May 15, 1945. E. A. HOLMGREN 2,375,788

MACHINE FOR ASSEMBLING UPPERS AND THEIR LASTS

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Fig. 1

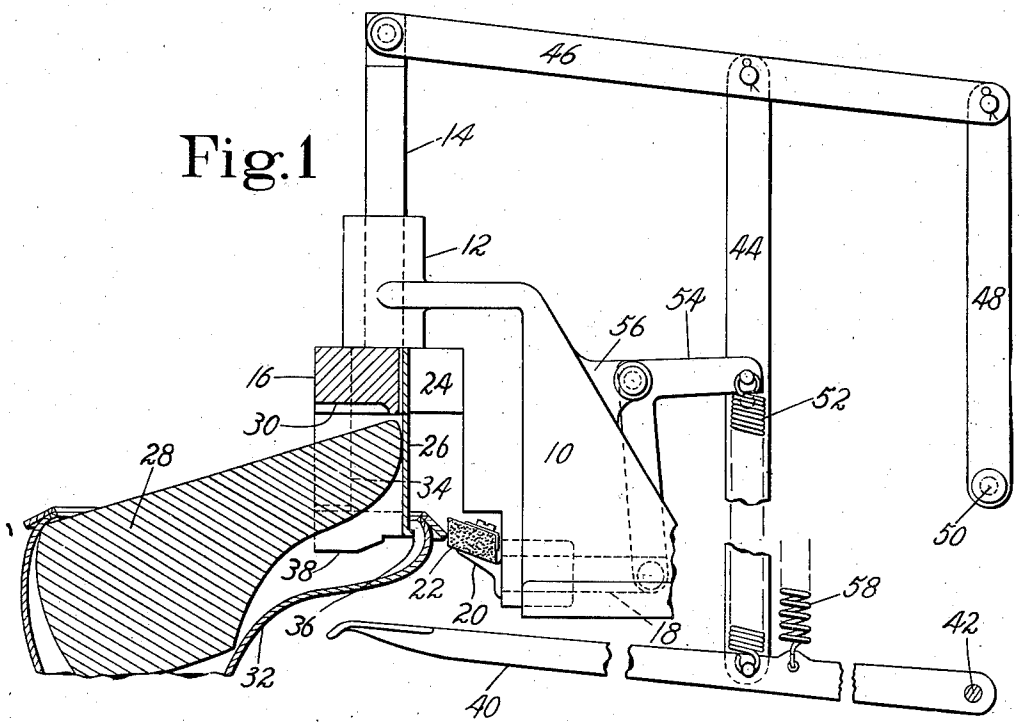
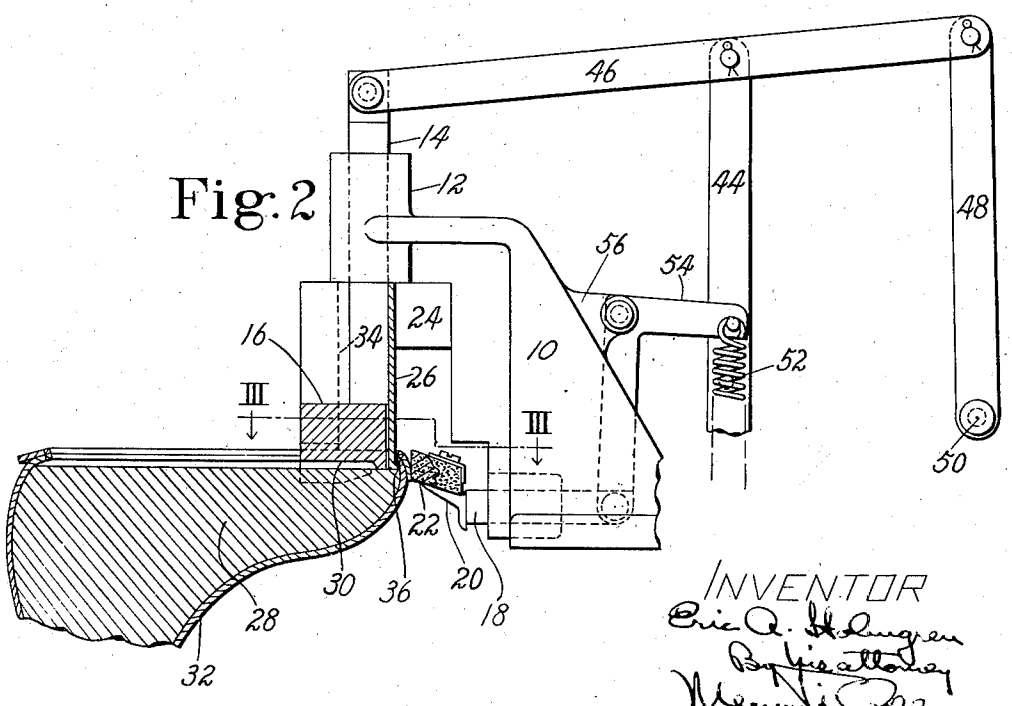


Fig. 2



INVENTOR

Eric A. Holmgren

By his attorney

Maurice Pollay

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Fig. 3

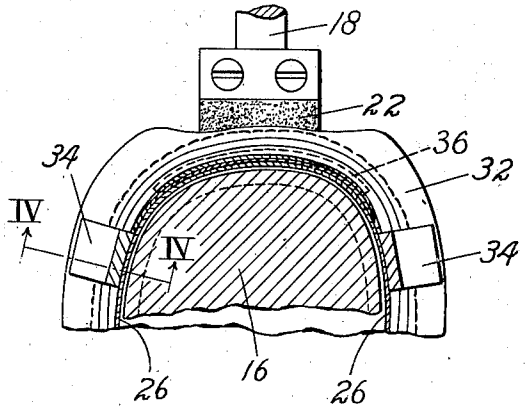
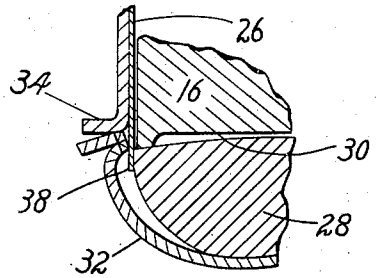


Fig. 4



INVENTOR
Eric A. Holmgren
By his Attorneys
Mason & Cobby

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UNITED STATES PATENT OFFICE

2,375,788

MACHINE FOR ASSEMBLING UPPERS AND THEIR LASTS

Eric A. Holmgren, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application December 29, 1942, Serial No. 470,464

10 Claims. (Cl. 12—7)

This invention relates to machines for assembling uppers and their lasts and is herein illustrated in its application to machines of this type particularly adapted to handle prewelt uppers, that is, uppers to which a sole-attaching welt is secured prior to the assembling operation. It is to be understood, however, that the invention is not limited in its scope to machines adapted to assemble prewelt uppers and their lasts but is applicable to machines adapted to handle shoe uppers generally.

It is usual in the manufacture of prewelt shoes to preshape the prewelted upper before the upper is mounted on its last. This is sometimes done by gathering the toe portion of the lasting margin during the operation of stitching the welt to the upper but I prefer to perform the preshaping operation in a machine specially designed for that purpose and illustrated in my co-pending application for Letters Patent of the United States, Serial No. 466,974, filed November 26, 1942. Said machine expands and forms both the toe portion and the heel portion of the upper, thus preparing the upper to receive the last. The welted margin of the upper thus prepared is slightly shorter than the peripheral measure of a last of a size correspoding to the upper and, consequently, the welted margin offers some resistance to the introduction of the last into the upper.

It is an object of the present invention to provide a manually operated machine for use in assembling the preshaped upper and its last. The use of such a machine facilitates and expedites the assembling operation and also insures the correct positioning of the upper on its last.

With the above object in view, the invention in one aspect thereof consists in the provision in a machine for assembling an upper on its last, of a member constructed and arranged to position the last and the upper during their relative movement into assembled position, said member having a gage for determining the heightwise position of the upper and another gage for determining the heightwise position of the last after it has been inserted into the upper. Said member in accordance with a feature of the invention is also provided with means herein illustrated as downward extensions at opposite side portions of said member for relatively positioning the last and the upper widthwise thereof. As herein illustrated, the last and upper positioning member is a rigid curved plate or horn the concave surface of which receives an end portion of the last, while the convex surface receives the corresponding end portion of the upper. The assembling operation is performed by a depressor which engages that end portion of the last which lies adjacent to the horn and forces it into the upper which is held in position on the convex surface of the horn by gripping means constructed and arranged to engage the sole attaching face of the welt. In accordance with a further feature of the invention, a common actuator is provided for operating the last depressor and the gripping means. The connections from the actuator to the gripping means include a resilient element which applies increasing pressure to the gripping means as the last is forced into the upper. The illustrated gripping means comprises a flange or lip formed in the horn and arranged to engage the inner surface of the welted margin of the upper and a resilient gripper element constructed and arranged to engage the sole attaching face of the welt.

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

In the drawings,

Fig. 1 is a side elevation illustrating the head and the treadle of a machine embodying the features of the present invention, a last and upper together with the last depressor and the horn being shown in longitudinal section;

Fig. 2 is a side elevation, similar to Fig. 1, showing the parts in their respective positions after the operations of the machine have been completed;

Fig. 3 is a section on the line III—III of Fig. 2; and

Fig. 4 is a section on the line IV—IV of Fig. 3.

The numeral 10 indicates the forward portion of the machine head and the numeral 12 indicates a vertical cylindrical portion in a forward extension of the machine head which is bored to provide a bearing for a vertical sliding shaft 14 having a last depressor 16 secured to its lower end portion. The lower portion of the machine head is bored to provide a bearing for a sliding shaft 18, the forward end portion of which is provided with a head 20 which carries a gripper member herein illustrated as a resilient rubber block 22. Secured to the arcuate forward face of an extension 24 of the machine head is a rigid horn 26 which is generally semi-circular in cross section and has its concave surface facing forwardly for the reception of the toe portion of a last, for example, the last 28 illustrated in Fig. 1. The side and rear faces of the last depressor 16 are

complemental in shape to the concave face of the horn 26, the last depressor being positioned adjacent to the horn for operation on the toe portion of the last 28. The bottom of the last depressor has a central recess 30 which enables the depressor to operate against the margin of the last bottom whatever the degree of convexity of the last bottom may be. This enables the depressor to level the last widthwise thereof as it is forced into the upper.

In the operation of the machine, the operator manually supports an inverted upper, for example, the prewelt upper 32 illustrated in Fig. 1, with the welted margin at the toe portion of the upper embracing the lower portion of the horn 26. The operator locates the upper heightwise thereof with relation to the horn by bringing the inner edge of the welt at opposite sides of the toe portion of the upper into engagement with gage members herein illustrated as plates 34 (Figs. 3 and 4) secured to the convex surface of the horn and having their lower end portions outturned for engagement with the welt. The toe portion of the upper is gripped and held in this position by the forward movement of the gripper member 22 which grips the margin at the toe end of the upper against an outturned flange or lip 36 at the lower portion of the horn. In operating on prewelt uppers, the gripper member 22 engages the sole-attaching face of the welt and grips both the welt and the upper against the lip 36. Thus, it will be seen that any possible injury to the finished surfaces of the upper or the welt by the action of the gripper members is obviated and there can be no strain on the welt seam such as might be expected if the gripper member 22 operated within the welt crease. For centering the toe portion of the last widthwise thereof, with relation to the toe portion of the supported upper, the opposite sides of the horn 26 have downward extensions 38 which engage opposite sides of the toe portion of the last as shown in Fig. 4.

Both the gripper member 22 and the last depressor 16 are actuated by the depression of a treadle 40 mounted to swing about a fulcrum 42 at its rear end portion. The treadle is connected by a link 44 to a lever 46 which operates the last depressor, the rear portion of said lever being fulcrumed at the upper end of an arm 48, the lower portion of which is mounted for swinging movement on a fixed fulcrum 50. At its forward portion the lever 46 is pivoted to the upper end of the sliding shaft 14 which carries the last depressor. For operating the gripper member 22, a spring 52 extends upwardly from the treadle 40 to the end of the horizontal arm of a bell crank lever 54 pivotally mounted at its elbow on a rearward extension 56 of the machine head, the vertical arm of said bell crank lever having a pin-and-slot connection to the rear portion of the sliding shaft 18.

In the operation of the illustrated machine in the manufacture of prewelt shoes, a prewelt upper which preferably has been preshaped by means of a machine, such, for example, as that illustrated in my co-pending application for Letters Patent of the United States, Serial No. 466,974, filed November 26, 1942, is manually supported in inverted position with its toe portion embracing the horn 26, as shown in Fig. 1. While the operator holds the upper in predetermined position on the horn, the last is inserted into the upper and positioned as shown in Fig. 1 with its toe portion resting against the concave surface of the horn 26. The operator then depresses the treadle 40 whereupon the gripper member 22 and the last depressor 16 advance simultaneously. The gripper member comes into gripping engagement with the sole attaching face of the welt before the last depressor completes the insertion of the last into the upper and during the remainder of the depression of the treadle, the spring 52 is expanded, thus applying increasing pressure to the gripper member 22. The limit of the downward movement of the last is determined by the movement of the peripheral surface of the toe end of the last off the concave surface of the horn 26 and the engagement of the toe end portion of the last bottom with the bottom face of the lip, as shown in Fig 2, said lip serving to gage the heightwise position of the last after it has been inserted into the upper. Upon completion of the last inserting movement, the treadle 40 is permitted to return to its elevated position under the tension of a spring 58 and during the upward movement of the treadle link 44 a pin projecting therefrom engages the bell crank lever and retracts the gripper member 22. Thereupon the last and upper are moved toewardly to disengage the upper from the lip 36 of the horn and then downwardly away from the upper-gripping mechanism. The upper is held on the last by the tension of the welt during the interval between the completion of the assembling operation and the lasting operation which follows immediately thereafter.

While the operation of the machine is herein illustrated in its application to the manufacture of prewelt shoes, it is to be understood that the invention is not limited in its scope to machines for assembling prewelt uppers and their lasts but is applicable to the assembling of other types of uppers on their lasts provided only the lasting margin of the upper has ben contracted or gathered so that it will remain on the last after the assembling operation.

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

1. In a machine for assembling an upper and a last, a member constructed and arranged to position the last and the upper during their relative movement into assembled position, said member having a gage for determining the heightwise position of the upper, and another gage for determining the heightwise position of the last after it has been inserted into the upper.

2. In a machine for assembling an upper and a last, a member constructed and arranged to position the last and the upper during their relative movement into assembled position, said member having a gage for determining the heightwise position of the upper, another gage for determining the heightwise position of the last after it has been inserted into the upper, and means on said member for positioning the last widthwise thereof relatively to the upper.

3. In a machine for assembling an upper and a last, a last depressor, a rigid horn for guiding the last during its depression into the upper, means for gripping the upper and holding it in position to receive the last including means extending outwardly from said horn for engagement with the inner surface of the upper, and means for pressing the upper against said upper-gripping means.

4. In a machine for assembling a prewelt upper and a last, a last depressor, a rigid horn for guiding the last during its depression into the

upper, and means for gripping the upper and holding it in position to receive the last comprising gripping means constructed and arranged to engage the inner surface of the upper and a coooperating gripping member constructed and arranged to engage the sole-attaching face of the welt and mounted for upper-gripping movement relatively to said gripping means.

5. In a machine for assembling an upper and a last, a last depressor for inserting the last into the upper, cooperating grippers constructed and arranged to close on the lasting margin of the upper to support the upper for the last-inserting operation, and a common actuator for operating the last depressor and the closing the grippers.

6. In a machine for assembling an upper and a last, a last depressor for inserting a last into a supported upper, a horn for guiding the last during its movement into the upper, a gripper member for gripping the lasting margin of the upper against the horn, an actuator, connections from the actuator to the gripper member including a resilient element, and connections from the actuator to the last depressor constructed and arranged to complete the last-inserting movement after the gripper member has gripped the upper against the horn.

7. In a machine for assembling an upper and its last, a last depressor for inserting a last into a supported upper, a horn for guiding the last during its movement into the upper, a gripper member for gripping the margin of the upper against the horn, an actuator, connections from the actuator to the gripper member including a resilient element and connections from the actuator to the last depressor constructed and arranged to complete the last-inserting movement after the gripper member has gripped the margin of the upper against the horn, and a gage extending outwardly from the horn for determining the heightwise position of the upper thereon.

8. In a machine for assembling an upper and its last, a last depressor for inserting a last into a supported upper, a horn for guiding the last during its movement into the upper, a gripper member for gripping the margin of the upper against the horn, an actuator, connections from the actuator to the gripper member including a resilient element and connections from the actuator to the last depressor constructed and arranged to complete the last-inserting movement after the gripper member has gripped the margin of the upper against the horn, a gage extending outwardly from the horn for determining the heightwise position of the upper thereon, and a gage on the horn for determining the heightwise position of the last after its insertion into the supported upper.

9. In a machine for assembling an upper and its last, a last depressor for inserting a last into a supported upper, a horn for guiding the last during its movement into the upper, a gripper member for gripping the margin of the upper against the horn, an actuator, connections from the actuator to the gripper member including a resilient element and connections from the actuator to the last depressor constructed and arranged to complete the last-inserting movement after the gripper member has gripped the margin of the upper against the horn, a gage extending outwardly from the horn for determining the heightwise position of the upper thereon, and downward extensions at opposite side portions of said horn between which the last is positioned widthwise thereof in predetermined relation to the supported upper.

10. In a machine for assembling a prewelt upper and its last, a last depressor for inserting one end portion of a last into a supported upper after the opposite end portion has been loosely positioned within the upper, a rigid horn for guiding the end portion of the last during its insertion into the upper, an upper gripping flange extending outwardly from said horn for engagement with the inner surface of the upper, a cooperating gripper member constructed and arranged to engage the sole-attaching face of the welt, and an actuator for simultaneously actuating said last depressor and said gripper member, the advancement of the gripper member being completed before the last is fully inserted into the upper.

ERIC A. HOLMGREN.