

Feb. 4, 1930.

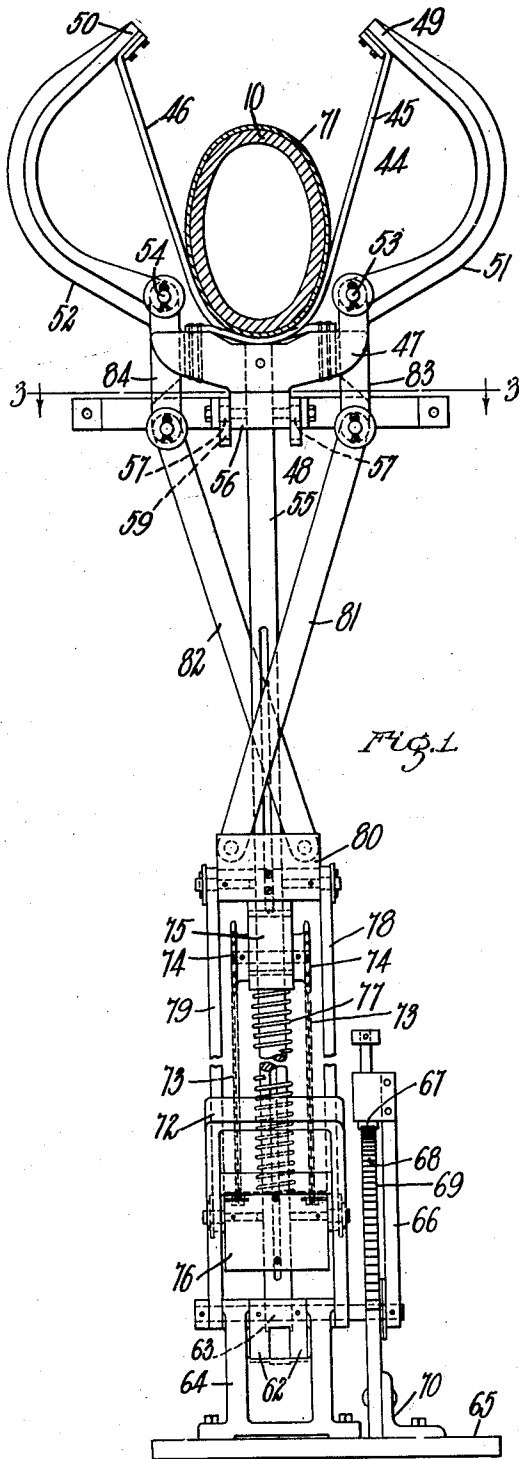
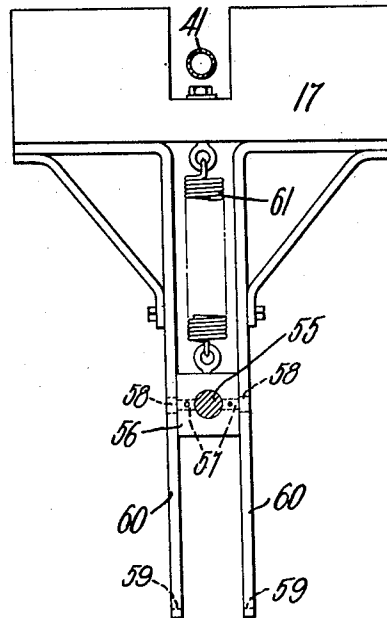
W. S. ASHTON

1,745,827

BOOT STRIPPING MACHINE

Filed Jan. 5, 1928

3 Sheets-Sheet 1



Inventor:
 William S. Ashton,
 by Charles S. Gooding,
 Att'y.

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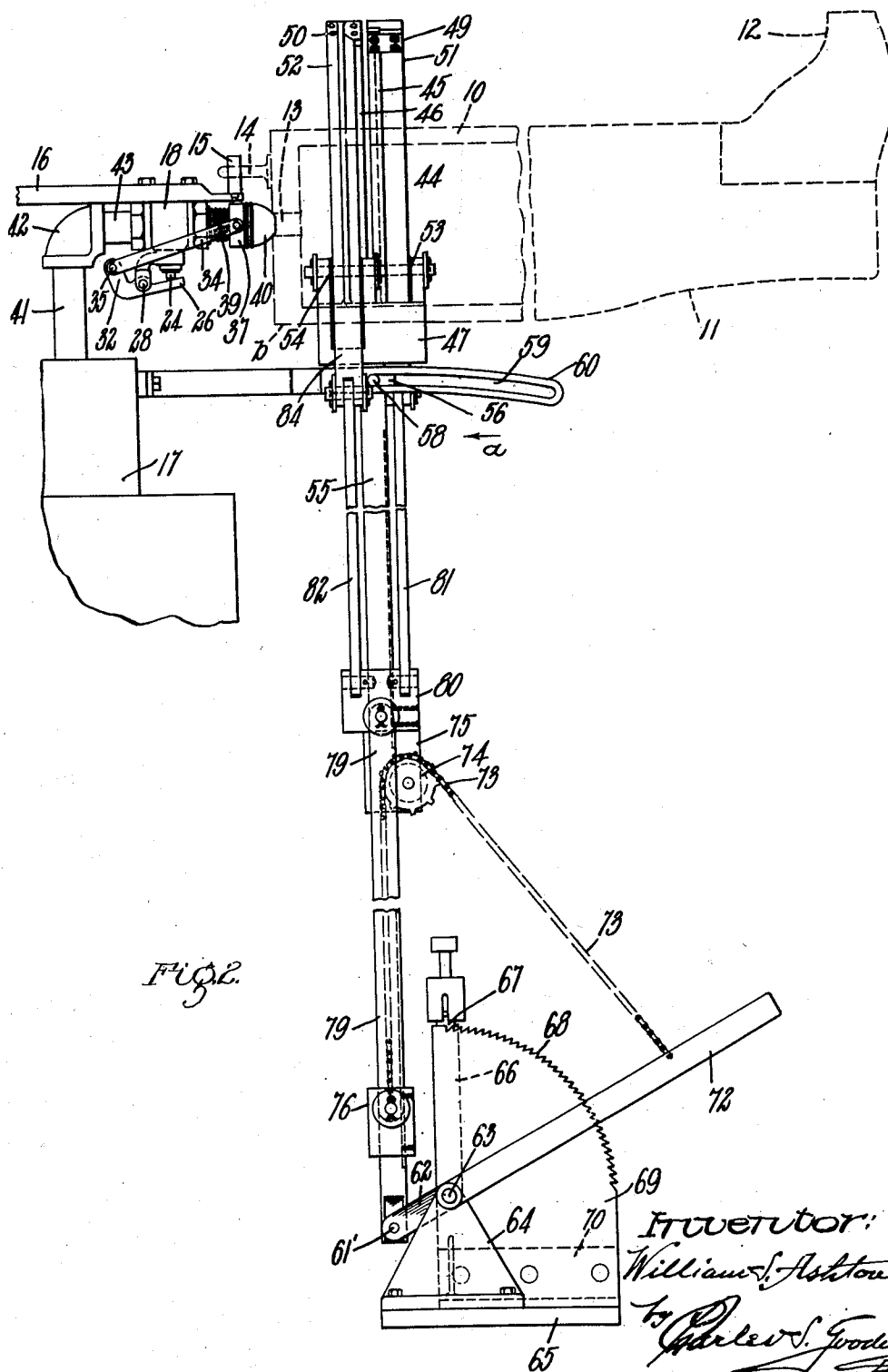
W. S. ASHTON

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BOOT STRIPPING MACHINE

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3 Sheets-Sheet 2



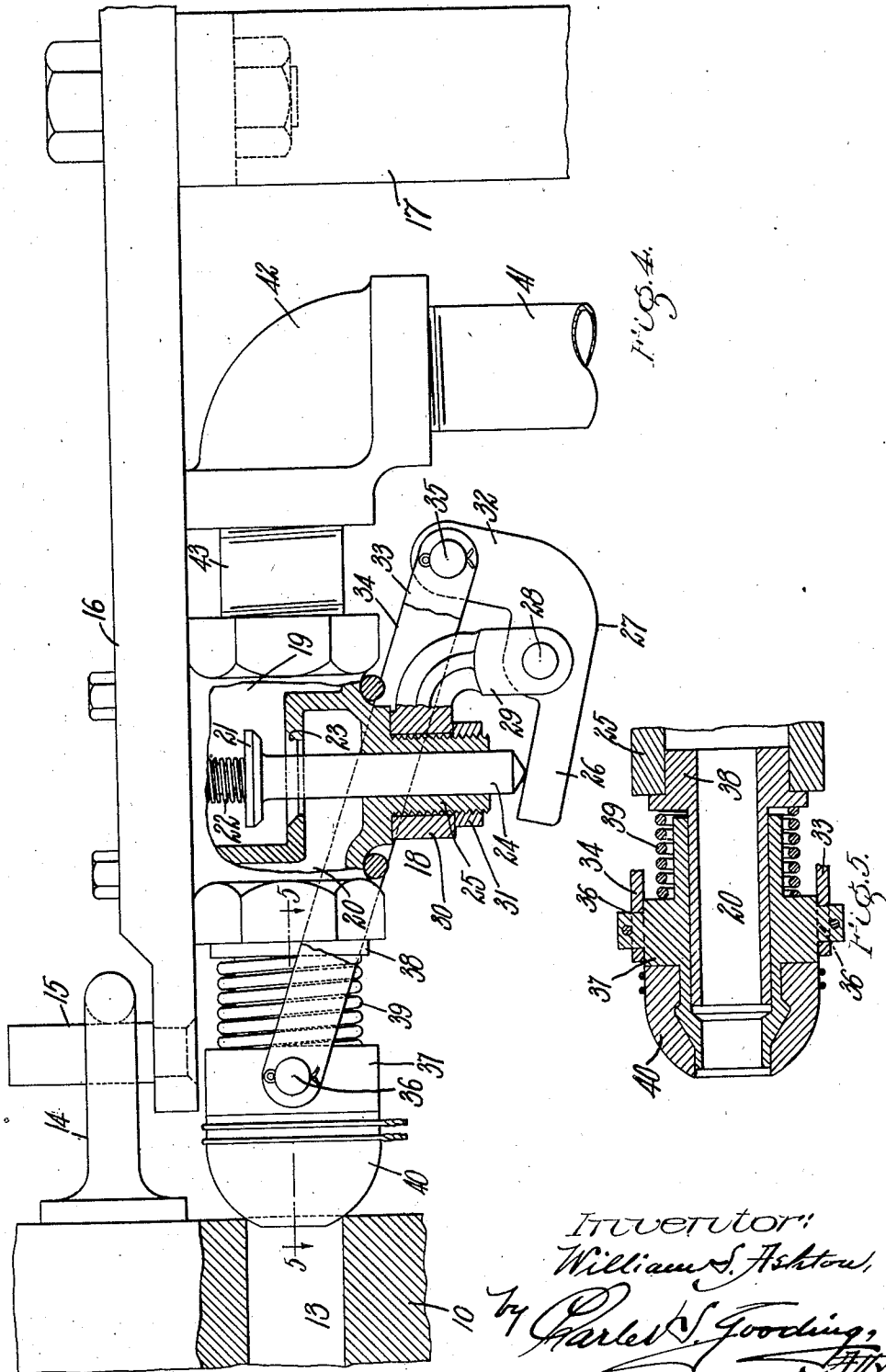
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W. S. ASHTON
BOOT STRIPPING MACHINE

1,745,827

Filed Jan. 5, 1928

3 Sheets-Sheet 3



Inventor:
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UNITED STATES PATENT OFFICE

WILLIAM S. ASHTON, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HOOD RUBBER COMPANY, INC., OF WATERTOWN, MASSACHUSETTS, A CORPORATION OF DELAWARE

BOOT-STRIPPING MACHINE

Application filed January 5, 1928. Serial No. 244,726.

This invention relates to a machine for stripping a rubber boot from a boot tree.

In stripping boots which have been cured or vulcanized on a vented boot tree or last with a differential pressure, great difficulty is experienced, due to the boot adhering to the last. This adhering of the boot to the last is due to the external pressure, which has been applied to the boot during the vulcanizing process, having caused the gum stock to be driven through the lining into contact with the boot tree, thus causing the boot to adhere to the tree, also, the adhering of the boot to the tree is caused by shrinkage of the boot as it cools, gripping the tree.

The object of the present invention is to overcome this difficulty by forcing air under pressure into the hollow boot tree and between the boot tree and the boot positioned thereon.

The invention consists in the improved boot stripping mechanism set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings:

Figure 1 is a front elevation of a boot stripping mechanism embodying my invention, the boot tree and boot thereon being shown in section.

Fig. 2 is a side elevation of the boot stripping mechanism, both Figs. 1 and 2 being broken away to save space.

Fig. 3 is a plan of the support guiding bracket, the compressed air supply pipe being shown in connection therewith in section.

Fig. 4 is a sectional elevation viewed in the opposite direction to that in which Fig. 2 is viewed, illustrating the air valve, the mechanism by which the valve is operated and a portion of a boot tree shown in connection therewith.

Fig. 5 is a sectional plan taken on line 5-5, Fig. 4.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, as shown in dotted lines Fig. 2, 10 is a hollow boot tree consisting of a leg portion 11 and a foot portion 12, the foot portion being slidably and pivotally mounted upon the leg portion, so that the

toe portion may be moved by pulling longitudinally of the tree thereon to cause the foot portion to assume the position illustrated in Fig. 7.

Any suitable form of boot tree may, however, be used instead of the boot tree shown in dotted lines, Fig. 2, this particular form being the same as a boot tree forming the subject matter of an application filed by me on February 17, 1927, Serial No. 168,984.

The boot tree 10 has a vent opening 13 in the upper end thereof and also an eye bolt 14 fast thereto, through which a stud 15, fast to a bracket 16, projects. The bracket 16 is fastened to a stationary frame 17. An air valve 18 is fastened to the bracket 16 and is provided with an inlet port 19 and an outlet port 20, communication between the two ports being normally closed by a valve member 21 which is held by air pressure and by a spring 22 against a valve seat 23.

A valve stem 24, forming a portion of the valve member 21, projects downwardly and out of the valve casing 25, the lower end of the valve stem resting against one arm 26 of a lever 27 pivoted at 28 to an arm 29 on a bracket 30 which is clamped to the valve casing by a nut 31. Another arm 32 of the lever 27 has a pair of links 33 and 34 pivoted thereto at 35, said links at their opposite ends being pivoted at 36 to a nozzle 37 which is slidably mounted upon a sleeve 38 fast to the casing 25 of the air valve. A spring 39 moves the slidable member 37 of the nozzle. A rubber nipple 40 is secured to the slidable member 37 and this nipple bears against the upper end of the boot tree 10 as shown in Figs. 2 and 4 with the outlet port 20 in alignment with the vent opening 13 of the boot tree.

In the drawings the spring 39 is shown compressed, the boot tree being in the position assumed thereby when the boot is being withdrawn therefrom, that is, the boot tree is pressed downwardly at that time, thus causing the nozzle to be moved rearwardly against the action of the spring 39 and through the links 33 and 34 tipping the lever 27 into the position illustrated in Fig. 4, thus raising the valve member 21 and opening communication

between the inlet port 19 and the outlet port 20, allowing the air to enter the boot tree.

Compressed air from a source of compressed air enters the air valve through a pipe 41, elbow 42 and pipe 43. When the air enters the boot tree it passes from the interior of the boot tree between the boot and the boot tree, the joint between the foot portion 12 and the leg portion 11 not being air tight, thus expanding the boot and loosening the same upon the boot tree, so that it can be removed therefrom by pulling thereon. The air entering between the boot and boot tree would pass out at the upper end of the leg of the boot, but this is prevented by the gripper 44 of the mechanism, which, in its preferred form, consists of two fabric straps 45 and 46. These straps may be made, however, in one piece, but preferably they are made in two pieces. The lower ends of the straps, see Fig. 1, are fastened to the upper end 47 of a support 48. The upper ends of the straps are fastened to the free ends 49 and 50 of a pair of oppositely disposed levers 51 and 52 which are pivoted at 53 and 54 to the head 47.

The head 47 is fastened to a vertical rod 55 forming a portion of the support 48. The vertical rod 55 extends downwardly through a sliding block 56 which has oppositely disposed studs 57 fast thereto and provided with cylindrical heads 58 which project into slots 59 in brackets 60 fastened to the frame 17.

A spring 61 is connected to the frame 17 at one end thereof and at the other end to the sliding block 56, which tends to move the sliding block 56 and the rod 55 forming a portion of the support 48 in the direction of the arrow *a*, Fig. 2. The lower end of the rod 55 is pivoted at 61' to a pair of arms 62 which are fastened to a rocker shaft 63 mounted to rock in a bracket 64 fast to a stationary base 65. The rocker shaft 63 has an arm 66 fast to one end thereof which has a spring-actuated pawl 67 slidably mounted on its upper end and engaging a ratchet 68 formed on a plate 69 also fast to the base 65 and to a bracket 70 on said base. The arms 62 and rocker shaft 63 constitute a rocker member.

It is desirable to have the lower ends of the gripper members 45 and 46 positioned relatively to the boot and the boot tree, as illustrated in Fig. 1. The distance, however, from the axial line of the vent opening 13 of the boot tree to the bottom edge *b*, see Fig. 2, of the boot tree varies in different boot trees, and to accommodate this variation and still have the lower ends of the gripper members positioned relatively to the boot tree, as illustrated in Fig. 1, it is desirable that the head 47 of the support 48 should be adjustable vertically, and this is accomplished by rocking the arm 66 and rocker member 62, which moves the rod 55 vertically, the same sliding during this movement in the

sliding block 56 until the head 47 is positioned as desired with reference to the boot tree and boot which is being operated upon, and when in adjusted position the support 48 is locked in that position by the pawl 67 and ratchet 68.

The gripper members 45 and 46 are wrapped around the upper end of the boot 71 on the upper end of the leg portion 11 of the boot tree by rocking the levers 51 and 52. This rocking movement is accomplished by means of a treadle 72, pivoted on the rocker shaft 63 and having a pair of chains 73 connected thereto and extending over idler sprockets 74 rotatably mounted upon a block 75 which is fastened to the rod 55. From the sprockets 74 the chains 73 extend downwardly and are connected to another block 76 which is slidably mounted on the rod 55.

A spring 77 encircles the rod 55 and bears at its upper end against the block 75 and at its lower end against the block 76. The block 76, slidably mounted on the rod 55, is connected by links 78 and 79 to another sliding block 80. The two blocks 76 and 80 and the links 78 and 79 connecting them, thus forming in effect a slide which is moved upwardly on the rod 55 by the downward movement of the treadle 72. The block 80 is connected by links 81 and 82 to the lower ends of arms 83 and 84 of the levers 51 and 52.

The general operation of the mechanism hereinbefore described is as follows:—The boot tree, with a vulcanized boot thereon, is placed with the eye bolt 14 in engagement with the stud 15. The gripper members 45 and 46 are then caused to encircle the upper end of the boot 71 by pressing downwardly upon the treadle 72 which, as before described, causes the levers 51 and 52 to rock upon their pivots through the medium of the sprocket chains 73, block 76, links 78 and 79, sliding block 80 and links 81 and 82. Pressure enough is brought to bear upon the treadle 72 to hold the upper portion of the leg of the boot against the boot tree with sufficient pressure to prevent the air from escaping at the upper end of the boot when it is admitted thereto through the air valve, as hereinbefore described.

The operator now pulls longitudinally upon the boot, thus admitting the compressed air to the interior of the boot tree, as hereinbefore described, and the air passes from the interior of the boot tree through the opening between the foot portion of the boot and the leg portion and distends the boot sufficiently to loosen it upon the boot tree. He then pulls forwardly on the boot which, being loosened from the leg of the boot tree, slips along the boot tree as though upon a film of air, and the gripper member is enabled to slide along relatively to the boot tree with the boot without twisting the same, by reason of the levers 51 and 52, to which it is connected, and the

links 81 and 82 of the slide member, to which they are connected, all being mounted upon the support 48, which tips upon its pivot 61 to allow this movement. During this movement of the rocking of the support upon its pivot, the sliding block 56 moves in the opposite direction to the arrow *a*, Fig. 2, the heads 58 of the studs 57 travelling along the slots 59 in the brackets 60 and the treadle 72 and the chains 73 and sprockets 74 move with it.

When the boot has been removed from the tree, the operator releases the treadle and the boot stripping parts are returned to their relative positions illustrated in Figs. 1, 2 and 3 by the springs 61 and 77. The boot tree is then removed from the machine in readiness for another boot to be vulcanized thereon, and when the nozzle 37 is released from the pressure of the boot tree thereagainst, the spring 39 expands, and through the links 33 and 34 and the air pressure, the valve member 21 closes communication between the inlet and outlet ports 19 and 20. The machine is then in readiness for the operation to be repeated.

It will be understood that the gripping device is designed to grip the boot and tree so that pressure can be held in the boot until it has been moved forward on the boot tree, so that the toe piece of the tree has been all or partially withdrawn from the toe of the boot.

It will be understood that as the boot is pulled off the boot tree, the gripping device moves forward with it and thus permits the holding of pressure as the boot is moved forward without straining or twisting the gripping members, the general effect of this operation being to enable the boot to be slipped forward on the tree as on a film of air.

I claim:

1. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, and means to expand said boot by air pressure, said gripper and its operating mechanism being movable longitudinally of the tree, whereby the boot may be stripped therefrom.

2. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the leg of a boot to said tree, means to expand said boot by air pressure, said gripper and its operating mechanism being movable longitudinally of the tree, whereby the boot may be stripped therefrom, and means to adjust the gripper and its operating mechanism transversely of the tree to accommodate trees of varying dimensions.

3. A machine for stripping a boot from a boot tree having, in combination, a support, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted

on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.

4. A machine for stripping a boot from a boot tree having, in combination, a support, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, means to expand said boot by air pressure, and means to adjust the support transversely of the tree.

5. A machine for stripping a boot from a boot tree having, in combination, a pivotally mounted support, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.

6. A machine for stripping a boot from a boot tree having, in combination, a support, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, a pair of links connected to said levers, a slide on said support to which said links are connected, and means to impart a reciprocatory motion to said slide, whereby the levers may be rocked to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.

7. A machine for stripping a boot from a boot tree having, in combination, a support, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, a pair of links connected to said levers, a slide on said support to which said links are connected, a treadle, and means connecting said treadle to said slide, whereby the levers may be rocked to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.

8. A machine for stripping a boot from a boot tree having, in combination, a support, a rocker member upon which said support is pivotally mounted, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.

9. A machine for stripping a boot from a boot tree having, in combination, a support, a rocker member upon which said support is pivotally mounted, means to lock said rocker member in adjusted positions, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.
10. A machine for stripping a boot from a boot tree having, in combination, a support, a rocker member upon which said support is pivotally mounted, means to guide the support when it is rocked upon its pivot, a flexible gripper attached to said support, a pair of oppositely disposed levers mounted on the support and attached to opposite ends of the gripper, means to rock said levers to cause the gripper to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.
11. A machine for stripping a boot from a boot tree having, in combination, a support, a pair of flexible members fast at one end thereof to said support, a pair of oppositely disposed levers mounted upon the support and attached at their free ends to said flexible members, and means to rock said levers to cause the flexible members to encircle the leg of a boot on said tree and grip it thereto, and means to expand said boot by air pressure.
12. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, and an air valve connected to a source of compressed air and to the interior of said tree and operable by movement of said tree to admit air thereto to expand said boot.
13. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, and an air valve connected to a source of compressed air and to the interior of said tree and operable by movement of said tree to admit air thereto to expand said boot, said gripper and its operating mechanism being movable longitudinally of the tree, whereby the boot may be stripped therefrom.
14. A machine for stripping a boot from a boot tree having, in combination, a hollow boot tree provided with a vent in the top thereof, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, a stationary member upon which said tree is movably mounted, an air valve provided with an inlet port connected with a source of compressed air and with an outlet port connecting with said tree vent, a valve member interposed between said ports and normally closing communication therebetween, and means operable by movement of said tree to move said valve member and open communication between said ports to admit air into said boot tree.
15. A machine for stripping a boot from a boot tree having, in combination, a hollow boot tree provided with a vent in the top thereof, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, a stationary member upon which said tree is movably mounted, an air valve provided with an inlet port connected with a source of compressed air and with an outlet port connecting with said tree vent, a valve member interposed between said ports and normally closing communication therebetween, a spring-actuated nozzle containing said outlet port and bearing against said tree, and means connecting said nozzle to said valve member operable by the movement of the nozzle by the tree to move the valve member and open communication between said ports to admit air into said boot.
16. A machine for stripping a boot from a boot tree having, in combination, a hollow boot tree provided with a vent in the top thereof, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, a stationary member constituting a pivot upon which said tree is pivotally mounted, an air valve provided with an inlet port connected with a source of compressed air and with an outlet port connecting with said tree vent, a valve member interposed between said ports and normally closing communication therebetween, a spring-actuated nozzle containing said outlet port and bearing against said tree below said pivot, and means connecting said nozzle to said valve member, operable by the movement of the nozzle and by the downward movement of the tree to move the valve member and open communication between said ports to admit air into said boot tree.
17. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the upper end of the leg of a boot to said tree to seal the upper end of the boot against the escape of air from the interior thereof, and means to expand said boot by air pressure, said gripper being movable

longitudinally of the tree, whereby the boot may be stripped therefrom.

18. A machine for stripping a boot from a boot tree having, in combination, a boot tree, a gripper, mechanism to operate said gripper to grip the leg of a boot to said tree, means to expand said boot by air pressure, said gripper and its operating mechanism being movable longitudinally of the tree, whereby the boot may be stripped therefrom, and means to adjust the gripper transversely of the tree to accommodate trees of varying dimensions.

In testimony whereof I have hereunto set my hand.

WILLIAM S. ASHTON.

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