

Nov. 21, 1961

J. S. KAMBORIAN
METHOD OF TOE LASTING

3,009,182

Filed Sept. 22, 1958

2 Sheets-Sheet 1

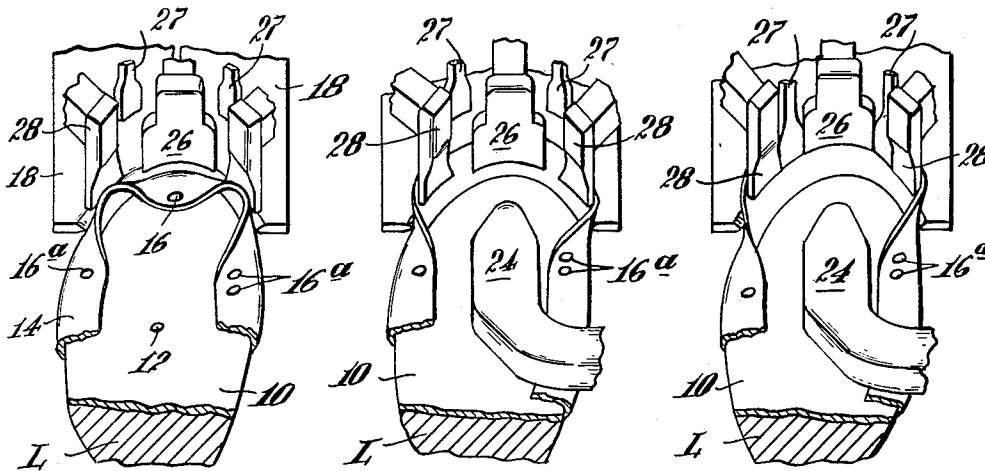


Fig. 1

Fig. 2

Fig. 3

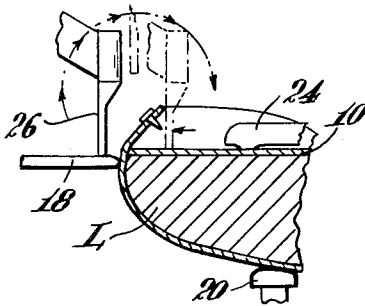


Fig. 4

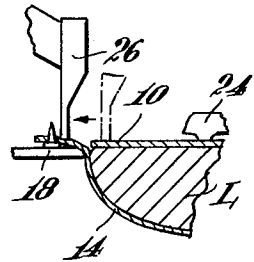


Fig. 5

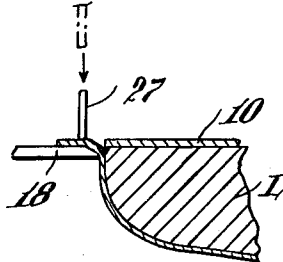


Fig. 6

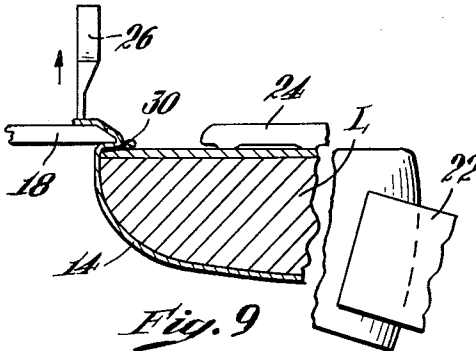


Fig. 9

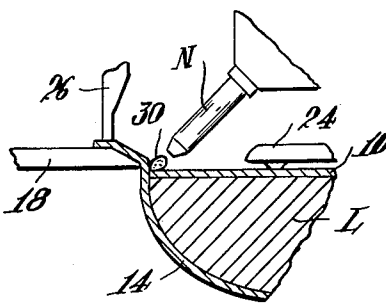


Fig. 8

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2 Sheets-Sheet 2

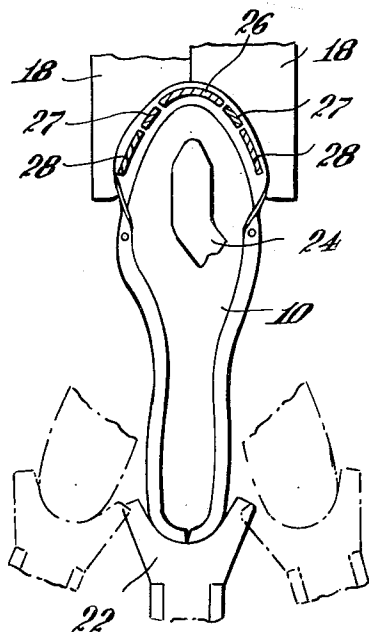


Fig. 7

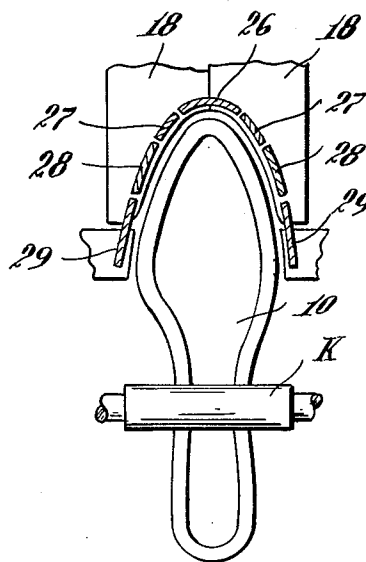


Fig. 12

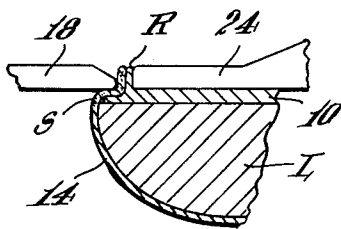


Fig. 10

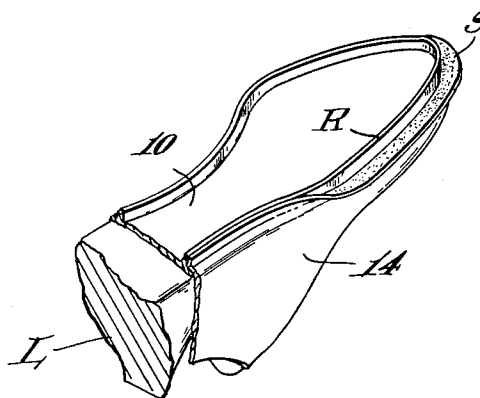


Fig. 11

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3,009,182

METHOD OF TOE LASTING

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17 Claims. (Cl. 12-145)

This invention relates to a method of making shoes, and more especially to improvements in lasting shoes by a procedure in which wipers are employed. While herein disclosed specifically with reference to end lasting, it is also applicable in its broader aspects to side lasting.

Objects of the invention are to provide a method of operating on the uppers of shoes, which have been assembled on a last together with an insole, by means of the usual pulling-over machine, in such a manner as to insure preservation of the initial centering of the upper on the last, attained during the pulling-over operation, so as to cause the upper to conform to a greater degree than usual, to the last about the toe, heel and foot opening; to assist in removing stubborn creases and wrinkles in the margin and to distribute the margin about the toe in such fashion as to minimize wrinkling as the margin is wiped inwardly over the bottom; to attain a higher degree of molding the upper especially in that area rounding the shoulder of the last; and optionally to impart sufficient set to the molded area and inlasted margin so that the latter will hug the sewing rib when the shoe is of welt construction, sufficiently so that a lasting wire or staple need not be employed to hold the upper in place until the in seam operation can be carried out. Other objects are to attain the foregoing without having manually to remove the pulling-over tacks or to force the inwardly folded margin outwardly away from the insole preparatory to lasting.

The several steps of the method are shown as performed by power-driven mechanical means, but is to be understood that the operative instrumentalities involved may be manually actuated if desired.

As here shown, an upper, previously assembled on a last together with an insole and temporarily fastened thereto by pulling-over tacks, is moved forwardly to enter the toe end of the assembly between the open wipers of an end-lasting apparatus provided with generally conventional wipers movable in a predetermined plane, but having means disposed symmetrically with reference to the wipers against which the tip of the assembly may be placed for registering the shoe preparatory to the wiping operation. Having thus positioned the toe of the assembly, forces are initially applied to the extreme forward end portion of the lasting margin and to portions spaced from each side thereof in directions such as to draw the extreme forward portion and the side portions forwardly and laterally outward respectively, symmetrically with respect to the median line of the last, to turn the margin outwardly from over the insole, and to press it down against the upper surfaces of the wipers. Other forces are then applied to the portions of the upper intermediate the extreme forward portion and side portions to clamp the intermediate portions, as thus outspread, into firm engagement with the wipers. The initially applied forces are applied downwardly against the insole and then shifted progressively from their points of contact with the insole, first toward and then outwardly beyond the edge of the insole, so as frictionally to press the margin into contact with the wipers. The initial forces also automatically remove any pulling-over tacks which may be present. The areas of initial application of the forces are narrow, elongate and substantially tangent to the curved edge of the insole, and successive positions of these respective areas are paral-

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lel with each other during the entire period of force application. Rigid members, which may hereafter be referred to as "hold-downs," "spreaders" or "fingers," each having a narrow, elongate, upper-contacting lower surface, may be employed for applying the forces just above referred to. The additionally applied forces are applied directly downward against the outspread margin at the points where the initial forces apply and their areas of contact are also narrow and elongate. Rigid members in the form of fingers, each having a narrow elongate arcuate lower edge may be employed. The several areas of the spreaders and clamps collectively contact nearly the entire arcuate area about the toe. During the application of the aforesaid forces, the bottom of the insole is supported above the level of the plane of the upper surfaces of the wipers, and is rigidly held stationary in this position, so that as the margin is drawn outwardly beyond the edge of the insole and turned down to contact the wipers, it is folded slightly downwardly away from the plane of the insole so as to expose the edge of the latter. After thus being folded outwardly and over the wipers, the last is forced down to bring the upper surface of the insole substantially to the level of the undersurfaces of the wipers and, since the margin is now gripped between the force-applying instrumentalities and the wipers, the upper is subjected to a powerful stretching action which draws it snugly about the last. The last is held during the operations of spreading the margin and lowering the last to stress the margin by clamping jaws at the forepart and heel end, which are movable about an axis extending heightwise of the last. Accordingly, when the last has been lowered, it may be swung laterally from side-to-side to permit twisting and stretching the margin so that any stubborn creases or wrinkles may be worked out. A quick setting adhesive is applied to the exposed insole close to the exposed outer edge, whereupon the wipers are moved inwardly over the bottom of the insole in opposition to the frictional or snubbing forces which resist release of the lasting margin from the upper surfaces of the wipers in response to such inward movement, thereby to wipe the lasting margin while under tension over the bottom of the insole. If the insole has a welt sewing rib, the lasting margin preferably is preliminarily impregnated with a material which will stiffen the upper during lasting, so that it will retain its shape without need for a toe wire or other fastening means.

While the method as related above pertains to toe lasting, it is also applicable to forepart lasting. If employed for forepart lasting, it is desirable to iron the wiped-in margin by application of a heated implement which will conform the margin to the bottom.

The invention will now be described in greater detail with reference to the accompanying drawings which illustrate the successive steps of the method and wherein:

FIG. 1 is a perspective view of an upper, including an insole, assembled on a last with the bottom side up, showing the margin of the last temporarily fastened with pulling-over tacks, the toe end of the assembly being disposed between conventional wipers (opened out to receive it) and the operating instrumentalities (which cooperate with the wipers to grip and stretch the lasting margin), in their initial positions;

FIG. 2 is a corresponding view showing the force-applying instrumentalities as having been moved upwardly, rearwardly, downwardly and outwardly, so as to have removed the forward pulling-over tack; folded the margin outwardly; and pressed it downwardly against the wipers;

FIG. 3 is a corresponding view showing auxiliary clamping instrumentalities, intermediate the force-applying instrumentalities, engaged with and clamping the outspread margin against the wipers;

FIG. 4 is a fragmentary vertical section lengthwise of

the last, showing the wipers and the centrally located force-applying instrumentality in successive positions, starting from its initial position in contact with the wipers and proceeding to its position in contact with the inside of the lasting margin, preparatory to applying force to the margin to fold it outwardly;

FIG. 5 is a corresponding view showing the centrally located force-applying instrumentality moved from the position of FIG. 4 outwardly so as to fold the margin down and to hold the margin frictionally engaged with the wipers, and with the edge of the insole fully exposed for the reception of adhesive;

FIG. 6 is a vertical section lengthwise of the last, showing one of the auxiliary clamping instrumentalities, intermediate the force-applying instrumentalities first, in dotted line position, elevated from the wipers, and then in full lines, clamping the outspread margin against the wipers;

FIG. 7 is a plan view showing the last as having been forced down so that the surface of the insole is substantially in the plane of the underside of the wipers and supported by the forepart and heel clamps, so that the last can be swung laterally from side-to-side;

FIG. 8 is a vertical section showing a bead of adhesive being applied by means of a nozzle along the exposed edge of the insole about the toe;

FIG. 9 is a vertical section, broken away intermediate its ends, showing the heel clamp engaged with the heel end of the last and the margin being folded inwardly over the insole by the inward motion of the wipers and with the margin partially withdrawn from beneath the force-applying and clamping instrumentalities;

FIG. 10 is a vertical section lengthwise of a shoe whose insole has a sewing rib and with the margin laid against the rib, and showing a hold-down so modified as to support the inside of the rib;

FIG. 11 is a perspective view of the upper assembly shown in FIG. 10, the inner surface of the upper, at its marginal portion, being shown as having been impregnated with a stiffening compound; and

FIG. 12 is a plan view illustrating the application of the present method to side lasting as well as toe lasting with means for ironing the margin after it is laid down.

In the practice of the invention, the toe end of a pulled-over upper assembly, such as shown in FIG. 1, consisting of a last 1 with an insole 10 temporarily attached thereto by means of tacks 12, and an upper 14 which has been stretched over the last by means of a conventional pulling-over machine and temporarily attached to the insole by pulling-over tacks 16 and 16a, is placed between the open wipers 18—18 of a lasting machine of the kind in which the last is supported with its bottom up in a position such that the bottom of the insole is in a plane above that of the undersurfaces of the wipers and supported for limited lateral movement of its heel end in a horizontal plane relative to the toe end by clamping means, including a toe rest 20, a hold-down 24 and a heel clamp 22, which are swingable in unison about an axis perpendicular to the bottom of the last. In so placing the assembly, a part 26, which constitutes one of the force-applying instrumentalities and which is situated at the junction of the wipers 18—18, functions as registering means to enable the operator to place the toe end of the assembly in accurately centered relation with the open wipers and the aforesaid clamping means preparatory to clamping.

Without first removing the pulling-over tack 16, or manually spreading the upper outwardly over the wipers as is customary, force is applied to the center of the extreme forward end portion of the lasting margin in a direction to pull and drag the margin forwardly from over the insole and to turn it downwardly into engagement with the wipers; and by progressive movement of the point of application of force, from its initial contact

with the margin, to exert a frictional drag on the margin in a forward direction. As here illustrated by way of example, this force is applied by means of the part 26, hereafter identified as a hold-down, spreader or finger (FIGS. 1 and 7), which moves from a position having contact with the wipers (FIG. 1), upwardly, inwardly over the margin and beyond the inner edge of the latter and beyond the pulling-over tack 16 and then downwardly following a course, such as indicated in broken lines in FIG. 4, and then outwardly (FIG. 5), with its lower edge contacting the upper surface of the insole, with the result that the lasting tack 16 is pulled out and the margin is turned forwardly and downwardly into frictional engagement with the subjacent wipers, so that at the end of its forward movement the margin is firmly pinched against the wipers. Simultaneously, those portions of the lasting margin, which are at each side of the part contacted by the element 26, are operated upon by hold-downs, spreaders or fingers 28—28, at opposite sides of the finger 26 and similar to the latter, which move in a cycle like that of the part 26, as above described, to engage the inner surface of the margin at opposite sides of the toe end of the assembly and just forwardly of the pulling-over tack 16a, so as to turn the engaged portions of the margin over and outwardly and then down into frictional engagement with the wipers. The force-applying spreader fingers 26 and 28—28 have narrow, elongate, arcuate surfaces that follow the natural curvature of the toe. Each of the fingers 26 and 28—28 moves in a direction that is non-parallel or oblique to the direction of movement of the other fingers, and each finger intersects the lasting margin and the edge of the last while moving in a direction substantially radial to the curvature of the last edge. This provides for a more effective spreading out of the lasting margin on the wipers than if the fingers were moved in parallel directions and produces a minimum of wrinkles and folds in the outspread lasting margin.

The side fingers 28—28 are spaced from the center finger 26 and consequently the margin intermediate the fingers 28—28 and 26 is unsupported and hence may sag. Accordingly, intermediate or auxiliary clamping fingers 27—27 are arranged above the wipers for clamping the intermediate portions of the margin against the wipers. These intermediate fingers, as shown in FIGS. 1 to 3 and 6, are situated vertically above the wipers and their movement is merely downwardly into contact with the outspread margin after the latter has been turned outwardly. The clamping fingers 27—27 also have narrow, elongate, arcuate surfaces at their lower edges.

Collectively, the arcuate surfaces of the spreader fingers and clamping fingers provide a nearly continuous arcuate surface about the toe for clamping the outspread margin against the wipers.

The entire lasting margin forwardly of the pulling-over tacks 16a is thus pulled forwardly and outwardly and slightly downwardly, because the upper surfaces of the wipers are below the insole level, and held frictionally engaged with the upper surfaces of the wipers by the parts 26, 27—27 and 28—28, so that the upper is uniformly stretched tightly about the last, and the edge of the insole is completely exposed for the application of adhesive.

According to the present method, as soon as the margin is spread outwardly and clamped against the wipers, the last is forced downwardly to bring the upper surface of the insole into the plane of the undersurfaces of the wipers (FIGS. 7 and 8). The hold-downs, spreaders, or fingers 26 and 28—28 and the clamping fingers 27—27 frictionally hold or snub the lasting margin about the edges of the wipers, and thus the upper is powerfully stretched about the last as the latter is moved downwardly. This relative heightwise movement of the last and wipers may be accompanied by a gradual delivery of the margin, which is pulled from between the fingers

26, 27—27 and 28—28 and the wipers, as the bottom surface of the insole approaches the plane of the underside of the wipers. However, at no time during such motion of the last do the fingers and wipers completely relinquish their frictional hold on the margin.

As heretofore pointed out, during the spreading of the margin and lowering of the last to stress the margin heightwise of the last, the last is supported by the forepart clamps 20 and 24 and the heel clamp 22. The aforesaid clamps are mounted to turn about an axis perpendicular to the last bottom; hence, at this point, the rear end of the last may, if desired, be swung laterally relative to its toe end. Thus, the operator may grip the heel end of the last and move it from side to side. Such movement twists the lasting margin and helps to remove stubborn creases and wrinkles which, when dealing with certain materials, may not entirely be removed by the pull heightwise of the last. Such creases sometimes run at an angle to the plane of the bottom.

After having thus worked out any wrinkles in the margin, if such were present, a bead of adhesive 30 (FIG. 8) of quick-drying or setting thermoplastic adhesive is applied to the very edge of the insole, for example, by extruding it from a nozzle N (FIG. 8), which may be moved quickly, usually by hand, about the end portion of the insole from one side to the other. Optionally, a pair of nozzles, constructed to move toward or away from each other along arcs corresponding to the curvature of the end of the shoe, may be employed in discharging this adhesive, so that the adhesive may be extruded in two strips, starting at the end of the insole and moving rearwardly in opposite direction, or vice versa, starting at the opposite sides and moving forwardly toward the tip, or alternatively, a crescent-shaped nozzle may be employed to extrude a circular or arcuate bead of adhesive about the entire margin at once. Means for accomplishing the above ways of applying the adhesive are more fully described in my United States Patent No. 2,969,555, dated January 31, 1961. In the aforesaid patent the adhesive-applying means is disclosed as applying the adhesive proximate to the edge of the insole and also at the very edge. The referred to applying means may obviously be used to apply the adhesive at the very edge of the insole by clamping the margin of the upper down against the wipers, as shown in FIG. 8, to expose the edge of the insole to the applying means. It is important, as pointed out in the aforesaid application, that the adhesive be applied quickly, if this adhesive be hot, so as to avoid heating the adjacent parts of the shoe which would prevent the setting of the adhesive instantaneously.

The wipers are now moved inwardly, while the margin is still snubbed about their edges and is held frictionally engaged with their upper surfaces by the members 26, 27—27 and 28—28 which resistingly give up the margin so that the inward movement of the wipers maintains a high degree of tension upon the margin until the wipers have pressed a substantial part of the width of the margin into intimate contact with the insole. This amount of resistance may be adjustable according to the lasting requirements of the individual shoe; any desired means may be provided for gradually or abruptly relieving the down-pressure upon the margin. The procedure herein described insures a maximum degree of snugness and molding of the upper to the outer surface of the last, because a firm bond is produced by the quick-drying adhesive before the margin is finally released, and hence there is no chance for the upper to pull back due to the natural elasticity of the upper material. Furthermore, by this procedure, it is possible to cut the upper material so as to reduce the lasting margin materially as compared with customary practice, thus saving leather.

The method, as above described, is also applicable to the manufacture of welt shoes (FIGS. 10 and 11) particularly if, before assembly, the margin of the upper be

impregnated with a stiffening material, such that the margin tends to retain any shape to which it may be bent. A thermoplastic adhesive is useful for this purpose, but among impregnants which have been found useful for the purpose, are "8070 Wood Resin" sold by Hercules Powder Company and "2070 Super Beckacite 2000" sold by Reichhold Chemical Company. However, these particular materials are mentioned merely by way of example and without limiting intent.

If the lasting margin has been impregnated with material having such characteristics, the practice of the present method so molds and sets the lasting margin that it hugs the shoulder and rib of the insole in close conforming relation thereto, and having thus been shaped by the operation of the force-applying instrumentalities and the wipers, the margin retains the position and shape so imparted to it without requiring the application of a toe-lasting wire, staples, or other extraneous holding means. Preferably, in impregnating the margin as above suggested, the impregnant material, for instance a thermoplastic adhesive, is forced, while hot and in fluid condition, into the texture of the upper at the flesh side of the latter prior to assembly of the upper on the last. Alternatively, if the upper comprises a lining, the lining may be impregnated with the stiffening compound, or as a further alternative, an impregnated insert may be placed between the lining and the upper.

If desired, when lasting the margin of the upper to an insole having an upstanding sewing rib, stapling means such as shown in my Patent No. 2,424,239 may be employed in conjunction with the wipers to drive staples through the margin into the rib as the margin is laid up against the rib by the wipers.

While the method of the present invention has been described in detail with reference to its usefulness in toe lasting, it is contemplated that it may also be usefully employed in side lasting. Thus, as suggested in FIG. 12, wherein instrumentalities 29 (similar to the parts 26, 27 and 28 above described) are arranged at opposite sides of the assembly, rearwardly of the parts 28 and actuated according to the same sequence of steps as are employed in actuating the parts 26 and 28, either in association with parts 26 and 27 and 28 or independently of the latter, the sides of the shoe may be lasted; and, if desired, in association with the parts, any conventional ironing means K may be employed for ironing the shank.

The principal advantages of the method followed herein are to preserve the initial centering of the upper on the last attained on the pulling-over machine; to attain a high degree of conformity to the last and to impart a permanent set, if a stiffening compound be applied to the margin, so that in the manufacture of welt shoes, a toe wire or other fastening means are not required. Other objects attained are to reduce manual operations on the part of the operator which may or may not be carried out with such dexterity and skill as to produce the optimum in lasting.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. That method of lasting the toe of a shoe upper, which has been assembled with an insole upon a last and which has been pulled over by conventional means, said method comprising as steps introducing the toe end of the pulled-over upper between open end-lasting wipers, with the surface of the insole above the plane of the wipers, applying a force to the extreme forward end of the lasting margin so as to draw said extreme end portion outwardly from the last and to clamp said portion against the wipers, applying forces to the lasting margin at opposite sides of the forward end so as to draw portions of the lasting margins at the opposite sides of the forward

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end outwardly from the last and to clamp them against the wipers, each of said forces moving in a direction oblique to the other forces so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge, clamping additional portions of the outspread margin, intermediate the forwardly drawn endmost portion and side portions, against the wipers; while the margin is thus clamped outspread, lowering the last to bring the surface of the insole into the plane of the lower side of the wipers, and then wiping the outspread margin inwardly over the bottom.

2. That method of lasting the toe of a shoe upper, which has been assembled with an insole upon a last, and which has been pulled over by conventional means, said method comprising as steps introducing the toe end of a pulled-over upper between open end-lasting wipers, with the surface of the insole above the plane of the wipers, applying forces to the extreme forward portions of the lasting margin and to portions spaced therefrom at each side, such as to draw the extreme end portion forwardly and the side portions outwardly away from the edge of the insole so as to expose the edge of the insole, and to clamp said portions against the wipers, to hold the margin outspread; while the margin is thus outspread applying additional forces to the margin intermediate said end and side portions to clamp said intermediate portions, lowering the last while the margin is thus clamped outspread, to stress the margin heightwise of the bottom surface of the insole, holding the last with the margin thus stressed and, while thus stressed, swinging the heel end of the last angularly relative to the toe in the plane of the bottom surface of the insole, and then wiping the outspread, stressed margin inwardly over the bottom surface of the insole while releasing the clamped portions thereof in proportion to the inwiping forces applied.

3. That method of lasting the toe end of a shoe upper, which has been assembled with an insole upon a last, and which has been pulled over by conventional means, which comprises as steps introducing the toe end of the pulled-over upper between open end-lasting wipers, with the surface of the inner sole above the plane of the wipers, applying forces to the endmost portion of the lasting margin and to portions spaced therefrom at each side, such as to turn the endmost portion forwardly and the side portions outwardly from over the insole, and then pressing the forwardly and outwardly turned margin downwardly against the wipers, applying additional forces downwardly against the downturned margin, intermediate the endmost and side portions, to clamp said intermediate portions against the wipers, lowering the last to bring the upper surface of the insole below the wipers, shifting the heel end of the last back and forth laterally about the toe end as a center to remove wrinkles inclined to the bottom, and moving the wipers in, thereby to wipe the wrinkle-free lasting margin into engagement with the insole.

4. That method of lasting the toe end of a shoe upper, which has been assembled with an insole upon a last, and which has been pulled over by conventional means, comprising as steps introducing the toe end of the pulled-over upper between open end-lasting wipers, with the surface of the insole above the plane of the wipers, applying a force to the endmost portion of the lasting margin and applying other forces to portions spaced therefrom at each side, such as to turn the endmost portion forwardly and the side portions outwardly from over the insole, each of said forces moving in a direction oblique to the direction of movement of the other forces so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge, and then pressing the turned margin downwardly against the wipers, applying additional forces downwardly against the downturned margin, intermediate said endmost and

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side portions, to press said intermediate portions against the upper surface of the wipers, moving the last downwardly while the margin is thus snubbed against the wipers until the upper surface of the insole is substantially in the plane of the lower surface of the wipers, applying to the exposed surface of the insole, close to the outer edge of the latter, a band of quick-setting adhesive, and then moving the wipers inwardly and concomitantly relinquishing the snubbed margin as the wipers move inwardly, thereby to lay the lasting margin tautly over the shoulder of the last and against the bottom surface of the insole.

5. That method of lasting the toe of a shoe upper, which has been assembled with an insole upon a last, and which has been pulled over by conventional means, comprising introducing the toe end of the pulled-over upper between open end-lasting wipers, with the surface of the insole above the plane of the wipers, applying a downwardly directed force to the insole, inwardly of the inturned lasting margin, at the extreme forward end of the insole close to its margin, applying downwardly directed forces to the insole at opposite sides and spaced from the first applied force, moving said forces across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole and to clamp the lasting margin against the wipers, each of said forces moving in a direction oblique to the direction of movement of the other forces so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge, lowering the last while the lasting margin is thus outspread and clamped at least an amount sufficient to bring the surface of the insole into the plane of the undersurfaces of the wipers, and moving the wipers across the insole to wipe the outspread margin inwardly over the insole.

6. That method of lasting shoes according to claim 5, wherein, in applying force to the forward end portion of the lasting margin for turning the latter forwardly and away from the edge of the insole, any pulling-over tack, which still remains, is removed.

7. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last, with the lasting margin of the upper extending above the insole, comprising the steps of: introducing the end of the last between open end-lasting wipers with the surface of the insole above the plane of the undersurfaces of the wipers; moving the upstanding margin of the upper outwardly from the edge of the insole and clamping the outspread lasting margin down against the wipers; lowering the last while the margin is thus outspread and clamped at least an amount sufficient to bring the surface of the insole into the plane of the undersurfaces of the wipers to stress the margin heightwise of the surface of the insole; while the margin is thus stressed moving the last laterally from side to side; and then moving the wipers across the insole to wipe the outspread margin inwardly over the insole.

8. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last, with the lasting margin of the upper extending above the level of the insole, comprising the steps of: introducing the end of the last between open end-lasting wipers with the surface of the insole above the plane of the undersurfaces of the wipers; applying a clamping force downwardly against a portion of the upper surface of the last and a clamping force upwardly against a portion of the lower surface of the last; moving the upstanding margin of the upper outwardly from the edge of the insole and clamping the outspread lasting margin down against the wipers; lowering the last while the margin is thus outspread and clamped at least an amount sufficient to bring the surface of the insole into the plane of the undersurfaces of the wipers; moving the wipers across the in-

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sole to wipe the outspread margin inwardly over the insole; and maintaining the clamping forces against said portions of the last surfaces during the outward movement of the lasting margin and the clamping of the lasting margin against the wipers, the lowering of the last, and the wiping of the lasting margin.

9. The method according to claim 8 wherein, subsequent to the lowering of the last and prior to wiping the margin, the last is moved laterally from side to side to remove any wrinkles or creases still remaining in the upper.

10. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last with the lasting margin of the upper extending above the level of the insole comprising the steps of: introducing the end of the last between open end-lasting wipers with the surface of the insole above the plane of the undersurfaces of the wipers; applying spaced forces across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole and to clamp the outspread lasting margin against the wipers, said forces moving in relatively oblique directions so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge; lowering the last while the margin is thus outspread and clamped at least an amount sufficient to bring the surface of the insole into the plane of the undersurfaces of the wipers; and then moving the wipers across the insole to wipe the outspread margin inwardly over the insole.

11. The method according to claim 10 wherein, subsequent to the lowering of the last and prior to the wiping of the lasting margin, the last is moved laterally from side to side to remove any creases or wrinkles still remaining in the upper.

12. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last with the lasting margin of the upper extending above the level of the insole, and wherein a surface of the lasting margin is to be adhesively bonded to a surface of the insole, comprising the steps of: introducing the end of the last between open end-lasting wipers with the uppermost face of the insole above the plane of the undersurfaces of the wipers; applying a force across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole, clamp the outspread lasting margin against the wipers, and expose the said surfaces; lowering the last while the lasting margin is thus clamped at least an amount sufficient to bring the uppermost face of the insole into the plane of the undersurfaces of the wipers; applying adhesive to at least one of the said surfaces; and then moving the wipers across the insole to wipe the outspread margin inwardly over the insole.

13. The method according to claim 12 wherein subsequent to the lowering of the last and prior to the application of the adhesive, the last is moved laterally from side to side to remove any wrinkles or creases still remaining in the upper.

14. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last with the lasting margin of the upper extending above the level of the insole, and wherein a surface of the lasting margin is to be adhesively bonded to a surface of the insole, comprising the steps of: introducing the end of the last between open end-lasting wipers with the uppermost face of the insole above the plane of the undersurfaces of the wipers; applying spaced forces across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole, clamp the outspread lasting margin against the wipers, and expose the said surfaces, said forces moving in relatively oblique directions so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge; lowering the last while the margin is thus clamped at least an amount sufficient to

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bring the uppermost face of the insole into the plane of the undersurface of the wipers; applying adhesive to at least one of the said surfaces; and moving the wipers across the insole to wipe the outspread margin inwardly over the insole.

15. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last with the lasting margin of the upper extending above the level of the insole comprising the steps of: introducing the end of the last between open end-lasting wipers with the surface of the insole above the plane of the undersurface of the wipers; applying a clamping force downwardly against a portion of the upper surface of the last and a clamping force upwardly against a portion of the lower surface of the last; applying spaced forces across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole and to clamp the outspread lasting margin against the wipers, said last mentioned forces moving in relatively oblique directions so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge; lowering the last while the margin is thus outspread and clamped at least an amount sufficient to bring the surface of the insole into the plane of the undersurfaces of the wipers; moving the wipers across the insole to wipe the outspread margin inwardly over the insole; and maintaining the clamping forces against said last surfaces during the outward movement of the lasting margin and the clamping of the lasting margin against the wipers, the lowering of the last, and the wiping of the lasting margin.

16. The method of lasting the end of a shoe upper which has been assembled with an insole upon a last with the lasting margin of the upper extending above the level of the insole, and wherein a surface of the lasting margin is to be adhesively bonded to a surface of the insole, comprising the steps of: introducing the end of the last between open end-lasting wipers with the uppermost face of the insole above the plane of the undersurfaces of the wipers; applying a clamping force downwardly against a portion of the upper surface of the last and a clamping force upwardly against a portion of the lower surface of the last; applying a force across the insole and against the lasting margin so as to draw the lasting margin outwardly from the edge of the insole, clamp the outspread lasting margin against the wipers, and expose the said lasting margin and insole surfaces; lowering the last while the lasting margin is thus outspread and clamped at least an amount sufficient to bring the uppermost face of the insole into the plane of the undersurfaces of the wipers; applying adhesive to at least one of the surfaces to be bonded; moving the wipers across the insole to wipe the outspread margin inwardly over the insole; and maintaining the clamping forces against said portions of the last surfaces during the outward movement of the lasting margin and the clamping of the lasting margin against the wipers, the lowering of the last, the application of the adhesive, and the wiping of the lasting margin.

17. That method of lasting the toe of a shoe upper, which has been assembled with an insole upon a last and which has been pulled over by conventional means, comprising: providing an insole which has a welt sewing rib; providing an upper whose lasting margin at the toe portion is impregnated with a material which so stiffens the upper that it retains its shape after having been lasted in against the welt rib without necessitating the employment of means for holding the lasted-in upper against the rib; introducing the toe end of the pulled-over upper between open end-lasting wipers with the surface of the insole above the plane of the wipers; applying a force to the extreme forward end portion of the lasting margin so as to draw said extreme end portion outwardly from the last and to clamp said portion against the wipers; applying forces to the lasting margin at opposite sides of the forward end so as to draw portions of the lasting margin at the opposite sides of the forward end outwardly from the

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last and to clamp them against the wipers, each of said forces moving in a direction oblique to the other forces so that each force may pass the edge of the last in a direction substantially radial to the curvature of the last edge; clamping additional portions of the outspread margin, intermediate the forwardly drawn endmost portion and side portions, against the wipers; while the margin is thus clamped outspread, lowering the last to bring the surface of the insole into the plane of the lower side of the wipers; and then wiping the outspread margin inwardly

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over the insole to fold the lasting margin against the insole and against the welt rib.

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