed Jan. 22, 1937

4 Sheets-Sheet 2



INVENTOR
Barthold Jorgensen
By his Attorneys
Victor Cobb.

Aug. 29, 1939.

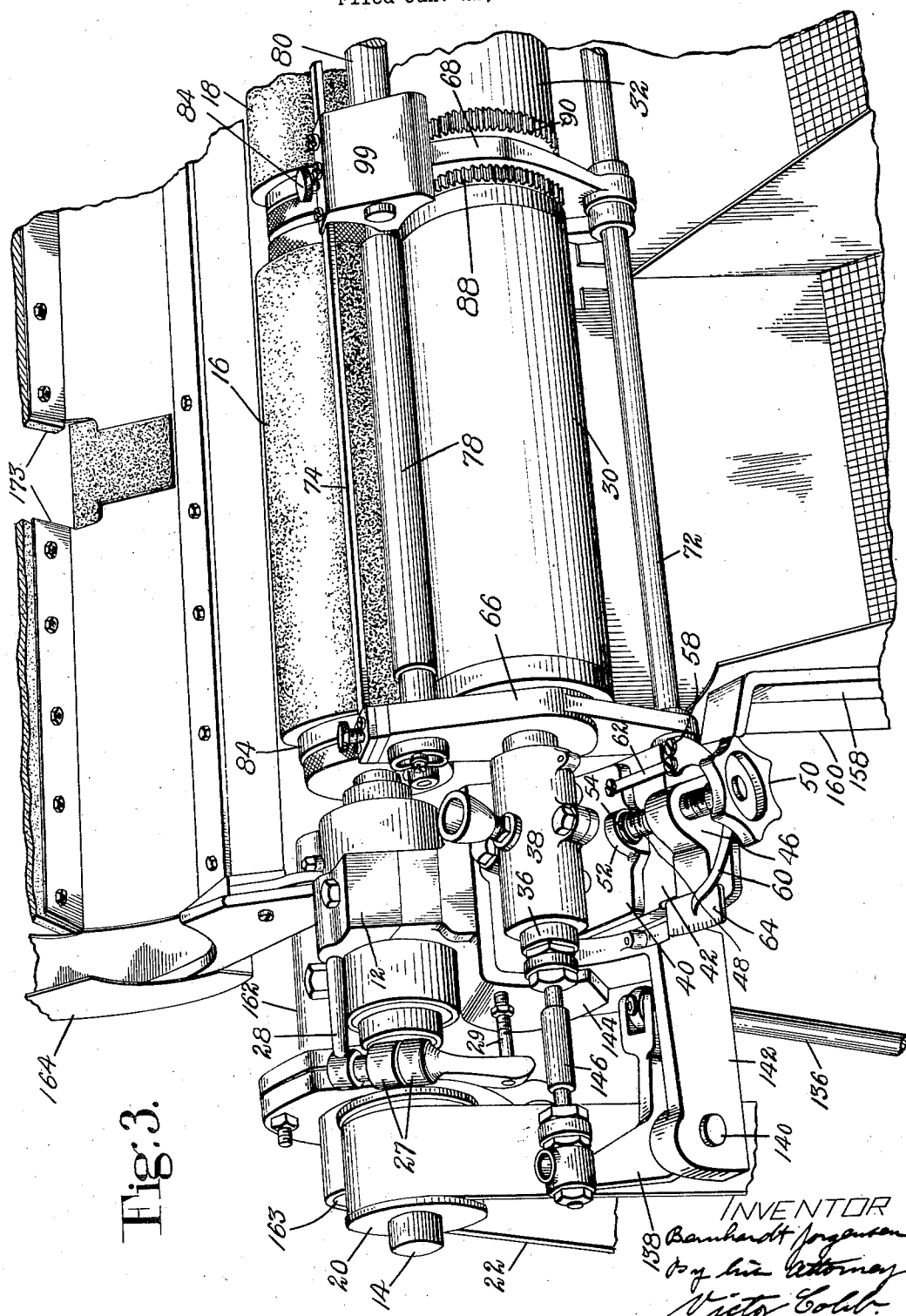
B. JORGENSEN

2,170,901

BUFFING MACHINE

Filed Jan. 22, 1937

4 Sheets-Sheet 3



Aug. 29, 1939.

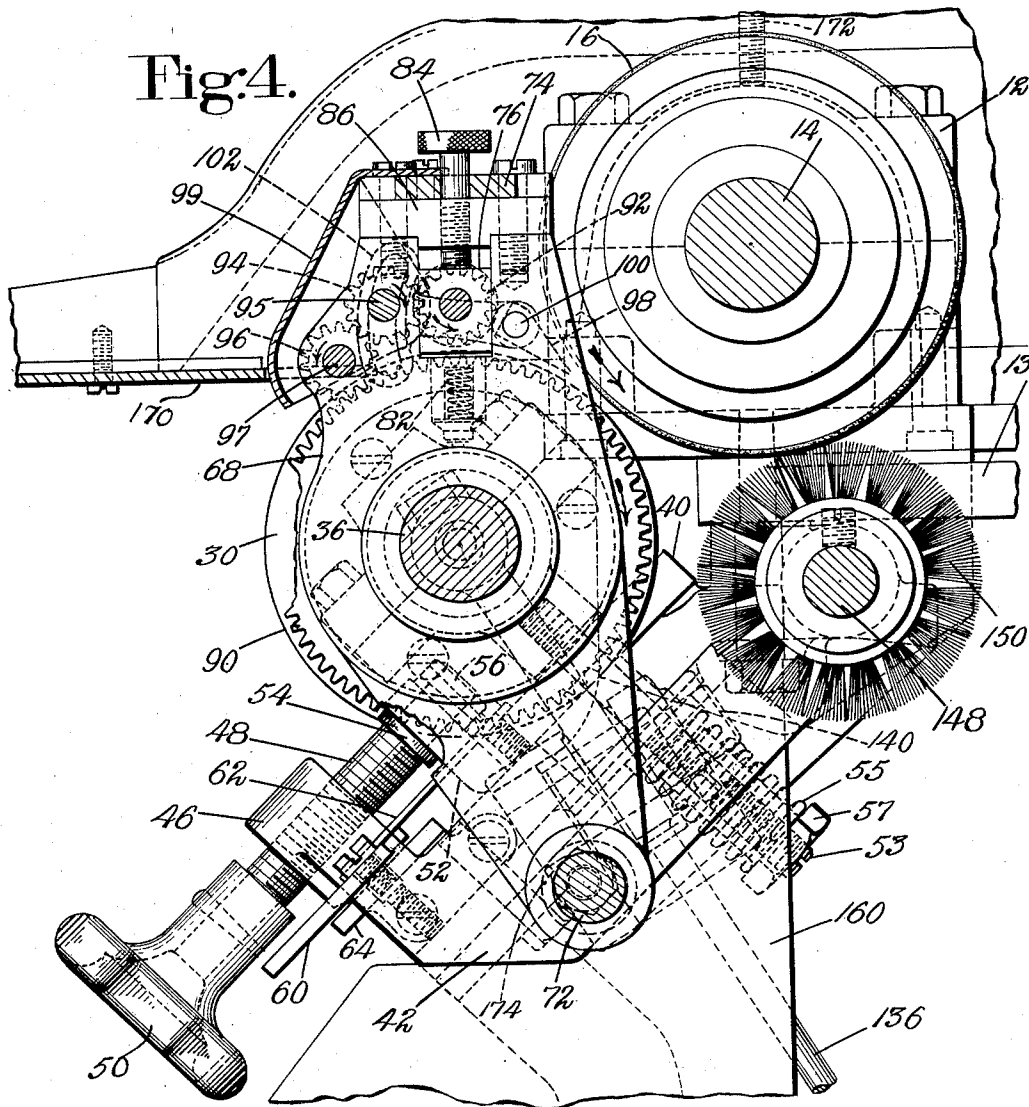
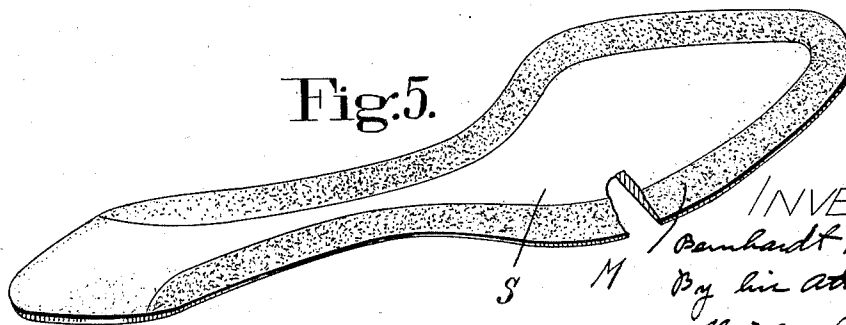
B. JORGENSEN

2,170,901

BUFFING MACHINE

Filed Jan. 22, 1937

4 Sheets-Sheet, 4



INVENTOR
Barnhart Jorgensen
By his attorney
Victor Cobb.

UNITED STATES PATENT OFFICE

2,170,901

BUFFING MACHINE

Bernhardt Jorgensen, Marblehead, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application January 22, 1937, Serial No. 121,853

5 Claims. (Cl. 51-78)

This invention relates to buffing machines and is herein illustrated and described as embodied in a machine suitable for use in buffing flat articles such as soles prior to their attachment to shoes.

I have discovered that in order to obtain a soft velvety finish upon the work piece it is necessary to present the work piece evenly to the buffing tool. The presence of any local inequalities of surface contour such as protuberances or hollows results in a deeper buffing action at the raised portion and a correspondingly shallower buffing action at the hollows. These inequalities of treatment affect the absorption of finishing material and thereby show up plainly in the finished sole. It is therefore desirable to insure that the sole be presented with a uniformly smooth surface to the buffing tool.

It is a purpose of the present invention to provide an improved buffing machine utilizing the principle above described. In accordance with a feature of the invention means are provided for smoothing the surface of a work piece as the work piece is being fed to the buffing tool. As illustrated, this smoothing means comprises a polished metal roll which presses the work piece against a resilient feed roll, the metal roll being driven at a greater peripheral speed than the feed roll to effect a burnishing action upon the surface of the work piece. In accordance with a further feature, means are provided for reciprocating the feed roll relatively to the buffing tool, which in the illustrated machine is also a roll. The metal smoothing roll is reciprocated in unison with the feed roll to insure that the work piece will partake of the reciprocatory movement. Such reciprocation of the work piece serves to obliterate scratch marks from the abrasive upon the work.

Other objects and advantages of the invention will be made apparent in the following description and by reference to the accompanying drawings, in which

Fig. 1 is a perspective view of the improved machine;

Fig. 2 is a view in side elevation of the machine;

Fig. 3 is an enlarged view in perspective of the upper portion of the machine;

Fig. 4 is an enlarged sectional view in end elevation of the upper portion of the machine;

Fig. 5 is a perspective view of a sole to be operated on by the machine;

Fig. 6 is a sectional view showing the progress of a work piece through the machine, and

Fig. 7 is a transverse sectional view of the work piece engaged between the feed and presser rolls.

The supporting structure of the machine consists of a frame 10 adapted to rest upon the floor. Journaled in bearings 12 which are supported by arms 13 extending from the frame 10 is a shaft 14 upon which are mounted a pair of buffing rolls 16 and 18 suitable for use in buffing shoe bottoms. The buffing rolls of the illustrated machine are of the type disclosed in United States Letters Patent No. 1,984,430, granted December 18, 1934 upon the application of William A. Reed. One of the buffing rolls is covered with an abrasive of relatively coarse grit and the other with an abrasive of relatively fine grit as is common in bottom buffing machines. Secured upon the shaft 14 is a pulley 20 driven by a belt 22 which, in turn, is driven from a pulley 24 mounted upon a shaft 26 which may be driven by a suitable motor or from any other convenient source of power. A brake 27 in the form of a split clamp operated by a handle 28 is provided for locking the shaft 14 when the abrasive covering upon one or both of the rolls is to be changed. A stationary post 29 holds the brake 27 from turning.

Mounted beneath and in advance of the buffing roll 16 is a feed roll 30. A second feed roll 32 is similarly mounted in relation to the buffing roll 18. The feed rolls 30 and 32 each comprise a thick sleeve of rubber 34 and are each mounted upon a shaft 36 which is journaled at its ends in bearings 38 and 39, respectively. These bearings are mounted for adjustment of the shaft 36 toward and from the shaft 14. To this end each of the bearings is secured upon a slide 40. Each of the slides 40 is mounted upon an inclined guideway formed on a bracket 42 and the brackets 42 are secured, respectively, to the arms 13. Threaded through a lug 46 on each of the brackets 42 is a screw 48 provided at one end with a handle 50 whereby it may be turned. The opposite end portion of the screw is reduced in diameter and the threads are omitted. This reduced portion passes through a lug 52 extending from the slide 40. Secured upon the reduced end portion of the screw 48 on opposite sides of the lug 52 are a pair of thrust collars 54 and 56 which, while permitting free turning movement of the screw, force the lug 52 and the slide 40 to move axially as the screw is turned. Extending through a slot in each of the brackets 42 from the bottom of each of the bearings 38 and 39 is a screw 53. A compression spring 55 surrounds each of the screws 53. Each

of the springs 55 is interposed between a shoulder on a nut 57 threaded on the outer portion of the screw 53 and a washer 59 which bears against the under surface of the bracket 42. The springs 55 hold the bearings 38 and 39 against their respective guideways with a pressure which may be adjusted by turning the nuts 57.

Fulcrumed upon a stud 58 on each of the brackets 42 is a pointer 60. A link 62 having its ends pivotally secured to the slide 40 and the pointer 60 respectively communicates any movement of the slide 40 to the pointer 60. A gage plate 64 provided with scale markings is secured upon the guideway 42. Because of the length of the pointer 60 any movement of adjustment of the slide 40 is magnified for purposes of indication and the position of the pointer relatively to the scale markings indicates accurately the distance of one end of the shaft 36 from the corresponding end of the shaft 14. The two adjusting devices, positioned respectively at the ends of the shaft 36, enable the operator to adjust with great accuracy the clearance between the outer ends of the rolls 30 and 16 and the outer ends of the rolls 32 and 18.

Mounted upon the shaft 36 at one end of the roll 30 is a frame 66. A similar frame 68 is mounted upon the shaft 36 between the rolls 30 and 32 and another similar frame 70 is mounted on the shaft 36 at the outer end of the roll 32. The shaft 36 is freely rotatable in the frames 66, 68 and 70. Each of the frames 66, 68 and 70 is secured at its lower portion to a rod 72 and at its upper portion to another rod 74. The three frames and the two rods thus constitute a unitary assembly in which the feed rolls rotate. This unitary assembly is held against axial movement relatively to the shaft 36 by reason of the fact that the intermediate frame fits between the adjacent ends of the rolls 30 and 32.

In the upper portion of each of the frames 66, 68 and 70 is formed a vertical guideway for a bearing block 76. In the bearing blocks carried by the frames 66 and 68 are mounted the reduced ends of a steel roll 78 having a smooth polished surface, and being considerably smaller in diameter than the feed rolls and the buffing rolls. A similar steel roll 80 is likewise mounted between the frames 68 and 70. The intermediate bearing block 76, i. e. the bearing block in the frame 68, is of sufficient length to accommodate the reduced ends of both rolls 78 and 80. The bearing blocks are urged upwardly by springs 82 against the ends of adjusting screws 84 which are threaded through cover plates 86 which bridge the guideways for the bearing blocks. The screws 84 thus enable the operator to adjust the distances of the steel rolls 78 and 80 from their respective feed rolls. The feed rolls 30 and 32 are provided with gears 88 and 90, respectively, which are positioned on opposite sides of the frame 68. Each of the rolls 78 and 80 carries a pinion (only one of which will now be described) 92 which engages an idler gear 94 mounted on a stud 95 carried by the frame 68. A second idler gear 96 on a stud 97 which also is carried by the frame 68 engages both the gears 94 and 88 (or 90 as the case may be) thereby transmitting rotation from the feed rolls to the steel rolls 78 and 80. The above-described gearing is arranged to drive the presser rolls in the direction of feed of the work and at a somewhat greater peripheral speed than the feed rolls. The driven pinions and the trains of idler

gears are housed in a cover 99 mounted on the frame 68.

A wedge-shaped presser member 98 extends the full length of the buffing and feed rolls and is positioned in advance of the rolls with its thin end or apex extending close to the bite of the rolls. The presser 98 is reduced at its ends to form trunnions 100 which are journaled in the frames 66 and 70, respectively. Extending from each of the trunnion ends 100 of the presser 98 is an arm 102 whereby the angular position of the presser may be adjusted to control the force with which the presser holds the work against the feed roll. Each of the arms 102 is provided with an enlarged end through which is formed an arcuate slot 104 concentric with the axis of the trunnion ends 100. Through each of the slots 104 extends a clamping screw 106 threaded into the adjacent frame 66 or 70. These screws are provided with heads which, when the screws are tightened, serve to clamp the enlarged ends of the arms 102 to the respective frames and thereby to hold the presser member 98 in a desired position of angular adjustment. By loosening the clamping screws and raising or lowering them in their respective slots the angular position of the presser may readily be changed.

Secured upon one end of the shaft 36 is a sprocket wheel 108 which is driven by a chain 110 which, in turn, passes over a sprocket wheel 112 secured upon a shaft 114 which is journaled in suitable bearings carried by a housing 116 secured upon a bracket 118 supported by the frame 10. A cover 117 is provided for the chain and sprocket wheels. Secured upon the shaft 114 is a worm gear 119 driven by a worm 120 secured upon a shaft 122 which is journaled in suitable bearings in the housing 116. The shaft 122 is driven by a belt 124 passing over a pulley 126 carried by the shaft 122 and a pulley 128 mounted upon the shaft 26. A pair of idler pulleys 130 and 132 are provided for directing the belt 124 between the driving pulley and the driven pulley 126.

In order to assure a smooth finish upon the work and to obliterate scratch marks from the abrasive the work piece is given a reciprocatory motion relatively to the buffing roll. This is accomplished by reciprocating the feed rolls 30 and 32, together with the presser rolls 78 and 80 and the presser member 98. To this end there is provided an eccentric 134 upon the shaft 26. A connecting rod 136 has one of its ends secured to a strip about the eccentric 134. The opposite end of the rod 136 is pivotally connected to one arm of a bell crank 138 which is fulcrumed upon a pin 140 supported by a bracket 142 secured upon an arm 144 (Fig. 3) extending from the lower portion of the bearing 12. A link 146 transmits oscillatory movement from the other arm of the bell crank 138 to one end of the shaft 36. The ends of the link 146 are connected by ball joints to the bell crank arm and to the shaft, respectively to provide for universal movement. Inasmuch as the rolls 30 and 32 are secured to the shaft 36 the frame 68 and with it the rods 72 and 74 and the frames 66 and 70 and also the presser member 98 will all be constrained to partake of the reciprocatory movement of the shaft 36. Journaled at its ends in suitable bearings carried by the brackets 42, respectively, is a shaft 148 upon which is mounted a rotary brush 150. Upon one end of the shaft 148 is secured a pulley 152 (Fig. 2) about which runs a belt 75

154. The belt 154 is driven by a pulley 156 (Fig. 1) secured upon the shaft 26.

Secured to and depending from each of the brackets 42 is an arm 158. Secured at its ends to the arms 158, respectively, and positioned beneath the rolls 30 and 32 is a receptacle 160 for the treated work pieces.

Carried by the frame 10 is a draft conduit 162. One end of the conduit 162 is closed. The bracket 118 may conveniently be designed as in the illustrated machine not only to support the housing 116 but also to close this end of the conduit 162. The opposite end 163 (Fig. 3) of the conduit 162 is adapted to be connected to the usual suction draft system. The feed and abrading rolls are covered by a draft suction hood 164 which is pivotally mounted for upward swinging movement upon pins 166 mounted in the frame 10. The space within the hood 164 and included between the hood 164 and a horizontal wall 168 which extends from the frame 10 to the brush 150 communicates with the interior of the conduit 162 to conduct thereto the dust arising from the operation of the buffing rolls on the work piece. Carried by the outer end of the hood 164 is a work table 170 which guides the work piece as the operator advances it to the feed roll. The level of the work table 170 may be adjusted by a screw 172 threaded through the hood 164 and engaging a suitable abutment upon one of the bearings 12. Depending flaps of felt 173, which yield to permit entry of the work pieces, normally close the forward end of the suction hood and concentrate the draft at the space between the brush 35 and the buffing rolls.

As has already been mentioned, the shaft 36 rotates freely within the frames 66, 68 and 70. The direction of rotation of the shaft 36, as indicated in Fig. 2, is such as to tend to rotate these frames in a clockwise direction, as viewed in that figure. In order to maintain these frames in a desired operating position there is provided upon one end of the rod 72 an eccentric 174 which is engageable with a suitable abutment formed upon one of the arms 158 to hold the rod 72 and the unitary assembly associated therewith from rotation. The operating position of the feed and presser rolls and of the presser member 98 may be adjusted relatively to the buffing rolls by turning the eccentric 174.

The operation of the machine is best illustrated in Figs. 6 and 7. The operator places a sole S, which as shown in Fig. 5 may have a skived margin M, upon the work table 170 with the tread surface of the sole uppermost. He then advances the sole until it is caught between one of the presser rolls and the corresponding feed roll. The presser roll thus cooperates with the feed roll to enable the latter frictionally to advance the work piece. The presser roll is adjusted sufficiently close to the feed roll to embed the sole into the rubber cushion 34 of the feed roll. The inequalities in the thickness of the sole as occasioned by its skived margins are thus accommodated by the cushion 34, as indicated in Fig. 7, while the resilience of the rubber cushion presses the tread surface against the presser roll. The frictional characteristics of the rubber cushion insure feeding of the work without slip relatively to the feed roll. The presser rolls which, as already pointed out, have smooth polished surfaces and are driven at a somewhat greater peripheral speed than the feed rolls perform an ironing or burnishing operation upon the tread surface of the sole, compacting the

surface and flattening it. This operation is particularly important in obtaining a uniform finish upon the sole inasmuch as it eliminates any slight protuberances or hollows such as normally occur. The elimination of these inequalities of surface contour enables the buffing roll to act uniformly over the entire area of the sole. At a locality beyond the presser roll the sole is deflected by the presser member 98. This member not only helps to curve the sole about the feed roll but also to maintain the sole pressed against the feed roll with the tread surface of the sole in uniform relation to the buffing roll, the thin edge of the member 98 being parallel to the buffing rolls and as close thereto as practicable. The buffing roll is driven in the direction of feed of the work but at a much greater speed than the feed rolls. The curvature of the sole about the feed roll at the locality of engagement with the buffing roll is conducive to a smooth finish. After passing the buffing rolls the work is engaged by the brush 150, which removes any dust adhering to the surface of the work and sweeps such dust into the air stream flowing through the suction hood 164. The finished work piece then drops upon a suitable screen supported within the receptacle 160. It has already been mentioned that the entire assembly comprising the feed rolls, presser rolls and presser member is reciprocated relatively to the buffing rolls. The presser rolls 78, by clamping the work against the feed rolls, insure of its being given a reciprocatory motion relatively to the buffing rolls.

When access to the buffing rolls is desired for the purpose of replacing the abrasive covers, the draft hood 164 may be swung upwardly and back about its pivots 166, and the frames 66, 68 and 70 may be swung in a counter-clockwise direction, as viewed in Fig. 4, about the shaft 36 until the rod 72 engages the receptacle 160.

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

1. A buffing machine comprising a buffing roll, a feed roll having a work-engaging surface of relatively high frictional characteristics, a polished metal roll, said feed roll and said metal roll being constructed and arranged to grip a work piece between them with the metal roll engaging that surface of the work piece which is to be buffed, means for driving said feed roll, and means for driving said metal roll at a peripheral speed different from that of said feed roll to effect a burnishing action upon the surface of the work piece.

2. An abrading machine comprising an abrading roll, a feed roll, a wedge-shaped presser located in advance of said abrading roll with its apex extending close to the bite of the rolls for holding a work piece against said feed roll, and a pivotal support for said presser constructed and arranged for swinging adjustment of said presser toward and from said feed roll to control the force with which the presser holds the work piece against the feed roll.

3. An abrading machine comprising an abrading roll, a feed roll, a polished ironing roll constructed and arranged to hold a work piece against said feed roll, means for driving said feed roll and said ironing roll at different speeds, and means for reciprocating said feed roll and said ironing roll in unison.

4. An abrading machine comprising an abrading roll for operating upon one surface of a work

- piece, a feed roll engaging the opposite surface of the work piece, said feed roll having a yielding surface, a hard surfaced roll engaging the first-mentioned surface of the work piece with pressure to embed the work piece into the feed roll, and means for effecting relative axial reciprocation between said feed roll and said hard surfaced roll on the one hand and said abrading roll on the other hand.
- 10 5. An abrading machine comprising an abrading roll, a feed roll of relatively large diameter positioned to hold a work piece against said abrading roll, said feed roll having a yielding surface, a roll of relatively small diameter posi-

tioned in advance of said abrading roll for holding the work piece against said feed roll to maintain the work piece at its locality of engagement with the abrading roll in a state of curvature, a presser engageable with the work piece at a locality between said roll of small diameter and said abrading roll to press the work piece against the feed roll and a frame supporting said roll of small diameter and said presser, said frame being mounted for movement of said roll of small diameter and said presser away from said abrading roll to provide access to the abrading roll.

BERNHARDT JORGENSEN