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G. CLAUSING

2,047,309

SHOE LAST

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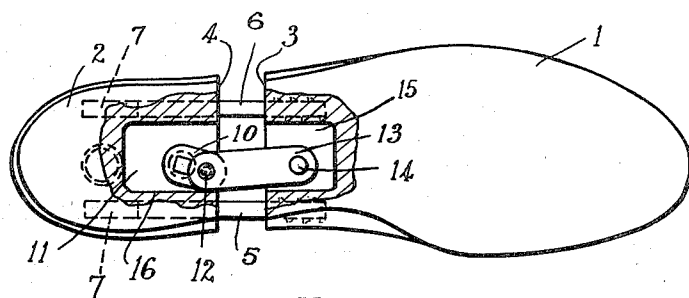


Fig 1

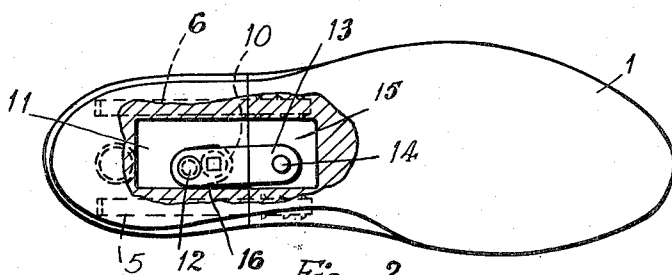


Fig 2

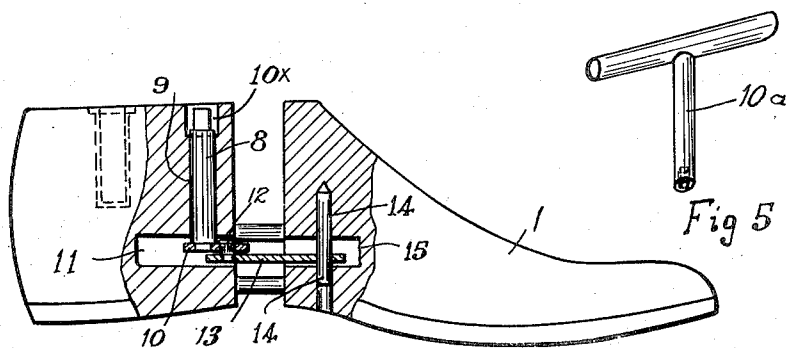


Fig 3

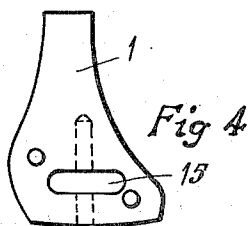


Fig 4

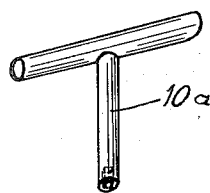


Fig 5

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SHOE LAST

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7 Claims. (Cl. 12-134)

This invention relates to shoe lasts, and particularly, to the type of last which is inserted in the shoe subsequently to the operation of sewing the upper to the insole.

5 It has been found in manufacturing the particular type of shoe in question that the stitching operations which join the quarter and the vamp and the upper to the insole are facilitated by executing the operations without the use of a last. To complete the shoe, the last is then inserted in the shoe and the final lasting operations are executed. It is the object of this invention to provide a last which can readily be inserted in the shoe after the above referred-to stitching operations, and be subsequently expanded into its normal or lasting position thereby to insure accurate standardization of the appearance and size of the shoe during and after the sole attaching operation.

20 A further object of the invention is to provide a means for readily and quickly expanding and contracting the last during the construction of the shoe.

25 A further object of invention is to provide an efficient means for guiding the fore and heel parts of the last during its expansion and contraction in a linear path along the longitudinal axis thereof, such means having incorporated therein means for locking the last in expanded position.

30 These and other objects of the invention will more fully appear from the following specification in connection with the accompanying drawing and will be particularly pointed out in the claims.

35 In the drawing:

Fig. 1 is a bottom plan view of a shoe last constructed in accordance with my invention with parts broken away more clearly to show the mechanism for expanding and contracting the fore and heel parts of the last, the parts of the last being shown in their expanded positions.

Fig. 2 is a view similar to Fig. 1 but showing the fore and heel parts in their contracted positions.

45 Fig. 3 is a side view of the last with parts broken away more clearly to show the expanding mechanism.

Fig. 4 is a view of the inner end of the fore part of the last.

50 Fig. 5 illustrates the tool used to operate the expanding means.

In order to present a better understanding of the invention, a particular embodiment thereof is illustrated and will be described. The last comprises two parts, a toe or fore part 1 and a heel

or back part 2, which are separated from one another in a vertical plane substantially at the instep, the division presenting oppositely disposed flat parallel surfaces 3 and 4.

The fore and heel parts are arranged for relative movement longitudinally along a linear path parallel to the longitudinal axis of the last. A desirable method of accomplishing this result is to provide two or more guiding rods such as 5 and 6 which desirably are constructed of metal 10 or any other suitably rigid material. The rods 5 and 6 are fixed at one end in one part of the last as for instance the fore part and are disposed in different horizontal planes and in parallel relation to the longitudinal axis of the last 15 and project with a sliding fit into cooperating apertures 7 formed in the heel part. The rods 5 and 6 act to guide the heel and toe parts during expanding and contracting movements thereof and also effectively prevent any relative rotational movement of the two parts about the longitudinal axis.

The expanding mechanism comprises a shaft 8 rotatably mounted in the heel part 2 desirably in perpendicular relation to the longitudinal axis 25 of the last. The shaft 8 is received in the aperture 9 in the heel part and has secured to its lower end an arm 10. The upper end of the shaft 8 is squared or otherwise shaped to receive an operating tool which may be of any suitable 30 construction to enable the operator to rotate shaft 8. The upper end of the aperture 9 is desirably counterbored at 10X to receive the end of the operating wrench and the squared portion of the shaft. Such construction provides that the shaft 35 8 may be wholly confined within the body of the last and present no undesirable external projections. The lower end of the shaft 8 projects into a chamber 11 within which is received the arm 10 on the end of the shaft 8. The arm 10 has 40 fixed in the outer end thereof a stud 12 which is pivotally connected to a link 13, the other end of which is pivotally connected to a pin 14 rigidly secured in the fore part 1 of the last. Thus, a toggle mechanism is provided. The fore part is 45 chambered at 15 to receive the link 13 and permit the link to pivot about pin 14.

To operate the last, the shaft 8 is rotated until the parts assume the position shown in Fig. 2, in which case the stud 12 in the arm 10 assumes its 50 extreme left hand position thereby causing the fore and heel parts of the last to assume their minimum longitudinal dimension. At this time the last may readily be inserted in the shoe. The shoe at this time consists of an upper and an in- 55

sole secured thereto by means of stitching or any other desirable means, the material being in mulled or softened condition. After inserting the last in the shoe the shaft 8 is rotated in the opposite direction which causes the elements thereof to assume the positions shown in Fig. 1 wherein the stud 12 assumes its extreme right hand position, thereby expanding the last to its maximum length. By so doing, the shoe is caused to assume its proper size and contour. The sole is then applied either by a stitching operation or is secured to the shoe by any other suitable method. This final lasting process desirably is performed while the shoe is still in a mulled or softened condition. The expansion of the last at this time tends to properly mold the shoe and insure that the shoes produced on the last will be uniform.

Desirably, means are provided for insuring that the last will remain in its expanded position after the rotation of the shaft 8 by means of the operator. To do this, the side wall 16 of the chamber 11 is so positioned relatively to the center of the shaft 8 that the arm 10 will engage the wall 16 when the center of the stud 12 is slightly beyond a line joining the center of the shaft 8 and the center of the pin 14. The compressive force set up between the pin 14 and the shaft 8 by the engagement of the last with the shoe will therefore act to maintain the arm 10 in engagement with the wall 16 of the chamber 11 until the operator desires to remove the last at which time he will rotate the shaft 8 to again contract the last, at which time it is removed from the finished shoe.

Desirably when the last is contracted the shaft 8 will be rotated until the arm 10 and the link 13 assume the position shown in Fig. 2 at which time the fore and heel parts are locked against expansion, thereby facilitating withdrawal of the last from the shoe.

It is obvious to one skilled in this art that a last constructed under the principle of this invention has many practical advantages. The operator, with a twist of his wrist, expands the last and locks it expanded with a minimum of time and effort. Throughout the expansion of the last the first motion of the shaft 8 causes a relatively rapid motion of the last parts while the final motion of the shaft in straightening the arm 10 and link 13 effects a slow and powerful final thrust at the time when the tension upon the last is greatest. Furthermore, the straight line motion between the last parts provides for a maximum shortening of the last and, therefore, facilitates insertion in and removal of the last from the shoe, thus effecting a saving of time and effort.

Having thus described the invention, I claim:

1. A shoe last, comprising a fore part and a back part movable relatively to each other along a line substantially parallel to the longitudinal axis of the last into last expanded or last contracted position, guide means for controlling the direction of relative movement of the last parts, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft.

2. A shoe last, comprising a fore part and a back part movable relatively to each other along a line substantially parallel to the longitudinal axis of the last into last expanded or last contracted position, guide means for controlling the direction of relative movement of the last parts, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft and being effective to lock said last parts in expanded position when the pivotal centers of said toggle mechanism are in alignment.

3. A shoe last, comprising a fore part and a back part movable relatively to each other along a linear path into last expanded or last contracted position, guide means for controlling the direction of relative movement of the last parts, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft.

4. A shoe last, comprising a fore part and a back part movable relatively to each other along a linear path into last expanded or last contracted position, guide means for controlling the direction of relative movement of the last parts, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft and disposed in a chamber provided therefor in said last part, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft, said arm being located in the said chamber provided therefor whereby to limit the movement of said arm and lock the last parts in expanded position by abutment of said arm against one of the walls of said chamber.

5. A shoe last, comprising a fore part and a back part movable relatively to each other along a linear path into last expanded or last contracted position, guide means for controlling the direction of relative movement of the last parts, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft and disposed in a chamber provided therefor in said last part, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft, said arm being located in the said chamber provided therefor whereby to limit the movement of said arm and lock the last parts in expanded position by abutment of

said arm at its point of pivotal connection with said link against one of the walls of said chamber.

- 5 6. A shoe last, comprising a fore part and a back part movable relatively to each other along a linear path into last expanded or last contracted position, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft and disposed in a chamber provided therefor in said last part, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft, said arm being located in the said chamber provided therefor whereby to limit the movement of said arm and lock the last parts in expanded position by abutment of said arm against one of the walls of said chamber.

7. A shoe last, comprising a fore part and a back part movable relatively to each other along a linear path into last expanded or last contracted position, and mechanism for moving said last parts relatively to each other including a rotatable shaft in one of said last parts, an arm rigidly secured at one of its ends to said shaft and disposed in a chamber provided therefor in said last part, a link pivotally connected at one of its ends to the free end of said arm and at its opposite end to the other of said last parts to thereby form a toggle mechanism effective to relatively move said last parts into expanded or contracted position on rotation of said shaft, said arm being located in the said chamber provided therefor whereby to limit the movement of said arm and lock the last parts in expanded position by abutment of said arm at its point of pivotal connection with said link against one of the walls of said chamber.

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