Dec. 16, 1941. G. A. PEIRCE ET AL 2,266,258

SHOE TREE

Filed Oct. 3, 1940 2 Sheets-Sheet 1

FIG. 1.

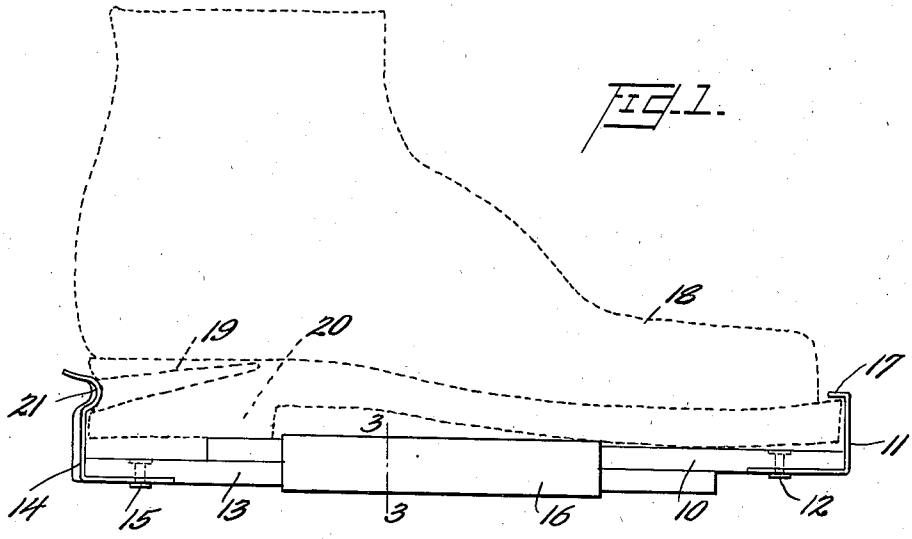


FIG. 2.

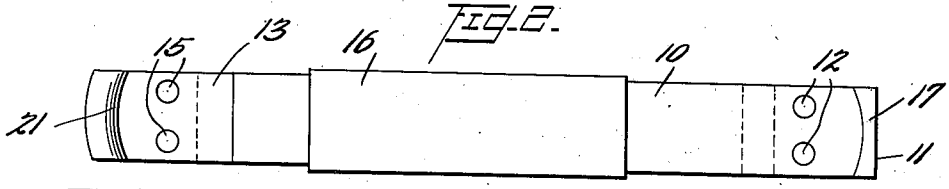


FIG. 7.

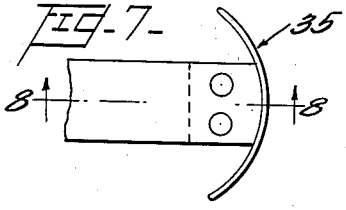


FIG. 3.

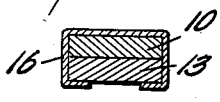


FIG. 8.

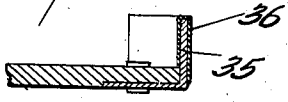


FIG. 4.

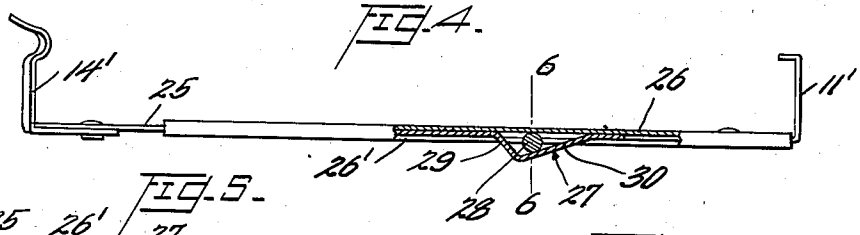


FIG. 5.

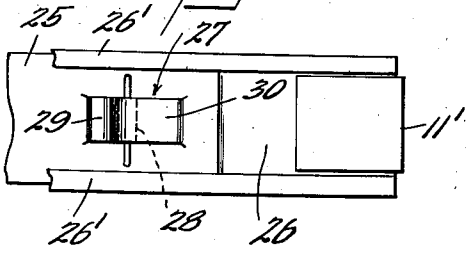
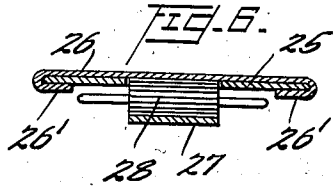


FIG. 6.



Inventor

George A. Peirce

Edward C. Newell

By Watson, Cole, Grindle & Watson

Attorneys

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SHOE TREE

Filed Oct. 3, 1940 2 Sheets-Sheet 2

FIG. 9.

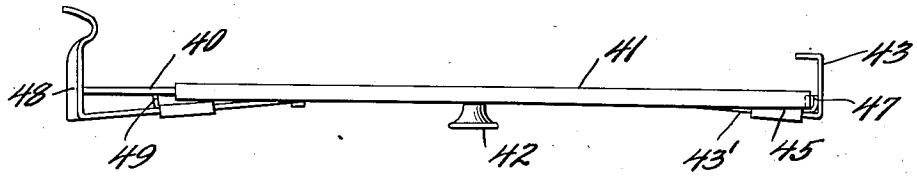


FIG. 10.

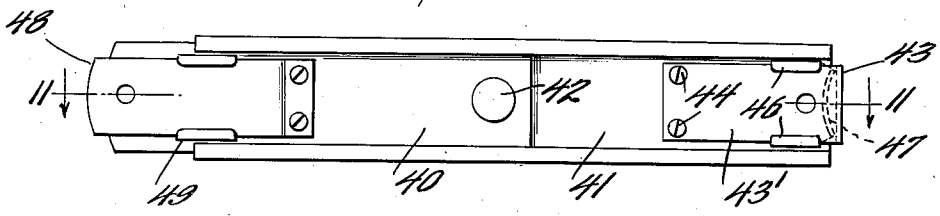


FIG. 11.

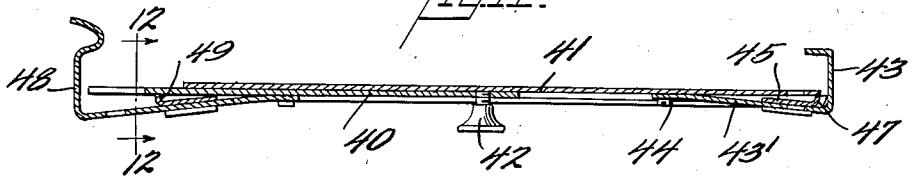


FIG. 12.

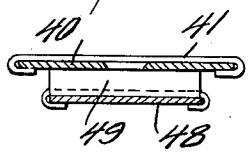


FIG. 13.

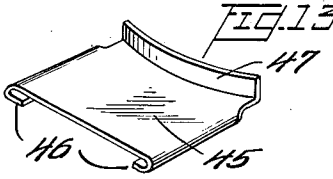
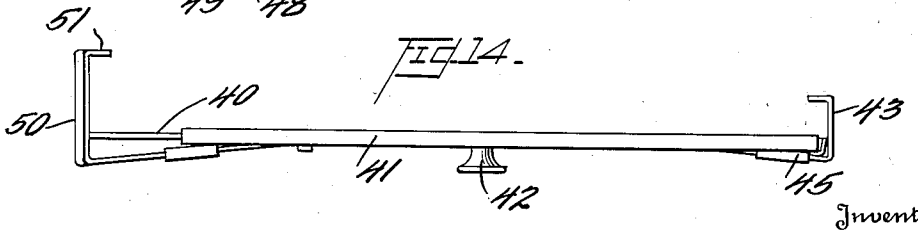


FIG. 14.



Inventor

George A. Peirce

Edward C. Newell

By Watson, Cole, Grindle & Watson

Attorneys

Patented Dec. 16, 1941

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UNITED STATES PATENT OFFICE

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SHOE TREE

George A. Peirce, Boscawen, and Edward C. Newell, Derry, N. H.

Application October 3, 1940, Serial No. 359,592

12 Claims. (Cl. 12—129.1)

The present invention relates to shoe straightening devices, commonly known as shoe trees, and particularly to devices adapted to be attached externally of a shoe for the purpose of straightening the sole of the latter and maintaining the shoe in the proper shape while not in use.

It is the general object of the present invention to provide a novel and useful shoe tree of the external type which is extremely simple in construction and operation, and may be economically manufactured, while at the same time possessing adequate rigidity and great durability. A further object is to provide a shoe tree of the type in question, which, in one embodiment, may be adjusted to various sizes of shoes without the necessity of manipulating any bolts, wing nuts or the like, the parts being maintained in adjusted relation by friction means only.

A further object of the invention is to provide a shoe tree of the external type which will be particularly suitable for use with heavy shoes and boots, and more specifically with ski-boots having the conventional grooved heels.

It is a further object of the invention to provide an external shoe tree comprising two members slidable relative to each other, one of such members carrying toe engaging means and the other member carrying heel engaging means, and a simple friction device for maintaining the two members in adjusted relation.

A further object of the invention is the provision of a novel friction lock for use in connection with shoe trees of the type in question.

A further object is the provision of a shoe tree of the type mentioned, having means for adjustment to accommodate shoes of varying thickness with respect to the soles and heels thereof, and ski-boots having grooves at varying distances above the bottom of the heel.

It is well known that shoe trees adapted for application externally of the shoe or boot have certain advantages, one important advantage being that such devices do not impede ventilation of the shoe, and therefore facilitate drying out of the shoe after use. Other advantages of such devices are that they do not bulge or distort the toe or heel of the upper, do not cause ripping of the seams of the upper, and do not stretch the material of the upper part of the shoe, as internal shoe trees are apt to do when sufficient pressure is applied to straighten the soles of the shoes to the desired degree.

Heretofore, however, shoe trees of the external type have had certain disadvantages, one principal disadvantage residing in the various expedients employed for securing the tree to the heel portion of the shoe. For this purpose, sharp pointed clamping devices of various kinds have been employed, which naturally mar the appearance of the shoe and likewise tend to separate the layers of leather or other material making up the heel. Other devices have been proposed, in which one or more members extends upwardly over the rear portion of the shoe and engages inside the heel portion of the shoe upper. Such devices not only tend to scuff and mar the leather, but also tend to pull the upper portion of the shoe out of shape.

The shoe tree of the present invention avoids the aforesaid disadvantages of the prior shoe trees of the external type, and possesses the advantage that it will not injure or mutilate any part of the shoe. Furthermore, it is easily and quickly adjusted and applied to any size shoe, provides a positive grip on the shoe insuring an adequate straightening effect, and is sufficiently rugged to be useful in connection with the heaviest types of boots and shoes.

Other and further objects, features and advantages of the present invention will be apparent to one skilled in the art from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a side elevation of a shoe tree constructed in accordance with the present invention, as it appears in use;

Figure 2 is a plan view of the device of Figure 1;

Figure 3 is a transverse section on line 3—3 of Figure 1;

Figure 4 is a side view, partly in elevation and partly in section, of a modified form of the invention;

Figure 5 is a fragmentary bottom view of the device of Figure 4;

Figure 6 is a transverse section on line 6—6 of Figure 4;

Figure 7 is a plan view of a modified form of heel gripping device;

Figure 8 is a section on line 8—8 of Figure 7;

Figure 9 is a side elevation of a further modification;

Figure 10 is a bottom view of the tree of Figure 9;

Figure 11 is a section on line 11—11 of Figure 10;

Figure 12 is a section on line 12—12 of Figure 11;

Figure 13 is a perspective view of a wedging element employed in the tree of Figures 9–12; and

Figure 14 is a view like Figure 9 but showing the use of a different heel gripping member.

In order to facilitate an understanding of the invention, reference is made to the embodiments thereof shown in the accompanying drawings and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

Referring to Figures 1–3, the shoe tree there illustrated comprises generally a flat rigid member 10 of wood, metal or other suitable material, carrying a toe clip 11 rigidly secured thereto by rivets 12; a second rigid member 13 carrying a heel clip 14 secured thereto as by rivets 15; and a sleeve 16 which serves to retain and guide the members 10 and 13 relative to each other, and to urge them into frictional engagement whereby they will be retained in the relation to which they have been adjusted. The sleeve 16 is preferably of metal having a certain amount of resilience, and may consist of a rectangular tube, either continuous or discontinuous, as desired. In the present instance, the sleeve 16 is discontinuous, as best seen in Figure 3, being made from a flat sheet of metal. The sleeve 16 may, if desired, be secured to one or the other of the members 10, 13, and if desired, may be deformed to increase the friction effect.

The toe clip 11 is preferably formed of metal of a sufficiently heavy gauge to be substantially rigid, and is provided at its upper end with an inwardly turned flange 17 which engages the upper edge of the forward or toe portion of the shoe sole, thereby clamping the latter securely against the member 10.

In the embodiment illustrated in Figures 1–3, the heel clip 14 is designed particularly for use in connection with ski-boots, the heels of which are provided with peripheral grooves, principally for the purpose of receiving the heel engaging member of the usual ski harness or binding. In Figure 1 the heel 20 of the boot 18 is provided with the groove 19.

The heel clip 14 extends upwardly and is curved slightly, about a vertical axis, to conform approximately to the general contour of the heel 20. In addition, the upper portion of the clip 14 is bent to provide an inwardly or forwardly projecting portion 21, which extends transversely throughout the width of the heel clip, and engages in the groove 19, thereby securely holding the heel of the boot down against the tree.

In applying the tree to the boot, the toe of the sole is first inserted under the flange 17 of the clip 11, after which the boot sole is pressed firmly against the rigid member 10, and the member 13 is adjusted lengthwise, relative to the member 10, until the portion 21 of the heel clip 14 engages in the groove 19. In adjusting the member 13 relative to the member 10, it is necessary to overcome the friction between their abutting surfaces and the friction between one or the other of such members and the sleeve 16. The friction between the members in question is initially regulated so that the adjustment may be easily made while at the same time there will be sufficient friction between the several members to prevent the accidental extension of the tree so as to unintentionally release the boot. It will be understood that once the tree is installed on the boot, there is little if any force exerted in a direction to extend the shoe tree, while in fact the friction between the members 10 and 13 and the sleeve 16 is enhanced by the force exerted by the boot in a direction normal to the tree.

Figures 4–6 illustrate a modified form of the invention in which the longitudinal members 25 and 26 are formed of metal. The member 26 is provided with downwardly and inwardly extending flanges 26' to enclose the edges of the member 25, so that the two members thus have a telescoping relation. The member 26 is provided with a toe clip 11' similar to the toe clip 11 described above, and the member 25 carries a heel clip 14' similar to the heel clip previously described.

This embodiment of the invention includes a novel frictional device for maintaining the members 25 and 26 in adjusted relation, against any force tending to move them apart so as to extend the shoe tree. Thus, a portion of the member 25 is deformed downwardly to provide a cage 27 for a small roller 28, which preferably has a roughened surface. The cage 27 has a short, sharply inclined portion 29 and a longer and more gently inclined portion 30. The inclination of the respective portions 29 and 30 is such that when the members 25 and 26 are moved in a direction to extend the shoe tree, the roller 28 will be gripped between the inclined portion 30 of the cage 27 and the undersurface of the member 26, effecting a wedging action which prevents relative movement of the members 25 and 26. However, when the latter members are pushed toward each other, the roller is released, and the inclination of the portion 29 of the cage is such that there will be no wedging action between that portion of the cage and the member 26.

When the members are frictionally locked in adjusted relation, as just described, and it is desired to extend the tree, it is only necessary to move the roller 28 slightly to the left, which destroys the wedging action, and permits the members 25 and 26 to be freely moved lengthwise of each other. It is obvious that any suitable wedging member might be substituted for the roller 28.

Figures 7 and 8 illustrate a modified form of heel clip for use with ordinary boots or shoes, the heels of which are not adapted to be satisfactorily engaged by the form of heel clip previously described. As will be seen in Figure 7, the upper portion of the heel clip 35 extends transversely to a greater distance than is the case with the heel clip 14, and has no bulged portion corresponding to the portion 21 of the latter. The upper portion of the clip 35 is curved to conform approximately to the contour of the rear edge of a shoe heel, and is coated, either entirely or on its inner surface only, with a layer 36 of rubber or other suitable material having a high coefficient of friction. Preferably, the curvature of the clip is slightly greater than that of the average shoe heel, so that the respective ends of the clip will have a resilient gripping action on the engaged heel, which action will be greatly enhanced by the layer 36 of friction material. The heel clip of Figures 7 and 8 may, of course, be used in lieu of the heel clip of either of the previously described embodiments.

In the modification of Figures 9–13, provision has been made for positively clamping the telescoping members in fixed relation, and means are also provided for adjusting the height of the heel and toe clips to accommodate different

thicknesses of heels and soles. In this form of the invention the telescoping longitudinal members 40, 41 correspond generally to the members 25, 26 of Figures 4–6, but the friction device 28—30 is omitted, the members 40, 41 being adapted to be secured in fixed relation by a thumb screw 42 threaded in the member 40. The toe clip 43 is secured at its inner end to the member 41 by screws 44 or other suitable means and is formed of resilient metal so as to be constantly urged upwardly relative to the member 41. The position of the clip 43 relative to member 41 may be adjusted by means of a wedge 45 which is best seen in Figure 13, and which is formed with in-turned edge flanges 46 whereby the wedge slidably engages the longitudinal portion 43' of the clip 43. An upturned flange 47 engages the underside of the member 41, and by adjusting the wedge along the portion 43' of the clip, the height of the latter may be varied.

The heel clip 48 is secured to the member 40, and is provided with a sliding wedge 49 similar to that just described. By adjusting the wedge 49, the heel clip may be accommodated to ski-boots having heel grooves at different heights.

Figure 14 illustrates the tree of Figures 9–13, but provided with a heel clip 50 similar to the toe clip 43, for use with ordinary dress and other shoes, in place of the heel clip 48 and in lieu of a heel clip such as that of Figures 7 and 8. It will be understood that the flange 51 of the clip 50 fits over the top edge of the heel proper, at the junction of the latter with the shoe upper.

In connection with each of the several embodiments of the invention it will be observed that the heel clip, whatever its form, engages the true heel of the shoe below the counter thereof. This insures engagement with a firm rigid and solid portion of the shoe which cannot be distorted or marred by the application of the shoe tree.

It is apparent that the shoe tree of the present invention has no points or surfaces which can in any way injure or mar any part of the shoe and that, by reason of its great simplicity and rigidity, it possesses important advantages over the shoe trees of the external type which have been in use heretofore.

Since the device of the present invention may be employed in connection with any type of boot, as well as footwear of the kind commonly designated as shoes in contradistinction to boots, the word "shoe" as employed in the appended claims is to be understood as comprehending exterior footwear of all kinds, whether commonly known as boots or as shoes.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second elongated rigid member slidable longitudinally of and in parallelism with said first member and carrying at its distal end heel-gripping means adapted to engage the rearward edge of a shoe heel below the counter, and means retaining and guiding said members for sliding movement only relative to each other.

2. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second rigid member slidable longitudinally of said first member and carrying heel-gripping means adapted to engage the rearward edge of a shoe heel, and means retaining and guiding said members relative to each other, said heel-gripping means comprising an upwardly extending member having a forwardly projecting portion adapted to engage a recess formed in the rearward edge of said shoe heel.

3. A shoe tree comprising an elongated rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second rigid member slidable longitudinally of said first member and carrying heel-gripping means adapted to engage the rearward edge of a shoe heel, and means retaining and guiding said members relative to each other, said heel-gripping means comprising an upwardly extending member curved to conform approximately to the contour of the rearward edge of a shoe heel and having a transversely extending, forwardly projecting portion adapted to engage a peripheral groove formed in the rearward edge of said shoe heel.

4. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second elongated rigid member slidable longitudinally of and in parallelism with said first member and carrying at its distal end heel-gripping means adapted to engage the rearward edge of a shoe heel below the counter, and means retaining and guiding said members relative to each other, said last means being adapted to automatically frictionally retain said members in the relation to which they are adjusted.

5. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second rigid member slidable longitudinally of said first member and carrying heel-gripping means adapted to engage the rearward edge of a shoe heel, and means retaining and guiding said members relative to each other, said last means comprising a sleeve embracing said members for urging them into frictional engagement.

6. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second elongated rigid member slidable longitudinally of and in parallelism with said first member and carrying at its distal end heel-gripping means adapted to engage the rearward edge of a shoe heel below the counter, and one way clutch means for frictionally locking said members against extension from the relation to which they are adjusted.

7. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second rigid member slidable longitudinally of said first member and carrying

heel-gripping means adapted to engage the rearward edge of a shoe heel, and means for frictionally locking said members in the relation to which they are adjusted, said last means comprising a wedging member loosely confined between relatively inclined surfaces of said respective rigid members and adapted to be wedged between said surfaces to prevent relative movement of said rigid members in a direction to extend said tree.

8. In a shoe tree comprising a pair of rigid members slidable relative to each other for extending and contracting said tree, means on said members for externally engaging, respectively, the projecting toe sole and the heel of the shoe locking means comprising a wedging member loosely confined between relatively inclined surfaces of said respective rigid members and adapted to be wedged between said surfaces to prevent relative movement of said rigid members in a direction to extend said tree.

9. A shoe tree comprising an elongated, rigid member adapted to engage the bottom of a shoe sole, said member having a hook portion at one end thereof adapted to engage the forward end of said sole and retain said sole in engagement with said member, a second rigid member slidable longitudinally of said first member and carrying heel-gripping means adapted to engage the rearward edge of a shoe heel, and means retaining and guiding said members relative to each other, said heel gripping means comprising an upwardly extending member curved to conform approximately to the contour of the rearward edge of a shoe heel and having a high friction surface adapted to engage and cling to said heel.

10. A shoe tree comprising an elongated rigid member adapted to engage the bottom of a shoe sole, toe-engaging means secured to said member, a second rigid member slidable longitudinally of said first member, means secured to said second member adapted to engage the heel below the counter, and means for adjusting the height of said toe-engaging and heel-engaging means relative to said members.

11. A shoe tree comprising an elongated rigid member adapted to engage the bottom of a shoe sole, toe-engaging means secured to said member, a second rigid member slidable longitudinally of said first member, heel-engaging means secured to said second member, and wedge means for adjusting the height of said toe-engaging and heel-engaging means relative to said members.

12. A shoe tree comprising an elongated rigid member adapted to engage the bottom of a shoe sole, toe-engaging means resiliently secured to said member, a second rigid member slidable longitudinally of said first member, means resiliently secured to said second member adapted to engage the heel below the counter, and wedges slidable longitudinally of said members and adapted to adjust the heights of said engaging means above said members.

GEORGE A. PEIRCE.
EDWARD C. NEWELL.