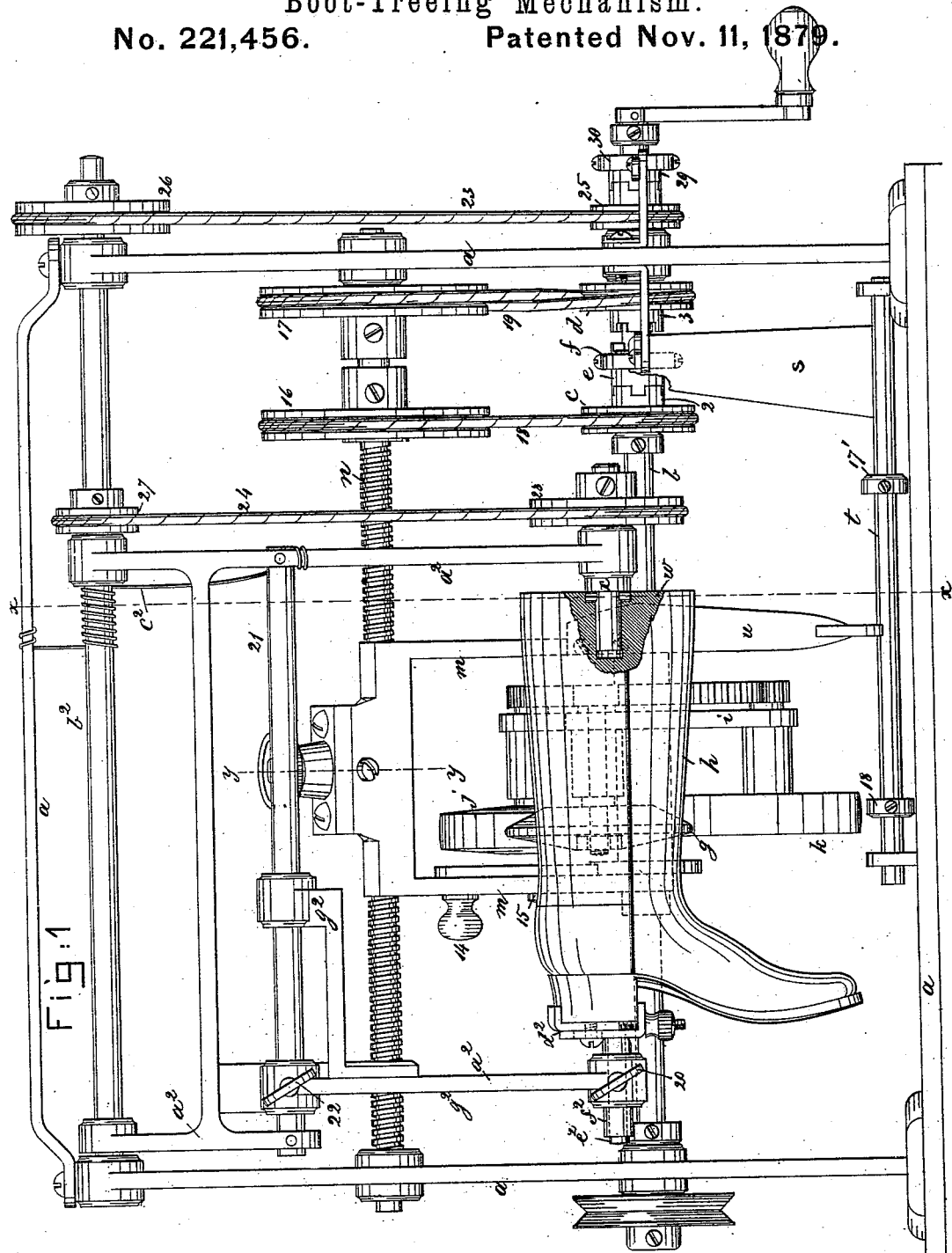


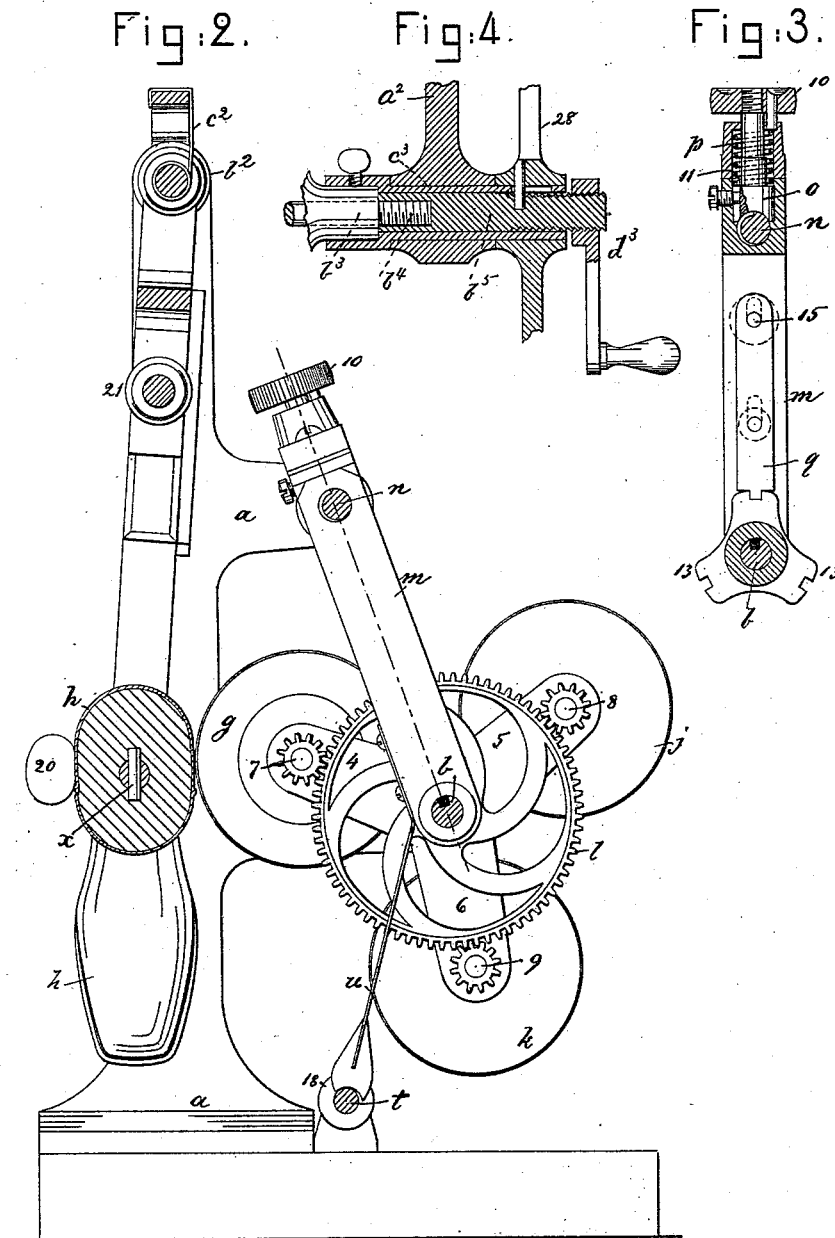
W. S. HALL.
 Boot-Treeing Mechanism.
 No. 221,456. Patented Nov. 11, 1879.



Witnesses.
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Inventor:
 William Smith Hall
 by Crosby Gregory, Atty.

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UNITED STATES PATENT OFFICE.

WILLIAM SMITH HALL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN BOOT-TREEING MECHANISMS.

Specification forming part of Letters Patent No. **221,456**, dated November 11, 1879; application filed September 5, 1879.

To all whom it may concern:

Be it known that I, WILLIAM SMITH HALL, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Boot-Treeing Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to mechanism for treeing-boots; and it consists, essentially, in the combination with a rotary rubbing wheel or tool and rotating boot-holding mechanism, of means to automatically change the relative position of the boot and wheel or tool, longitudinally, as the wheel or tool is rotated, whereby the wheel may be made to operate upon the boot from one to its other end, to fit it to the tree, and rub out wrinkles.

In this present embodiment of my invention a boot, supposed to be held upon a tree of usual construction, is so supported in a swinging frame as to be rotated slowly about an axis substantially parallel with the side seams of the boot, and a rapidly-rotated rubbing-wheel, in addition to its rotations, is also moved longitudinally in the direction of the length of the boot, so that the said wheel, preferably first placed in contact with the boot near the sole, may be made, as the boot and wheel are rotated, to travel over the boot vamp and counter to the top of the leg, fitting the boot to the tree and treeing it in a most thorough manner.

Figure 1 represents, in front elevation, a boot-treeing machine containing my invention; Fig. 2, a section thereof on the line *x x*; Fig. 3, a section of the rubbing-wheel carrying-frame and its actuating-shaft on the line *y y*, and Fig. 4 a detail of a modification to be referred to.

The frame *a* of the machine may be of proper shape to hold the working parts.

The main rotating shaft *b* of the machine, driven in any usual way by power or otherwise, has placed loosely upon it two belt-pulleys, *c d*, the hubs 2 3 of which are adapted to be engaged, the one or the other by a clutching-sleeve, *e*, placed on shaft *b*, so as to rotate with and slide on the said shaft, the sleeve being under the control of a suitable shipper, *f*, in order that the sleeve may be made to engage the hub of and rotate one or the other of the pulleys *c d*, according to the direction in

which it is desired to move the wheel *g* along over the boot *h*.

Surrounding the shaft *b* is the frame *i*, which carries the shafts of the rubbing-wheels *g j* and a rag-wheel, *k*, each of said shafts having a pinion engaged by the toothed gear *l*, splined upon the shaft *b*, the said toothed gear keeping the said wheels in rotation, one or the other of them always acting against the boot as may be desired or needed.

The frame and toothed gear are held between the arms of a yoke, *m*, or equivalent engaging device, fitted loosely at its lower end to shaft *b*, and receiving at its upper end a screw-shaft, *n*, adapted to be engaged by a half-nut, *o*, connected with a stem, *p*, provided with a head, 10, by which the stem may be lifted to disengage the half-nut from the screw-shaft when it is not desired that the frame and rubbing wheel be moved longitudinally by the shaft, a spring, 11, holding the said half-nut down at all other times.

The sleeve part of the wheel-carrying frame *i* has at one end notched arms 13, adapted to be engaged by the holding device *q*, herein shown as a sliding bolt connected with the yoke *m*, the bolt having a handle, 14, and a screw or fastening device, 15, to hold it in place.

By this contrivance either of the wheels *g*, *j*, or *k* may be placed in position to operate upon the boot.

If desired, the frame may carry one or any desired number of rubbing-wheels.

The screw-shaft *n* has fixed upon it two belt-pulleys, 16 17, connected, the first by the plain belt 18 with the pulley *c*, and the latter by the crossed belt 19 with the pulley *d*, so that one or the other of the said pulleys *c d* may, when engaged by the clutch-sleeve *e*, turn the shaft *n* to the right or left, according to which direction it is desired the frame and rubbing-wheel to move, the said wheel operating against the boot from the counter and vamp end along the leg to its top, and vice versa.

The clutching mechanism is herein shown as operated automatically.

The clutch-lever *f* is engaged by the arm *s* of the shipper-rod *t*, having collars 17' 18' acted upon at intervals or at the completion of the traverse of the frame by the shipper-moving arm *u* attached to yoke *m*.

The collars 17' 18', one or both, are made adjustable on the shipper-rod, according to the length of the boot.

Instead of the particular shipping mechanism and clutching mechanism herein shown, I may employ other well-known devices for like purposes.

The boot-tree *w* is herein shown as a solid boot-shaped piece, upon which it is supposed a boot, *h*, is fitted, as indicated in the drawings; but in practice I propose to employ the same kind of a tree and centrally-located expanding device for it, that is now commonly used in boot-factories; and in Fig. 4 I have shown a suitable connection for it.

The boot-tree, Fig. 1, at its leg end is shown supported upon a short rotating shaft, *x*, held in one arm of the swinging frame *a*² pivoted at *b*², and provided with a suitable spring, or equivalent, *c*², by which to keep the boot, stretched over the tree, pressed against the rubbing-wheel.

The heel of the boot is held by a heel-clamp, *d*², made adjustable for heels of different sizes, the said clamp being upon a shaft, *e*², extended loosely through a tubular bearing, *f*², adjustably held in the movable arm *g*² of the frame *a*² by the screw 20. The arm *g*² is connected with the rod 21 of frame *a*² by means of the screw 22.

When a boot on the tree is to be treed, the leg end of the tree is first placed over the shaft *x*, and fixed thereto, so as to rotate with the said shaft when it is rotated. Then the arm *g*², which at this time is loose on rod 21, is turned down until the shaft *e*² is in line with shaft *x*, when the heel-clamp is moved to engage the heel, and is clamped in position thereon.

The boot-tree being supported in front of the rubbing-wheel then to operate upon it, the machine is started with the wheel in contact with the counter of the boot next the sole, or against the vamp near the sole, and as the rubbing-wheel is rotated and moved longitudinally, as before described, the tree and boot thereon are also rotated through the belts 23 24, clutch-pulley 25, pulleys 26, 27, and 28, the latter on shaft *x*, which supports the tree.

The clutch-pulley 25 is loose on the main shaft *b*, and when turned is engaged by the clutch-sleeve 29, under control of the clutch-lever 30, so that, when desired, the boot-tree may have its rotation stopped altogether, or so that a boot provided with a fancy top in front, the wheel *g* having arrived at the top of the boot-leg, may be turned by hand for part of a rotation in opposite directions, so that the wheel will come in contact only with the rear of the boot-leg.

In Fig. 4 I have shown the end *b*³ of a boot-tree in common use, with the end of the usual expanding device, *b*⁴, which is to be partially drawn out from it, and upon the end of *b*⁴ I have added a screw-threaded extension, *b*⁵.

Instead of the shaft *x* shown in Fig. 1, I have shown a socketed sleeve, *c*³, to receive

the end *b*³ of the tree and the said extension. The sleeve *c*³, extended loosely through the frame *a*², has fastened to it the driving-pulley 28.

The handle *d*³, or it may be a hand-wheel, is applied to the end of the extension-rod *b*⁵, and by turning *d*³, one face of it acting against the hub of the pulley, the extension-rod and usual expanding device, *b*⁴, may be drawn partially out of the end of the tree *b*³, thereby expanding it. The rubbing-wheel *j* has a broader edge than the one *g*.

The rag-wheel is a wheel having a soft elastic surface for brushing or cleaning the surface of the boot.

The wheel *j* may, if desired, be employed to stuff or rub into the leather oil or dressing removed from the boot before crimping it, such oil or dressing being necessary when the boot is being treed.

The wheel *g* is shaped as a disk, and its narrow periphery or edge is adapted to operate upon the entire foot of the boot-upper and into the shank, which, it is obvious, would not be the case if rubbing devices were made as a cylinder with concaved surface, and mounted on an axis at right angles to the axis about which the boot-tree is rotated, as is common.

The axis of rotation of the rubbing-disk *g* is substantially parallel with the axis of rotation of the tree.

I claim—

1. In a boot-treating machine, the rotating disk-shaped rubbing-wheel *g*, having its axis substantially parallel with the axis of the boot-tree, and boot-tree and its supporting devices, combined with mechanism adapted to change the relative positions of the said disk *g* and tree longitudinally, while the edge of the said disk operates upon the boot, substantially as described.

2. A rotary rubbing-wheel, combined with a boot-tree and a swinging frame to support it, to thereby permit the boot held on the rotating boot-tree to be pressed in contact with the said rubbing-wheel, substantially as described.

3. In a boot-treating machine, a boot-tree and mechanism to engage and rotate it, combined with a clamp to embrace and hold the heel of the boot, substantially as described.

4. The swinging frame and its rotating shaft to engage and turn the boot-tree, combined with a pivoted arm and connected heel-clamping devices to permit the boot-tree to be placed upon and be withdrawn from the shaft which rotates it, substantially as described.

5. In a boot-treating machine, a frame provided with a rubbing-wheel, a yoke, and a screw-shaft to move the frame horizontally, and a shaft and connecting devices, substantially as described, between it and the shaft of the rubbing-wheel, to rotate it, substantially as set forth.

6. In a boot-treating machine, a rotating boot-tree and a frame provided with two or more rotating wheels to act upon a boot held upon the tree, combined with the holding de-

vice for the frame, to permit either of the said wheels to be held in position to act upon the boot, substantially as described.

7. In a boot-treeing machine, a rotary rubbing-wheel and mechanism to reciprocate its carrying-frame longitudinally, combined with belt-shipping devices and clutch-pulleys, substantially as described, to reverse the movement of the said frame and rubbing-wheel, substantially as and for the purpose set forth.

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

WM. SMITH HALL.

Witnesses:

G. W. GREGORY,
N. E. WHITNEY.