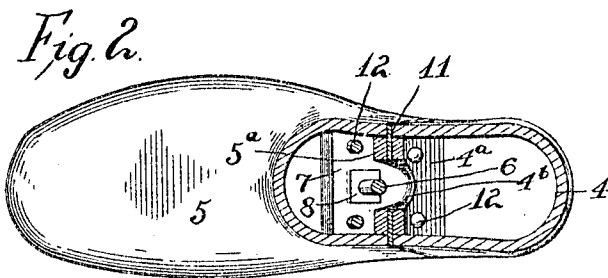
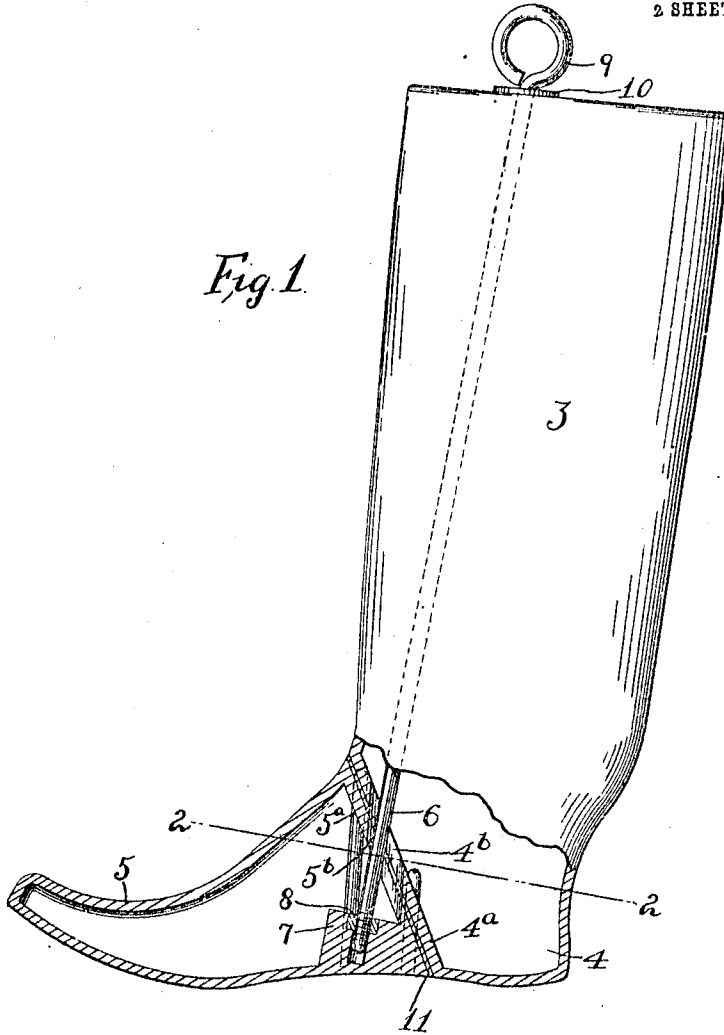


W. W. DUNCAN.  
 BOOT TREE OR LAST.  
 APPLICATION FILED FEB. 20, 1909.

950,379.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.



ATTEST.  
*Berthm. Stahl.*  
*Edw. L. Tolson.*

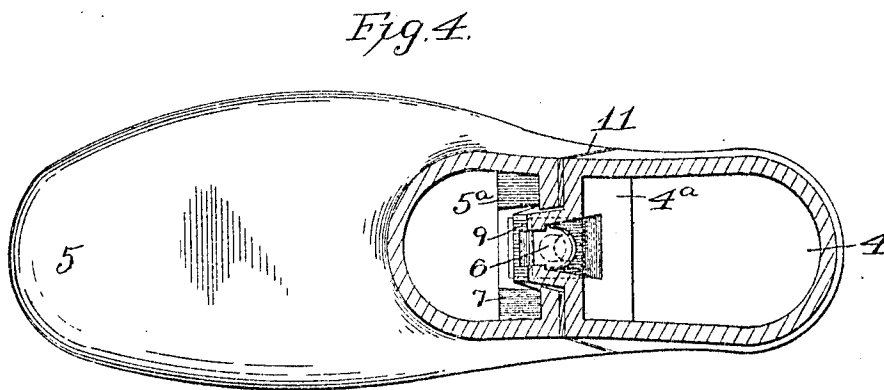
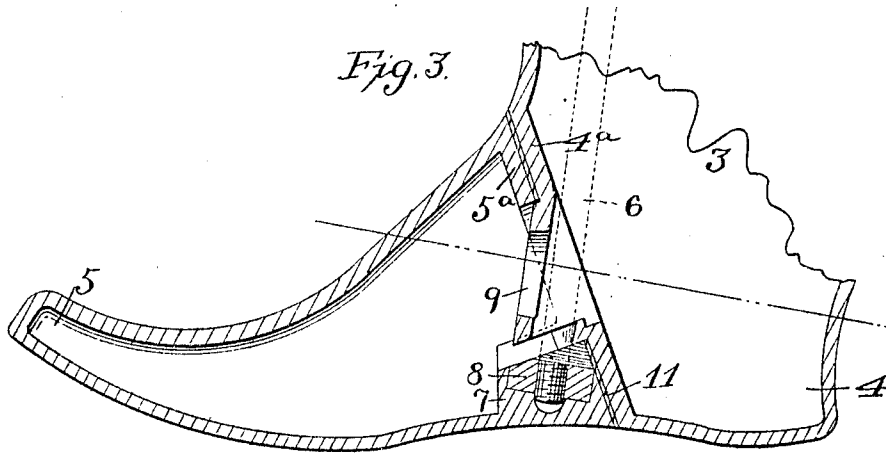
INVENTOR.  
 WILLIAM W. DUNCAN.  
 BY *Frederic Middleton Donaldson*  
 ATTYS.

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2 SHEETS—SHEET 2.



ATTEST.

*Bent M. Stahl.*  
*Edward N. Sutton*

INVENTOR.

WILLIAM W. DUNCAN

*By Spear Middleton Donaldson & Spear*  
 ATTYS.

# UNITED STATES PATENT OFFICE.

WILLIAM W. DUNCAN, OF WATERTOWN, MASSACHUSETTS.

BOOT TREE OR LAST.

950,379.

Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed February 20, 1909. Serial No. 479,190.

*To all whom it may concern:*

Be it known that I, WILLIAM W. DUNCAN, a citizen of the United States, residing at Watertown, Massachusetts, have invented certain new and useful Improvements in Boot Trees or Lasts, of which the following is a specification.

My said invention relates to improvements in boot trees or lasts, such as are used in the formation of rubber boots. Such lasts have been made of wood or metal, and are provided with a toe portion made removable to enable the tree to be withdrawn from the last, this removability also permitting different shapes or styles of toe to be used with the same leg or body portion. The connection between the toe and leg portions is made by means releasable from the top of the leg portion, as by the use of a screw rod passing downward through the leg and engaging the toe portion, thus enabling the toe to be disconnected for the removal of the tree from the boot.

It has been found desirable to effect the cure of the rubber boots after they have been formed in the usual manner upon the trees by subjecting them to the action of heated water or steam, as disclosed in an application filed Dec. 11/08, Serial No. 467460, but in effecting such cure it is necessary that all moisture should be excluded from the interior of the boot.

It is the object of the present invention therefore to provide a boot tree or last so constructed as to prevent the admission of any moisture to the interior of the boot, while at the same time the toe portion may be readily removed and replaced.

The invention includes the novel features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

A boot tree or last constructed in accordance with my invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a side elevation partly in section, and Fig. 2 is a transverse section on the line 2—2 of Fig. 1. Figs. 3 and 4 are detail views of a modified form.

Referring by reference characters to this drawing, the numeral 3 designates the body or leg forming portion of the last having the usual heel portion 4, and 5 designates the toe portion. These parts may advantageously be made hollow for lightness and preferably

have inclined abutting walls 4<sup>a</sup> and 5<sup>a</sup>, as clearly shown in Fig. 1. As a convenient means of securing the parts together, a rod 6 may be used passing downwardly through the leg portion 3 and through openings 4<sup>b</sup> and 5<sup>b</sup> in the inclined walls and having its lower end threaded to engage a correspondingly threaded part in the toe portion. As aluminum of which these trees are made is a soft metal, it is preferable to provide an enlargement 7 in the toe portion and to seat therein a nut 8 of hard metal with which the rod engages. The upper end of the rod is provided with a suitable handle 9 by which it may be manipulated, this handle bearing as the rod is screwed down, on a washer 10. Between the adjoining faces of the inclined walls 4<sup>a</sup> and 5<sup>a</sup> is inserted a layer 11 of suitable packing material. The toe portion and body portion are respectively provided with interlocking or engaging parts which guide them as they are being drawn together by the securing rod.

In the form of my invention as embodied in Figs. 1 and 2, one of the tree parts is provided with substantially vertical pins 12 and the other with corresponding openings to receive the pins. I prefer to have the pins carried by the toe portion and projecting upwardly therefrom and engaging corresponding openings in the inclined wall 4<sup>a</sup> of the body portion, the packing sheet being of course perforated to permit the passage of the pins. As these pins extend upwardly at an angle to the inclined faces 4<sup>a</sup> and 5<sup>a</sup>, it will be seen that as the toe portion is drawn upward by the rod, its wall 5<sup>a</sup> is drawn against and compresses the packing against the wall 4<sup>a</sup> with a wedging action and by this means any moisture which has gained access to the interior of the last through the open top thereof is absolutely prevented from passing out through the joint between the toe portion and the body portion.

While it might be possible to exclude moisture by making the tree of solid metal and providing a packing around the rod at the upper end of the tree to prevent the entrance of moisture to the opening through which the rod passes, such a proceeding would be highly objectionable, in that it would prevent the access of the heated fluid to the interior of the tree and thus enable the vulcanizing to be effected only from the exterior, which with thick heavy goods would greatly increase the length of time

necessary to effect complete vulcanization. It would further be open to the objection that the air confined within the chamber through which the rod passes would tend to expand as the tree was heated and would force its way out through the joint and enter between the stock and tree. By the structure described, however, I am enabled to permit the heated fluid to not only act upon the exterior of the rubber boot upon the tree, but also to pass freely into the tree and thus transmit its heat through the comparatively thin conducting walls of the tree to the interior surface of the rubber boot, thus greatly facilitating the vulcanizing action.

In the form shown in Figs. 3 and 4, instead of using pins from one part engaging corresponding openings in the wall of the other part, I provide a single projection from the one part engaging a correspondingly shaped recess in the other part, this single projection by its size and shape affording proper alinement of the parts, as shown. The action of the two parts as they come together are in other respects substantially the same.

What I claim as new is:—

1. A boot tree or last comprising a hollow body portion, a hollow toe portion, means for holding said parts together, and means

for making the joint between said parts water tight, substantially as described.

2. A boot tree or last comprising a body portion, and a toe portion having adjoining faces, guide pins projecting from one of said parts and entering corresponding openings in the other part, said guide pins being located in planes at an angle to the plane of the adjoining faces, packing material interposed between said adjoining faces, and means for drawing said parts together.

3. A boot tree or last comprising a body portion and a toe portion having inclined adjoining faces, packing material interposed between said inclined faces, pins carried by the toe portion and engaging corresponding openings in the body portion, said pins extending at an angle to the inclined faces, and a rod extending downwardly through the body portion and into the toe portion for drawing upon the toe portion and causing the same to be pressed laterally against the packing, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

WILLIAM W. DUNCAN.

Witnesses:

C. H. ROPER,  
CARL W. JOHNSON.