S. ROSS, Jr.
Shoe-Shaping Machine.

2 Sheets—Sheet 1.

No. 211,427. Patented Jan. 14, 1879.

Fig. 1

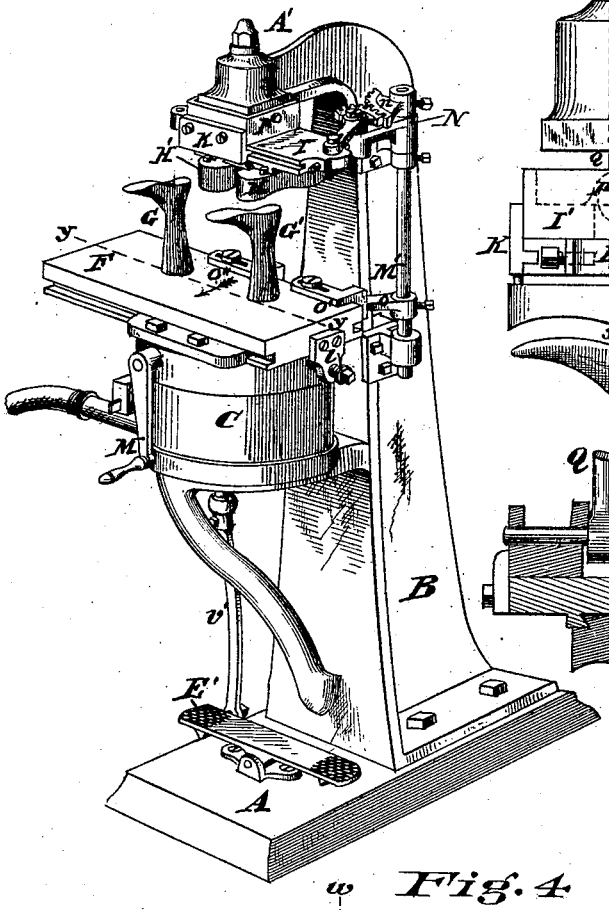


Fig. 2

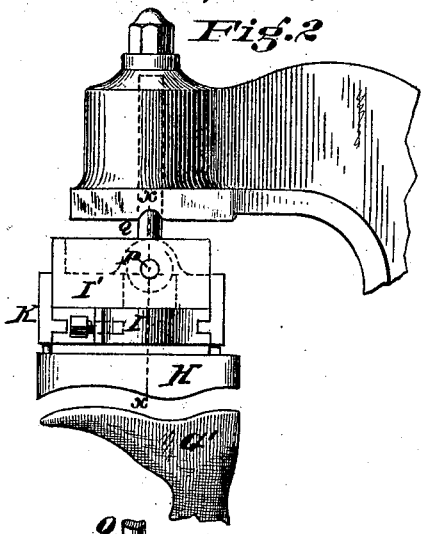


Fig. 3

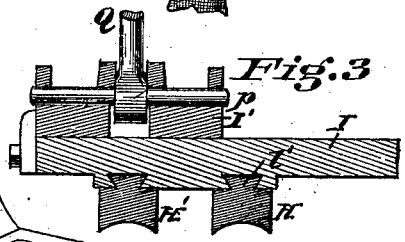
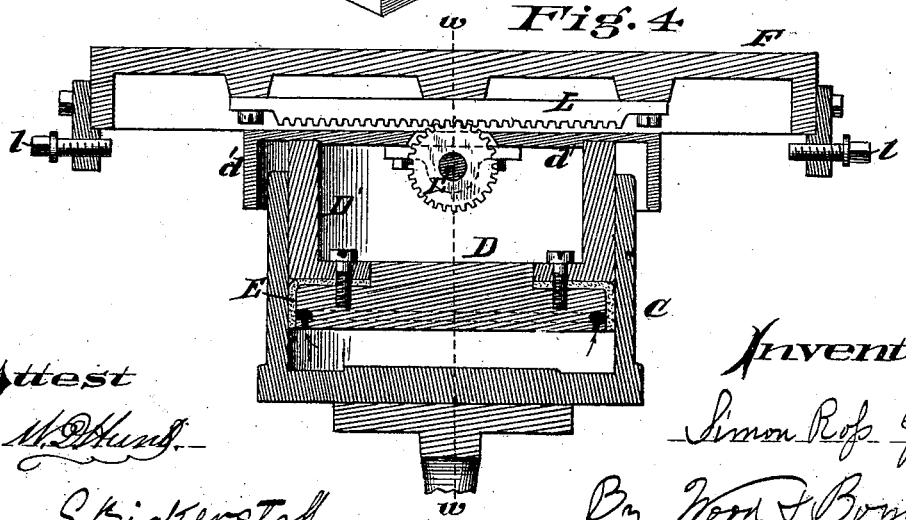


Fig. 4



Attest
M. D. Hungerford
S. Bickerstaff

Inventor:
Simon Ross Jr.
By Wood & Boyd
his Attys.

S. ROSS, Jr.

2 Sheets—Sheet 2.

Shoe-Shaping Machine.

No. 211,427. Patented Jan. 14, 1879.

Fig. 5

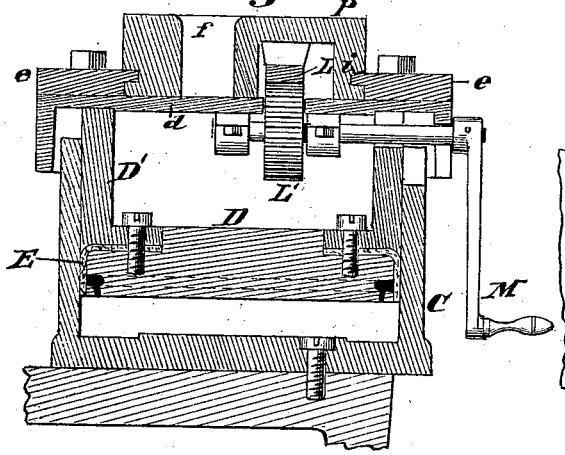
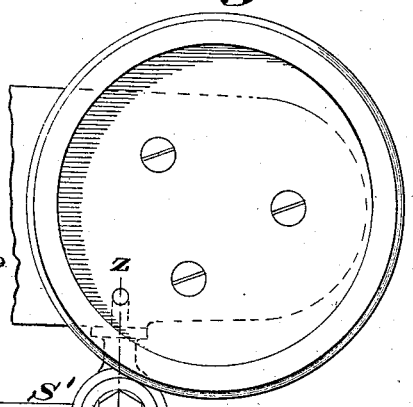


Fig. 6



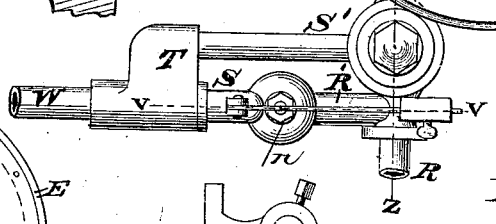


Fig. 8

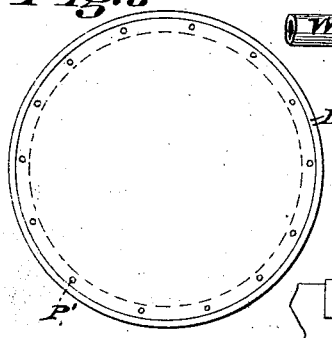


Fig. 9

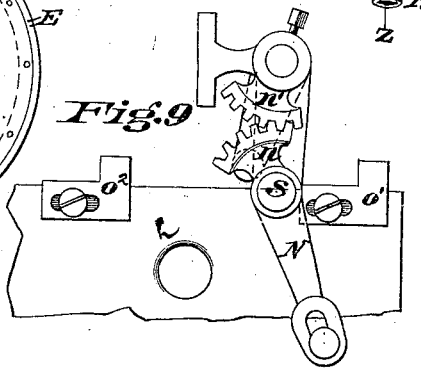


Fig. 7

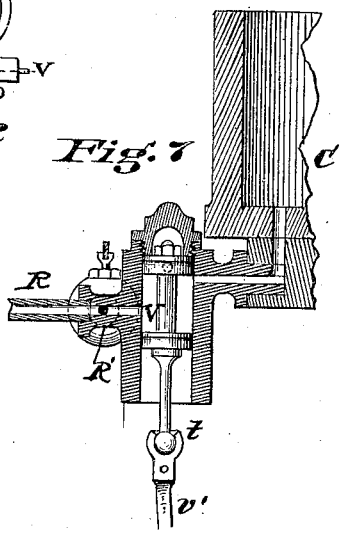
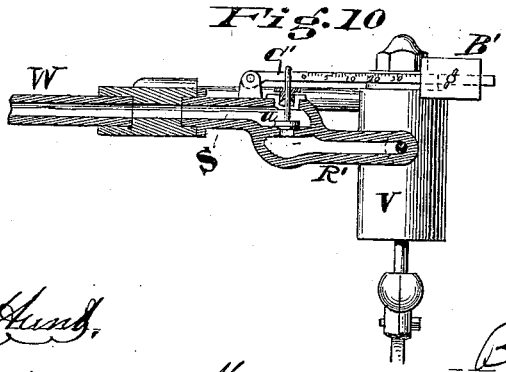


Fig. 10



Attest

M. D. Hunt,

S. Bieberstaff

Inventor

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By Wood & Boyd

His Attys

UNITED STATES PATENT OFFICE.

SIMON ROSS, JR., OF NEWPORT, KENTUCKY.

IMPROVEMENT IN SHOE-SHAPING MACHINES.

Specification forming part of Letters Patent No. **211,427**, dated January 14, 1879; application filed November 2, 1878.

To all whom it may concern:

Be it known that I, SIMON ROSS, JR., of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Shoe-Shaping Machines, of which the following is a specification:

My invention relates to an improved boot and shoe sole shaping machine, adapted to be driven by either steam, compressed air, or hydraulic power.

The object of my invention is to furnish a cheap, durable, and accurately-working machine, which rapidly performs its work, and saving cost of labor employed to run the machine.

The first part of my invention consists of a piston, on which is mounted a last, which, in operation, will strike against a former with either the last or former being mounted on its bed in such a manner that it will rock, and the faces of the last and former will assume parallel planes with respect to each other when the force of the piston is exerted thereon.

The second part of my invention consists of mounting the two lasts on a carriage, which is attached to the cylinder-head in such a manner that it can be reciprocated by a crank to bring the two lasts alternately into operation.

The third feature of my invention consists in mounting the fixed former on a slideway, and so connecting it with the last-carriage that it can be made to reciprocate in unison therewith, so that a right and left last and former can be alternately brought into use at the will of the operator.

Another feature of my invention consists of adjustable stops for regulating the movements of the last and former carriages.

Another feature of my invention consists of a regulating-valve, which is adjusted to control the pressure operating the piston, said valve being located between a cut-off valve, which admits the pressure to the piston, and the device employed to produce the power or fluid pressure.

Another feature of my invention consists in providing a leather packing for the piston when water or compressed air is used as a motor; the feature of my invention being the piercing of a series of holes on the face of the piston near its periphery, which holes extend inwardly and then laterally outward through the periphery of the piston, thus forming passages for the flow of the pressure-producing fluid, which imparts pressure to the inner face of the packing, forcing it against the cylinder and preventing leakage.

Other features of my invention will be fully explained in the following description of the drawings.

Referring to the drawings, Figure 1 is a perspective view of the machine embodying my invention. Fig. 2 is a side view of the top forward part of the machine; Fig. 3, a vertical section on line *x x*, Fig. 2. Fig. 4 is a broken section on line *y y*, Fig. 1. Fig. 5 is a vertical section on line *w w*, Fig. 4. Fig. 6 is partly in perspective and partly in plan, showing the arrangement of cylinder, piston, and valves. Fig. 7 is a section on line *z z*, Fig. 6. Fig. 8 is a plan of piston-head and packing. Fig. 9 is a plan, showing the segmental gear and its relation to the last-carriage; and Fig. 10 is a section on line *v v*, Fig. 6.

A represents the base of the machine; B, a column or frame, on which are mounted the operative parts. C represents a cylinder. D′ represents a cylindrical piston; D, the piston-head; E, the packing, and *d* a cylindrical cap or platform, rigidly fastened to the piston D′, with flanges encompassing the cylinder C, which flanges are of a length to cover the cylinder when the piston is fully elevated. F represents a carriage, mounted on cap *d*, to which it is attached by means of gibs *e e*, which are gained to fit into groove *i* of the carriage; *h*, a hole pierced in the carriage to receive lasts G G′, which are tenoned to fit therein. H H′ represent formers, which are attached to slide I by a dovetail, as shown in Fig. 1. K K represent gibs, which sustain slide I in connection with the rocking bed-piece I′, which is secured by eyebolt Q and pivot P to the overhanging part of the frame A′. On these gibs are tongues, which fit into corresponding grooves cut in them for the part I, and form ways for it to slide upon.

L represents a rack-bar, fastened to the un-

der side of carriage F. The teeth of rack L engage with pinion L′, which is mounted on a shaft and revolved by means of crank M.

l represents a set-screw, which acts as a stop for carriage F, the travel of which is regulated by the set-screw. M′ represents a shaft, journaled on column B; *n*, a segmental gear, rigidly attached to shaft M′; N, a segmental arm, journaled on stud S′, which is shown journaled on shaft M′. Segment *n* engages with segment *n′*, and the arm N is attached to slide I by a pivot passing through a slot, as shown in Fig. 9.

o represents a tripping-arm, rigidly secured to shaft M′. *o″ o′* are dogs, which engage with tripping-lever *o* as the carriage F is moved back and forth laterally on its ways.

The dogs *o″ o′* are secured to carriage F by screws, and the holes are slotted to allow of their being adjusted to regulate the oscillation of shaft M′, and thereby adjusting the travel of slide I.

G G′ are right and left lasts, and H H′ right and left formers, against which lasts G G′ are forced by the stroke of the piston D′. It is desirable to have the lasts G G′, respectively, above the center of piston D′.

When the stroke is made, and when right and left shoes or boots are to be shaped, each last with its former should be brought alternately into operation. This is accomplished as follows: The machine being set as in Fig. 1, with last G vertically under former H, by turning crank M to the right, carriage F is also moved to the right by means of pinion L′ and rack-bar L, and the last G is brought to the center of the piston. This movement causes dog *o″* to strike tripping-arm *o*, which turns shaft M′ and segmental gear *n n′*, when slotted arm N moves slide I to the left, bringing former H vertically over last G. By adjusting the dogs *o″* and *o′* and set-screws *l*, the position of the lasts G G′ and formers H H′ can be regulated so as to be brought into exact vertical planes for making the stroke.

I′ represents a bed-piece, to which slide I is attached; Q, an eyebolt, and P a pivot for securing the bed-piece to the frame A′. Instead of the eyebolt, a ball-and-socket joint may be employed; but this will not be ordinarily necessary. This joint enables the formers H H′ to rock and adjust themselves to the faces of the last when the stroke is made, thereby bringing the strain vertically on the last. The machine is adapted to be driven by any kind of fluid-pressure. It is shown, however, packed for using water or compressed air, the latter being preferable.

It is necessary to regulate the pressure for different kinds of work, and to increase and decrease the same at pleasure. To enable this to be practically and readily done when steam, hydraulic, or hydrostatic force is employed, I have invented the following arrangement, which will enable the operator to have perfect control of the machine.

R represents a supply-pipe; *v*, a cut-off valve, which is fully described in my patent of May 16, 1876. R′ represents a branch of pipe leading from R to a weighted valve, *u*, and from hence to waste-pipe W.

To regulate the pressure, weight B′ is adjusted on the graduated lever C′ to the point indicating the required pressure. A greater pressure of the fluid than that indicated by the position of the weight will raise valve *u*, which will permit the escape through pipes S and W of a portion of the medium of pressure.

The piston D′ is, of course, arrested in its stroke by the resistance of the last against the former, and as long as valve *v* is open it will be held under pressure. As soon as valve *v* is lowered, the piston D′ will return to its normal position, ready for a second stroke, and the fluid in cylinder C will run out through the valve-chamber into pipe S, through T and escape W.

When a hydraulic force-pump is employed to supply the fluid-pressure, the escape W may lead back to the reservoir which supplies the pump, and thus may be used over continually.

E represents a leather packing, secured between the piston and piston-head by screws, as shown in Fig. 5. P′ represents a series of holes pierced in the face of the cylinder near its periphery, and extended laterally through to the leather. The pressure acting on the face of the piston will enter through holes, and force the leather against the sides of the piston, and prevent all leakage between piston and cylinder. E′ represents a treadle, pivoted on base of frame A; *v′*, a connecting-rod, pivoted to the stem of valve-rod *v* by a ball-and-socket joint, *t*. The arrangement of these devices is such that the operator can with his foot move the cut-off valve *v* up and down and control the piston movement at will.

When straight lasts are employed, but one former, H, is necessary. In such a case segmental arm N is detached from slide I, which is adjusted to be stationary over the center of the piston; and a short platform with a single former may be substituted for the slide I, if desired.

What I claim is—

1. The bed-piece I′, pivoted to frame A′, so as to allow the former to rock and adjust itself to the face of the lasts, substantially as set forth.

2. The combination, with the piston D′, adapted for operation by fluid-pressure, of the carriage F, mounted on said piston and provided with the lasts, and a suitable former arranged above said lasts, the carriage being adapted to reciprocate to bring the lasts alternately under the former, substantially as and for the purpose set forth.

3. In combination with the reciprocating carriage F, the reciprocating slide I and the mechanism for automatically operating the carriage and slide in unison, substantially as set forth.

4. In combination with carriage F, the adjustable dogs *o' o''*, for adjusting the throw of slide I, substantially as set forth.

5. The combination of a suitable former, the carriage F, carrying the lasts and provided with the adjustable screws *l*, for limiting the travel of said carriage, and the cap or platform *d*, upon which the carriage is supported, substantially as described.

6. The combination, with the cylinder and its piston, of the pipe R, cut-off valve *v*, branch pipe R', regulating-valve *u*, and pipes S, substantially as described.

7. In combination with the regulating-valve *u*, the pipe S, arranged to relieve the piston of excessive pressure, substantially as herein set forth.

8. The piston D', having a series of holes, P, to supply pressure between the periphery of the piston-head and the packing E, substantially as set forth.

In testimony whereof I have hereunto set my hand.

SIMON ROSS, JR.

Witnesses:
M. D. HUNT,
E. G. WOOD.