Feb. 11, 1930. E. GALTERIO 1,746,466

SHOE STRETCHING LAST

Filed Nov. 12, 1928 2 Sheets-Sheet 1

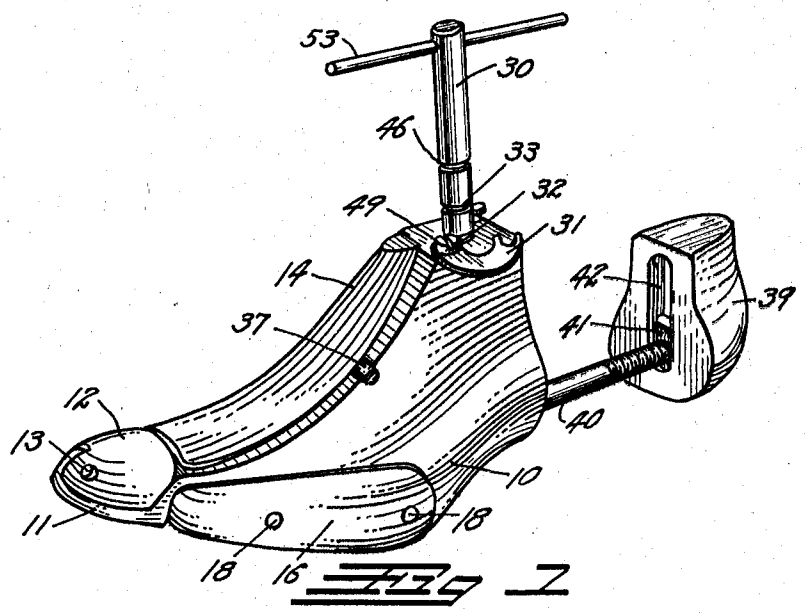


Fig 1



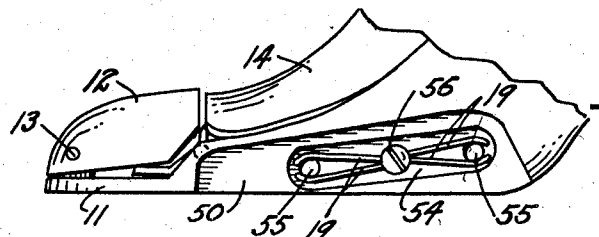


Fig 4

Fig 2

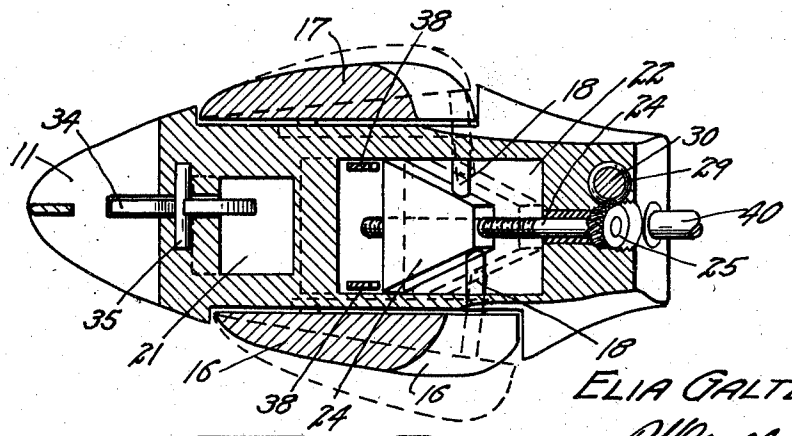


Fig 3

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SHOE STRETCHING LAST

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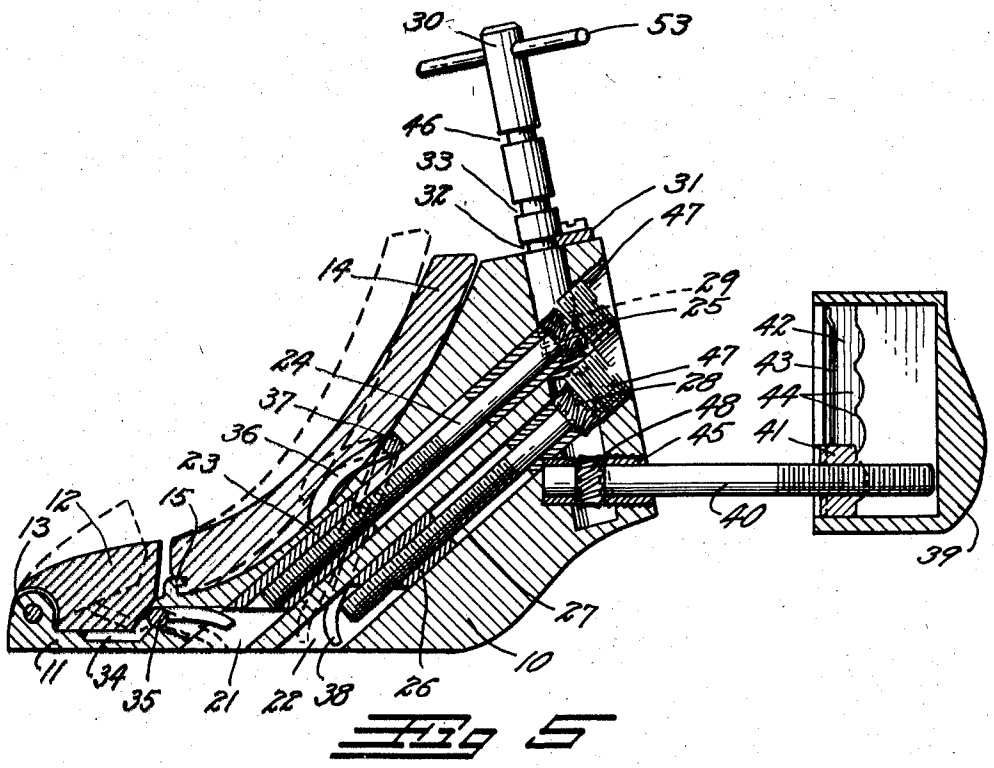


Fig 5

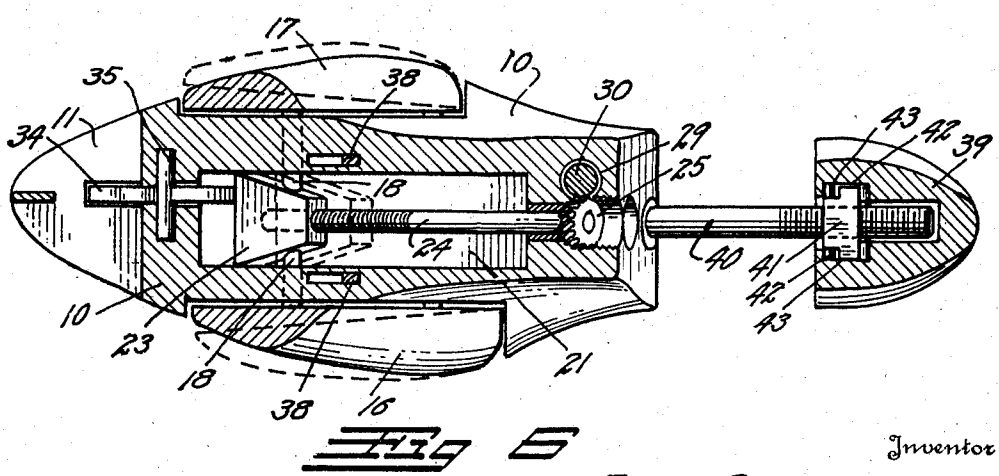


Fig 6

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Patented Feb. 11, 1930 1,746,466

UNITED STATES PATENT OFFICE

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SHOE-STRETCHING LAST

Application filed November 12, 1928. Serial No. 318,667.

This invention relates to a shoe stretching last and has for its principal object the provision of a last of this character in which a single operating shaft or key may be employed for independently stretching the shoe at a plurality of different points.

Another object of the invention is to provide a single last which can be used for a large variety of differing sizes and shapes of shoes.

Still another object of the invention is to so construct the heel portion of the last that it will be adaptable to various heights of heels.

A further object of the invention is to provide a last which can be easily operated within high topped boots.

A still further object is to provide a last which will require but a single operating shaft to raise the toe box, widen the ball, raise the vamp, and stretch the length of the shoe, and which can be adapted for all of these functions while in place within the shoe, without the necessity of changing parts or sections.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a perspective view of my improved shoe stretching last.

Fig. 2 is a fragmentary side elevation of the last with one of the width blocks removed.

Fig. 3 is an angular section taken on the line 3—3, Fig. 5.

Fig. 4 is a small scale detail of an extension arm employed for operating the last in high topped boots.

Fig. 5 is a longitudinal vertical section on the center line of the last.

Fig. 6 is an angular section taken on the line 6—6, Fig. 5.

The invention comprises a body 10 shaped to conform to a composite or average shoe interior. The body 10 terminates at its forward extremity in a toe shelf 11, to which a removable toe form 12 is hinged by means of a removable hinge pin 13. A vamp plate 14 is detachably carried by the body 10 upon a hook-shaped hinge projection 15 extending from the body 10. At the sides of the body 10, right and left width blocks 16 and 17 are carried.

The width blocks 16 and 17 are carried on supporting pins 18 which project from the blocks into the body 10 and are maintained in place therein by means of a clamp spring 19 which clamps the pins 18 and engages flattened sides 20 formed thereon.

The toe form 12, the vamp plate 14, and width blocks 16 and 17, are all detachable so that they can be replaced with various sizes and shapes of plates and blocks to accommodate the stretcher for either men's, or women's and children's shoes.

The width blocks 16 and 17 are attached to the body by simply forcing the pins 18 into the body so that the clamp springs 19 will snap around the pins. The vamp plate can be easily lifted from or placed on the body section by slipping it under the hook-shaped hinge 15. The toe form 12 can be removed or attached by means of the removable hinge pin 13.

Within the body 10 two angularly positioned wedge channels 21 and 22 are formed. The upper wedge channel 21 encloses a slidable wedge lock 23 which is operable therein by means of a screw 24 rotated from a worm wheel 25. In the lower wedge channel 22 a similar but relatively wider wedge block 26 is operated by means of a second screw 27 rotated from a second worm wheel 28. The forward pins 18 of the width blocks 16 and 17 project into the wedge channel 21 into contact with the angular sides of the wedge block 23. The rearward pins of the width blocks 16 and 17 project into the wedge channel 22 into contact with the angular sides of the second wedge block 26.

The worm wheels 25 and 28 are rotated from a single common worm 29 carried upon an operating shaft 30. The shaft 30 is vertically slidable so that the worm 29 can be brought into mesh with either of the worm wheels 25 or 28, as desired. A locking pawl 31 is employed for holding the worm 29 in mesh with the desired worm wheel. The pawl 31 projects into a ring groove 32 in the shaft 30 when the worm is in mesh with the worm wheel 25 and into a second ring groove 33 when the worm 29 is in mesh with the wheel 28.

Thus, to stretch the width of a shoe at its forward ball portion, the pawl 31 is placed in the groove 32 and the shaft 30 is rotated to cause the screw 24 to pull the wedge block 33 rearwardly. The wedge block 33, in passing between the forward pins 18, will force the forward extremities of the width blocks 16 and 17 outwardly, as illustrated in Fig. 6. To stretch the width of the rear portion of the ball, the shaft 30 is forced into the body 10 until the pawl 31 engages the groove 33 and the shaft 30 is rotated to cause the screw 27 to draw the second wedge block 26 rearwardly. This causes the wedge block 26 to separate or force the rearward pins 18 outwardly and widens the rearward extremities of the width blocks 16 and 17, as shown in Fig. 4. If it is desired to stretch the entire length of the ball, both of these operations can be carried on in succession, causing the width blocks 16 and 17 to separate from the body throughout their entire length.

The rearward portion of the toe form 12 rests on the forward extremity of a lever 34 extending from a pivot shaft 35. The rearward extremity of the lever 34 extends into the wedge channel 21 so as to be contacted by the wedge block 23 at it moves forwardly and downwardly.

Thus, to raise and strength the toe box of the shoe, the pawl 31 is placed in the groove 32 and the shaft 30 is rotated in the reverse direction. This causes the screw 24 to force the wedge block 23 forwardly and downwardly into contact with the lever 34. The lever 34 rocks upon its pivot shaft 35 and raises the rearward portion of the toe form 12, as shown in broken line in Fig. 5.

The vamp plate 14 rests upon a lifting lever 36 extending from a pivot shaft 37. The pivot shaft 37 is rotated by means of a pair of operating arms 38 which extend from the pivot shaft 37 into the body 10, at each side of the wedge channel 21 and into the wedge channel 22, so that they will be contacted with the second wedge block 26 as it moves forwardly and downwardly.

Thus, to raise or stretch the vamp of the shoe, the operating shaft 30 is forced into the body 10 until the pawl 31 engages the groove 33. The shaft is then rotated in the reverse direction causing the wedge block 26 to travel forwardly and downwardly against the operating arms 38. This causes the lifting lever 36 to rise and swing the upper extremity of the vamp plate 14 outwardly, as illustrated in Fig. 5.

For forcing the last into the toe of the shoe and for stretching the shoe length a heel block 39 is provided. The heel block 39 is carried on the extremity of a length screw 40, which passes through a nut 41 in the heel block. The nut 41 is maintained stationary by means of nut channels 42 formed in each side of the heel block. The vertical position of the heel block can be changed upon the nut 41 by allowing the nut to slide in the channels 42. A leaf spring 43 forces the nut into depressions 44 formed in the nut channels 42, so that the heel block will be held in any desired vertical position depending upon the height of the heel of the particular shoe.

The length screw 40 is rotated from a worm wheel 45 carried thereon, which is engaged by the worm 29 when the operating shaft 30 is forced into the body 10 its greatest distance. A third ring groove 46 is formed on the shaft 30 to allow the pawl 31 to lock the worm 29 in mesh with the worm wheel 45. Thus, to stretch the length of a shoe or force the last into the toe thereof, the shaft 30 is forced into the body 10 until the pawl 31 engages the groove 46. Rotation of the shaft will now rotate the length screw 40 causing the heel block 39 to move away from, or toward, the body 10 as desired.

The screws 24 and 27 are maintained in the body by means of threaded plugs 47. The worm wheel 45 is maintained within the body by means of a threaded bushing 48.

The pawl 31 may be of any desired design. As illustrated, it comprises a semi-circular lever adapted to partially surround the operating shaft 30. The lever is pivoted upon a pivot screw 49 at its one extremity and may be maintained in engagement with the ring grooves by means of a spring clip.

For operating the last within high topped boots and the like, an extension shaft 51 is provided. The extension shaft 51 terminates in a forked extremity 52 which passes over and engages a handle pin 53 carried in the upper extremity of the operating shaft 30.

For stretching large shoes, relatively large width blocks, toe form and vamp plate can be placed upon the body. The last however, has such a wide range of adjustment that change of the parts is usually required only when adapting it to either women's, children's or men's shoes. A single last can be used for either foot by interchange of the width blocks 16 and 17.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended

claims, without departing from the spirit of the invention.

Having thus described the invention, what I claim and desire secured by Letters Patent is:—

1. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from each extremity of said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members at one extremity thereof so that longitudinal movement of said wedge will force said width stretching members outwardly; and a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently.

2. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; and means for operating said wedge said means comprising a screw; a gear carried by said screw; an operating shaft extending into said body portion; and a second gear carried by said operating shaft and adapted to mesh with said first gear.

3. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; and means for operating said wedge said means comprising: an independent screw for each wedge; a gear carried by the first screw; a second gear carried by the second screw; an operating shaft extending into said body portion; an operating gear carried by said operating shaft, said operating gear being movable within said body portion so as to mesh with either said first or second gear.

4. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; means for operating said wedge said means comprising: an independent screw for each wedge; a gear carried by the first screw; a second gear carried by the second screw; an operating shaft extending into said body portion; an operating gear carried by said operating shaft, said operating gear being movable within said body portion so as to mesh with either said first or second gear; and means for locking said operating gear in either meshed position.

5. A shoe stretching last comprising: a body portion; a heel block; a length screw extending between said body portion and said heel block; and means for rotating said length screw so as to cause said heel block to separate from said body portion, said means comprising: a gear operatively connected to said screw within said body portion; an operating shaft extending into said body portion; a second gear carried by said operating shaft and adapted to mesh with said first gear, said operating shaft being longitudinally movable so as to place said gears into and out of mesh as desired; and means for locking said shaft in either the meshed or out of mesh position.

6. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; means for operating said wedge said means comprising: an independent screw for each wedge; a gear carried by the first screw; a second gear carried by the second screw; an operating shaft extending into said body portion; an operating gear carried by said operating shaft, said operating gear being movable within said body portion so as to mesh with either said first or second gear; and means for locking said operating gear in either meshed position; a heel block; a length screw connecting said heel block to said body portion; a third gear adapted to rotate said length screw so as to cause said heel block to separate or approach said body portion; and means for placing said operating gear in mesh with said third gear.

7. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; and a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; a vamp plate hinged to said body member; an operating lever adapted to raise said vamp plate said operating lever being contacted and operated by said second wedge block.

8. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; and a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; a toe form hinged to said body portion; a pivoted lever adapted to raise said member, said lever extending into said body portion so as to be contacted and operated by said first wedge block.

9. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; and a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; a vamp plate hinged to said body member; an operating lever adapted to raise said vamp plate said operating lever being contacted and operated by said second wedge block; a toe form hinged to said body portion; a pivoted lever adapted to raise said member, said lever extending into said body portion so as to be contacted and operated by said first wedge block.

10. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; and means for operating said wedge said means comprising: an independent screw for each wedge; a gear carried by the first screw; a second gear carried by the second screw; an operating shaft extending into said body portion; an operating gear carried by said operating shaft, said operating gear being movable within said body portion so as to mesh with either said first or second gear; a vamp plate hinged to said body member; an operating lever adapted to raise said vamp plate said operating lever being contacted and operated by said second wedge block; a heel block; a length screw connecting said heel block to said body portion; a third gear adapted to rotate said length screw so as to cause said heel block to separate or approach said body portion; and means for placing said operating gear in mesh with said third gear.

11. A shoe stretching last comprising: a body portion; width stretching members carried at the sides of said body portion; pins projecting into said body portion from said width stretching members; a wedge arranged to travel in a channel in said body portion and engage the pins of both width stretching members so that longitudinal movement of said wedge will force said width stretching members outwardly; a second wedge adapted to engage the pins at the opposite extremity of said width stretching members so that either extremity thereof can move outwardly independently; and means for operating said wedge said means comprising: an independent screw for each wedge; a gear carried by the first screw; a second gear carried by the second screw; an operating shaft extending into said body portion; an operating gear carried by said operating shaft, said operating gear being movable within said body portion so as to mesh with either said first or second gear; a vamp plate hinged to said body member; an operating lever adapted to raise said vamp plate said operating lever being contacted and operated by said second wedge block; a toe form hinged to said body portion; a pivoted lever adapted to raise said member, said lever extending into said body portion so as to be contacted and operated by said first wedge block; a heel block; a length screw connecting said heel block to said body portion; a third gear adapted to rotate said length screw so as to cause said heel block to separate or approach said body portion; and means for placing said operating gear in mesh with said third gear.

12. In a shoe stretching last having a body

portion, a heel block; a substantially horizontal threaded shaft supporting said heel block from said body portion; and slides formed in said heel block for changing the vertical position of said heel block on said shaft.

13. In a shoe stretching last having a body portion, a heel block; a substantially horizontal threaded shaft supporting said heel block from said body portion; and slides formed in said heel block for changing the vertical position of said heel block on said shaft; a nut threaded on said shaft within said slides; and means for locking said nut in predetermined vertical positions in said slides.

In testimony whereof, I affix my signature.

ELIA GALTERIO.