

Sept. 17, 1957

A. R. HUBBARD ET AL

2,806,233

LASTS

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Fig. 1

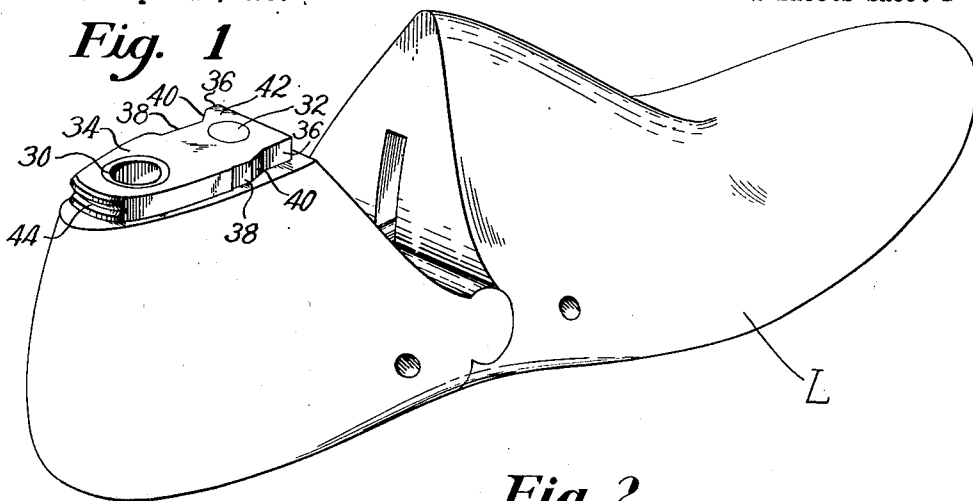


Fig. 2

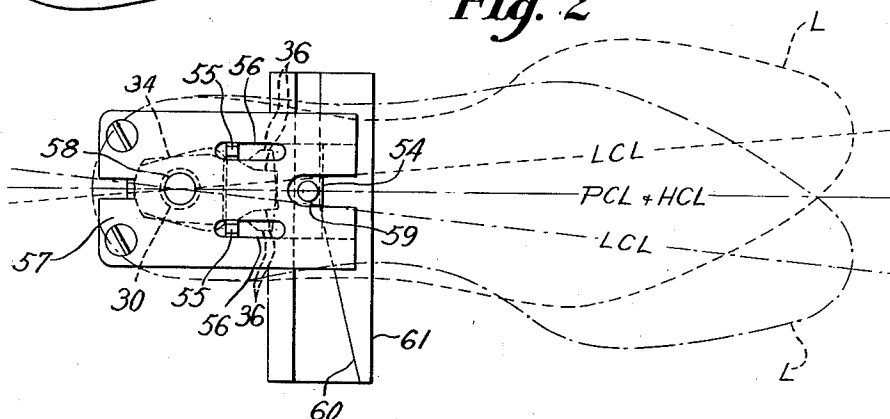
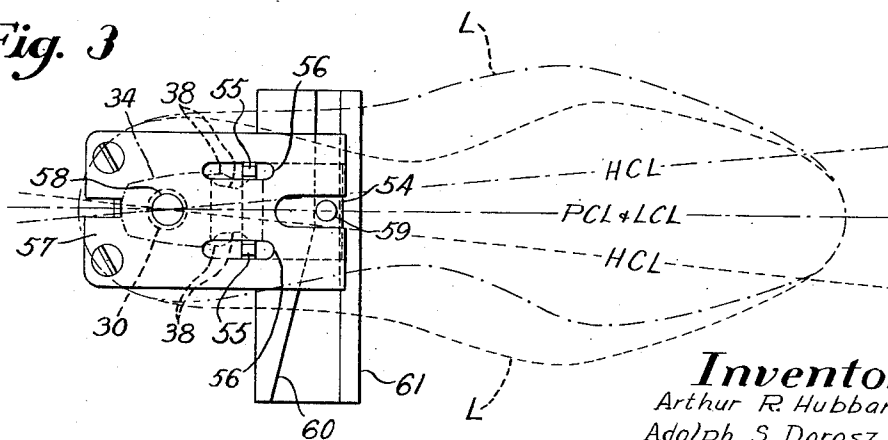


Fig. 3




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Fig. 4

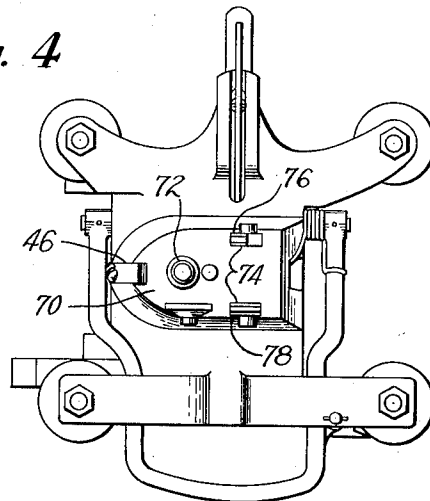


Fig. 5

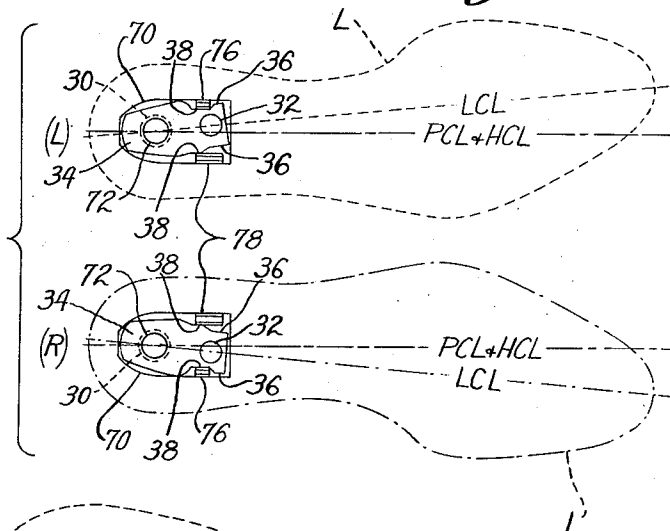
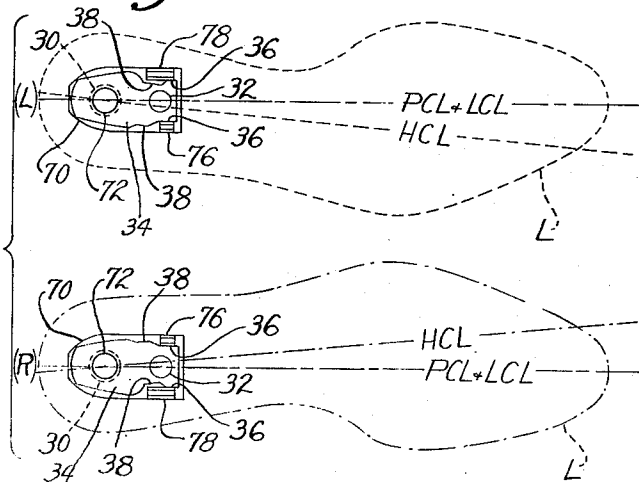


Fig. 6



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Application September 26, 1955, Serial No. 536,444

21 Claims. (Cl. 12—133)

This invention relates to lasts, and is illustrated herein as embodied in an improved last suitable for use in the automatic manufacture of shoes.

Prior to the development of automatic shoemaking machines the positioning of the shoe relatively to the operating tools of a machine has been a most important function of the operator, upon whose skill and attention the accuracy of the operation depends to a considerable extent. It is evident that the labor saving advantages of an automatic machine will be of no avail unless the work is accurately positioned in the machine without requiring an operator's attention.

Certain machines have, in the past, been provided with jacks or supports for a last which are movable in a predetermined path to present a shoe on a last to the operating tools of the machine. However, insufficient consideration has been given to the positioning of the last relatively to the jack or support to insure that the relation between the shoe and the machine, when the operation is carried out, is established and maintained as accurately as is desirable if the machine is to be unattended. Moreover, it is necessary that both right and left lasts be positioned on the jack or support in the same position for one type of operation such, for example, as a heel part operation, and if the shoes are to be subjected to an operation upon another part thereof, such as the forepart or toe end, then the lasts must be positioned in a different relation to the jack or support.

It is contemplated that lasts carrying shoes to be operated upon be presented to an automatic machine on pallets which are moved in a predetermined path into operative relation to the machine, as in the instance disclosed in United States application of A. S. Dorosz, Serial No. 607,363 filed on August 31, 1956.

In view of the foregoing, it is one object of the invention to provide an improved last characterized by the fact that it has positioning means in the form of indicia or surfaces thereon suitable for cooperating with a pallet, such as that disclosed in the above-mentioned Dorosz application, for positioning lasts, whether rights or lefts, in either of two predetermined relations to the pallet.

Another object of the invention is to provide an improved last having positioning indicia or surfaces thereon suitable for cooperating, in a similar manner, with a pallet of the type disclosed in detail in United States application Serial No. 536,443 of A. S. Dorosz, filed on September 26, 1955. In the latter instance, each pallet is adapted to hold either a right last or a left last, but not both, and the construction and arrangement of the positioning indicia or surfaces on the lasts embodying the invention is such as not only to cause the lasts, when assembled upon the pallets, to be positioned thereon properly in either one of two relations, but also to prevent the complete assembly of mismatching lasts and pallets if it is attempted to assemble either a right or left last upon a pallet of the other hand.

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The above and other objects of the invention are fulfilled by the illustrative last disclosed herein, the various novel features of which will appear from the following detailed description and will be set forth in the appended claims.

In the drawings,

Fig. 1 is a perspective view of a last embodying the invention;

Figs. 2 and 3 are diagrammatical views illustrating the positioning of a last (bottom up) of the type shown in Fig. 1, by one form of positioning means on a pallet for holding this type of last;

Fig. 4 is a plan view of another form of pallet embodying a second form of means for positioning a last of the type shown in Fig. 1 upon the pallet; and

Figs. 5 and 6 are diagrammatical views illustrating the positioning of the illustrated last (bottom up) upon the pallet of Fig. 4.

The illustrative last L (Fig. 1) has fixed upon the top of its heel part, by means of the usual thimble or socket 30 and a pin 32, a positioning plate 34 having formed thereupon at its forward end a set of two positioning surfaces 36 which are symmetrically placed with respect to the center line LCL (Fig. 2) of the last which passes through the extremities of the last and the axis of the socket 30, and corresponds, approximately, to the turning axis of the last.

The surfaces 36 are vertical and constitute shoulders which are equally spaced laterally of the last at each side of the center line LCL and also are parallel to this center line.

The positioning plate is also provided with a second set or pair of positioning surfaces 38 which are spaced from each other laterally of the last the same as the surfaces 36 but are offset, laterally of the last, with respect to the surfaces 36. Although the surfaces 38 are unsymmetrically related to (that is, unequally spaced from) the center line LCL, they are, however symmetrically related to, and equally spaced from, the center line HCL of the bottom of the heel part; and the angle by which the two sets of the positioning surfaces 36, 38 are offset laterally from each other corresponds to the angle of swing between the forepart and heel part of the last.

Inclined to and connecting the positioning surfaces 36, 38 at both sides of the plates are surfaces or shoulders 40 which are substantially parallel to each other and are slightly staggered lengthwise of the plate.

This arrangement of positioning surfaces 36, 38 and inclined shoulders 40 results in a positioning plate having an asymmetrical profile as viewed in plan, there being a lobe 42 at one side of the plate at its forward end upon which one of the positioning surfaces 36 is formed, this surface being shorter than the opposite surface 36. The positioning surface 38 at the side of the plate having the lobe 42 is longer than the opposite surface 38 on the same side of the plate with the longer surface 36.

It is to be understood that right and left lasts carry identical positioning plates, as described above, the plates being assembled, either one side or the other up, upon the lasts and, for distinguishing between right and left lasts, it is noted that the above-mentioned lobe 42 is always at the inside of the last as viewed from above.

The rear end of the plate has formed therein a notch 44 suitable for receiving a member, such as a spring clip 46 on the pallet shown in Fig. 4, for holding the last assembled upon the pallet.

The positioning of the illustrated last for either a heel part or forepart operation will next be described with reference to the structure disclosed in the first-mentioned Dorosz application. In this instance, a pallet is provided with a slide 54 (Figs. 2 and 3) having a pair of fingers 55

which project upwardly through elongated slots 56 formed in a plate 57 from which there projects upwardly a last pin 58 adapted to be received in the thimble or socket 30 of the illustrated last. The fingers 55 are spaced so as to receive between them either set of positioning surfaces 36, 38 and are moved into operative relation to one set of positioning surfaces when a pin 59, which is fixed to the slide 54, is moved into a restricted portion of a cam groove 60 formed in a fixed cam 61. As is described in the first-mentioned Dorosz application, the cam groove 60 has the shape shown in Fig. 2 for an operating station where a heel part operation is to be performed. In this case, as the pallet is moved to carry the pin 59 into the throat or restricted portion of the cam groove 60, the fingers 55 are positioned in cooperative relation with the set of positioning surfaces 38. Accordingly, the heel part center lines HCL of both right and left lasts, being coincident with each other and with the center line PCL of the pallet, are disposed in the same relation with respect to the pallet as well as to a machine to which the pallet is presented.

If the shoemaking operation involved is to be performed upon the forepart the cam 61, associated with such an operating station, has a cam groove 60 of the type illustrated in Fig. 3 and, upon movement of the pin 59 into the throat of the cam groove, the fingers 55 will be moved into cooperative relation to the set of positioning surfaces 36 whereby, as illustrated in Fig. 3, the center lines LCL of both right and left lasts are brought into coincidence with each other and the center line PCL of the pallet. Accordingly, the toe ends of the lasts have the same relation to the pallet, as well as to a machine to which the pallet is presented.

When the fingers 55 are moved from one set of positioning surfaces to the other, they cooperate with the inclined shoulders 40 to swing the last from one side to the other according to the offset relation of the two sets of positioning surfaces 36, 38, the inclined shoulders 40 being substantially parallel to each other and staggered lengthwise of the plate so as to receive the fingers 55 with a free sliding fit throughout their movement.

In another application of the illustrated last and positioning plate to the positioning of the last for either a heel part or forepart operation, disclosed in the above-mentioned Dorosz application Serial No. 536,443, a pallet 70 (Fig. 4) is provided with a last pin 72 adapted to be received in the thimble 30 of the illustrated last and has formed in its sides, equally spaced from the pin 72 and from the center line PCL of the pallet at each side thereof, recesses 74 in which are mounted lugs 76, 78. The lower portions of the lugs, which fit closely within the recesses 74, have the same length and form as the recesses do so that the lugs are interchangeable in the recesses. Both lugs protrude above the upper surface of the pallet so as to overlap the edges of the positioning plate 34 of a last fully seated upon the pallet and the upper part of the lug 76, which projects above the upper surface of the pallet, is only one-half as long as the lug 78.

With the lugs 76, 78 installed upon the pallet 70 in the arrangement illustrated in Figs. 4 and 5-L, the pallet is made a left pallet for positioning a left last suitably for the performance of a heel part operation, the lugs 76, 78 now being arranged to cooperate with the positioning surfaces 38 which are symmetrical with respect to the heel part center line HCL on the last. If the lugs are inverted, from side to side on the pallet, into the arrangement illustrated in Fig. 5-R, the pallet is made a right pallet and, because of the manner in which the lugs cooperate with the positioning surfaces 38, a right last will be positioned upon the right pallet with its heel part center line coincident with the pallet center line.

If, starting with the arrangement of lugs 76, 78 shown in Fig. 5-R, the lug 76 is inverted so that its operative portion is forward (Fig. 6-L), opposite to a positioning surface 36 on the positioning plate of a last fully seated

upon the pallet, the pallet is made a left pallet and positions a left last with its center line LCL in alignment with the center line PCL of the pallet. With an inversion of the lugs 76, 78 shown in Fig. 6-L, from side to side on the pallet, the pallet is made into a right pallet (Fig. 6-R) which receives a right last with its center line LCL coincident with the center line PCL of the pallet.

The above-mentioned arrangements of the lugs 76, 78 make the pallets either right or left pallets for, as explained in the last mentioned Dorosz application, the complete assembling of a nonmatching last with a pallet is prevented by interference between the positioning plate on the last and the lugs.

While the usefulness of positioning means, as disclosed herein, is not limited to any particular kind of last, their value is most fully realized when they are used upon a geometrically graded last as disclosed in United States Letters Patent No. 1,948,547, granted on an application of L. E. Topham. Because of the accuracy with which such lasts are made, various relations between different parts of the lasts can be as accurately represented by positioning surfaces on the lasts; and the use of the sets of positioning surfaces 36, 38 on the illustrated positioning plate 34 in their laterally offset relation conforming to the angle of swing between the forepart and heel part is to be regarded as illustrative of the invention rather than a limitation thereof.

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

1. A last having a socket and sets of positioning shoulders formed upon its heel part, said sets being offset from each other one at each side of said socket, the shoulders of one set being positioned in a predetermined relation to the forepart of the last and the shoulders of another set being positioned in a predetermined relation to its heel part.

2. A last having two sets of positioning means formed upon its heel part, portions of each set of positioning means being spaced laterally of the last identically with the spacing of corresponding portions of the other set, said sets of means being angularly spaced from each other in accordance with the angle of swing of the last.

3. A last having sets of positioning shoulders formed upon its heel part, the shoulders of one set being arranged to extend lengthwise of the last and being disposed in a predetermined relation to a portion of the forepart of the last and the shoulders of another set being arranged at an angle to said first-mentioned shoulders and in a predetermined relation with respect to a portion of the heel part of the last.

4. A last having a positioning plate upon which are formed two sets of positioning surfaces, said sets being offset from each other laterally of the last, said plate being rigidly fixed to the top of the heel part of the last with one set of said surfaces in a predetermined relation to the heel part of the last and with the other set of surfaces in a predetermined relation with respect to the forepart of the last.

5. A last having two sets of positioning shoulders formed upon its heel part, the shoulders of one set being equally spaced from and at opposite sides of the center line of the last, and the shoulders of the other set being equally spaced from and at opposite sides of the center line of the heel part.

6. A last having a positioning plate upon which are formed two sets of positioning surfaces, said sets being offset from each other laterally of the last by the angle between its center line and the center line of the heel part, said plate being fixed to the top of the heel part of the last with the positioning surfaces of each of said sets disposed symmetrically with respect to the corresponding center line.

7. A last having sets of positioning shoulders formed upon its heel part lengthwise thereof, the shoulders of one

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set being parallel and symmetrical with respect to the center line of the last, and the shoulders of another set being parallel and symmetrical with respect to the center line of the heel part.

8. A last having a socket the axis of which is intersected by the center lines of the last and its heel part and sets of positioning shoulders formed upon its heel part spaced from said socket, the shoulders of one set being symmetrically disposed with respect to the center line of the last, and the shoulders of another set being symmetrically disposed with respect to the center line of the heel part of the last.

9. A last having two sets of positioning shoulders upon its heel part, the shoulders of each set being spaced laterally of the last identically with the spacing of the shoulders of the other set, said sets of shoulders being spaced from each other laterally of the last by the angle between its center line and the center line of the heel part.

10. A last having formed in its heel part a socket and a pair of positioning surfaces spaced from each other laterally of the last and arranged symmetrically with respect to an axis extending longitudinally of the last between said surfaces and through the axis of said socket another portion of the heel part having a second pair of positioning surfaces formed therein asymmetrically with respect to said axis.

11. A last having fixed upon its heel part a positioning plate upon the opposite sides of one portion of which are formed positioning surfaces, the sides of another portion of the plate having the same spacing as that of said surfaces but being unequally spaced from a center line between said surfaces.

12. A last having fixed upon its heel part a positioning plate having a socket and a set of positioning surfaces, formed upon one portion of the plate, said surfaces being equidistant from a center line extending between them through the axis of said socket, another portion of said plate being wider at one side of said center line than at the opposite side thereof.

13. A last having a socket and opposed positioning surfaces formed upon the outer sides of one portion of the heel part, the outer sides of another portion of the heel part having positioning surfaces formed thereon which are unequally spaced outwardly from a center line extending midway between said first-mentioned positioning surfaces through the axis of said socket.

14. A last having fixed upon its heel part a positioning plate having a positioning surface formed upon one side thereof, said plate having formed upon its other side directly opposite and parallel to said positioning surface a second positioning surface, said plate having at its said other side a lobe extending outwardly beyond said second positioning surface.

15. A last having a positioning plate upon its heel part, said plate comprising a positioning surface at one

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side thereof from which the edge of the plate flares outwardly thereof, said plate having formed upon its opposite side directly opposite to said first-mentioned positioning surface another positioning surface from which the edge of the plate is recessed inwardly thereof, the width of the plate between its recessed and flared edges being equal to its width between said positioning surfaces.

16. A last having two sets of positioning surfaces upon its heel part, each of said sets being offset with respect to the other both laterally and longitudinally of the last, the positioning surfaces at each side of the last being connected by a surface which is inclined to said positioning surfaces.

17. A last having two sets of positioning surfaces upon its heel part, the spacing of the surfaces of both sets laterally of the last being the same, and a set of inclined surfaces disposed between and connecting said sets of positioning surfaces.

18. A last having a set of positioning surfaces of unequal lengths upon its heel part, a second set of positioning surfaces offset laterally of the last from said first-mentioned set, and a set of inclined surfaces connecting said sets of positioning surfaces.

19. A last having a positioning plate fixed upon the top of its heel part, said plate having a pair of opposed positioning shoulders of different lengths extending longitudinally of the last and disposed laterally thereof in predetermined relation to the turning axis of the last, said plate having a second set of positioning shoulders which is offset laterally of the last from said first-mentioned set and is disposed in a predetermined relation to the axis of the heel part of the last, said plate having another set of shoulders inclined to and connecting said sets of positioning shoulders.

20. A last having opposed positioning surfaces on its heel part extending lengthwise thereof and terminating at different distances from the heel end of the last, a second set of positioning surfaces offset laterally of the last from said first-mentioned set, and another set of surfaces inclined to and connecting said sets of positioning surfaces.

21. For use with a series of lasts including right and left lasts in pairs, positioning plates each having an asymmetric contour one part of which is related to the heel part of the last and another part of which is related to the forepart of the last, the plates being identical, fixed upon the heel parts of right lasts one side up, fixed upon the left lasts the other side up, and with the relation between the right last and its positioning plate geometrically similar to that between the left last and its positioning plate.

References Cited in the file of this patent

UNITED STATES PATENTS

810,594 Wright Jan. 23, 1906