(No Model.) 2 Sheets—Sheet 1.

T. E. KEAVY.

BUFFING MACHINE.

No. 382,041. Patented May 1, 1888.

Fig. 2.

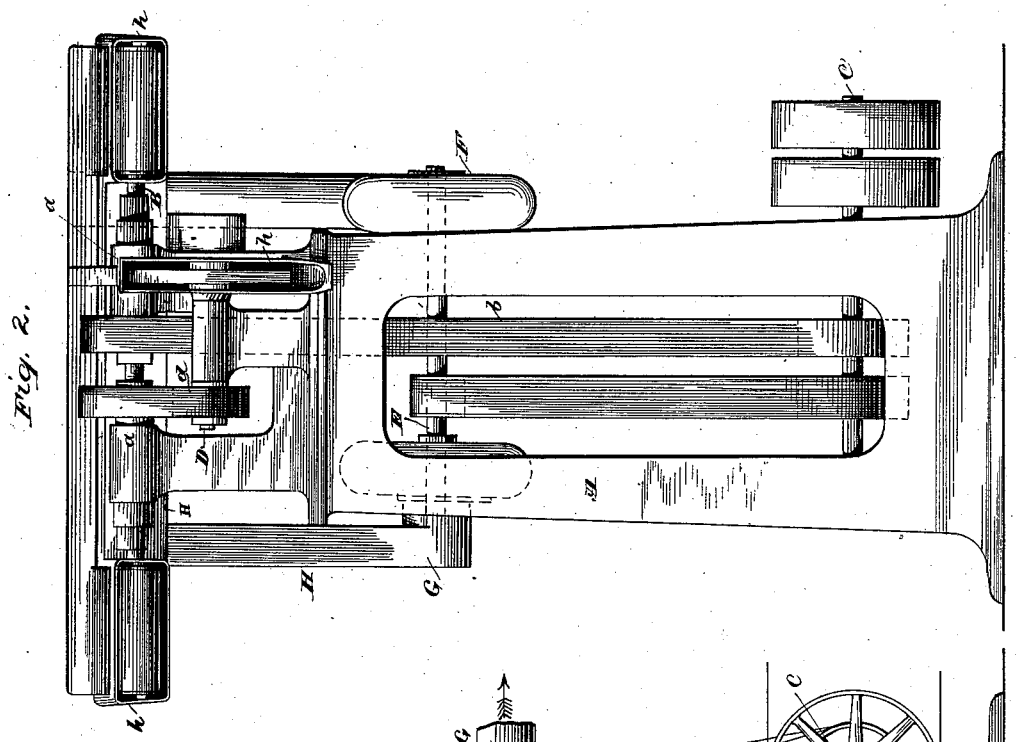
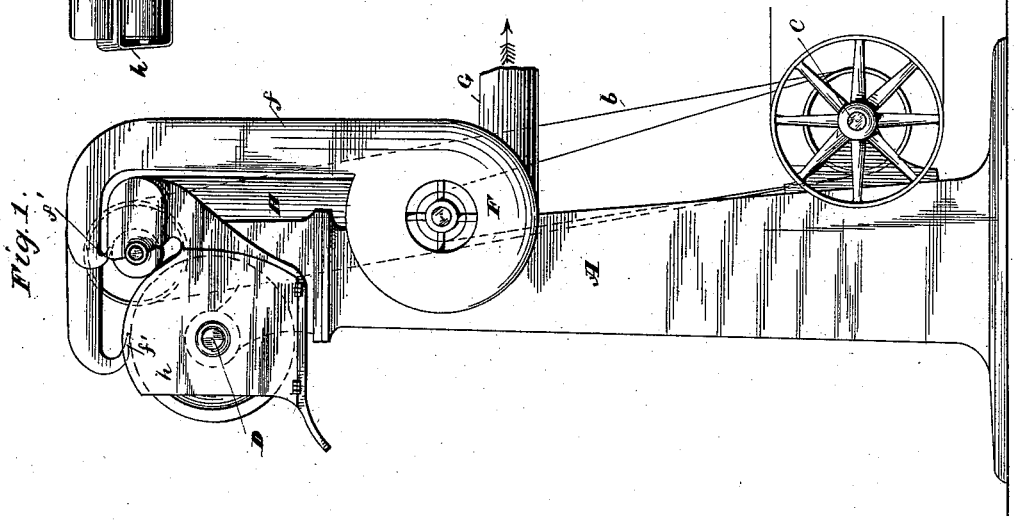


Fig. 1.



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Wm. A. Miller

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N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

T. E. KEAVY.

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Fig. 3.

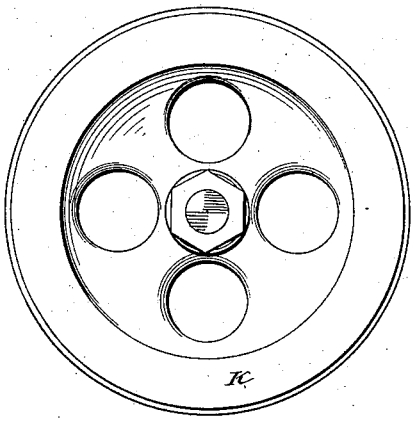


Fig. 4.

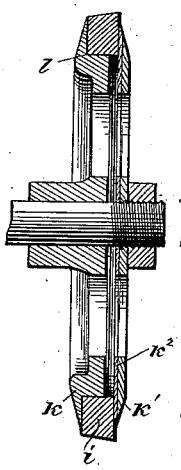


Fig. 5.

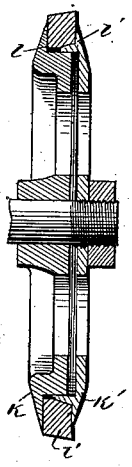


Fig. 11.

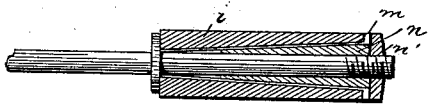


Fig. 13

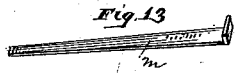


Fig. 12.

Fig. 6.

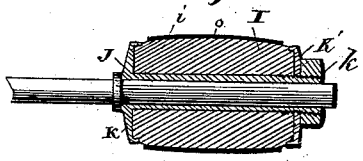


Fig. 7.

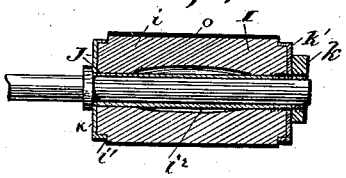


Fig. 8.

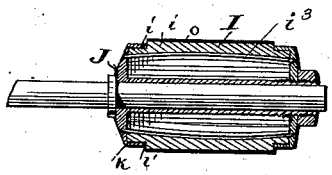


Fig. 10

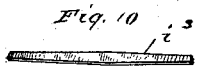
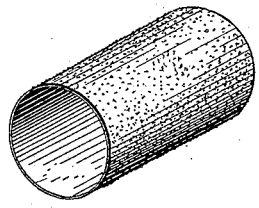


Fig. 9.



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UNITED STATES PATENT OFFICE.

THOMAS E. KEAVY, OF CLEVELAND, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO AUGUSTINE A. TILLOTSON, OF AKRON, OHIO.

BUFFING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 382,041, dated May 1, 1888.

Application filed July 5, 1887. Serial No. 243,344. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. KEAVY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Boot and Shoe Buffing Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to boot and shoe buffing machines, and while it is designed to be adaptable to all machines in which sand-paper or other abrading fabric is employed in scouring or dressing leather, wood, or other fibrous material, the invention, for the purpose of this description and patent, is considered more especially in connection with boot and shoe buffing or dressing mechanism. In this latter class of machines, and as the art is now practiced, sand-paper or ruby-paper is extensively used in scouring and buffing the soles of boots and shoes, different varieties of buffing-machines in which this use and operation occur being common. One variety—an endless sheet or belt of paper—is employed, which is stretched and run over two pulleys placed a short distance apart. Considerable machinery is necessary in operating this style of machine, which my improvement avoids, and it is liable to still further objections affecting its operation, as will appear further on in this description. In the other style of machines the paper is in sheet form, and its ends are turned in and fastened by a system of clamping when the sheet is stretched around the roller. This style of fastening the sheet is liable to the material objection of wasting much paper in securing the ends, which, considering the number of changes made daily and the amount of sanded paper lost on each sheet, aggregates considerable in time. It is further objectionable for the reason that, as one end of the sheet is first fastened and the paper then drawn around the pulley to secure the other end, a gap or break in the surface of the pulley is unavoidably formed across the pulley at this point. This gap or break unduly exposes the paper on the opposite sides thereof, from which the sand is more quickly worn than from the other parts, and the working-surface of the pulley is thus rendered uneven and the work becomes unsatisfactory on that account. A further source of annoyance and expense in this class of machines as heretofore used is found in the accumulation of dust and fibers on the cutting-surface of the rolls. The cutting or dressing pulleys operate at an average speed of, say, thirty-five hundred revolutions a minute. Running at this high velocity and with the paper in fairly good condition it is not necessary to bear hard upon the shoe that is being dressed to get the necessary action, and by reason of the speed of the roll the fibers are cut off sharply and mostly cast at a tangent from the surface of the roll, though, of course, some will adhere to its surface; but in the class of machines using the endless belt this casting-off process is less effective than in those with a plain roll, and a large amount of the severed material adheres to and is carried round by the paper. Ordinarily both classes of machines are provided with exhaust or suction fans for carrying away the detached particles, and for this purpose exhaust-tubes with hoods extend round to the rear and sides of the cutting devices, and a strong exhaust is maintained to make the operation as complete as possible; but, owing to a tendency in both machines of the separated fibers to adhere to the sand-paper, and the further tendency of the fibers to be caught up again by reason of the velocity of the pulleys notwithstanding the exhaust, especially in the machine with the endless sand-paper belt, it has been found in practice and in every day experience that the sand-paper so quickly becomes embedded and encrusted with leather that not exceeding thirty or forty pairs of shoes can be dressed before the efficiency of the paper is gone and new paper must be supplied. Now, I have found that originally these leather fibers are not really embedded in the sand-paper, but cling to the surface merely, and that the embedding mostly occurs when they are carried round and pressed in by the action of the

shoe in further dressing, until, finally, the whole surface becomes clogged and smooth, although the paper itself in fact may be almost as good as new; hence I conceived the idea of devising some effectual means of not only preventing accumulations from the air, but also cleaning the sand-paper surface of the pulley of the stuff that may gather there from any cause. This I am enabled to do by introducing a sharp blast of air to the surface of the paper or pulley at about the point where the accumulations from the air would otherwise occur, and where the removed particles will be carried into the exhaust, thus not only practically overcoming and preventing such accumulations, but really cutting away adhering fibers and carrying all into the exhaust, which is the same as in the old machines. This operation insures a clean roll of paper until the paper is literally worn out, and thus I am enabled to buff and dress three or four hundred pairs of shoes with the same paper that would dress not exceeding thirty or forty pairs in the old style of machines.

I am aware that a process of washing the paper after it becomes filled with leather is known and used by some; but this process to be carried out necessitates the removal of the paper from the machine, can only be done by experts, as there is great danger of softening the glue and loosening the sand, and at the best it leaves the paper with much less efficiency than before.

Referring to the drawings, Figure 1 is a side view of a machine embodying my improvements. Fig. 2 is a front elevation of the machine. Fig. 3 is a side elevation of a wheel or disk designed for buffing the shank of the shoe, and Figs. 4 and 5 are cross-sections of different forms of such a wheel. Figs. 6 to 8, inclusive, are longitudinal central sections of slightly-different forms of buffer pulleys or rolls. Fig. 9 is a cylindrical cover of sand-paper adapted to these rolls. Fig. 10 is a detail of a light metal spring employed in form Fig. 8. Fig. 11 is a longitudinal central section of a buffer-roll shown in cross-section in Fig. 12. Fig. 13 is a detail of a metal spring, of which there are several in said roll.

In Figs. 1 and 2, A represents the supporting-frame of the machine, which may be of any desired size or fashion. In the front view, Fig. 2, on a single arbor or shaft, B, and supported in bearings *a*, are shown two pulleys or rolls, say of the style illustrated in Figs. 6, 7, and 8. This shaft B is driven by a band, *b*, from a shaft, C.

D is a counter-shaft carrying the shank-buffing wheel and run by a band, *d*, from the shaft B. E is another shaft, on which are hung the blast-blower F and the exhaust-blower G, which are run by band from the shaft C.

As hereinbefore described, the exhaust-tubing H is extended around at the rear and sides of the buffing-rolls, forming hoods, as shown at *h*, so as to gather up and carry away as fully as possible the dust from and flying material produced by the machine. The exhaust and blast blowers may be of any preferred style, of which there are many in the market. As here shown, the blast-tubing *f* extends up from the blower F, as seen in Fig. 1, and supplies air somewhat at a tangent to the buffing wheels or rolls, as seen at the mouth or delivery *f'*. The entire length of the roll is exposed to the blast, as seen in Fig. 2, where two long rolls are shown, and the blast-tubing is arranged to enter the exhaust-tubing, so as to deliver the blast where it will clean the roll, and deliver the material where it will be taken up by the exhaust and carried away.

I, Figs. 6, 7, and 8, represents different forms of the general style of expansible pulley or roll made by me, and used for buffing the surface of the sole. The purpose in all these forms is to expand the pulley or roll laterally as to the axis thereof by compressing the roll endwise. Thus, in Fig. 6 is shown a rubber or other elastic or flexible body, *i*, supported on a sleeve, J, having a flanged head, K, projecting over a reduced portion, *i'*, of the body, and at the other end a cap or head, K', with a nut, *k*, screwing on the sleeve. As the screw is tightened, the rubber body will be compressed in its length and expanded in its width. Then, having first slipped the sand-paper tube over the pulley, the lateral expansion will fill the tube and hold it firmly on the rubber roll ready for work. As the rubber is easily controlled by tightening or loosening the nut, I can readily and quickly make a change of the paper tubes on the roll. The sleeve J is used chiefly to prevent contact of the rubber with the arbor, and its becoming oiled by such contact; otherwise the sleeve might be dispensed with and the rubber placed immediately upon the arbor or shaft. In Fig. 7 the construction is the same as in Fig. 6, except that the rubber body *i* is cored centrally, as shown at *i'*, to make the body respond more readily to the compression from the ends. In Fig. 8 is shown a body, *i*, of less thickness than the other, and having spring-staves *i*³ to support the body between the ends or heads.

In Figs. 4 and 5 I show in cross-section forms of wheels having an expansible band-shaped body, *i*, preferably of rubber, clamped between two sections, K K', an auxiliary clamping-plate, K², being shown in Fig. 4. The sand-paper is fashioned in the form of a tire or band for this wheel, and as the wheel is designed to work in the shank of the shoe it is narrow and beveled slightly on its working-face. In Fig. 4 only one section is shouldered, as *l*, to support the body *i*, and in Fig. 5 both sections have shoulders, as at *l l'*.

In Fig. 11 is shown a longitudinal section, and in Fig. 12 a cross-section, of a heel-scouring roll having a body part, *i*, with conical bore, and provided with tapered spring-plates *m*, Fig. 13, and a conical sleeve, *n*, which is driven in by the nut *n'* on the end, and thus

expands the body sufficiently to tighten the sand-paper thereon. This roll is purposely made long and narrow, so as to form and dress the concave which surrounds the heel of the shoe transversely to the lifts, forming the layers of the heel, thus closing the joints between the lifts and making the subsequent burnishing more easy, the method now in use of using a wheel of large diameter and scouring lengthwise of the joints exposing the joints and roughening the surface.

In case the body *i* is made of somewhat firm material not having much elasticity, the surface should be cushioned and softened by a covering of woolen or other elastic substance, (letter *o*,) so as to render the touch less harsh than it would be if the covering were omitted.

Obviously the air-blast herein described may be used with buffing rolls or wheels that are not expansible, and can readily be attached to the machines in use before this invention was known.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a buffing-machine, a roll made of elastic material, sheet-metal strips arranged within the roll to expand the same, and caps on the roll, which confine the ends thereof, substantially as set forth.

2. In a buffing-machine, an elastic roll, metallic spring-plates within the roll, a supporting-axle, adjustable caps on the roll to expand the same and to confine the ends, and a buffing-band upon the roll, substantially as set forth.

3. The process of cleaning a buffing-roll while at work and of removing the dust from about the roll at the same time, consisting in applying a blast of air to the surface of the roll at a tangent thereto opposite to the direction of rotation, and in maintaining an air-exhaust about said blast and buffer-roll to carry away the dust, substantially as set forth.

4. In a buffing-machine, the combination of a buffing-roll and a hood extending partly around the roll, and having a tube to maintain an exhaust about said roll, with air-blast mechanism having the jet or delivery point of the blast arranged to direct the air at a tangent to the surface of the buffing-roll, whereby the sand-paper is cleaned on the roll and the dust is removed, substantially as set forth.

In testimony whereof I hereunto set my hand this 27th day of June, 1887.

THOMAS E. KEAVY.

Witnesses:
H. T. FISHER,
JOHN C. HUTCHINS.