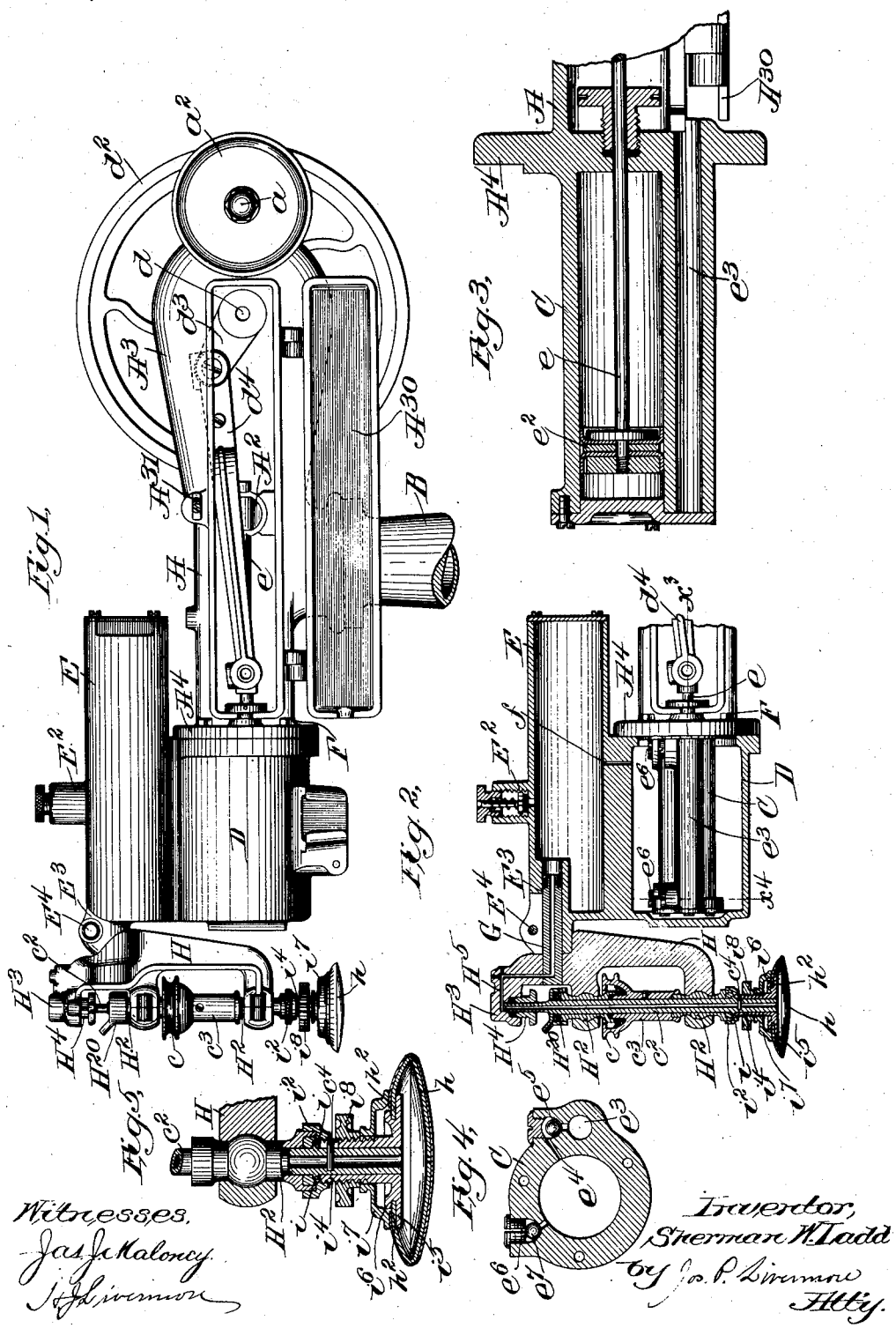
S. W. LADD.

BUFFING MACHINE.

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Witnesses.
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UNITED STATES PATENT OFFICE.

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BUFFING-MACHINE.

No. 901,923. Specification of Letters Patent. Patented Oct. 20, 1908.

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To all whom it may concern:

Be it known that I, SHERMAN W. LADD, of Beverly, county of Essex, and State of Massachusetts, have invented an Improvement in Buffing-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 a machine for buffing the soles of boots and shoes, and is intended as an improvement on machines of that class as shown in patent to Winslow and Fifield No. 221647, Nov. 11, 1879; and patent to Webster No. 490,419, Jan. 24, 1893.

The machine forming the subject of the present invention is intended to operate a spindle having connected therewith a foot provided with a clamp to hold a flexible hollow expansive pad provided with an abrasive cover in the form of a disk which is rotated rapidly by said spindle, the flexible pad constituting a yielding cushion to support the abrasive material against the pressure of the boot or shoe sole presented to it to be buffed. The pad is hollow and is clamped to the foot in such manner as to afford a substantially air tight joint or connection between the wall of the pad and the foot of the spindle, which latter is hollow or bored longitudinally so as to afford an air passage through it. The spindle runs in suitable bearings in a bracket connected with the arm or overhanging frame of the machine, and said bracket is constructed to afford a substantially air tight passage from the frame of the machine to the hollow spindle.

The construction of the spindle with reference to the expansive pad and abrasive cover is not herein claimed, same forming the subject of my Patent No. 721,052 dated February 17, 1903.

The spindle and pad are herein shown and described to facilitate an understanding of the present invention, which relates mainly to the means for supplying air by which the expansive pad is inflated when the machine is in operation.

The machine is provided with an air pump which serves to compress air while the machine is running, and there are intermediate chambers or reservoirs on the arm of the machine between said air pump and the bearing bracket for the buffing spindle, which reservoirs receive air under the desired pressure from the pump, and supply air under pressure through the passages of the bearing bracket and spindle to the interior of the pad, thereby keeping the same distended and producing a very effective yielding cushion for the abrasive material.

Figure 1 is a side elevation of the head portion of the buffing machine embodying this invention; Fig. 2 a longitudinal vertical section of a portion thereof; Fig. 3 a longitudinal section on dotted line x^3 of Fig. 2 showing the air pump proper on enlarged scale; Fig. 4 a transverse section thereof on line x^4 of Fig. 2; and Fig. 5 an enlarged longitudinal section of the lower part of the spindle and parts directly connected therewith.

The head portion of the machine is in the form of a horizontal arm A adapted to be secured to a suitable column or support, the upper end of which is shown at B in Fig. 1. At the rear end of said arm there is a countershaft a having belt pulleys a^2 for the belt which drives the pulley c on the spindle c^2 that carries the buffing pad and its abrasive cover. Towards the rear end of the said arm A there is supported in suitable bearings a shaft d provided with a driving pulley d^2 and a crank d^3 connected with a pitman d^4 which is connected with the piston rod e of the air pump C (see Figs. 1, 2 and 3). The said piston rod e is steadied by a guide A^2 upon the arm which is provided with or constructed to constitute a slotted hood or cover A^3 for the crank, pitman, and piston rod, as clearly shown in Fig. 1. The slot in said arm is for the purpose of affording access to the joints and bearings of the pitman and piston rod, and is provided with a hinged cover A^{30} shown as open in Fig. 1, and adapted to be held closed when the machine is in use by a fastening or button A^{31}.

The air pump C is contained within a chamber D at the forward end of the arm A, said chamber communicating by a small passage f (see Fig. 2) with a second chamber or reservoir E, said chambers D and E being herein shown as made in a single casting, and connected by bolts F with a flange A^4 on the main casting of the arm with which latter the cylinder of the air pump C is made integral as best shown in Fig. 3. The end of the air pump cylinder adjacent

to the flange A^4 is closed by an integral portion of the casting except for the packed passage through which the piston rod e works, and the other end of said cylinder is provided with a removable head or bonnet, as clearly shown in Fig. 3, through which the piston e^2 may be introduced in assembling the apparatus.

The air pump C is provided with an inlet passage or suction pipe e^3 best shown in Figs. 3 and 4, the end of which communicates with the interior of the arm A and column B as shown in Fig. 3, so that a sufficient supply of air is afforded without danger of entrance of dust or chips. The said passage e^3 near the end of the pump C is provided with passages e^4 (see Fig. 4) entering the said pump cylinder and controlled by inwardly opening ball valves e^5, and said cylinder is also provided at its ends with outlet passages e^6 controlled by outwardly opening ball valves e^7, said passages opening into the chamber D surrounding the pump, so that at each stroke of the piston e^2 air is taken from the supply passage e^3 to the passage e^4 into one end of the cylinder and at the same time delivered through the passage e^6 at the other end of the cylinder into the chamber D surrounding the pump and thence through the passage f into the reservoir E. Air is thus compressed into the chamber E, and by reason of the small passage f is caused to flow into the reservoir E with substantial uniformity, so that the pressure in the reservoir E is but slightly affected by the pulsations due to the strokes of the piston e^2. Said chamber E is provided with a relief valve E^2 which may be regulated to maintain any desired pressure, and to permit the air to escape from the reservoir when such pressure is exceeded.

The reservoir E is provided at one end with an outlet passage E^3 constructed to form a clamping socket for a cylindrical arm G secured in the bearing bracket H for the spindle c^2 which carries the buffing pad proper. The socket E^3 at the end of the chamber is split and provided with a clamping bolt E^4 as shown in Figs. 1 and 2 so that the cylindrical arm G may be locked in any suitable position but may be turned in the socket when required in order to vary the angle of the bracket H and buffing spindle to suit the requirements of the workman, said bracket being used in approximately vertical position, although it is capable of being turned to any desired angle, by the construction just described.

The bracket H is provided with bearings H^2 for the spindle c^2, said bearings being in the form of long bushings fastened to said bracket which is provided at its upper end with a socketed cap H^3 into which the upper end of the spindle c^2 extends, said cap being provided with a stuffing box or packing as shown at H^4 to afford a tight connection between the spindle c^2 and the interior of said cap H^3 which is provided with a passage H^5 communicating with a passage in the cylindrical arm G, and thus with the interior of the reservoir E from which air is thus delivered through said passages into the longitudinal passage through the spindle c^2 and to the hollow flexible pad h secured to the lower end thereof.

The driving pulley c for the spindle is made as a part of a sleeve c^3 which surrounds the said spindle between the bearings H^2 and is recessed at its ends to engage with said bearings and thereby secure the spindle against endwise movement, and at the same time protect the bearing surfaces from the entrance of dust. The upper bearing H^2 is provided with a lubricating reservoir H^{20} containing fibrous material which may be saturated with oil. Below the lower bearing H^2 the spindle c^2 is provided with a flange i see Fig. 5 engaging with a corresponding flange in a threaded clamping nut i^2 adapted to engage with the upper end of a threaded sleeve i^4 provided at its lower end with a wide flange i^5 surmounted by a narrower flange i^6 with an intervening groove or channel, said flanges serving to receive between them the upper wall h^2 of the flexible pad h.

The clamping plate i^7 is adapted to fit loosely upon the threaded sleeve i^4 and is recessed at its lower part to receive the upper flange i^6, while the periphery of said clamping disk i^7 bears upon the edge of the upper wall h^2 of the flexible pad and clamps the same securely between said clamping plate and the lower flange i^5 on the threaded sleeve. Said clamping plate i^7 is forced down, to thus clamp the flexible pad, by a nut i^8 operating upon the screw thread of the sleeve. Thus the hollow flexible pad which is commonly made of molded india rubber may be fastened air tight upon the end of the threaded sleeve, which latter is secured to the hollow spindle c^2 by the nut i^2 engaging with the upper end of the thread of said sleeve, which is provided with a longitudinal notch engaging with a pin c^4 on the hollow spindle to prevent axial displacement of the former on the latter.

The pad h h^2 is provided with a small central perforation to admit of escape of air, so that the air is not strictly speaking confined therein, but flows slowly therethrough, maintaining a pressure above the atmospheric pressure, and thus distending the pad but not putting it under severe expansive strain.

Any suitable abrasive pad cover may be used, but the pad covers are preferably molded and provided with an inturned flange constructed to form a series of tongues which are inserted between the

clamping disk i^7 and the upper wall h^2 of the pad, so that said clamping disk serves both to clamp the abrasive cover on the pad, and to afford an air tight junction between the latter and the sleeve which is secured to the end of the driving spindle.

The guide A^2 for the piston rod is made in the form of a block having a bore, to receive the piston rod, and a cylindrical outer surface, the axis of which surface is at right angles to that of the piston rod, said block being contained in a socket or bearing formed in the main casting A of the arm. This construction enables the guide A^2 to be accurately fitted to the piston rod, which would be difficult on account of location, if the said bearings were formed in the material of the casting itself.

Claims.

1. A buffing machine having a tubular spindle; an inflatable buffing pad carried by the spindle; and means for producing a substantially constant pressure of air in the pad, comprising an air compressor, a chamber to receive the compressed air, a reservoir communicating with the pad, a restricted orifice connecting the chamber to the reservoir and proportioned to retard the transmission of the compressed air from the receiving chamber to the reservoir.

2. A buffing machine having a tubular spindle; an inflatable buffing pad carried by the spindle; and means for maintaining a constant pressure of air in the pad, comprising a pump, an air supply duct therefor leading from a point remote from the buffing pad, a chamber into which the pump discharges air, a reservoir of large capacity, an orifice of small capacity between the chamber and the reservoir, a conductor of small capacity communicating with the tubular spindle and extending into the reservoir to a distance beyond its end wall, and a relief valve in the reservoir.

3. In a buffing machine, a flexible pad adapted to be inflated and to carry an abrasive covering; means for compressing air; and connecting means between the compressor and the pad, comprising a receiving chamber, a reservoir, a passage connecting the compressor with the chamber, a conduit of small diameter connecting the chamber and reservoir, and a passage between the reservoir and the pad.

4. A buffing machine having a supporting frame; a tubular spindle journaled thereon; an inflatable buffing pad carried by the spindle; and means for maintaining air pressure in the pad, comprising a pump cylinder mounted in the frame, a piston, piston actuating mechanism inclosed in the frame, an air supply duct extending from the interior of the frame to the pump cylinder, a valve between the duct and the cylinder, and a passageway leading from the pump cylinder to the pad spindle.

5. A buffing machine having a frame; a tubular spindle; an inflatable buffing pad carried by the spindle; and means for maintaining air pressure in the pad, comprising a pump cylinder projected from the frame, a piston, and actuating mechanism therefor inclosed by the frame, a casting comprising a chamber D, and a reservoir E communicating with each other through the relatively small passage *f*, said casting being arranged with the chamber D inclosing the pump cylinder, and a connection between the reservoir and the spindle.

6. A buffing machine having a frame or arm, a spindle carrying an inflatable buffing pad at one end of the arm, a driving shaft at the other end thereof, a driving connection between the spindle and shaft, air compressing mechanism supported on said arm, a driving connection between the compressor and said shaft, an air chamber supported on the arm in relation to receive air from the compressor, a reservoir communicating with the chamber through a restricted orifice, and means for conducting air from the reservoir to the spindle.

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

SHERMAN W. LADD.

Witnesses:
GEORGE E. FROST,
FRANK A. WEBB.