W. GORDON.

BUFFING MACHINE.

APPLICATION FILED APR. 21, 1909.

1,103,957.

Patented July 21, 1914

2 SHEETS—SHEET 1.

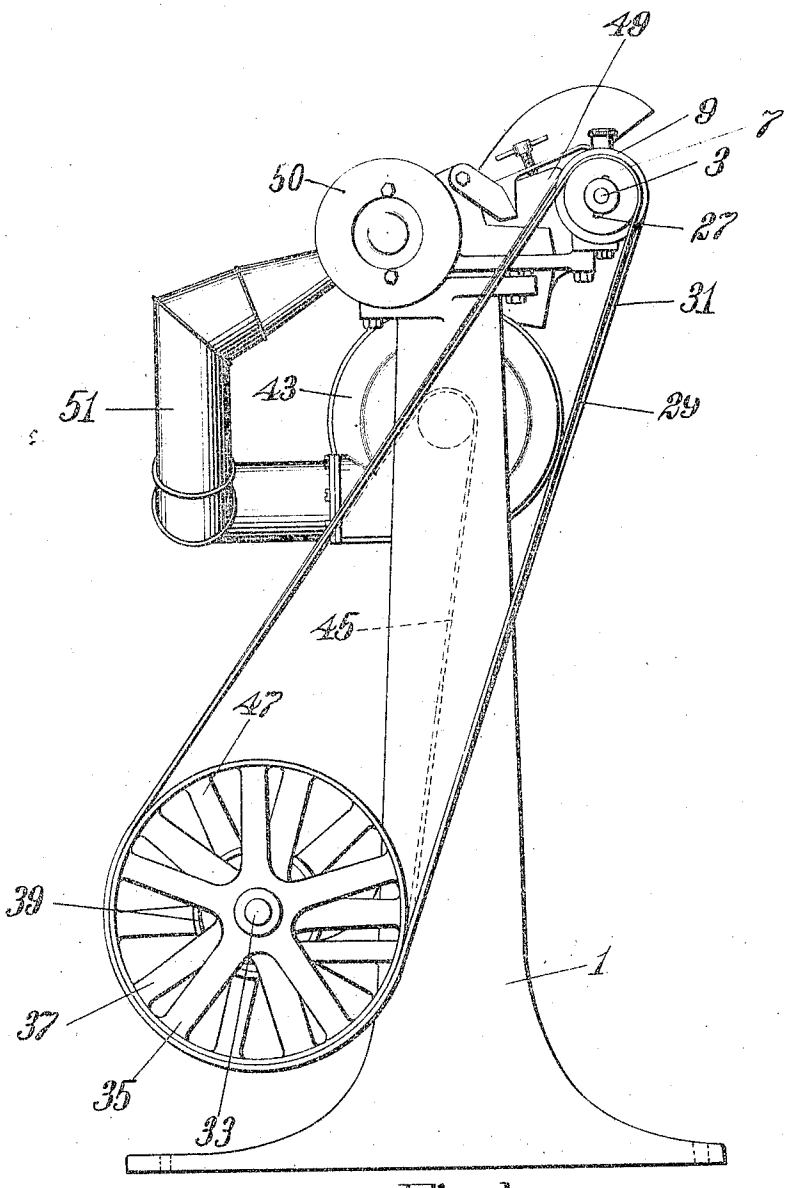


Fig. 1.

WITNESSES.

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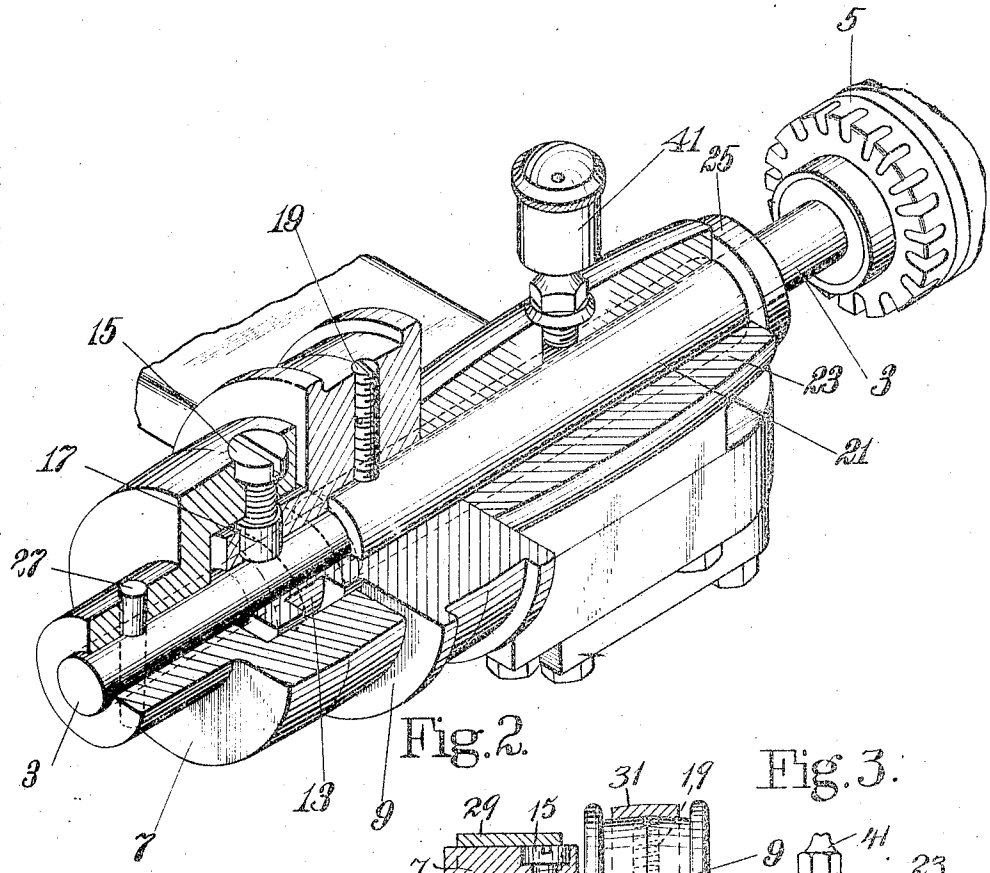
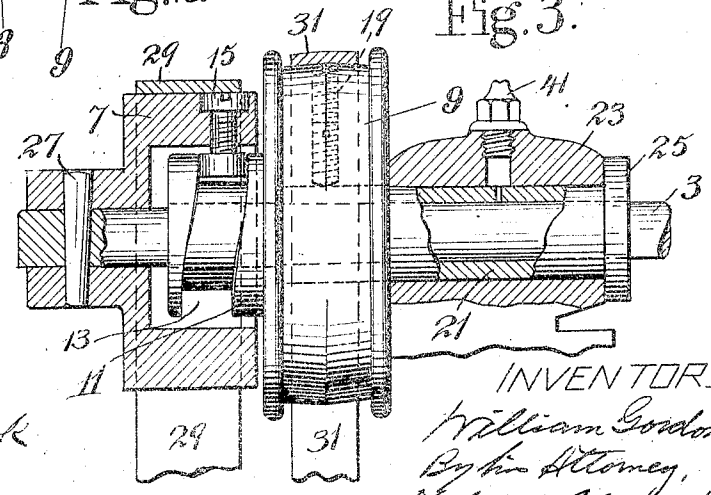


Fig. 2.

Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM GORDON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BUFFING-MACHINE.

1,103,957. Specification of Letters Patent. Patented July 21, 1914.

Application filed April 21, 1909. Serial No. 491,297.

To all whom it may concern:

Be it known that I, WILLIAM GORDON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Buffing-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 grinding and polishing machines and particularly to machines for buffing or scouring leather.

It is common in machines of this class to make use of a rotary roll covered with an abrasive material and to present the stock, for example the sole of a shoe, to this roll. It has long been known that a more desirable surface is produced by a roll to which is imparted a reciprocatory movement in addition to its rotary one, and machines provided with rolls so actuated have been in use from time to time. It has been found in practice that certain ratios of reciprocation to rotation, said ratios being dependent upon the nature of the stock to be operated upon, produce the best results. For example, in buffing the soles of shoes at the usual speed of rotation the ratio referred to above is approximately one to eight. The machines hitherto devised, however, either have been adapted to produce one or more reciprocations with every rotation of the shaft or else some comparatively complicated mechanism for reciprocating the shaft has been employed, said mechanism being separate except for its connection with the counter shaft from the mechanism for rotating said shaft.

One object of the present invention, therefore, relates to a construction whereby the ratio of reciprocation to rotation may readily be varied and wherein the mechanism for reciprocating the shaft and that for rotating it are adjacent each other and preferably interconnected, said construction resulting in a muchemore simple, compact, efficient and inexpensive device. Any convenient means for accomplishing this result may be employed, and in the illustrated embodiment two rotatable members are shown said members being so connected that the reciprocation produced by them depends upon their relative angular movement. In order to simplify the structure one of these members is shown as fast to the shaft, said member serving also as a means for rotating said shaft.

A further object of this invention relates to a construction and arrangement of parts whereby the friction is distributed over a comparatively large area and the abrasion of the shaft thereby reduced. In the illustrated embodiment this is accomplished by mounting the shaft in a rotatable sleeve and causing said sleeve and shaft to rotate in the same direction so that the friction is distributed between the bearing for the shaft and that for the sleeve.

These and other features of the invention including certain details of construction and combinations of parts will be explained in connection with the following description of a machine and will be pointed out more definitely in the claims.

Referring now to the accompanying drawings, Figure 1 is an elevation of a buffing machine equipped with a device embodying the present invention; Fig. 2 is a perspective with parts broken away showing the manner in which the shaft is mounted and its relation to the device for rotating and reciprocating it, and Fig. 3 is a detail partly in elevation and partly in section of the mechanism for rotating and reciprocating the shaft.

The frame 1 of the machine sustains in a manner presently to be described one end of a shaft 3 upon which is mounted an operating member 5 herein shown as a buffing roll, the other end of said shaft being slidably supported in a bearing of ordinary construction, not shown. In order to reciprocate said shaft two rotatable members 7 and 9 are provided, said members being so connected that relative angular movement between them will produce relative longitudinal movement. In the illustrated embodiment the member 9 is provided with a projection 11 having a cam groove 13 cut therein, while the member 7 is provided with a socket to receive said projection and with a finger or pin, shown here as a screw-threaded member 15 having mounted upon its inner end in any suitable manner a roller 17, adapted to coact with the walls of said groove. With this construction it is clear that any relative angular movement of the

members 7 and 9 will cause the roller 17 to travel in the groove 13 and thereby alternately separate said members and bring them together. In order that this motion may be transmitted to the shaft it is necessary that one of these members should be held against longitudinal movement and the other be permitted to move and to carry with it the shaft. Any convenient construction for accomplishing this may be employed, and in the illustrated embodiment the member 9 is shown as fastened by means of a screw 19 to a sleeve 21 rotatably mounted in a bearing 23 which is rigid with the frame 1. This sleeve is provided with a flange 25 which abuts one end of the bearing 23 while the side of the member 9 abuts the other end, so that the sleeve 21 and with it the member 9 may rotate but cannot move longitudinally. The shaft 3 is rotatably mounted in the sleeve 21 and is also capable of longitudinal movement. In order to effect this longitudinal movement or reciprocation the member 7 should be so mounted that the shaft will be compelled to move longitudinally with it. This also may be accomplished in any convenient manner; and inasmuch as means must be provided for rotating the shaft the member 7 is made fast to said shaft by means of a pin 27; but it should be understood that in order to produce reciprocation only of said shaft it is essential merely that said member 7 shall be held from longitudinal movement with respect to said shaft and that angular movement may be permitted if desired.

With the construction thus far described it is evident that if the member 9 is held stationary while the member 7 is rotated or if the two members have imparted to them different velocities the roller 17 will traverse the groove 13, and simultaneous rotation and reciprocation of the shaft 3 and operating member 5 will result. Since, as has been stated above, the ordinarily desirable ratio of reciprocation to rotation is approximately one to eight, it is evident that the member 9 should be rotated as well as the member 7. Any suitable means may be provided for accomplishing the rotation of these members, and in the illustrated machine the members 7 and 9 are shown as pulleys of different diameters which are rotated by belts 29 and 31 respectively, said belts passing around two pulleys 35 and 37 on the counter shaft 33, the counter shaft itself being rotated by means of a pulley 39 to which power is applied from any suitable source. By substituting for the pulley 35 or 37 a pulley of different diameter the rate of rotation or reciprocation of the shaft 3 as desired may readily be varied.

In order to lubricate the bearings for the sleeve 21, the shaft 3 and the roller 17, an oil cup 41 has its stem threaded into the bearing 23. A portion of the oil thus fed to the sleeve works along the periphery of said sleeve to the ends thereof and then along the inside of said sleeve between it and the shaft while another portion enters the bore in the projection 11 and passing through said bore works to the surface of said projection and into the cam groove 13.

The machine is provided with the usual hood and suction device for removing the dust produced by the buffing operation. The hood is shown at 49 and is connected with a cylinder 50, to the further end of which is attached the suction device (not shown). In order to clean and cool the roll there is provided a blower 43 operated by means of a belt 45 which passes around a pulley 47 on the counter shaft and from this blower a pipe 51 leads through the cylinder 50 and terminates in a member which delivers a thin stream of air tangentially along the surface of the roll 5.

In operation, power having been applied to the counter shaft, the roller 17 is caused to travel in the groove 13 at a rate dependent upon the relative angular velocities of the pulleys 7 and 9 and thereby to reciprocate the shaft 3, rotation of said shaft being caused by the rigid connection between the pulley 7 and the shaft. The stock to be operated upon is then presented to the roll 5. The cup 41 applies lubricant to certain of the moving parts as described above while the blower assists the suction device in removing the dust and at the same time cleans and cools the roll.

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

1. A grinding or polishing machine having, in combination, a rotary and reciprocatory shaft, an abrading member connected therewith, a plurality of rotary actuating members for said shaft, said members having overlapping parts, and connecting means between said actuating members for causing relative angular movement of said members to reciprocate said shaft.

2. A grinding or polishing machine having, in combination, a shaft, an abrading member connected therewith, a plurality of actuating members also connected therewith and with each other independently of the shaft and means for rotating said actuating members at different velocities.

3. A grinding or polishing machine having, in combination, a shaft, an abrading member connected therewith, a plurality of actuating members mounted thereon, said members being connected with each other independently of the shaft, and means for rotating said members in the same direction at different velocities.

4. A grinding or polishing machine having, in combination, a rotary shaft, an abrad-

ing member connected therewith, and means for reciprocating said shaft, said means including means for rotating said shaft.

5. A grinding or polishing machine having, in combination, a shaft, an abrading member connected therewith, and actuating mechanism for rotating and reciprocating said shaft, said mechanism being carried wholly by said shaft.

6. A grinding or polishing machine having, in combination, a shaft, an abrading member connected therewith, a member slidable relatively to the axis of said shaft, a second member fixed relatively to said axis, said members being provided with interengaging parts, and means for actuating said members at different velocities.

7. A grinding or polishing machine having in combination, a rotary shaft, an abrading member connected therewith, a pulley loose on said shaft and held from longitudinal movement, a pulley held against longitudinal movement relatively to said shaft, said pulleys being constructed with an interengaging pin and groove, and means for rotating said pulleys at different velocities.

8. A grinding or polishing machine having, in combination, a bearing, a sleeve provided with a flange mounted in said bearing, a pulley fast to that end of the sleeve remote from the flange whereby said sleeve is held from longitudinal movement, said pulley having a projection provided with a groove, a shaft mounted in said sleeve, an abrading member fast to said shaft, a second pulley fast on said shaft and having a socket to receive the projection on said first pulley, and a member carried by said second pulley and engaging said groove.

9. A grinding or polishing machine having, in combination, an abrading tool, a member held against longitudinal movement with respect to said tool, a second member slidable longitudinally relatively to said tool, said members being provided with an interengaging pin and slot, and means for actuating said members at different velocities.

10. A grinding or polishing machine having, in combination, an abrading tool, a pulley rigid with said tool, said tool and pulley being free to move longitudinally, a second pulley held from longitudinal movement, said pulleys having interengaging parts, and means for rotating said pulleys at different velocities.

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

WILLIAM GORDON.

Witnesses:
FRED W. GUIBORD,
FREDERICK L. EDMANDS.