

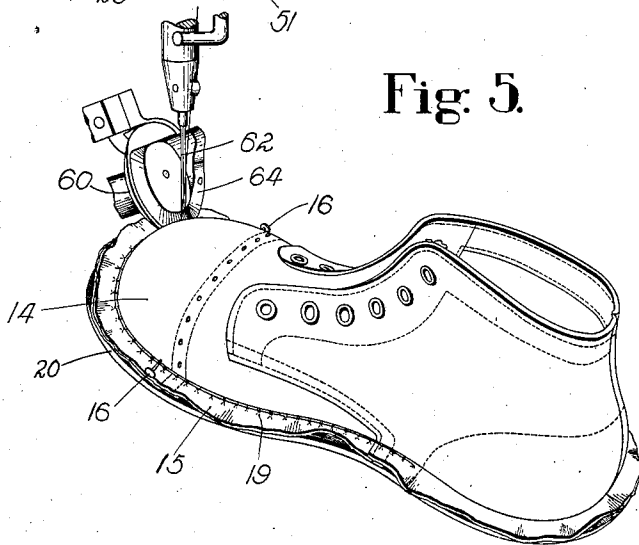
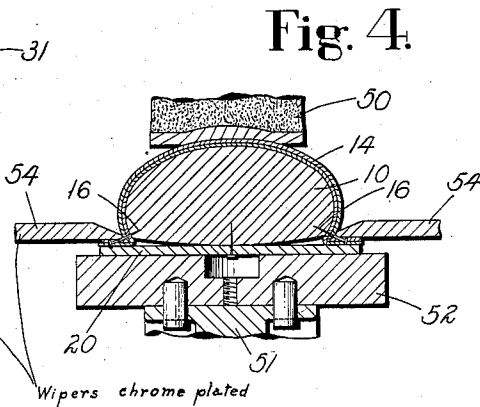
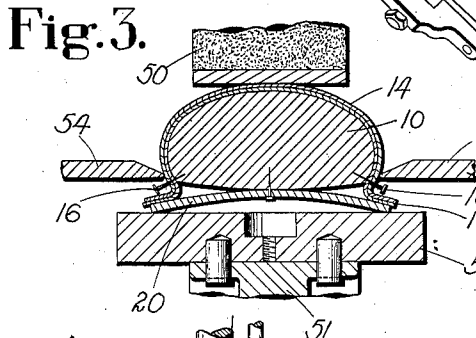
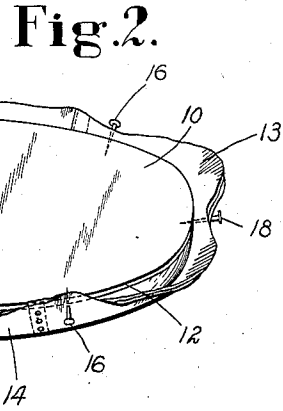
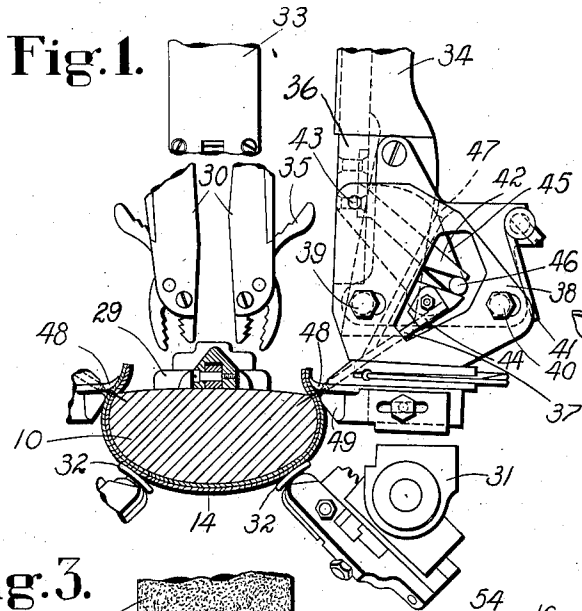
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METHOD OF MAKING SHOES AND APPARATUS THEREFOR

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METHOD OF MAKING SHOES AND APPARATUS THEREFOR

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This invention relates to the manufacture of stitchdown shoes and comprises a novel method of shoemaking characterized by the step of simultaneously bending toward or into the out-turned margin of the upper those tacks by which the upper has been preliminarily positioned upon the last.

It will be understood that in the manufacture of stitchdown shoes the margin of the upper, at least about the forepart and in the shank, is turned outwardly from the last and is secured in that position to the projecting margin of a sole which is larger in contour than the bottom face of the last. In the manufacture of such shoes, it is customary to shape the upper over the last and position it thereon by pulling it at the end of the toe and the opposite sides of the forepart, and then driving tacks through the upper into the last in different locations about the forepart at such an angle and in such relation to the bottom face of the last as to permit the margin of the upper to extend outwardly upon the projecting margin of the sole without interfering with the tacks. The pulling over tacks are, accordingly, so located in relation to the last and shoe that while holding the upper closely in the angle between the last and the projecting margin of the sole they may remain in place until the out-turned margin of the upper has been permanently secured in place. Heretofore, it has been the practice to bend the pulling over tacks without definite system toward the out-turned flange of the margin in order to permit the seam to be carried over the tacks during the operation of stitching the margin of the upper to the margin of the sole.

I contemplate, as a novel shoemaking operation, engaging all or several of the pulling over tacks at separate points about the contour of the shoe and bending them simultaneously to position them accurately in locations which will tend to improve the lasting of the upper and facilitate other subsequent operations in the shoemaking process. I have discovered that it is practical and advantageous to combine the step of lasting the forepart of the upper with the step of bending the pulling over tacks into position to facilitate the stitching operation. This not only eliminates the necessity of separately bending the pulling over tacks but brings about an improved degree of accuracy in bending the tacks simultaneously toward or into the out-turned margin of the upper and in effecting a symmetrical tightening of the upper over the last.

I have herein disclosed the lasting and tack-

bending step as carried out by the cooperative action of a work-supporting plate beneath the sole and wiper plates located above the out-turned margin of the upper, the two being moved and manipulated as is customary in performing the operation of lasting the toe and forepart of a stitchdown shoe but serving also in this instance to carry out the additional function of simultaneously bending the pulling over tacks and embedding them in the out-turned flange of the upper. It will be apparent that the method of my invention is not limited to this or to any particular type of mechanism but may be carried out by any instrumentality adapted to act simultaneously on the pulling over tacks in the manner above outlined.

Considered in another aspect, my invention contemplates novel and improved apparatus comprising means for supporting a last having a pulled-over upper secured thereto, as by tacks located about its forepart, and wiper plates cooperating with the support to conform the pulled-over upper to the last and simultaneously bend the tacks, preferably into a common plane, the wiper plates being provided with non-wetting surfaces having no tendency to stick to the upper and thereby causing the wiper plates to release the upper cleanly, without tendency to displacement. Such non-wetting surfaces may be furnished, for example, by highly polishing the wipers. Preferably, the wiper plates are plated to provide the desired non-wetting surfaces. Thus, the illustrated wiper plates are chrome plated. Such an organization is particularly useful in lasting stitchdown shoes having water boxes or stiffeners, but it may also be used advantageously in operating upon shoes of other types.

The features and advantages of the invention will be best understood and appreciated from the following description of a preferred manner in which it may be carried out with the assistance of the mechanism shown in the accompanying drawing, in which

Fig. 1 is a fragmentary view in front elevation of portions of the pulling-over and tacking instrumentalities of a pulling-over machine, a shoe being shown in section;

Fig. 2 is a view in perspective of the forepart of a stitchdown shoe upon which the pulling-over operation has been effected;

Fig. 3 is a fragmentary view of parts of a toe forming machine suitable for the lasting and tack bending operations, the shoe being shown in section and the parts of the machine occupying their initial position;

Fig. 4 is a similar view showing the parts of the machine in the position which they occupy at the conclusion of the lasting and tack bending steps; and

5 Fig. 5 is a view in perspective of a stitchdown shoe and parts of a stitching machine, illustrative of the stitching operation.

The step of positioning an upper upon the last and securing it in place is illustrated herein as 10 being carried out by the operation of a pulling-over machine of well-known commercial type, the main features of the general organization of which are disclosed in Letters Patent of the United States No. 1,916,275, granted July 4, 1933, 15 upon the application of J. Matheu. Only such parts of the machine, therefore, as it is necessary to refer to for an understanding of the present invention are shown in the accompanying drawing.

In Figs. 1 and 2 a portion of the last 10 is shown 20 to which the upper 14 of a stitchdown shoe is conformed and secured in place by side tacks 16 and a toe tack 18 partially driven into a beveled marginal rim 12 which bounds the bottom of the last.

For positioning the work and supporting the last 25 against the pull applied to the upper, the machine is provided with a work rest 29 which, in the operation of the machine on a shoe of the character illustrated, directly engages the bottom face of 30 the last. For pulling the upper at the end of the toe and the opposite sides of the forepart, there are provided a toe gripper (not shown) and opposite side grippers 30. When the operator 35 presents the work to the machine he positions the margin of the upper within the open jaws of the grippers and then starts the machine, whereupon the grippers are operated by power to pull the upper over the last with its margin extending generally vertically or heightwise of the last, the 40 machine coming automatically to a stop with the upper held under tension. Opportunity is then afforded for such manual movements of the grippers as may be necessary to adjust the upper and shape it properly to the last. When the machine 45 is again started side clamping arms 31 are swung inwardly toward the sides of the shoe to clamp the forepart of the upper against the last and support the last for the upper fastening operation, the arms in the machine herein shown 50 being provided with pads 32 which engage the upper far enough under the forepart of the last to furnish the requisite support.

In the continued operation of the machine the upper fastening devices are moved inwardly into 55 position to locate the tacks in the beveled rim 12 of the last. The upper fastening devices may comprise a tacker for driving a single tack at the end of the toe and a pair of tackers for driving one or two tacks at opposite sides of the forepart. 60 The toe end tacker is carried by a front arm 33, a portion of which only is shown in Fig. 1, and this is mounted for swinging movement lengthwise of the shoe. The side tackers are carried respectively by side arms 34 mounted to swing transversely of the shoe. The arms 33 and 65 34 are swung inwardly to position the tackers relatively to the shoe and in their swinging movement they act on fingers 35 on the grippers to cause the grippers to open and release the upper. 70 After the several arms have been swung inwardly, the tacks are driven through the upper into the last in such a relation to the bottom face of the last that the margin of the upper may be turned outwardly to lie in substantially parallel relation to the projecting margin of a sole 75

applied over the bottom of the last. As best shown in Fig. 1, the tacks enter the beveled rim of the last which forms the junction of the bottom face of the last and its upper shaping surface and in order to permit the desired positioning 5 of the margin of the upper the tacks are inserted at an angle oblique to the bottom face, extending outwardly and upwardly from the inverted last, as shown in Fig. 1.

For driving the side tacks each side arm 34 10 is provided with a self-adjusting carrier plate 38 having a guideway for a tack driver 37 arranged at the required inclination. Each plate 38 is provided with a tack holder and an adjustable upper clamping stop 49 and a wiper 48. In each plate 15 38 there is also provided a tack passage 47 through which a tack may be fed into driving position in advance of the driver 37. As already stated, the plates 38 are not fast upon the arms 20 34 but are so mounted as to permit adjusting or conforming movement so that they will assume the proper relative position determined by the last before the tacks are driven. For this purpose each plate is provided with slots extending 25 laterally and receiving bolts 39 and 40 which serve as guides, the slots being somewhat wider than the diameter of the bolts, so that the plates may rock in response to the action of the shoe on the wiper 48. A torsion spring 41 acts at all 30 times to urge the plate 38 toward the last.

Each of the arms 33 and 34 is provided with a reciprocating driver bar 36 which carries at 35 its lower end an outwardly-projecting bracket arm 45 from which projects a pin 46. Adjacent to each of the bracket arms 45 is disposed a swinging arm 42 pivoted upon a stud 43 to the side arm 34 and having a slot in its free end to receive the pin 46. The swinging arm 42 also carries a pivoted clamping member 44 in which 40 the driver 37 is held. It will be apparent that when the driver bar 36 is lifted the pin 46 will tend to swing the arm 42 upwardly and outwardly, retracting the driver 37. On the other hand, when the driver bars are forced downwardly this 45 connecting mechanism operates to impart a driving stroke to the drivers. Sufficient lost motion is provided in the clamping member 44 to permit the latter to move in substantial alignment with the driver passage throughout its 50 range of movement.

Fig. 2 illustrates the forepart of a stitchdown shoe after it has been operated upon by the mechanism shown in Fig. 1, and while it is apparent that the tacks 16 and 18 are driven in such relation as to permit the margin of the 55 upper to be turned outwardly in a substantially horizontal flange, it is also apparent that to carry out this step the heads of the tacks should be bent toward the plane of the last bottom. In accordance with the method of my invention this 60 step may be carried out advantageously by engaging the tacks between relatively movable plates disposed substantially parallel to the last bottom, as, for example, the work supporting plate and the wipers of a toe forming machine such as that disclosed in Letters Patent of the United States No. 1,861,832, granted June 7, 1932, upon 65 the application of W. C. Baxter. In Figs. 3 and 4 certain portions of this machine are illustrated in their operation of carrying out the tack bending 70 step. In the particular shoe herein illustrated a sole 20, larger than the last bottom, is secured in place by tacks with its margin symmetrically overlapping the last bottom and in contact with the marginal edge of the upper beneath the tacks 75

16. The shoe in this condition is placed upon the work supporting plate 52 of the toe forming machine and a holddown member 50 is brought into engagement with the upper surface of the forepart of the shoe. The machine is provided with cooperating wiper plates 54 disposed at a fixed height and arranged initially to engage lightly the sides of the upper above the tacks 16. In Fig. 3 the shoe is illustrated as initially positioned in the machine.

Having thus presented the shoe, the plunger 51 carrying the work supporting plate is elevated to exert a preliminary pressure upon the work located between it and the under face of the wipers 54. The wipers are then forced inwardly, pressing the tacks in a direction to tighten the upper over the last and when the wipers have reached the inner limit of their movement the work supporting plate 52 is given further upward movement, acting upon the work as shown in Fig. 4. In this operation the body of each tack is engaged by the edge of the wiper where it emerges through the upper and forced inwardly in a direction to tighten the upper, as already explained. At the same time the projecting portion of the tack is bent upwardly with the projecting flange of the upper and embedded in the latter. The tendency is to impart a compound curve to the projecting portion of the tack first slightly downwardly, where it passes through the upper, and then upwardly into a plane coinciding with the surface of the wipers and parallel to the sole. It will be apparent that by engaging the tacks between flat plates and then closing the plates together with the tacks between them, all the tacks will be simultaneously and accurately positioned and the ensuing steps of the shoemaking process may be carried out with assurance that the tacks will be found in the definite locations thus determined. In Fig. 2 the upper is shown as being secured by a single toe end tack 18 and a pair of side tacks 16 and it will be apparent that the number and location of the tacks may be varied without in any way interfering with the operations above described. In these steps the margin of the upper has not been permanently secured in place and it is, accordingly, desirable to retain the tacks, or some of them, until the upper is so secured as otherwise the upper is likely to slacken over the last.

It is the practice to provide the toe part of the upper, forward of the tip seam, with a stiffener, rendered pliable by moistening prior to the lasting operation and dried stiff in the finished shoe. These stiffeners or boxes are termed water boxes when they are of a type softened by water rather than other solvents. In Fig. 2 the part 13 represents such a stiffener and this may be associated with a lining if desired. In lasting uppers provided with water boxes, it is desirable that the wiper shall leave the upper cleanly and without tendency to stick in its retracting movement as otherwise the upper is pulled away from the last and the quality of the lasting impaired. When this happens a second molding or lasting operation is necessitated. This difficulty is avoided in accordance with another feature of the present invention by employing wipers provided with non-wetting surfaces. For example, by highly polishing the wipers or by chrome plating them the tendency to stick to the upper is substantially eliminated and the upper is left undisturbed when the wipers are retracted.

The side tacks 16 may be located in advance of the tip seam or sufficiently far forward in the shoe to secure the margin of the stiffener 13 when driven into the last. In this location the side tacks are well within the range of operation of the wiper plates 54.

The step of securing the margin of the upper to the projecting margin of the sole 20 by stitching is illustrated in Fig. 5, where the roller presser foot 60, needle 62 and needle guide 64 of a stitch-down thread lasting machine are depicted. A machine of this character is fully disclosed in Letters Patent of the United States No. 1,864,510, granted June 21, 1932, upon the application of B. T. Leveque. Such a machine may be employed to form a seam 19 located in the angle of the out-turned margin and extending through the margin of the upper and the sole. The seam 19 is started at the heel end of the shoe and carried continuously around the contour thereof, passing directly over and across the tacks which have been bent into position and embedded in the margin of the upper, as already explained. As herein suggested, the toe tack 18 may be removed before the stitching operation and the seam is shown as extending over the side tacks 16 but, as already explained, the use or retention of additional tacks would require no variation of the process.

Having permanently secured the upper and sole by the seam 19, the tacks 16 have no longer any useful function and may be removed and the shoe completed in the ordinary process of manufacture. Certain of the benefits and advantages of the novel sequence of steps above outlined will be apparent in the improved quality of the lasting exhibited by the shoe and in the facility with which the stitching operation may be carried out upon the shoe presented to the stitching machine.

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

1. The method of making stitchdown shoes, which consists in securing the upper to the last at opposite sides thereof by tacks driven in such relation to the bottom face of the last as to permit the margin of the upper to extend outwardly upon the projecting margin of a sole, then tightening the upper about the last and simultaneously bending the tacks into contact with the out-turned margin of the upper, and subsequently stitching said margin over the tacks so bent.

2. The method of making stitchdown shoes, which consists in securing the upper to the last in different locations about the forepart by tacks driven in such relation to the bottom face of the last as to permit the margin of the upper to extend outwardly upon the projecting margin of a sole, then simultaneously bending towards each other the tacks and the out-turned margin of the upper to tighten the upper about the last, and subsequently stitching the margin to the sole by a seam passing over the tacks so bent.

3. The method of making stitchdown shoes, which consists in securing the upper to the last at different points about the forepart by tacks driven in such relation to the bottom face of the last as to permit the margin of the upper to extend outwardly upon the projecting margin of a sole, engaging said tacks, together with the sole and upper margins, between substantially parallel plates and compacting them therebetween, and subsequently stitching the material so compacted over the tacks.

4. The method of making stitchdown shoes, which consists in securing the upper to the last by tacks driven obliquely to the last bottom at the edge thereof, out-turning the margin of the upper beneath the tacks, tightening the upper over the last by simultaneously bending the tacks, and subsequently stitching a sole to the out-turned margin of the upper by a seam passing over the tacks so bent. 5
5. The method of making stitchdown shoes, which consists in securing the upper to the last by tacks driven obliquely to the last bottom at the edge thereof, out-turning the margin of the upper to form a flange disposed parallel to the last bottom, positioning a sole thereon, and then improving the condition of the shoe for stitching by simultaneously embedding the tacks in the out-turned flange of the upper and tightening the upper about the last. 10
6. The method of making stitchdown shoes, which consists in pulling over and tacking the forepart of the shoe at a plurality of points, lasting the upper with its margin out-turned and at the same time bending the pulling over tacks into a plane substantially parallel to the shoe bottom, and then stitching the out-turned margin of the upper to the projecting edge of a sole over the tacks so bent. 15
7. The method of making stitchdown shoes, which consists in securing an upper to the last by tacks driven at opposite sides of the forepart in a direction oblique to the last bottom, out-turning the margin of the upper beneath the tacks, engaging the upper in a plane above said tacks with wiper plates while the said margin is supported from beneath, lasting the upper by means of said wipers and simultaneously embedding the tacks in the supported margin, and then stitching a sole to said margin by a seam passing over the embedded tacks. 20
8. The method of making stitchdown shoes, which consists in securing an upper to the last by tacks driven at opposite sides of the forepart and extending outwardly and obliquely with respect to the last bottom, out-turning the margin of the upper, and then engaging all of the tacks, forcing them in a direction tending to tighten the upper over the last and at the same time embedding the outer part of each tack in the out-turned margin of the upper. 25
9. The method of making stitchdown shoes, which consists in pulling the upper over the last, securing the upper to the last at points upon opposite sides thereof well in advance of the tip line by tacks driven obliquely into the edge of the last, and then simultaneously bending the tacks into parallelism with the last bottom and placing the upper under further tension. 30
10. The method of making stitchdown shoes, which consists in securing to the last, by means of tacks driven at separate points about the forepart, an upper having a softened water box therein, out-turning the margin of the upper, and then conforming the upper to the last by a wiper plate having a non-wetting surface and at the same time bending the tacks into parallelism with the out-turned flange. 35
11. In apparatus for operating upon stitchdown shoes having water boxes, means for supporting a last having a pulled-over upper secured thereto by tacks located about its forepart, and wiper plates movable toward and from the last and cooperating with said support to conform the pulled-over upper to the last and simultaneously bend the tacks into a common plane, said wiper plates being chrome-plated upon those surfaces which engage the upper, whereby the wiper plates are caused cleanly to release the upper in their retracting movement. 40
12. In apparatus for operating upon stitchdown shoes, means for supporting a last having a pulled-over upper secured thereto by tacks located about its forepart, and wiper plates movable toward and from a last on the supporting means and co-operating with said support to conform the pulled-over upper to the last and simultaneously bend the tacks into a common plane, said wiper plates having polished upper-engaging surfaces. 45
13. In apparatus for operating upon stitchdown shoes having water boxes, means for supporting a last having a pulled-over upper secured thereto by tacks, and wiper plates constructed and arranged upon relative movement of the last-supporting means and the wiper plates to conform the upper to the last and simultaneously bend the tacks and to be disengaged from the upper, said wiper plates having plated upper-engaging surfaces whereby the wiper plates are caused cleanly to release the upper. 50

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