Jan. 24, 1939. W. C. BAXTER 2,144,732

METHOD OF AND MACHINE FOR USE IN SHAPING MOCCASINS OVER LASTS

Filed Dec. 29, 1936 2 Sheets-Sheet 1

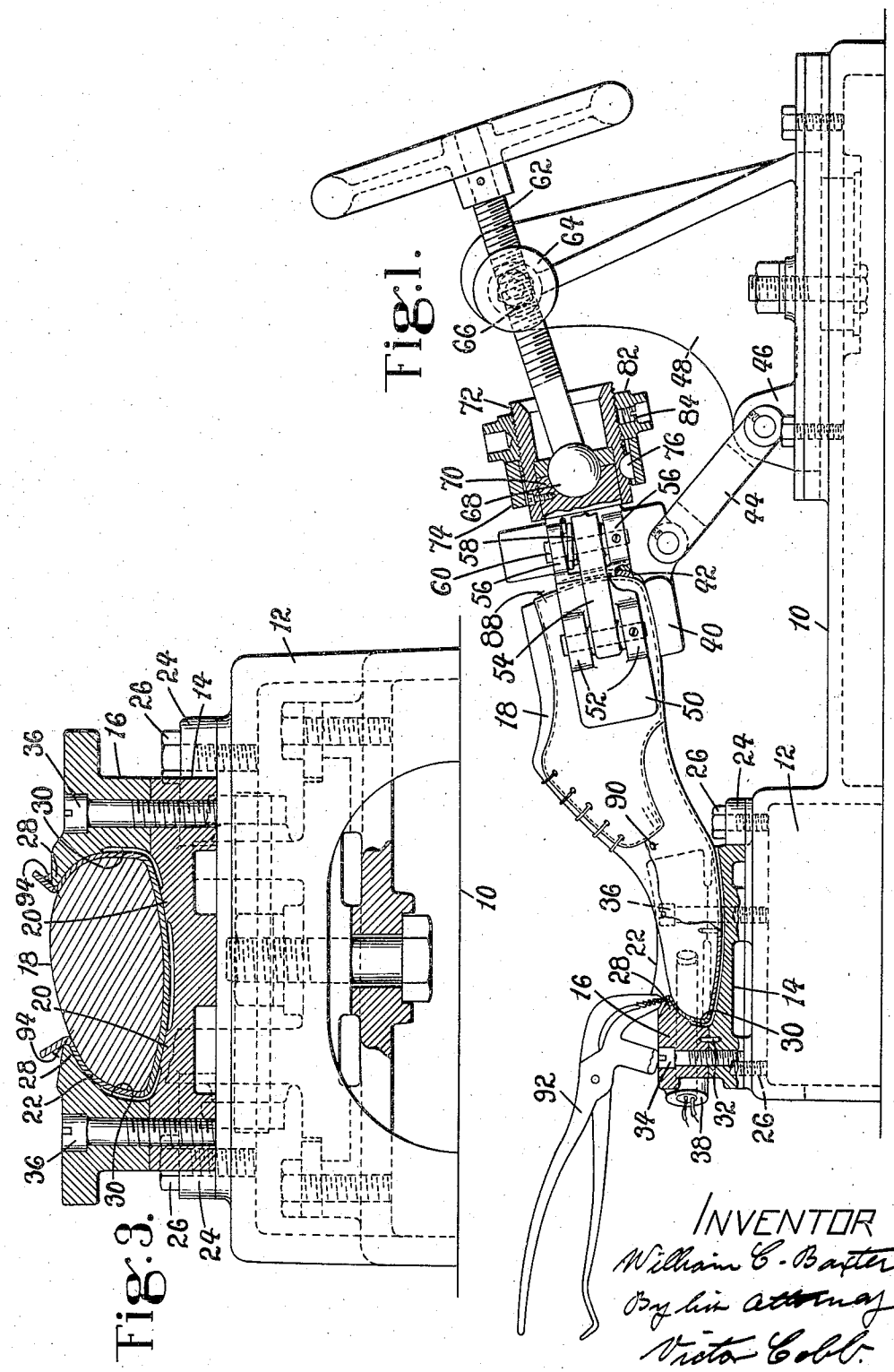


Fig. 1.

Fig. 3.

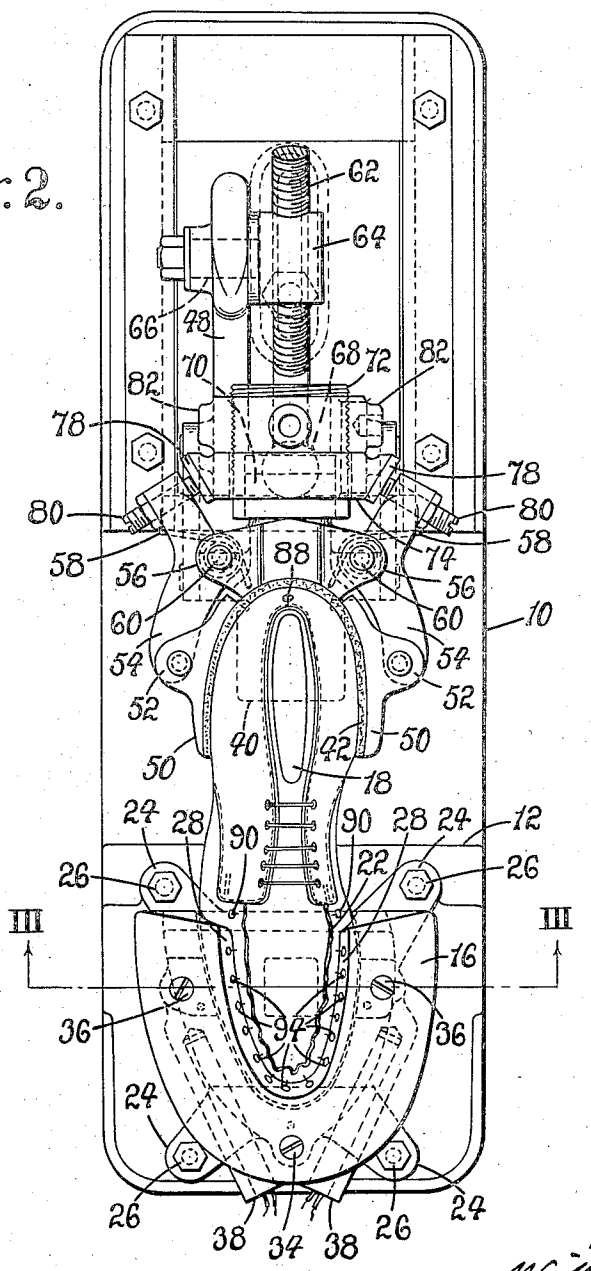
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Filed Dec. 29, 1936 2 Sheets-Sheet 2

Fig. 2.



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2,144,732

METHOD OF AND MACHINE FOR USE IN SHAPING MOCCASINS OVER LASTS

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10 Claims. (Cl. 12—7)

The present invention relates to methods of and means for use in manufacturing footwear and is herein illustrated in its application to the manufacture of moccasins. The term "moccasin" as hereinafter employed includes all types of footwear whereby the bottom of the foot from the region of the ball forwardly is provided with an integral covering the marginal portions of which extend upwardly and inwardly over the top of the forepart of the foot, such foot bottom covering being hereinafter identified as the "moccasin bottom". The moccasin bottom in some types of moccasins covers the bottom of the foot throughout its entire length while in other types the heel or the heel and shank portions of the bottom of the foot are not so covered.

It is an object of the present invention to provide a simple machine or device which may be employed by a moccasin lasting operator to increase his production and to improve the quality of his work. It is a further object of the invention to provide a machine for use in lasting moccasins whereby wrinkles which often occur at the toe end of a moccasin during the lasting operation may be prevented or eliminated.

With the above objects in view a feature of the invention consists of a machine for use in lasting moccasins and moccasin type footwear comprising a form or mold for shaping the forepart of a moccasin about a last in the machine, a heel-embracing member, herein illustrated as a band constructed and arranged to close upon the heel portion of the moccasin, and means for closing the heel band on the moccasin and moving the moccasin and the last forwardly therewith. As herein illustrated, the last and the moccasin parts mounted thereon are supported in upright positions on a heel rest and on the base of the forepart-shaping mold and are held in upright position thereon by the heel-embracing band which holds the last from turning movement about its longitudinal axis during the lasting operation which, as herein illustrated, is performed with the aid of hand pincers which are operated progressively about the forepart of the last to pull the margin of the forepart upwardly between the last and the mold. The illustrated forepart-engaging mold includes a member constructed and arranged to engage the upstanding margin of the forepart of the moccasin and to lay said margin over upon the top of the forepart of the last as the moccasin and last are advanced lengthwise thereof into the mold.

In one aspect thereof the invention comprises a method of shaping moccasins over lasts wherein a moccasin bottom on its last is supported by its heel portion while the last and the moccasin bottom thereon are moved forwardly thereof into a forepart-receiving mold and the upstanding margin of the forepart of the moccasin is pressed against the top of the forepart of the last by the mold, the moccasin bottom being stretched or tensioned over the last by pulling its upstanding margin heightwise thereof while the moccasin is held in said mold.

In another aspect thereof the invention consists in positioning the forepart of a moccasin bottom on its last in a mold constructed and arranged to engage the sides and the top of the forepart of the moccasin and thereafter tensioning the margin of the forepart heightwise of the last and applying heat thereto for the purpose above set forth.

These and other aspects and features of the invention will now be described with reference to the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a front elevation partly in section of a machine embodying the features of the present invention;

Fig. 2 is a plan view of the machine illustrated in Fig. 1, and

Fig. 3 is a sectional elevation taken substantially on the line III—III of Fig. 2.

The invention is illustrated as embodied in a bench machine comprising a base 10 which is generally rectangular in plan view, as seen in Fig. 2, and is provided with a raised end portion 12 (Fig. 1) on which are mounted forms 14 and 16 into which a moccasin on its last is forced to shape the forepart of the moccasin to the last. The form 14 is herein illustrated as a plate having in its upper surface a concave area having the same outline as the forepart of a last, for example the last 18 illustrated in the drawings, and having a conformation complementary to the conformation of the bottom of the forepart of the last. As illustrated in Fig. 3, the plate 14 is provided with raised portions 20 which project upwardly slightly from the concave portion of the plate, the conformation of the upper surfaces of said raised portions being such that a moccasin bottom on its last, for example the moccasin bottom 22 illustrated in Fig. 3, lies flat against said raised portions. In the illustrated machine there are three such portions, one at each side of the forepart of a last in the machine and one adjacent to the toe end of the last. For securing the plate 14 to the raised portion of the base, ears 24 (Fig. 2)

project outwardly from opposite sides of the plate and clamping screws **26** extend through said ears and into the base. The upper form **16** is a U-shaped plate the inner surface of which is shaped to conform to the periphery of the forepart of the last. As illustrated in Fig. 3, the plate **16** has an inwardly extending flange **28** which overlies the top of the last **18** and has its lower surface shaped to conform to the last. The flange **28** extends somewhat beyond the line along which the overlasted margin of the moccasin bottom is to be trimmed for the reception of a toe piece and provides means for shaping to the last that portion of the moccasin bottom which is gathered inwardly over the top of the forepart of the last. Extending downwardly from the flange **28** of the plate **16** is a recess **30** which extends along the inner surface of the plate and communicates with the concave portion of the plate **14**. Referring to Fig. 3, it will be seen that the sole portion of the moccasin bottom **22** is engaged by the raised portions **20** of the plate **14** and the marginal portion of the moccasin bottom is engaged by the inner surface of the flange **28** while the remainder of the moccasin bottom is spaced from the plates **14** and **16**. This construction is such that the surface of the plates **14** and **16** which engages the moccasin bottom is no greater than is required to support the work and to shape the margin of the moccasin bottom to the top of the last. This construction facilitates the pulling of the moccasin bottom upwardly between the plate **16** and the last by reducing to a minimum the resistance to this pulling operation caused by the friction of the moccasin bottom against the plates as the moccasin bottom is drawn upwardly between the plate **16** and the last. For so positioning the plate **16** that the inner edge of its bottom face registers exactly with the periphery of the concave portion of the plate **14** a plurality of dowel pins **32**, one of which is illustrated in Fig. 1, are mounted in bores in the plate **14** and extend upwardly from said plate into corresponding bores in the upper plate **16**. For securing the plates **14** and **16** together a headed clamping screw **34** (Fig. 1) extends through a counterbored hole at the toe end of the plate **16** and into a tapped hole in the plate **14** and similar screws **36** (Fig. 3) secure together the side portions of said plates. Thus it will be seen that the toe plates **14** and **16** may be removed as a unit after unscrewing the clamping screws **26** which secure the plate **14** to the base and a similar unit adapted to operate on a different run of sizes substituted therefor; or if desired the top plate **16** may be separately removed after first unscrewing the clamping screws **34** and **36**. This might be desirable, for example, if it was intended to last another style of moccasin while maintaining the same run of sizes.

In order to shrink the upstanding portion of the forepart of the moccasin bottom thereby to facilitate the shaping of the moccasin bottom to the last heat is applied to the upstanding margin by two electrical heating units **38** (Fig. 2) which are mounted in bores in opposite sides of the plate **16** in substantially parallel relation to the opposite sides of the forepart of the last **18** in the machine.

For supporting the heel portion of the last **18** and the moccasin thereon and for moving the last forwardly thereof into engagement with the forming plates **14** and **16**, the illustrated machine is provided with a heel support comprising a plate **40** constructed and arranged to engage the bottom of the heel portion of the last and is provided also with a heel-embracing band **42** which holds the last in upright position and holds the heel portion of the last from movement widthwise thereof. The last-supporting plate **40** is pivotally mounted between upwardly extending ears of a plate **44** (Fig. 1) the lower end of which is provided with downwardly extending ears which are pivoted on a boss **46** extending upwardly from the base of a bracket **48** which is adjustable toward and from the raised portion **12** of the base **10** in order to position the plate **40** to support lasts of different sizes. The central portion of the heel-embracing band **42** is secured to an upward extension of the plate **40** and the side portions of the band are secured to plates or shoes **50** the inner surfaces of which conform generally to the shape of the opposite sides of the heel portion of the last. The plates **50** are provided with upper and lower ears **52** between which are mounted the forward ends of bell crank levers **54** (Fig. 2) which are fulcrumed at their elbows between ears **56** projecting outwardly from the upwardly extending portion of the plate **40**. The bell crank levers **54** are yieldingly swung outwardly in order to hold the heel band **42** out of heel-engaging position by torsion springs **58** which surround the pins **60** on which the bell crank levers are fulcrumed and have their inner ends mounted in bores in the member **40** while their outwardly extending ends engage shoulders on the bell crank levers. For moving the supported last and moccasin forwardly into the plates **14** and **16** and simultaneously closing the heel band on the heel portion of the last the illustrated machine is provided with a hand screw **62** which is mounted in a tapped hole in a head **64** at one end of a rock shaft **66** which is journaled near the upper extremity of the bracket **48**. The hand screw **62** is provided at its forward end with a ball **68** which is seated in a socket in an extension **70** of the heel-supporting plate **40**. Secured to the extension **70** is a collar **72** which has slidably mounted thereon a ring **74** which is held from rotation upon the collar by a Woodruff key **76** (Fig. 1). As illustrated in Fig. 2, the ring **74** is provided at opposite sides thereof with extensions **78** the outer faces of which converge forwardly of the last in the machine and engage the inner ends of screws **80** carried by the bell crank levers **54**. The ring **74** is backed up by a capstan nut **82** which is mounted on the externally threaded portion of the collar **72** and secured in adjusted position thereon by a set screw **84** (Fig. 1).

The preferred method of lasting moccasins with the aid of the illustrated machine will now be described but in order that the condition of the moccasin as it comes to the lasting operation may be understood certain preliminary operations will be briefly referred to. After the moccasin parts have been stitched together to form the shoe construction illustrated in Fig. 1, the shoe is manually assembled on the last **18** and secured by the usual assembling tack **88** which is driven through the quarter in the region of the back seam and into the last. The sides of the moccasin bottom are then lasted, for example, by means of hand pincers and are secured in lasted position by tacks **90** (Fig. 2). The toe portion of the moccasin bottom is then pulled upwardly over the top of the toe end of the last and temporarily secured in pulled over position by tacks (not shown). The last and the parts thus secured thereto are then positioned in the illustrated lasting machine, the heel-supporting mechanism of which is retracted from its position illustrated

in Fig. 1 to facilitate mounting the last in the machine. The hand wheel 62 is then operated to advance the moccasin bottom into the forms or plates 14 and 16. As the forward motion of the last meets with the resistance of the plate 16 further operation of the hand screw closes the heel-embracing band 42 on the quarter. The amount of force which is applied to the last by the hand wheel 62 to force the moccasin bottom 22 into the plates 14 and 16 is for the operator to determine, having in mind particularly the weight and condition of the material of the moccasin bottom. Under any circumstances, however, the preliminary pressure of the forepart of the last and the moccasin bottom against the plates 14 and 16 must be relatively light, in fact this pressure need only be sufficient to hold the upwardly extending margin of the moccasin bottom in pulled over position on the last after the pulling-over tacks have been removed. It will facilitate the lasting of the moccasin bottom if this preliminary pressure of the moccasin bottom against the plates 14 and 16 is no greater than is actually required to hold the moccasin bottom in position on the last. The lasting of the moccasin bottom is performed by drawing its lasting margin upwardly between the last and the plate 16, for example by means of lasting pincers such as the pincers 92 illustrated in Fig. 1, and advancing the last by turning the hand screw 62 thereby to increase the pressure of the moccasin bottom against the plate 16 to the extent required to maintain the tension of stretch which is imparted to the moccasin bottom by the operation of the pincers 92. It will be understood that this pressure must not create a resistance to upward movement of the margin of the moccasin bottom between the plates 16 and the last which would necessitate undue straining of the material of the moccasin bottom during the lasting operation. During the lasting operation the heat which is imparted to the plate 16 by the heating units 38 assists in the shaping of the moccasin bottom to the last and assists in the elimination of such wrinkles as may occur in the course of the lasting operation by causing contraction or shrinking of the material of the moccasin bottom. After the lasting operation has been completed the moccasin bottom is secured in lasted position by lasting tacks 94 (Fig. 2). These tacks are driven through that part of the margin of the moccasin bottom which is trimmed away in preparing the moccasin bottom for the reception of a toe piece and consequently there are no tack holes in the completed forepart.

While the invention is herein illustrated in its application to the lasting of a moccasin type shoe including a blucher quarter, it is to be understood that the invention is not limited in its scope to the lasting of this type of footwear but is applicable generally to the lasting of all types of footwear in which the forepart may be lasted upwardly and inwardly over the top of the forepart of the last and the term "moccasin" as herein employed is to be understood to include all types of footwear the foreparts of which may be lasted in this manner.

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

1. A machine for use in lasting moccasins comprising a mold for shaping the forepart of a moccasin about a last, a member constructed and arranged to close upon the rear portion of the moccasin, and means for closing the member on the moccasin and moving the moccasin and the last forwardly to force them into said mold.

2. A machine for use in lasting moccasins comprising a mold for shaping the forepart of a moccasin about a last, a heel band constructed and arranged to close upon the rear portion of the moccasin, and manually operated means for simultaneously closing the heel band on the rear portion of the moccasin and forcing the foreparts of the last and moccasin into said mold.

3. In a machine for use in shaping moccasins over lasts, means for supporting a last and a moccasin thereon in upright position comprising a toe rest constructed and arranged to engage the bottom of the forepart of the moccasin, a rest constructed and arranged to engage the heel seat portion of the moccasin, a heel band, and means for closing the band upon the rear portion of a moccasin in the machine.

4. A machine for use in shaping moccasins over lasts having a mold constructed and arranged to engage the bottom and the upstanding margin of the forepart only of a moccasin on a last, said mold being so constructed that movement of the last rearwardly thereof out of the mold is not obstructed, and means for effecting relative movement of the last and the mold lengthwise of the last to position the mold about the forepart of the last.

5. A machine for use in shaping moccasins over lasts having a forepart-engaging mold comprising a base member constructed and arranged to engage the bottom of the forepart of a moccasin on a last, and a member constructed and arranged to engage the upstanding margin of the forepart of the moccasin and to lay said upstanding margin over upon the top of the forepart of the last, said mold being so constructed that movement of the last rearwardly thereof out of the mold is not obstructed.

6. That method of shaping moccasins over lasts which comprises positioning a moccasin bottom on a last, positioning the forepart of the moccasin in a mold constructed and arranged to engage the sides and top of the forepart of the moccasin, and thereafter tensioning the margin of the forepart heightwise of the last and applying heat thereto.

7. That method of shaping moccasins over lasts which comprises positioning a moccasin bottom on a last, moving the last and the moccasin bottom forwardly thereof into a forepart-receiving mold, and while the upstanding margin of the forepart of the moccasin bottom is pressed against the top of the forepart of the last by the mold pulling the upstanding margin of the forepart of the moccasin bottom heightwise thereof.

8. That method of shaping moccasins over lasts which comprises positioning a moccasin bottom on a last, supporting the last by its rear portion, and moving the last and the moccasin bottom thereon forwardly thereof into a forepart-receiving mold and while the upstanding margin of the forepart of the moccasin bottom is pressed against the top of the forepart of the last by the mold pulling the upstanding margin of the forepart of the moccasin bottom heightwise thereof.

9. That method of shaping moccasins over lasts which comprises positioning a moccasin bottom on a last, moving the last and the moccasin bottom forwardly thereof into a forepart-receiving mold, while the upstanding margin of the forepart of the moccasin bottom is pressed against the top of the forepart of the last by the mold pulling the upstanding margin of the forepart

of the moccasin bottom heightwise thereof, and applying heat to the mold.

10. That method of shaping moccasins over lasts which comprises positioning a moccasin bottom on a last, supporting the last by its rear portion, moving the last and the moccasin bottom thereon forwardly thereof into a forepart-receiving mold and while the upstanding margin of the forepart of the moccasin bottom is pressed against the top of the forepart of the last by the mold pulling the upstanding margin of the forepart of the moccasin bottom heightwise thereof, and applying heat to the mold.

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