M. BROCK.

METHOD OF END LASTING.

APPLICATION FILED AUG. 11, 1917.

1,373,483.

Patented Apr. 5, 1921.

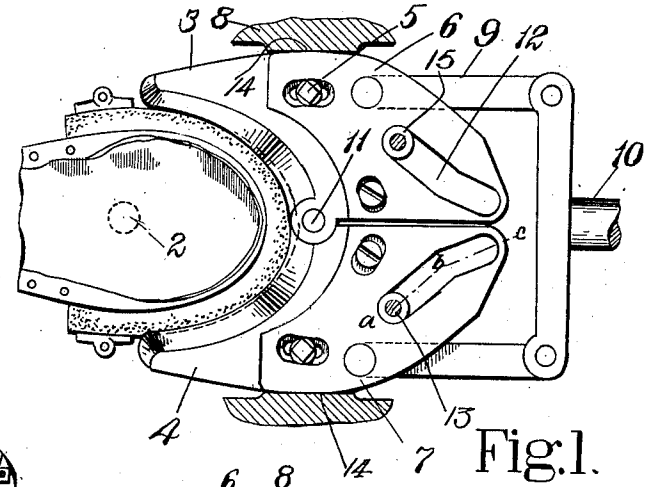


Fig. 1.

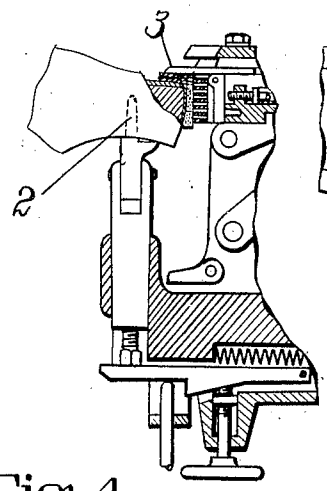
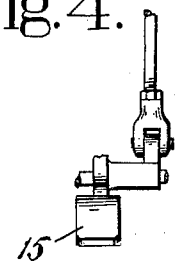


Fig. 4.



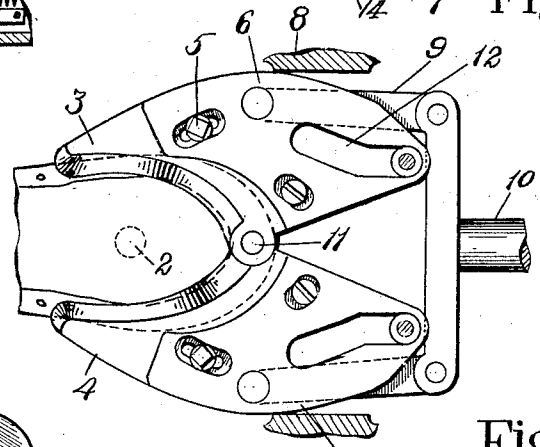


Fig. 3.

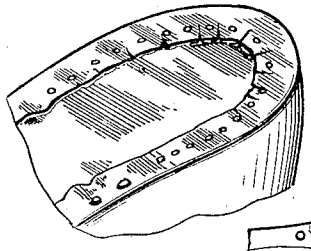


Fig. 6.

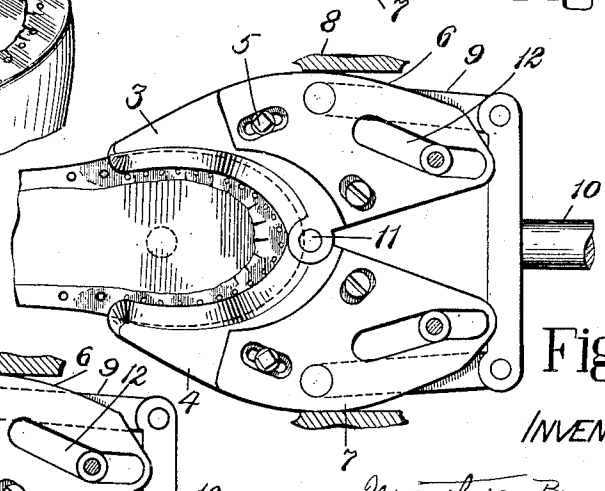


Fig. 5.

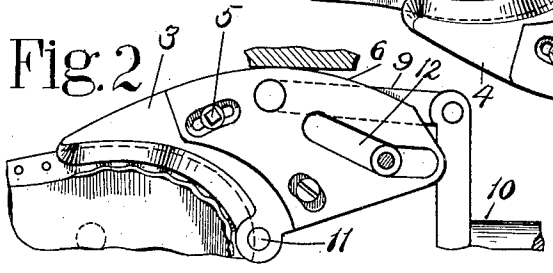


Fig. 2.

INVENTOR.

Matthias Brock

UNITED STATES PATENT OFFICE.

MATTHIAS BROCK, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

METHOD OF END-LASTING.

1,373,483. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed August 11, 1917. Serial No. 185,693.

To all whom it may concern:

Be it known that I, MATTHIAS BROCK, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Methods of End-Lasting, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to the manufacture of shoes and particularly to methods of end lasting applicable to the heel portions of shoes and to the toe portions of McKay shoes.

In lasting toes or heels it is important that the upper be bent over the edge of the shoe bottom substantially simultaneously at all points around the shoe end. In this way the fullness of the margin of the upper gathered over the end of the insole is best distributed and the smallest and least prominent wrinkles are produced. This result is accomplished by shaping the usual end lasting wipers to fit substantially the end of the last which they are to embrace and by operating the wipers to advance and close simultaneously, thus wiping the upper radially inwardly from the curved portions of the last edge. The edge of the wipers thus symmetrically advanced and closed is used as a guide by the operator in inserting the upper fastening tacks in a line around the shoe end preferably distanced inwardly from the shoe edge to be out of the way of the other line or lines of fastenings used subsequently to connect the sole and the heel to the lasted shoe. For the reasons stated this has been the accepted method of end lasting.

An object of the present invention is to conserve all that is good in the customary method of end lasting and to add thereto an upper smoothing operation by which to iron down the margin of the upper. It is the present general practice to pound down the heel seats and the toes of McKay shoes after the lasting, lasting machines being provided for this purpose with rests adapted to sustain the respective shoe ends as shown, for example, in Figure 1 of my co-pending application, Ser. No. 176,784, filed June 25, 1917, while the machine operator uses a hand hammer to flatten down the upper beyond where the wipers acted. Special "pounding" machines have also been provided and are extensively used for this purpose.

This invention, in one important aspect, provides a method whereby the margin of an upper is folded or wiped inwardly around the end of a last and is then rubbed or wiped in a different direction to set it in its inwardly folded condition. In accordance with the practice exemplified in the accompanying drawings, the different portions of the margin of the upper around the end of the last are first gathered and wiped inwardly in directions substantially or approximately radially to the curve of the edge of the last bottom and are then further wiped in the same plane in a uniform direction lengthwise of the last. The lengthwise wiping or rubbing action may be repeated a plurality of times to assist in flattening the materials and in forming a sharply defined edge line.

In a further important aspect, this invention consists in extending, longitudinally of the shoe, the wiping or rubbing action after the margin of the upper has been folded or wiped inwardly around the end of the last to a suitable extent. In accordance with this part of the invention, the margin of the end portion of the upper beyond the tacking line and the usual field of action of the wipers is smoothed and compacted on the insole by a new or additional wiping movement. In the illustrative manner of practising this invention, the end embracing wipers are given, after they have made an appropriate advancing and closing movement to or beyond the tacking line, a further advancing movement, with less or with no closing motion, sufficient to iron down and compact to its extreme edge the upper that has been gathered over the end of the last.

By the procedure herein illustrated, the flange of the upper is first folded across the last edge and gathered in and wiped down on substantially radial lines and the direction of wiping action is then changed to run substantially lengthwise of the shoe. As I am advised it is new by this invention to shape the upper in lasting by a wiping movement the direction of which is changed as the wiping proceeds in such

manner that portions of the stock are wiped in a plurality of directions successively.

In another aspect of this invention, the present method consists in shaping an upper to the end portion of a last by closing and advancing end embracing wipers approximately to the desired tacking line, then advancing the wipers without the same degree of closing movement to complete the laying down of the margin of the upper and then retracting the wipers to such position as to uncover the tacking line and constitute a guide during insertion of the fastenings. This method has the advantage, in addition to the superior upper shaping produced by folding over and rubbing radially inward and then rubbing in another direction which is more nearly lengthwise of the side edges of the last bottom, of enabling the wipers to be moved far enough endwise to lay down the extreme edge of the upper material. This it is impossible to do on narrow shank shoes by the combined closing and advancing rubbing movement heretofore employed because the ends of the wipers collide with each other on such shanks before they have advanced far enough to cover all the upper at the rear end of the heel. This invention for the first time permits end embracing wipers to be so used as to iron down and compact the whole of a wide margin of upper lasted over a narrow shank shoe. By use of this invention the amount of pounding required after lasting at the heel and at the toe end of McKay shoes is greatly reduced, and on some shoes it is entirely eliminated, thus increasing the capacity of the lasting machines. Commercial lasting machines, as shown, for example, in said co-pending application, have mechanism by which to effect relative vertical movement of the last and the toe and heel embracing wipers to compress, iron down, and compact the upper materials between the wipers and the last bottom, and when the method of this invention is employed such compression by or against the fully advanced wipers produces exceedingly smooth seats on the toes and heels of lasted shoes upon which to lay the outsole.

The invention will now be explained in connection with drawings showing, by way of example, end lasting mechanism with the aid of which I have successfully practised this invention.

Fig. 1 is a plan view of open heel embracing wipers and the heel portion of a shoe to be end lasted.

Fig. 2 shows the step of moving a wiper over the margin of the heel seat to the tacking line location by a combined advancing and closing movement derived from part *a*—*b* of the wiper cam path.

Fig. 3 shows the step of advancing the wipers farther to lay down the extreme edge of the upper from the rear end of the heel, by part *b*—*c* of the wiper cam path. This step may be performed repeatedly without opening the wipers.

Fig. 4 illustrates the step, which is optional, of elevating the last to compress the upper materials between the usual iron heel seat plate of the last and the lower face of the wipers. The step illustrated in Fig. 3, or a repetition of it, and the step illustrated in Fig. 4, may be concurrent or overlap.

Fig. 5 shows the step of uncovering the tacking line by retracting the wipers, without substantially opening them.

Fig. 6 shows an end lasted heel seat with the upper materials ironed or crushed down to their extreme edge, as the result of the described method.

In practising the invention with the aid of the illustrative machine, heel end lasting will be first considered. A shoe prepared for end lasting is sustained by supports including the last pin 2 within the end embracing wipers 3, 4, which are removably attached by bolts 5 to cam plates 6, 7 that are mounted to slide in the frame 8 by force transmitted through links 9 from a thrust rod 10. The wipers are contoured at their inner edges to fit substantially the end portion of the shoe which they embrace. The wipers turn about a common center in the pivot 11 and their path of movement is controlled by the engagement of the outer edges of the cam plates with walls 14 of the frame and by the engagement of the walls of cam slots 12 with fixed roll studs 13. The cam slots comprise two portions, the first acting portion *a*—*b* being cut at such an angle to the longitudinal axis of the machine and adjacent portion of the shoe as to impart to the wipers, when they are advanced, a closing movement. The advancing and closing movements are simultaneous and the components thereof are so proportioned that the different portions of the upper extending around the end of the last are folded over the edge of the last bottom simultaneously and then wiped inwardly on lines that are substantially radial to the curvature of the last edge. The length of the portion *a*—*b* of the cam slots is such as to permit the wipers to move in the direction described about as far as the location of the tacking line. As thus far particularly described, the wiper movements and the mechanism for effecting these movements are those in common use.

I first wipe the upper radially inwardly across the margin of the last bottom, as by advancing and closing the wipers by the described means, to about the location of the tacking line. This line should have a fairly definite location in order that the last-

ing tacks shall not be in the way of the subsequently applied sole-attaching fastenings. The described direction of radial overwiping gathers the upper over the last end with the minimum size of plaits and produces the best edge line. To set the edge line and compact the margin of the upper, so that the overwiped upper will remain folded down on the shoe bottom and so that the edge line shall be angular and sharply defined as is desirable in lasting, I now rub the upper in a definitely different direction, which, as shown, is longitudinally of the last or lengthwise of the opposite side portions of the edge line. This changed direction is desirable because the upper material from the extreme end of the last is often longer than from the sides of the last end and it is important to form it down upon the last bottom to produce a suitable smooth and compact seat for the outsole, such as has heretofore been produced by pounding. Another reason why the wiper movement beyond the tacking line is preferably without accompanying closing movement is that on narrow shank shoes the wiper ends collide if it be attempted to close them far enough to wipe down all of the upper at the end of a heel. I obtain the desired result as follows: The portion *b*—*c* of the cam paths is formed at an angle to the portion *a*—*b* such that when the portion *b*—*c* reaches its stud 13, said portion is substantially parallel with the longitudinal axis of the machine and shoe and with rod 10 and the wiper guiding walls 14 of the frame, all as may be seen in Figs. 2, 3 and 5. By thus shaping the cam slots, the direction of movement of the wipers is definitely changed at *b*, the closing movement being eliminated or substantially reduced and the advancing movement continued.

The method of end lasting has been described as applied to heel lasting but I have also used it with advantage in toe lasting of McKay shoes.

Advantageously strong pressure is applied perpendicularly to the plane of the last bottom for compacting the overwiped upper materials and in many instances this can be done simultaneously with the rubbing of the upper. For this purpose the last may be forced upwardly toward the wipers by power transmitted through the last spindle 2 from a foot treadle 15 and connections as indicated in Fig. 4. This can be done while the operator, by means of the usual wiper hand lever, is advancing the wipers. The wipers may be advanced and retracted repeatedly. When the upper has been adequately rubbed and pressed down the wipers are retracted to uncover the tack line location and the tacks are inserted, as in Fig. 5, the edge of the wipers being used by the operator as a guide in locating the tacks in a line properly distanced from the last edge. The work produced by this method is exemplified in Fig. 6 and requires little or no pounding to make a seat for the outsole.

Having explained the nature of the invention and described how it may be practised, I claim as new and desire to secure by Letters Patent of the United States:—

1. That improvement in methods of end lasting which consists in folding over the edge of a last bottom the margin of upper materials extending around the end of the last and wiping them radially inwardly approximately to the tacking line and then, without substantially relaxing the wiping pressure on the folded over stock, wiping the margin of the upper in a direction substantially lengthwise of the last.

2. That improvement in methods of end lasting which consists in folding over the edge of a last bottom the margin of upper materials extending around the end of the last and wiping them radially inwardly approximately to the tacking line and then abruptly changing the direction of wiping action and extending the wiping action beyond the tacking line.

3. That improvement in methods of end lasting which consists in folding over the edge of a last bottom the margin of upper materials extending around the end of the last and wiping them radially inwardly approximately to the tacking line and then, without substantially relaxing the wiping pressure on the folded over stock, rubbing the stock on the last bottom substantially lengthwise of the last to set it in folded position.

4. That improvement in methods of end lasting which consists in advancing and simultaneously closing end embracing wipers to fold the margin of upper materials over the edge of a last bottom and wipe said materials radially inwardly approximately to the tacking line and then advancing the wipers without substantial further closing movement to lay down the upper from the extreme end of the last.

5. That improvement in methods of end lasting which consists in advancing and simultaneously closing end embracing wipers to fold the margin of upper materials over the edge of a last bottom and wipe said materials radially inwardly approximately to the tacking line and then effecting a further upper smoothing movement of the wipers substantially lengthwise of the shoe to iron down the upper.

6. That improvement in methods of end lasting which consists in advancing and simultaneously closing end embracing wipers to fold the margin of upper materials over the edge of a last bottom and wipe said materials radially inwardly approximately to the tacking line, then advancing the

wipers without substantial further closing movement to lay down the upper from the extreme end of the last, retracting the wipers substantially longitudinally of the shoe to uncover the tacking line location, and using the wipers as a guide in inserting the upper fastening tacks in a row properly located with reference to the location of the sole fastenings that are subsequently to be inserted.

7. That improvement in methods of end lasting by means of end embracing wipers which advance and close over a last end which consists in extending the action of the wipers longitudinally of the last in substantially the same plane without substantial closing movement after their simultaneous advancing and closing movement has carried them partially across the overlaid margin of the upper at the end of the shoe.

8. That improvement in methods of end lasting which consists in wiping an upper radially inward from the curved extremity and sides of a last end and then while maintaining the pressure over the area of the overwiped portion rubbing the overwiped upper longitudinally of the edge of the sides of the last end in a plane substantially parallel to the plane of the last bottom.

9. That improvement in methods of end lasting which consists in wiping an upper radially inward from the curved extremity and sides of a last end and then rubbing the overwiped upper longitudinally of the edge of the sides of the last end while applying over the area of the overwiped portion increased pressure variably proportioned to the extent of the rubbing action as determined by the operator.

10. That improvement in methods of end lasting which consists in wiping an upper radially inward from the curved extremity and sides of a last end and then rubbing the overwiped upper longitudinally of the edge of the sides of the last end repeatedly forwardly and backwardly in a plane substantially parallel to the plane of the last bottom.

11. That improvement in methods of end lasting which consists in wiping an upper radially inward from the curved extremity and sides of a last end as far as the tacking line, and then wiping the upper substantially longitudinally of the last beyond the tacking line to the edge of that portion of the upper which is folded in from the extreme end of the last.

12. That improvement in methods of end lasting which consists in forming the edge line on the shoe bottom by folding the margin of the upper radially inwardly and in setting the edge line by rubbing the folded in upper longitudinally of said edge line with pressure applied simultaneously along the entire length of the overwiped margin and variably proportioned to the extent of the rubbing action as determined by the operator.

13. That improvement in methods of end lasting which consists in shaping an entire end portion of the upper in one operation by a continuous wiping movement in substantially the same plane, the direction of which movement is changed as the wiping proceeds in such manner that the same portions of stock are wiped in a plurality of directions successively during one continuous wiping action.

14. That improvement in methods of end lasting which consists in wiping the margin of an upper inwardly around the end of a last in directions substantially or approximately radial to the curve of the edge of the last bottom, and then continuing the wiping action over the same portion of the stock and farther forwardly in a uniform direction substantially parallel to the longitudinal medial line of said end of the last.

15. That improvement in methods of end lasting which consists in wiping the margin of an upper inwardly around the end of a last in directions substantially or approximately radial to the curve of the edge of the last bottom, and then while maintaining the wiping pressure over substantially all portions of the overwiped margin rubbing said margin repeatedly in directions substantially parallel to the longitudinal median line of said end of the last.

16. That improvement in methods of end lasting which consists in folding the margin of an upper inwardly around the end of a last with pressures differently directed at different points along the edge of the last bottom, and then while maintaining the folding pressure rubbing substantially all portions of said margin simultaneously in a uniform direction lengthwise of the last and substantially parallel to the plane of the last bottom to set it in its inwardly folded condition.

17. That improvement in methods of end lasting which consists in wiping the margin of an upper inwardly around the end of a last in different directions at different points along the edge of the last bottom, and then continuing the wiping action upon said margin in substantially the same plane and in a uniform direction lengthwise of the last.

In testimony whereof I have signed my name to this specification.

MATTHIAS BROCK.