May 15, 1945. H. F. LOEWER ET AL 2,375,931

FULL FORM SHOE TREE

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Fig. 3

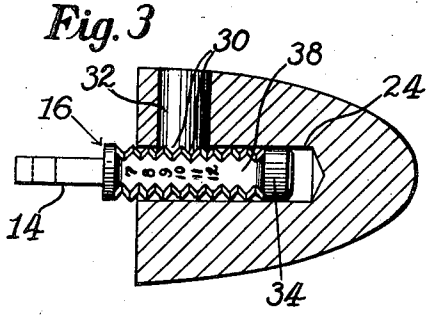


Fig. 1

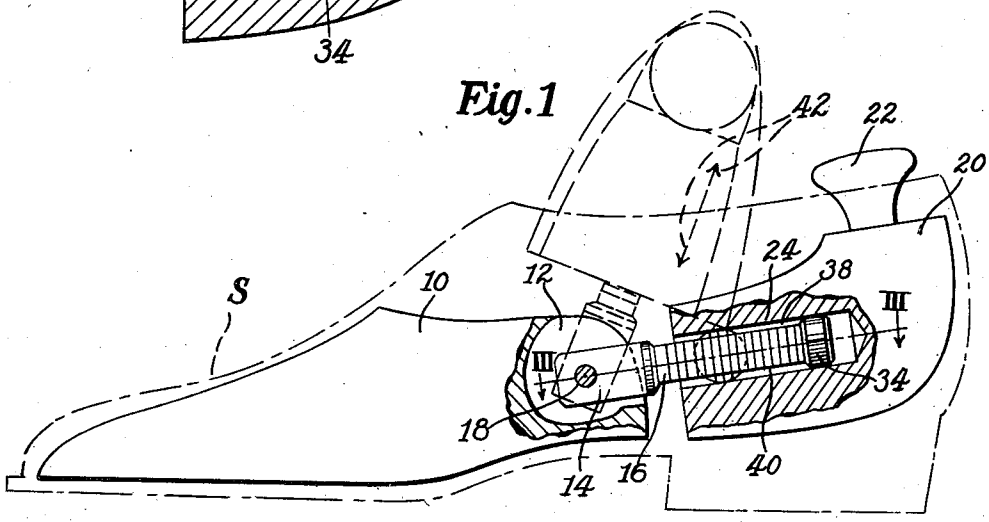
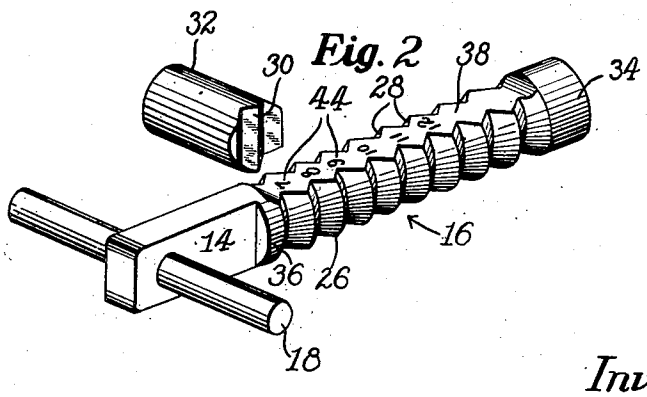


Fig. 2



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FULL FORM SHOE TREE

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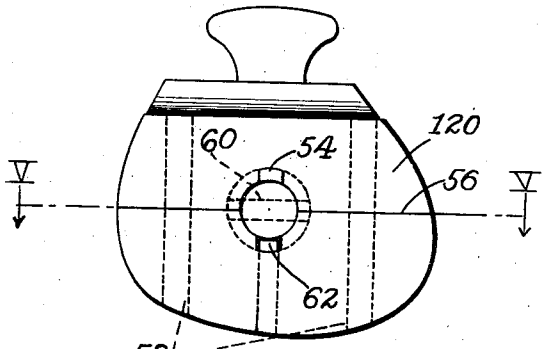


Fig. 4

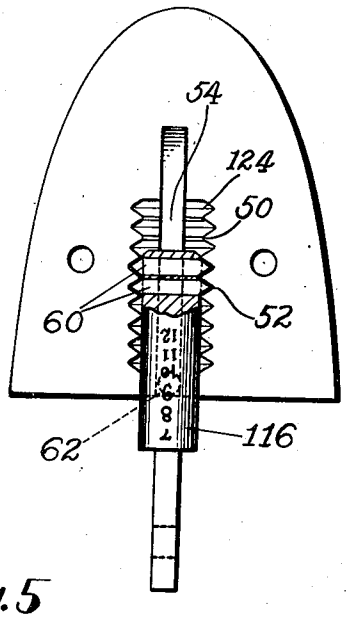


Fig. 5

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FULL-FORM SHOE TREE

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Application October 6, 1943, Serial No. 505,168

16 Claims. (Cl. 12—128.6)

This invention relates to full form shoe trees of the type in which a toe and a heel part are joined by a connector arranged to permit adjustment of the length of the tree to fit shoes of different sizes. Many of the trees of the type under consideration have required complicated metallic parts which are not available under present conditions and, for this or other reasons, have been costly, frequently requiring numerous manufacturing operations which called for skilled mechanics.

It is therefore an object of the present invention to devise a strong and simple construction providing for easy longitudinal adjustment of the tree parts and enabling the tree to be made without the use of metal.

It is desirable in any shoe tree, and particularly so in full form trees, that the length of the tree should be readily adjustable after the forepart of the tree has been inserted in the shoe and, for obvious reasons, it is also desirable that this adjustment may be made quickly and simply without involving the use of any removable parts which might be lost. A feature of the invention resides in a novel arrangement of interengaging elements between one of the tree parts and a connector so that the parts may be held in any of a series of longitudinal adjustments or may be changed to another position of adjustment, after a fractional relative angular rotation of one part with respect to the other, thereby to bring the interengaging elements into such a relation that the tree may be shortened or lengthened by a sliding movement. Following such adjustment, these elements are turned back to interlock in another position. As illustrated, the interlocking elements comprise a projection on one tree part adapted to engage one of a series of ribs on the other part. The arrangement is such that the heel part may not be fully detached from the forepart, but it can easily be adjusted longitudinally after the forepart has been inserted in the shoe whenever the connector is uptilted, after which the heel part may be pushed down into the counter portion of the shoe to thrust the forepart completely forward and thereby to cause the tree to fit the shoe.

These and other features of the invention will be understood from a consideration of the following description taken in connection with the accompanying drawings, in which

Fig. 1 is a side elevation of the shoe tree with parts in section and showing it within a shoe;

Fig. 2 is an exploded angular view showing the interlocking elements by which the two parts of the tree are held in extended position;

Fig. 3 is a horizontal section through the heel part on the line III—III of Fig. 1, to show the interengagement of the interlocking elements;

Fig. 4 is a front elevation of the heel part in an alternative form of the invention in which the ribs are formed in the inner surface of the socket in the heel part while the projection is on the connector; and

Fig. 5 is a horizontal section on the line V—V of Fig. 4.

A wooden toe part 10 of the tree is slotted at 12 to receive the flattened end portion 14 of a wooden connector rod 16 which is hinged to said toe part by means of a transverse pin 18, also of wood. The projecting end of this connector cooperates with a wooden heel part 20 having a handle 22 and recessed to provide a socket 24 to receive the connector. Means is provided for interlocking the socketed heel part with the connector in various positions of longitudinal adjustment and, to this end, the heel part and the connector are provided with interengaging elements. These comprise ribs 26 on the connector rod, resulting from the production of a series of circumferentially extending and hence transverse grooves 28, and projections or teeth 30 upon a wooden locking member or plug 32. This plug, which may conveniently be a cylindrical member, is received in a corresponding hole in the side of the heel part 20 which lies away from the observer in Fig. 1 and, at its inner end, the plug projects into the socket 24 where, in the relative angular relation of the tree parts which obtains when the tree is in use in a shoe, it adjustably engages the connector in any one of a series of lengthwise adjustments with respect to the socket 24 and hence to the heel part 20. It will be observed that the end portion 34 of the connector is of the full diameter of a dowel or rod from which the connector will usually be made, like the diameter found at 36 and like the heightwise dimension of the flattened portion 14. This full-sized end portion 34 fits the socket 24 and, having been inserted therein before the plug 32 is brought into operative position, prevents complete disengagement of the connector and the heel part 20. This plug may be secured in the heel part in any desired fashion, such as by means of glue or by a suitable transverse metallic fastener (not shown).

To enable a quick adjustment of the length of the shoe tree, one of the interengaging elements between the connector 16 and the recessed part of

the tree will be provided with a slideway having such relation to the projection upon the other part that there is no interlocking engagement, and such that one may slide relatively to the other. As herein illustrated, the connector 16 itself has a portion of reduced diameter, it being flattened on the top to provide a slideway 38 and at the bottom to provide a corresponding slideway 40, both joining the ends of adjacent grooves and spaced apart a distance about equal to the diameter between the bottoms of opposite grooves. The grooves 28 and the interposed ribs 26 between these grooves lie alongside the slideways and occupy the two other side portions of the connector. They are circumferentially arranged and here shown as parallel to one another and occupy only a fraction of the total circumference of the connector. Size marks 44 may be applied to the slideway 38 to aid in adjusting the heel part to the desired position for the particular shoe in which the tree is to be used.

In the alternative form of the invention which is illustrated in Figs. 4 and 5, the heel part 120 is provided with a socket 124 in the wall of which there is formed a series of ribs 50 space longitudinally of the heel part and with resulting intermediate grooves 52. Near the top and bottom sides of the socket, these ribs are omitted along limited areas to form slideways 54. For ease of manufacture, it may be found desirable to make the heel part of the tree in two pieces divided along the line 56 and held together by an adhesive with or without dowels 58. When the heel part has a socket with ribs, the connector 116 is provided with one or more pins 60 the ends of which form projections which extend around only a fraction of the circumference of the connector and the ends of which, in the section shown in Fig. 5, are shown to have a triangular cross section complemental to the shape of the grooves 52 and adapted to be received therein so that, by engaging the ribs, relative longitudinal movement between the connector and heel part will be prevented when the heel part is in treeing position. It will be seen from Fig. 4 that the circumferential extent of these projections 60 is less than the extent of the slideways 54 so that, after the heel part has been given a quarter turn, it is free for longitudinal movement with the projections 60 passing along the slideways and, when the heel part has been turned back into treeing position, as shown in Figs. 4 and 5, then, the two parts will be interlocked. A stop pin 62, inserted through the bottom of the tree and glued in place, extends into the lower slideway 54 to contact one of the pins 60 and prevent complete separation of the connector and the socketed heel part.

When, in the use of the tree, the toe part 10 has been introduced into the forepart of a shoe, such as is illustrated by the dot-and-dash lines S, the heel part 20 and the then upwardly tilted connector 16 may be given a partial relative rotation of 90° to bring them into the position illustrated in dash lines in Fig. 1, at which time the projecting teeth 30 of the plug 32 will be free of the grooves of the connector and may slide axially of the connector, as indicated by the double arrow 42, along the slideway 38 to adjust the total length of the tree to the requirements of the shoe. Another partial rotation of the parts, as by turning the heel part away from the observer in Fig. 1, will interlock the propecting teeth 30 between the ribs 26 of the connector in such a position as to give the tree its desired length. The heel part 20 will then be pushed down into the counter portion of the tree to thrust the toe part 10 forward and to cause the tree to substantially fill the shoe, removing such wrinkles therefrom as have resulted from wearing the shoe. The similar operation of the modified form shown in Figs. 4 and 5 will be evident from the preceding description.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. An extensible shoe tree comprising heel and toe parts, a connector associated with one of said parts and slidable longitudinally in as well as rotatable in a socket formed in the other to permit adjustment of the length of the tree, and interengaging means respectively carried within said socket and on said connector, said means engaging one another automatically in any position of the tree, thereby to prevent longitudinal sliding movement of the connector when rotated to bring the heel and toe parts of the tree into operative treeing relationship.

2. An extensible shoe tree comprising heel and toe parts, a connector associated with one of said parts and slidable longitudinally in as well as rotatable in a socket formed in the other to permit adjustment of the length of the tree, and interengaging means respectively carried within said socket and on said connector to prevent longitudinal sliding movement of the connector when rotated to bring the heel and toe parts of the tree into operative treeing relationship, said means comprising respectively a projection and a plurality of longitudinally spaced ribs for selective engagement by said projection.

3. In a shoe tree, a toe part, a heel part, a connector between said parts received in a socket formed in one of them, locking means between said connector and said socketed part, the length of said tree being adjustable by a rotative unloocking movement, a sliding movement and a rotative relocking movement between the connector and the socketed part of the tree, said locking means comprising parallel partial circumferential grooves on one part and a cooperating projection on the other part.

4. A shoe tree comprising a toe part and a heel part, one of said parts being socketed and the other part having associated with it a connector slidably and rotatively received in the socketed part, adjustable interlocking means between the socketed part and the connector comprising a series of ribs on one of the parts, a projection on the other part, and a slideway on one of the parts extending axially thereof and along which said projection may slide freely to enable adjustment of the length of the tree and from which it may rotate into interlocking engagement with a selected rib.

5. In a shoe tree, a toe part, a heel part, a connector associated with one of the parts, the other of said parts having a socket to receive a portion of the connector slidably and rotatably, interlocking means between the socketed part and the connector comprising a series of ribs on one of the parts, a projection on the other part, and a slideway on one of the parts extending axially thereof and along which said projection may slide to enable adjustment of the length of the tree and from which it may rotate into interlocking engagement with a selected rib, and means positioned at the end of a slideway for engagement with said projection to prevent separation of the parts.

6. In a shoe tree having heel and toe parts, a connector carried by one of said parts, said connector being rotatable and longitudinally slideable in a socketed portion of the other part, a plurality of ribs partially surrounding the connector and extending transversely of the axis thereof, and means within the socketed portion of said other part for interlocking engagement with one of said ribs to prevent relative sliding movement of the connector when the parts are rotated into treeing relation to each other.

7. An extensible shoe tree comprising heel and toe parts, a connector associated with one of said parts and slidable longitudinally in as well as rotatable in a socket formed in the other to permit adjustment of the length of the tree, and interengaging means respectively carried within said socket and on said connector to prevent longitudinal sliding movement of the connector when rotated to bring the heel and toe parts of the tree into operative treeing relationship, said means comprising a fixed projection extending into said socket and a plurality of longitudinally spaced ribs on the connector for selective engagement with said projection.

8. In a shoe tree, a toe part, a heel part, and a connector adjustably connected with one of said parts, said latter part being provided with a socket adapted to receive and closely surround the periphery of said connector, said connector being provided with a series of parallel grooves extending circumferentially thereof and having a longitudinally extending portion of reduced diameter communicating with said grooves, said socketed part having teeth entering the grooves of the connector but adapted to slide along the reduced portion thereof when the latter is brought opposite to said teeth by relative rotation between the socketed part and the connector.

9. In a shoe tree, a toe part and a heel part joined by a four-sided connector rod, one of said parts being provided with a longitudinally extending socket to receive and closely surround said connector rod, said connector having along opposite sides thereof a series of transverse grooves, the other two sides of the connector being separated by a distance not substantially greater than the diameter between the bottoms of opposite grooves, said socketed part having a projection extending into the socket to enter a groove in the connector or to be free to slide along either of the other sides after a relative quarter turn has brought the projection opposite to one of said other sides.

10. In a shoe tree, a toe part, a heel part, one of said parts having a longitudinally extending cylindrical socket, and a connector rod hinged to one part and received in the socket of the other part, said connector rod having a full-sized end portion substantially fitting the socket and a flattened side portion adjacent to said end portion, a locking member projecting into a side of said socket substantially into engagement with said flattened side portion, thereby, by cooperation with the end portion of the rod, preventing complete disengagement of the connector and the socketed part, said connector being also provided with a series of grooves adapted to receive said projecting member in interlocking engagement upon relative rotation of the connector and the socketed part.

11. In a shoe tree, a toe part, a heel part, one of said parts being provided with a socket, the other of said parts having a connector received in the socket, and means for interlocking the connector with said socketed part comprising transverse grooves formed in the wall of the socket, and a projection on said connector adapted to be rotated into any one of said grooves as the tree parts are brought into treeing position, said socket also having a slideway groove permitting longitudinal adjustment of the connector.

12. In a shoe tree, a toe part, a heel part, one of said parts being provided with a socket, the other of said parts having a connector longitudinally slidable in the socket and rotatable therein, ribs spaced axially of the socketed part and projecting into the socket, a projection on the connector adapted to be rotated into interlocking engagement with one of the ribs, a slideway along the socket communicating with the spaces between said ribs, and a stop at the outer end of the slideway to prevent disengagement of the heel part from the connector by contact with the projection.

13. An extensible shoe tree comprising heel and toe parts, a connector associated with one of said parts and both slidable longitudinally and rotatable in a socket formed in the other to permit adjustment of the length of the tree, and interengaging means respectively carried within said socket and on said connector to prevent longitudinal sliding movement of the connector when rotated to bring the heel and toe parts of the tree into operative treeing relationship, said means comprising a laterally extending projection carried on the connector and a plurality of ribs spaced longitudinally along the wall of the socket for selective engagement with said projection.

14. An extensible shoe tree comprising heel and toe parts, a connector associated with one of said parts and slidable longitudinally in as well as rotatable in a socket formed in the other to permit adjustment of the length of the tree, and interengaging means respectively carried within said socket and on said connector arranged normally and automatically to interengage when rotated to bring the heel and toe parts of the tree into operative treeing relationship, thereby to prevent longitudinal sliding movement of the connector.

15. In a shoe tree, a toe part, a heel part, a connector between said parts received in a socket formed in one of them, locking means between said connector and said socketed part, the length of said tree being adjustable by a rotative unlocking movement, a sliding movement and a rotative relocking movement between the connector and the socketed part of the tree, said locking means comprising a series of transverse grooves on one part and a cooperating member entering a groove on the other part.

16. In a shoe tree having heel and toe parts, a connector carried by one of said parts, said connector being rotatable and longitudinally slidable in a socketed portion of the other part, a plurality of grooves partially surrounding the connector and extending transversely of the axis thereof, and means within the socketed portion of said other part for interlocking engagement with one of said grooves to prevent relative sliding movement of the connector when the parts are rotated into treeing relation to each other.

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