

April 20, 1943.

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2,316,863

METHOD OF MAKING LASTS

Filed July 10, 1942

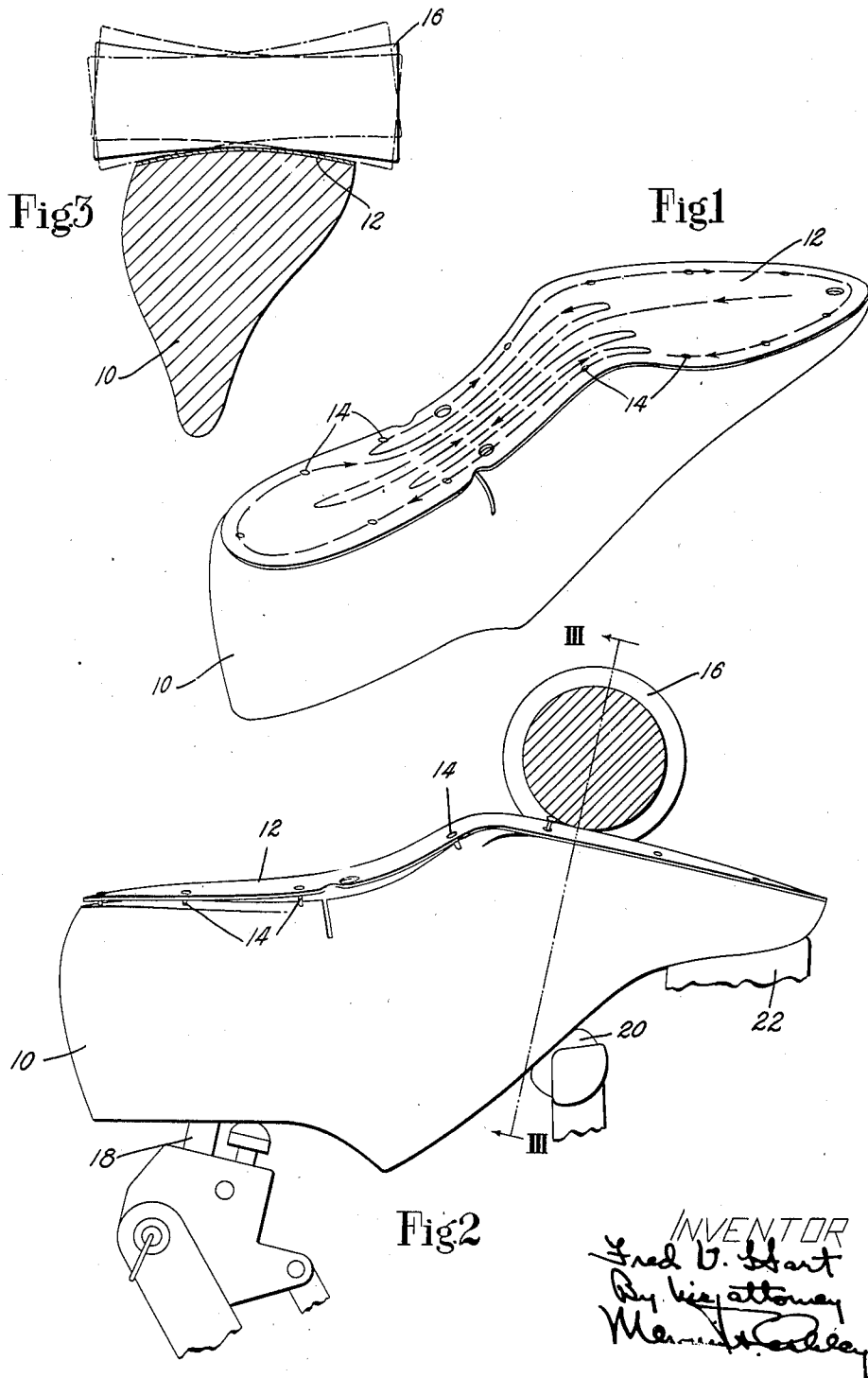


Fig2

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UNITED STATES PATENT OFFICE

2,316,863

METHOD OF MAKING LASTS

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Application July 10, 1942, Serial No. 450,423

10 Claims. (Cl. 12—146)

This invention relates to last making and is exemplified herein with reference to the fitting and attaching of metal plates to the bottoms of lasts.

In some shoes, of which the McKay shoe is a typical example, the marginal portion of the upper is fastened to the innersole in the lasting operation by the use of nails or tacks; and the heels of many types of shoes, particularly if they are low heels, are attached by the use of nails. These tacks or nails are driven from the outside of the shoe and are clinched into the inside surface of the shoe bottom as a result of being driven against a metal plate on the last bottom. Most lasts, therefore, are provided with a metal plate covering the bottom of the heel part at least, and a great number of lasts have plates entirely covering their bottoms.

The fitting and attaching of a bottom plate to a last has been done heretofore by hand. In carrying out this operation, the plate, having the peripheral shape of the last bottom, or that portion thereof to be covered, is bent so as to conform approximately to the profile of the last bottom as viewed directly from the side without being shaped to fit the transverse curvature of the last bottom. Tacks or nails are then driven through holes in the plate into the last bottom to hold the plate thereon.

At this stage there invariably will be gaps between the plate and the last bottom except in the immediate vicinity of the nails. The fit of the plate on the last bottom is the poorest at the "break" of the last bottom, between the forepart and shank, where the longitudinal contour of the bottom changes its direction abruptly. The bend in the plate at this locality extends straight across it whereas the "break" of the last bottom is curved. Consequently, extensive gaps occur between the plate and last bottom at the locality in question. All of these gaps are eliminated by pounding or hammering the plate until it is closely seated on the last bottom. In thus hammering the plate, parts of it which were once brought into engagement with the last bottom are disturbed by blows imparted to other parts of the plate, causing the fastenings, as well as the plate, to become loosened. Thus, the same fastening and the same parts of the plate may have to be hammered at several different times before all parts of the plate are finally made to fit the last bottom closely. This repeated loosening of the nails so weakens the grip of the wood of the last upon them that they commonly become loose in the ordinary use of the last, be-

cause of the jars resulting from handling and also the pounding and hammering to which the last is subjected during certain shoemaking operations.

Furthermore, the shape of the last bottom as turned is marred, particularly along its margin, by hammering the plate since the wood of the last is not rigid enough to withstand the localized impact of hammer blows. Consequently, a wavy appearance typical of hand peened or hammered work is usually imparted to the plate, particularly along its edge, and in the vicinity of the "break" which part of the plate is more difficult than any other to force into close contact with the last. This hammering of the plate also tends to loosen the usual galvanized coating on the plate and hence increases the likelihood of its rusting.

In view of the foregoing, it is a general object of the invention to provide an improved method of applying plates to last bottoms in the practice of which the above objections are avoided and the accurate fitting and secure attachment of plates to last bottoms is effected.

To this end, one illustrative method provided by my invention consists in applying a plate to a last bottom by applying pressure progressively to different portions of the plate successively to conform it to the lengthwise and widthwise curvatures of the bottom of the last while holding the plate on the last bottom with their edges in the desired relation to each other, and to complete the driving of fastenings through the plate into the last bottom.

The force which is thus imparted to the plate is applied continuously although at different places at different times thereby avoiding the above mentioned objections to hammering. Moreover, the fastening of the plate to the last is not effected until the plate is made to fit the last bottom completely, with the result that the holding power of the fastenings is utilized to the utmost.

As herein illustrated, the pressing of the plate against the last bottom is effected, in accordance with one aspect of the method, by relatively moving the last and a pressing member, against which the plate is held, to and fro lengthwise of the last and simultaneously relatively tilting the last and pressing member. Thus, the pressure of the pressing member on the plate is exerted along lines extending longitudinally thereof and disposed at different positions widthwise thereof. By an appropriate combination of these movements any part of the plate may be subjected to

the pressure of the member as many times as may be necessary to shape it closely to the last bottom without disturbing or needlessly operating upon other parts of the plate.

During the shaping operation the plate is held in the desired position longitudinally or widthwise of the last bottom by fastenings which extend through holes in the margin of the plate and which are partially driven into the last bottom. The complete driving of these fastenings is effected, in accordance with the invention in another aspect, by the action of the pressing member which, as it approaches a fastening to be driven, holds that portion of the plate contiguous to the fastening in close contact with the last bottom.

These and other features of the invention including various novel details of construction and combinations of parts will now be described in detail in the specification and then pointed out more particularly in the appended claims.

In the drawing:

Fig. 1 is a perspective view of a last having a metal plate which has been applied to the bottom of the last by the practice of the present method, the path along which pressure is imparted to the plate being indicated in broken lines;

Fig. 2 is a view in side elevation of a last, with a plate partially fitted to its bottom, illustrating the driving of the fastenings; and

Fig. 3 is a sectional view, the section being taken along the line III—III of Fig. 2, showing the roll in its extreme tilted positions (broken lines) as well as in an intermediate position (full lines).

The illustrated last 10 is of the McKay type and, as illustrated herein, is provided with a galvanized iron plate 12 adapted to cover the entire bottom of the last. The peripheral shape of the plate 12 is the same as that of the last bottom, and before being attached to the last, the plate may be perfectly flat. Preferably, however, the plate is slightly cupped so as to cause the edge of the plate to be seated snugly on the margin of the last bottom when the mid portion of the plate is pressed against the last bottom. The plate 12 is first placed against the last bottom, with the edges of the plate and last bottom in register with each other. The plate is then bent by hand over the "break" of the last, at the junction of the shank and forepart, and also just ahead of the heel breast line to make its longitudinal shape approximate that of the last bottom. The plate 12 is next finally adjusted on the last bottom to insure that the edge of the plate and the edge of the last bottom are in register with each other. That is, the edge of the plate, if not flush with the edge of the last bottom, will be brought directly above the latter. The plate 12 is next loosely attached to the last by partially driving fastenings 14 through holes in the plate into the last bottom. Although the fastenings are not intended, at this stage, to hold the plate closely against the bottom of the last, they nevertheless hold it against any movement longitudinally or widthwise of the last bottom which would disturb the relation of register between the edges of the plate and last bottom.

The complete shaping of the plate 12 into conformity to the last bottom, and the final driving of the fastenings 14 are effected progressively by the action of a pressing member, herein illustrated as a roll 16. This operation is performed by relatively moving the last 10 and the roll 16, to

and fro lengthwise of the last, and also by relatively tilting the last and roll to cause the point of operation of the roll on the plate to be transferred crosswise of the last bottom, as well as lengthwise thereof. Thus, by a combination of these movements the plate may be subjected to pressure at any and all points and, hence, is completely shaped into conformity to the last bottom.

This operation will now be described in detail with reference to an illustrative machine, which is adapted for use in carrying out the present method, and is completely disclosed in United States Letters Patent No. 2,230,244, granted on February 4, 1941, on an application of F. V. Hart et al. The machine referred to includes a jack comprising a pin 18 adapted to be received in the thimble of the last 10, and supports 20, 22 adapted to engage the instep and toe portions, respectively, of the last. The jack is constructed and arranged to be oscillated to and fro lengthwise of a last mounted thereon, and is so controlled that its stroke can be limited, if desired, both as to length, and position between its extreme limits. The machine also comprises a pressing member, the roll 16 as illustrated herein, which is mounted so as to exert a yielding pressure against the bottom of the last, and can be raised out of engagement with the last at any time. The roll can also be tilted laterally of the last to permit pressure to be applied to the last bottom at any desired point widthwise thereof.

The roll 16 and plate are first brought into engagement with each other a short distance behind the toe end of the plate 12. The jack is now moved to cause the last 10 to be moved forwardly thereof as a result of which the point of operation of the roll on the plate moves rearwardly of the last along the center of the plate. During this and subsequent movements of the last, such fastenings 14 as may extend above the part of the periphery of the roll which is directly over them will be partially driven, and accordingly, the plate 12 will be held in the position into which it is bent by the roll at each stage of the rolling operation.

When the point of operation of the roll on the plate reaches the heel breast line, the movement of the last is reversed. At this time, the roll 16 is tilted to cause the point of operation of the roll to travel a short distance outwardly toward the edge of the last bottom or, if as usually is the case, there is no dwell at the end of each movement of the last, the tilting movement of the roll will be progressive and occur simultaneously with the movement of the last. Thus, the point of operation of the roll on the plate is moved to and fro lengthwise thereof a few times between the heel breast line and points somewhat ahead of the "break," successive lines of pressure of the roll being disposed at progressively increasing distances from the center of the plate toward one edge.

After one side of the shank portion of the plate 12 has thus been rolled into conformity to the shape of the last bottom the point of operation of the roll 16 on the plate is transferred around the margin of the heel end of the plate, thereby causing the fastenings 14 in this part of the plate to be completely driven, and the heel part of the plate to be closely seated on the last bottom. As the roll 16 approaches the heel end of the plate, the roll is tilted gradually in the direction opposite to that in which it was tilted before to cause the roll to operate progressively around the mar-

gin of the heel part as described above. Then a rolling action is imparted back and forth along the part of the shank portion of the plate which was not operated upon before. Later, the roll is tilted at the same time that the last is moved longitudinally of itself so as to cause the roll to operate on the margin of the plate from one side to the other around the toe end, as indicated in Fig. 1.

As stated above, the fastenings 14 are driven a little at a time to the extent which their heads extend above the periphery of the roll. However, whenever the roll is so tilted that its line of pressure on the plate intersects a fastening, that fastening is driven completely. It will be apparent by referring to Fig. 2, although this figure does not illustrate precisely the condition just mentioned above, that the roll 16 simultaneously engages the fastening which is being completely driven and also the portion of the plate contiguous to this fastening. As the roll approaches a position directly over a fastening being driven, the portion of the plate contiguous to the fastening will have been forced into close contact with the last bottom, and the plate in the vicinity of each fastening is shaped into conformity to the last bottom before the plate is fastened to the last bottom. Consequently, the holding power of the fastenings is not wasted in preserving the shape of the plate, but is fully utilized firmly to hold the plate on the last bottom.

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

1. That improvement in methods of applying plates to the bottoms of lasts which consists in holding a plate on the bottom of a last with their edges in the desired relation to each other, progressively pressing said plate into conformity to the last bottom along lines extending longitudinally thereof and disposed at different positions widthwise thereof, and fastening the plate to the last bottom while holding the plate in engagement with the last bottom.

2. That improvement in methods of applying plates to the bottoms of lasts which consists in assembling a plate on the bottom of a last with the edge of the plate in the desired relation to the edge of the bottom face of the last, holding the plate in that relation to the last by partially driven fastenings, and then applying pressure progressively to different portions of the plate successively to conform it to the lengthwise and widthwise curvatures of the bottom of the last and to complete the driving of the fastenings.

3. That improvement in methods of applying plates to the bottoms of lasts which consists in partially driving fastenings through a plate into the bottom of a last, the edges of the plate and the last bottom being in register with each other, progressively pressing said plate into conformity to the last bottom along lines extending longitudinally thereof and disposed at different positions widthwise thereof, and completing the driving of the fastenings while holding the portion of the plate contiguous to each fastening being driven in engagement with the last bottom.

4. That improvement in methods of applying plates to last bottoms which comprises holding a plate on the bottom of a last against displacement longitudinally and widthwise thereof, relatively moving the last and a pressing member adapted to engage said plate relatively to each other lengthwise of the last, tilting the last and pressing member relatively to each other thereby

to cause the point of operation of the pressing member on the plate to be transferred along lines extending lengthwise of the plate and disposed at different positions widthwise of the plate, and fastening the plate to the last bottom.

5. That improvement in methods of applying plates to last bottoms which consists in holding a plate on the bottom of a last against displacement longitudinally and widthwise thereof, progressively pressing said plate into conformity to the last bottom by the use of a roll, said roll and last being moved relatively to each other lengthwise of the last and tilted relatively to each other laterally of the last whereby the point of operation of said roll on said plate is transferred along lines extending lengthwise of said plate at different distances from the edges of said plate, and fastening the plate to the last bottom.

6. That improvement in methods of applying plates to last bottoms which consists in partially driving fastenings through a plate into the bottom of a last with the edges of the plate and last bottom in register with each other, moving the last and a roll in engagement with said plate relatively to each other lengthwise of the plate, relatively tilting the last and roll during their relative movement lengthwise of the plate whereby the point of operation of the roll on the plate is progressively transferred along lines extending lengthwise of the plate and disposed at different positions widthwise of the plate, and completing the driving of the fastenings into the last bottom, each fastening being driven by said roll while the portion of the plate contiguous thereto is held in engagement with the last bottom by said roll.

7. That improvement in methods of applying plates to the bottoms of lasts which consists in holding a plate on the bottom of a last with their edges in the desired relation to each other, moving the last to and fro lengthwise thereof with the plate thereon in contact with a roll, and simultaneously tilting the last and roll relatively to each other, whereby the point of operation of the roll on the plate is transferred to and fro along lines extending lengthwise of the plate at different positions widthwise thereof, and fastening said plate to the last bottom.

8. That improvement in methods of applying plates to the bottoms of lasts which consists in partially driving fastenings through a plate into the bottom of a last, the edges of said plate and last bottom being in the desired relation to each other, moving the last lengthwise thereof with the plate thereon in engagement with a yieldingly mounted pressing member, progressively tilting said pressing member during the above-mentioned movement of the last to cause the point of operation of the member on said plate to move across the plate, said movement of the last being utilized by said member to complete the driving of the fastenings.

9. That improvement in methods of applying plates to the bottoms of lasts which consists in holding a plate on the bottom of a last with their edges in register with each other, moving the last lengthwise thereof to and fro with the plate thereon in engagement with a pressing member and simultaneously tilting the pressing member laterally of the last to cause the point of operation of the member on said plate to move laterally thereof, and driving fastenings into the last bottom through said plate while holding the portion of the plate contiguous to each fastening

firmly against the last bottom during the driving of the fastening.

10. That improvement in methods of applying plates to the bottoms of lasts which consists in partially driving fastenings through a plate into the bottom of a last, the edges of said plate and last bottom being in register with each other, and simultaneously moving the last lengthwise

thereof with the plate thereon in engagement with a roll and tilting the roll laterally of the last whereby the point of operation of the roll on the plate is transferred across the plate, the driving of said fastenings being completed by said roll when it is so tilted that its line of pressure on said plate intersects the fastenings.

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