

R. C. SIMMONS.
LAST.
APPLICATION FILED SEPT. 8, 1908.

Patented Apr. 15, 1913.
2 SHEETS—SHEET 1.

1,059,081.

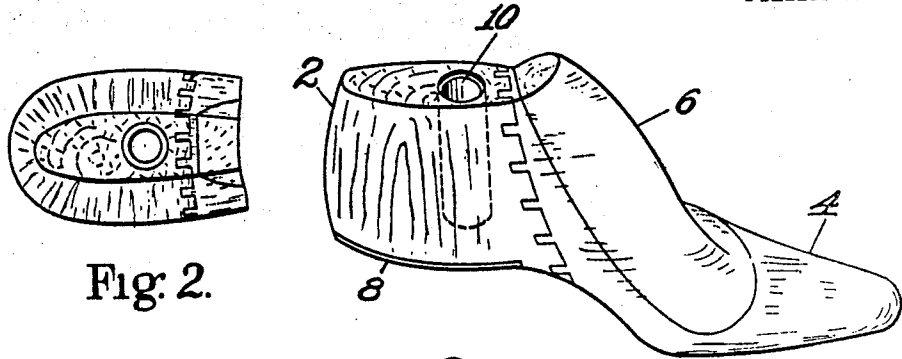


Fig. 2.

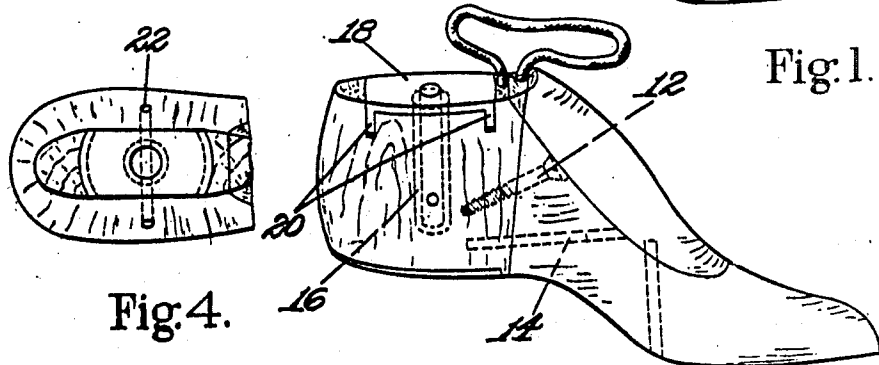


Fig. 1.

Fig. 4.

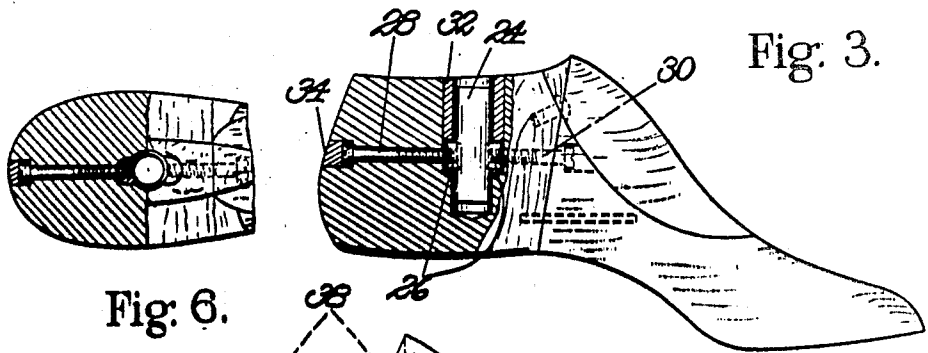


Fig. 3.

Fig. 6.

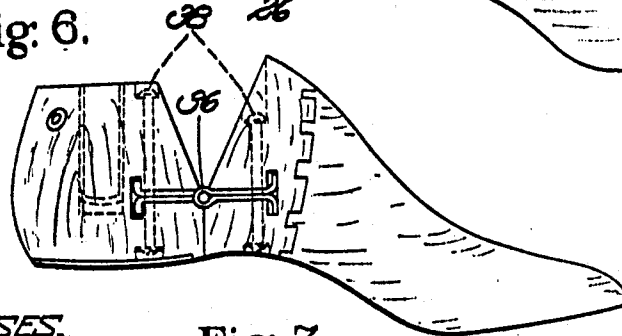


Fig. 5.

WITNESSES.
Bernard Barrows
Allan H. Barrows.

Fig. 7.

INVENTOR.
Ralph C. Simmons.

R. C. SIMMONS.
LAST.
APPLICATION FILED SEPT. 8, 1908.

1,059,081.

Patented Apr. 15, 1913.
2 SHEETS—SHEET 2.

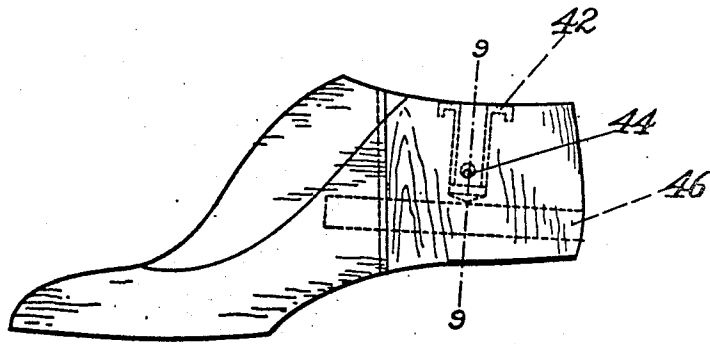


Fig. 8.

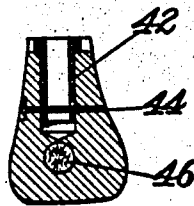


Fig. 9.

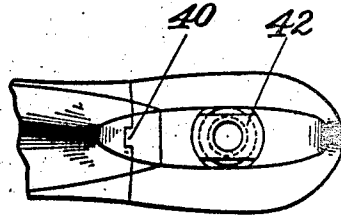


Fig. 10.

WITNESSES.
Bernard Barrows
Allen H. Barrows.

INVENTOR.
Ralph C. Simmons.

UNITED STATES PATENT OFFICE.

RALPH C. SIMMONS, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LAST.

1,059,081.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed September 8, 1908. Serial No. 452,052.

To all whom it may concern:

Be it known that I, RALPH C. SIMMONS, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Lasts, 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 lasts.

The life of a wooden last is frequently much abbreviated by injury to its heel portion occurring during the sole leveling operation or the heel attaching operation. In each of these operations there is liability of the wood of the last adjacent to the cone being crushed by the great stress which it must resist. It is frequently found that a last after being used but little has become so battered at the cone that it is unfit for use.

The primary object of the present invention is to provide a last which shall not be liable to such rapid deterioration as occurs with lasts now in use.

An important feature of the present invention consists in a last so constructed that the fiber of wood at the heel is approximately normal to the surface which constitutes the cone of the last. It is well-known that wood offers much greater resistance to compression in a direction along the grain than in a plane at right angles thereto. In a last embodying this feature, a part or all of the pressure applied to the cone of the last in the direction of the height of the last is transmitted through the heel portion along the fiber of the wood. The heel portion of the last is thus rendered capable of resisting great pressure or heavy blows in the direction of its height without being crushed or materially bruised.

In the preferred embodiment of the invention the heel portion of the last is formed of a single integral block of wood so arranged that its fiber extends approximately in the direction of the height of the last. The forepart of the last is preferably so formed that its fiber extends longitudinally thereof. The stresses to which this part of the last is subjected in the manufacture of boots and shoes are resisted more effectively when the fiber extends longitudinally than

would be the case if it extended in the direction of the height of the last.

In producing a last embodying the present invention, the blocks which are to constitute the forepart and the heel part of the last are secured together before the foot-shape contour of these parts is formed. The last block thus produced is turned to the desired foot-shape contour in a last turning lathe. This method of producing the last forming the subject of this application is not claimed herein, but is covered by another application filed contemporaneously herewith.

An important feature of the invention consists in the provision of means for reinforcing a heel part of the nature referred to against stresses which may have a tendency to cause fracture of such a heel part. For example, one of the embodiments of the invention herein shown is provided with means for reinforcing the heel part against shearing stress along the fiber of the wood. This may conveniently be effected by inserting a reinforcing member in the heel part extending longitudinally therethrough. I have also shown herein a last equipped with means for reinforcing the heel part against longitudinal tension. Such tension is particularly liable to occur in the heel attaching operation wherein it is frequently desired to apply greater pressure at the breast of the heel than at rear.

Other features of the invention will be hereinafter described and defined in the claims.

In the drawings:—Figure 1 is a view in perspective of a block last embodying the present invention; Fig. 2 is a fragmentary plan view of the last shown in Fig. 1; Fig. 3 is a view in perspective of a block last constituting another embodiment of the invention; Fig. 4 is a fragmentary plan view of the last shown in Fig. 3; Fig. 5 is a view in side elevation, partly in section, of a block last constituting still another embodiment of the invention; Fig. 6 is a fragmentary plan view, partly in section, of the last shown in Fig. 5; Fig. 7 is a view in side elevation of a hinged last embodying the invention; Fig. 8 is a view in side elevation of a block last embodying further features of the invention; Fig. 9 is a transverse sectional view on the line 9—9 of Fig. 8; Fig. 10 is a top plan

view of the rear portion of the last shown in Fig. 8.

Referring to the drawings and more particularly to Figs. 1 and 2, the block last shown in these figures comprises a heel part 2 in which the fiber of the wood extends approximately in the direction of the height of the last and a forepart 4 provided with a removable instep block 6. The forepart and instep block are formed from a single, integral block of wood, and the fiber of the wood in these parts extends approximately in the direction of the length of the last. The heel part 2 is formed from a single, integral block of wood and the forepart and heel part are connected by a mortise and tenon joint, their meeting surfaces being preferably glued. The connection between these parts is made before the foot contour of the last is formed and before the block 6 is severed from the forepart. As will appear from Fig. 2, the tenons upon the heel part are of greater width than those upon the forepart. This is of advantage in producing a stronger joint than would be secured if the tenons were of the same width, as will be apparent from a consideration of the fact that the grain of the wood in the heel part extends vertically. It will also be seen from Fig. 1 that the line of junction of forepart and heel part is inclined from the cone of the last toward the toe. This is also of advantage in producing a stronger joint than would be the case if the line of junction extended vertically.

The last shown in Figs. 1 and 2 is provided with the usual heel plate 8 and also with a tubular bushing 10 inserted in a vertical bore in the heel part to provide a spindle socket. The upper end of the bushing 10 lies slightly below the surface constituting the cone of the last, as will appear from Fig. 1. This insures that pressure applied to the cone of the last will not tend to force the bushing toward the bottom of the last and thus tend to split the heel part.

In the last shown in Figs. 3 and 4 the meeting surfaces of forepart and heel part are plane. These surfaces are glued together and are also held in fixed relation by a screw 12 passing through the forepart into the heel part, and one or more dowel pins 14, which may conveniently be of wood. The screw 12 and dowel pins 14 are inserted in the last after the block 6 has been severed from the last. The last shown in these figures is provided with a tubular bushing 16 having formed integrally therewith a top plate 18. The top plate 18 rests upon the cone of the last, this part of the last being preferably so cut away that the upper face of the top plate is flush with the upper surface of the last. The top plate 18 is provided at each end with a depending flange 20 inserted in grooves formed in the last.

The flanges 20 are preferably curved longitudinally, as is shown in Fig. 4. This curvature is of advantage in reinforcing the wood of the last about the spindle socket against tension produced laterally of the last. The grooves in which are received the flanges 20 are made of such depth that there will be no liability of the flanges having contact with the bottom of the grooves. This insures that pressure applied to the top plate will not split the last in the vicinity of the flanges. The bushing 16 may be secured in the last if desired by a pin 22 passing transversely through the heel part of the last and the bushing.

In the last shown in Figs. 5 and 6 there is provided a tubular bushing 24 provided upon opposite sides intermediate its ends with bosses 26. The bosses 26 are tapped to receive screws 28 and 30. The screw 28 is inserted from the rear of the last, and the screw 30 passes through the forepart and forward portion of the heel part. It will be observed that the screw 30 is so arranged that it has the function of holding the forepart and heel part together and in this respect it takes the place of the screw 12 of the last shown in Figs. 3 and 4. The space between the upper portion of the bushing 24 and the wall of the bore in which it is received is filled by an annular filling piece 32 of wood, and the head of the screw 28 is covered by a wooden block 34. The wooden block 34 insures that the head of the screw 28 will not prevent tacks from being driven in the rear end of the last at any point desired. The upper end of the tubular bushing 24 preferably lies below the cone of the last. It will be seen that by means of the bushing 24 and the screws 28 and 30 the heel part of the last may be reinforced against tension produced therein longitudinally of the last.

In Fig. 7 is illustrated one way of embodying features of the present invention in a hinged last. In making this last the foot-shape contour is turned after the sections have been united, as in the manner indicated in connection with the preceding embodiments of the invention. After the formation of the foot-shape contour, the last is divided at the shank in the manner customary in making hinged lasts, and the heel section and forepart section are formed to receive the members of the hinge 36. I have shown pins 38 extending vertically through the hinge members in order to secure them firmly in the last sections.

In the last shown in Figs. 8, 9 and 10, the heel section is provided with a vertical tenon 40 and the forepart section with a groove to fit the tenon. The heel part is provided with a combined spindle socket and top plate 42 of the general form illustrated in Figs. 3 and 4. A pin 44 passes transversely through

the heel section and the spindle socket 42. As will appear from Fig. 9, the apertures in the spindle socket are of such a height as to permit the spindle socket to be forced downwardly a short distance without coming into engagement with the pin 44. This feature may be found desirable in order to prevent fracture of the heel section by downward pressure exerted upon the pin 44. The last shown in these figures is also provided with a longitudinal wooden pin 46. The pin 46 is embedded in the last adjacent to the sole and extends from the extreme rear of the heel section through the surface of union of the two sections of the last into the forepart section. To receive this pin a hole is bored into the last from its rear end after the foot-shape contour is formed. The pin is then covered with glue and driven into place. It will be seen that this pin not only serves to reinforce the heel section against shearing stress along the fiber of the wood, but also holds firmly together the forepart section and heel section.

It will be observed that in the last shown in Figs. 8, 9 and 10 the surface of union of forepart and heel part passes through the upper end of the instep block. The groove and tenon connection between the parts is, as will be obvious, of advantage in insuring a firm connection between the two parts of the instep block.

It will be understood that the weakest portion of the heel part in the several embodiments of the invention illustrated is at its middle portion where the necessity of providing a vertical bore to receive the spindle socket occasions some weakness. The top plate shown in Figs. 3 and 4 and 8, 9 and 10 is of particular advantage in reinforcing the wood in the vicinity of the spindle socket, inasmuch as it resists tension exerted longitudinally of the heel part adjacent to the cone and on account of the curved form of its flanges also holds the wood together in a direction transverse to the heel part. It will also be seen that with the construction shown in Figs. 5 and 6 the heel part is reinforced against longitudinal tension.

The pin 46 inserted longitudinally in the heel part is particularly desirable in the heel attaching operation. In this operation the last is frequently so supported that it rests at the extreme rear of the cone upon the last supporting surface. Under these circumstances pressure applied to the sole of the last is more or less liable to shear the wood of the heel part along the fiber. The pin 46 effectually prevents this occurrence.

It will be understood that the several lasts herein shown and described are illustrative of different ways in which the invention may be embodied.

As will be obvious modifications in the lasts shown may be made without departing from the present invention, the scope of which will be defined in the appended claims.

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

1. A last constructed substantially throughout of wood and having the fiber of the wood throughout the heel portion extending approximately in the direction of the height of the last and the fiber throughout the remaining portion extending longitudinally of the last.

2. A last constructed substantially throughout of wood and having the fiber of the wood throughout its heel portion extending approximately in the direction of the height of the last and having means for reinforcing the heel part against shearing stress along said fiber.

3. A last constructed substantially throughout of wood and having the fiber of the wood throughout its heel portion extending approximately in the direction of the height of the last and having means for reinforcing the heel part against tension across the fiber.

4. A last having its heel portion formed with the fiber of the wood extending approximately in the direction of its height and having a member embedded longitudinally in said heel portion adjacent the sole of the last for reinforcing the heel portion against shearing stress along the fiber of the wood.

5. A wooden last comprising a forepart section and a heel section united at the shank portion, the heel section being arranged with the fiber of the wood extending approximately in the direction of the height of the last and a reinforcing member embedded longitudinally in the last and extending from the extreme rear of the last through the surface of union of the sections into the forepart section.

6. A last comprising a plurality of longitudinally successive wooden sections, the fiber of the wood throughout the heel section extending approximately in the direction of the height of the last and the fiber throughout the forepart section extending longitudinally of the last, said sections having abutting surfaces extending from side to side of the last and being permanently and rigidly secured together.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RALPH C. SIMMONS.

Witnesses:

BERNARD BARROWS,
ALLAN H. BARROWS.