April 10, 1945. A. L. RUSSELL 2,373,264

METHODS OF LASTING SHOES

Filed Oct. 16, 1942 2 Sheets-Sheet 1

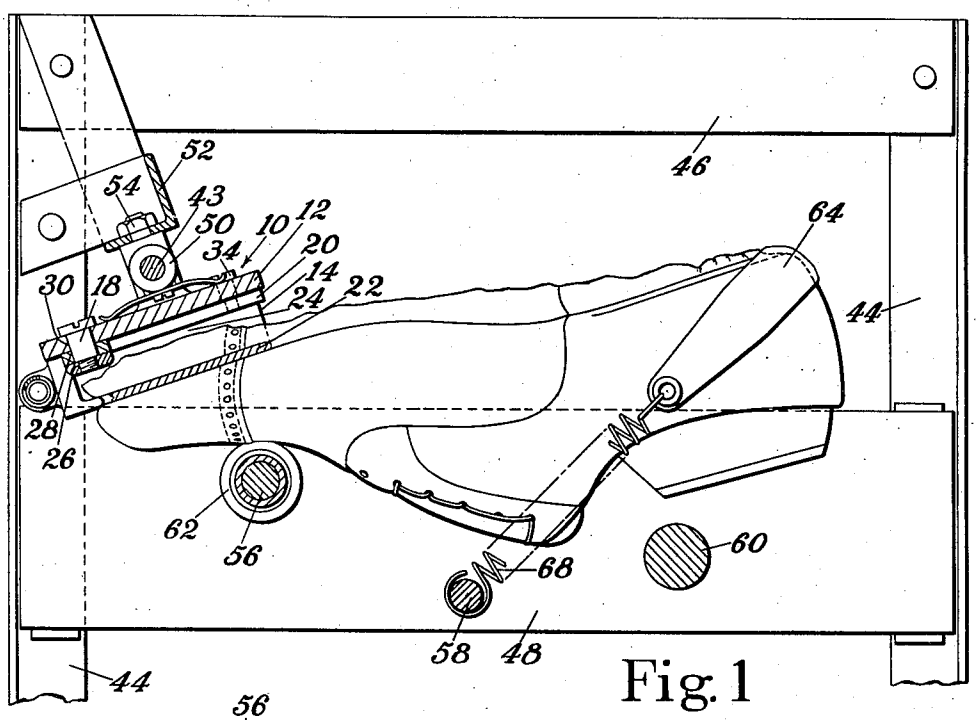


Fig. 1

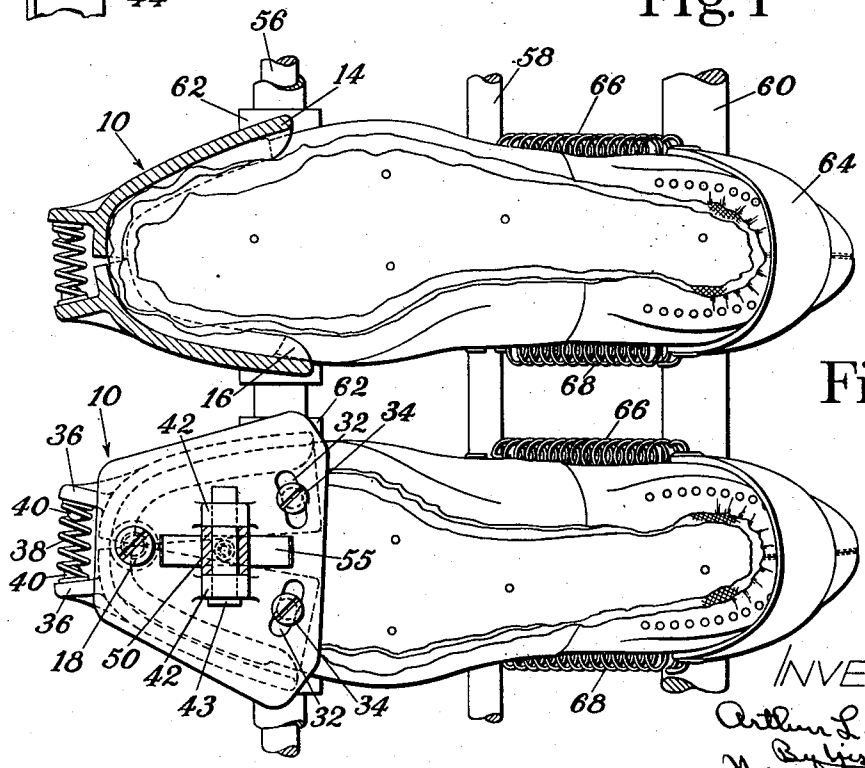


Fig. 2

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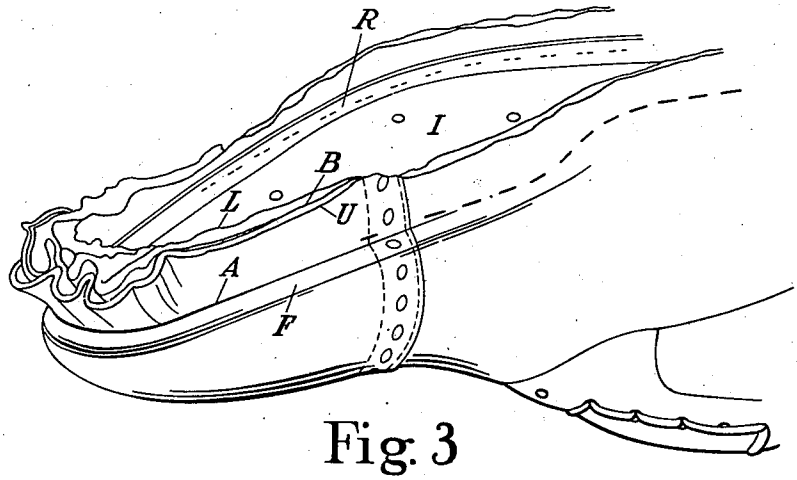


Fig. 3

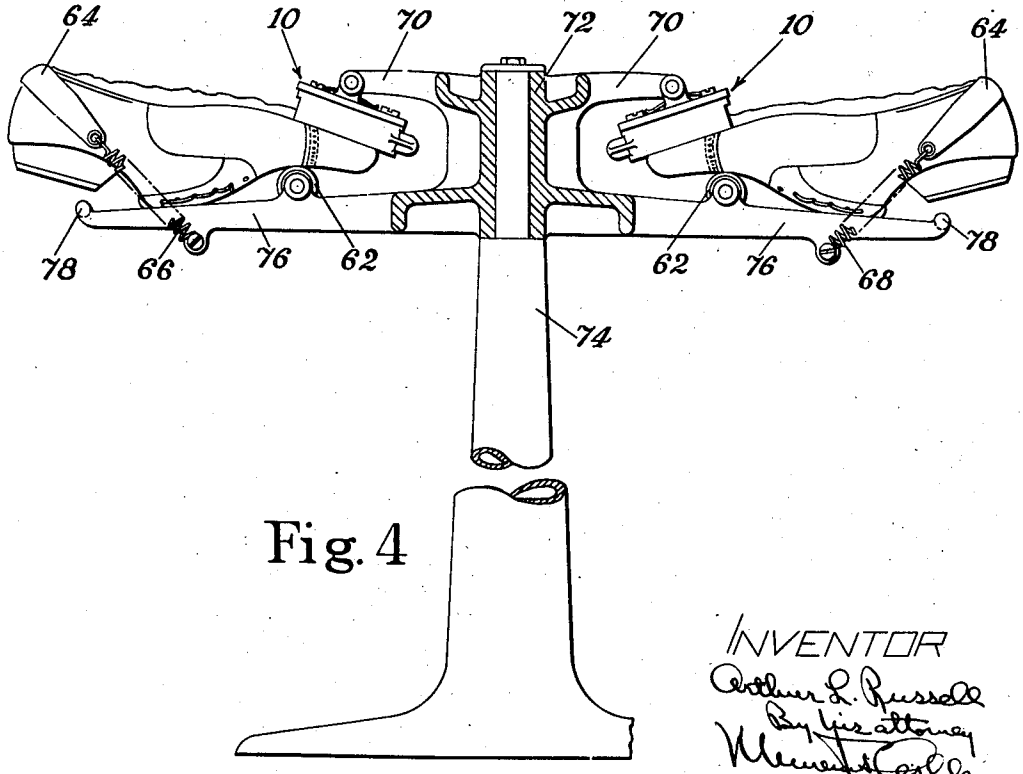


Fig. 4

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METHOD OF LASTING SHOES

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Application October 16, 1942, Serial No. 462,256

10 Claims. (Cl. 12—145)

This invention relates to the manufacture of welt shoes, and more particularly to improvements in methods for lasting the toe ends of such shoes.

In accordance with the usual shoemaking practice, the toe-lasting operation is performed in a bed-lasting machine having end-embracing wipers, by means of which the upper materials at the toe end of the shoe are shaped about the last and worked over the bottom of the last and into engagement with the feather and rib of an insole secured thereto. After this has been done, the wipers are retracted somewhat, and the operator applies a binding wire for holding the upper materials in lasted position, until they become permanently held in place by the inseam stitches which secure the welt to the insole. This operation of applying the binding wire to the toe end of welt shoes takes up a considerable amount of time, during which the lasting machine is necessarily idle, and not available for use to last another shoe. Also, the use of such a binding involves a further expenditure of time and labor in the removal thereof before the shoe is presented to the inseam machine, or, if the binding wire, together with its anchoring tacks, is left on the shoe during the inseaming operation, as is sometimes done, the danger of needle breakage is greatly increased.

Accordingly, it is a primary object of this invention to provide a novel method of lasting the toe ends of welt shoes by means of which the use of a binding wire is avoided and the bed laster immediately made available for the lasting of another shoe at the completion of each bed-lasting operation. To this end, and in accordance with my novel method, the shoe is removed from the influence of the lasting instrumentalities, as for example, the wipers of a bed-lasting machine, after the upper materials at the toe end have been brought into lasted position, upon the feather and against the rib of the insole, but while still in unfastened condition, and the upper materials immediately subjected to clamping pressure for holding them in lasted position until they become wholly set. Conveniently, this clamping pressure is applied by means of the herein illustrated auxiliary pressing apparatus which comprises an abutment having surfaces, shaped somewhat like wipers, for engaging the overlasted upper at the toe end of the shoe, where it lies on the feather and against the rib of the insole, to apply clamping pressure thereto and a support for the top of the shoe, so arranged with respect to the abutment as to form a fulcrum about which the shoe and its last may be swung, by its own weight, or some equivalent force, to press the toe end of the shoe bottom against the abutment surfaces. To facilitate use, this auxiliary pressing apparatus may be located adjacent to the bed laster, so that each lasted shoe can readily be transferred thereto from the bed lasting machine, and preferably this apparatus is provided with a plurality of such abutments and shoe supports for accommodating several shoes at the same time, thus making it possible to maintain each shoe under clamping pressure for a longer period. In order to augment the effect of the weight of the shoe and its last to press the toe end of the shoe bottom against the pressure abutment, resilient means may be provided in the apparatus, these means being arranged to exert a downwardly and forwardly directed force on the heel end of a shoe therein.

The above and other objects and features of the invention will be more readily understood from the following detailed description of my novel method and of an auxiliary pressing apparatus used in connection therewith, when considered in connection with the accompanying drawings, and will be pointed out in the appended claims.

In the drawing,

Fig. 1 is a view in side elevation, with some parts in section, of an auxiliary pressing apparatus embodying features of this invention;

Fig. 2 is a plan view of a portion of the apparatus shown in Fig. 1;

Fig. 3 is a perspective view of the toe end of a welt shoe; and

Fig. 4 is a view in side elevation of an auxiliary pressing apparatus, similar to that shown in Fig. 1 but mounted on an alternative type of supporting structure.

In practicing my novel method, the shoe is prepared for the bed lasting operation in the usual manner, the pulling-over tacks being first removed, and the upper materials at the toe end then subjected to the action of heat and vapor to make them readily workable in the bed lasting machine. This heat and vapor treatment also softens the toe box, so that it can be shaped readily about the toe end of the last and easily worked in over the feather of the insole and against the insole rib with the upper materials. If the box material has adhesive qualities these will be enhanced by this treatment so that the upper and lining will stick thereto and also to

the rib after cooling and drying. Usually the shoe will be side lasted before it is toe lasted, in which case the toe end of the shoe will be in the condition illustrated in Fig. 3 at the conclusion of the bed lasting operation.

In this figure, the upper materials, comprising the upper stock U, toe box B, and lining L, have been shaped about the toe end of the last by means of the toe wipers of the bed lasting machine, and have also been worked in over the shoe bottom so as to lie flatly upon the feather F of the insole I and to fit snugly into the angle A between the feather and rib R. At this stage in the lasting operation, the usual practice would be to retract the toe wipers a short distance away from the rib and to apply the binding wire for holding the upper materials in lasted position. However, in accordance with my novel method, instead of doing this, the wipers are fully withdrawn and the shoe is immediately transferred from the bed laster to an auxiliary pressing apparatus in which the upper materials are subjected to clamping pressure for holding the upper materials in the position shown in Fig. 3, until they have cooled and dried so as to become fully set in place. I have found, under ordinary conditions and with usual upper materials, that, after the clamping pressure has been maintained for a period of about three minutes, the upper materials have cooled and dried sufficiently so that there is no longer any tendency for them to pull away from the insole rib, or to loosen up about the toe end of the last.

While this clamping pressure may be applied in any convenient way, and could in fact be obtained by leaving the shoe in the bed laster if the length of time necessary for setting the upper materials was not prohibitive, it may be applied most conveniently by means of apparatus of the type shown in Figs. 1, 2 and 4 of the drawings. In these views, the reference character 10 designates generally an abutment, against which the toe end of the shoe is pressed. This abutment comprises a block 12 on which there are mounted a pair of articulated members 14 and 16, that are secured to each other and to the block by means of a stud 18. These articulated members are channel-like in cross section, each having upper and lower flanges 20 and 22 connected by a web 24, the upper flanges being of considerably greater width than are the lower flanges. Near the stud 18 the upper flange of one member is brought down below the corresponding flange of the other member, and is threaded at 26 to receive the stud which passes up through a bore 28 in the other flange and also through a bore 30 in one end of the block 12. Adjacent to the opposite end of the block there are two arcuate slots 32, through which studs 34, threaded into the upper flanges 20 of the articulated members, extend. At their forward ends each of these members is provided with an ear 36 and between these ears is positioned a compression spring 38, held in place by means of projections 40 thereon. This spring tends at all times to urge the articulated members to a closed position.

For mounting the abutment on a supporting structure, the block 12 has two ears 42 provided with bores through which a pivot pin 43 extends. In Figs. 1 and 2, the supporting structure for a plurality of these abutments is a frame having uprights 44, and cross members 46 and 48. The abutments are mounted on trunnion blocks 50, through which the pins 43 pass, that are secured to a longitudinal member 52 by means of nuts 54. A leaf spring 55, secured to the trunnion block, bears on the upper surface of each abutment to keep it in the position shown, while permitting a slight degree of swinging movement of the abutment for leveling on the bottom of a shoe.

Supported by the cross members 48, below the abutment, are three rods 56, 58 and 60. On the first-mentioned of these rods, there are rotatably mounted a plurality of rolls 62, which are spaced lengthwise along the rod, one beneath each abutment. This rod is offset rearwardly from the effective center of pressure of the downwardly facing bottom surface of the lower flanges 22 of the articulated members associated with each abutment. As can be seen in Fig. 1, these rolls engage the top side of the toe end of a shoe just back of the tip line, when the shoe is presented to the apparatus with its overlasted upper materials at the toe end held against the flanges 22. In this position the major part of the shoe and its last overhang in back of the supporting roll 62, so that the weight of the shoe and its last is effective to swing the shoe about the roll, as a fulcrum, to press the toe end of the bottom of the shoe against the abutment with considerable force. This causes the upper to be pressed very firmly down onto the feather F of the insole. Also, when the shoe was placed in the apparatus, the articulated members were spread apart against the action of the spring 38, the closing action of which now forces the inside edges of the flanges 22, which form shoulders, firmly against that portion of the upper which is in the angle A between the feather and lip. While so held, the upper materials cannot loosen or creep back from their lasted position.

The inside edges of the flange 22 of the articulated members are shaped, somewhat like wipers, so as to conform to the average contour of the ribs of the insoles of shoes having conventional toe shapes, and, by the closing action of the springs 38, these members are able to accommodate a full run of sizes. However, where the shape of the toe of the shoes being lasted varies too much from the conventional, a set of articulated members having a different inside edge contour may be readily substituted.

Ordinarily, the effect of the weight of the shoe and its last alone is sufficient to produce the necessary pressure, for thus holding the upper materials in place while they set. However, the clamping pressure may, if desired, be increased by augmenting the weight effect. A convenient means for doing this, shown in Figs. 1 and 2, comprises a strap 64 connected to the rod 58 by means of two tension springs 66 and 68. In use, this strap is brought up over and into engagement with the heel end of the shoe, and the direction of pull of the springs 66 and 68 is such as to have a downward component for augmenting the weight effect of the shoe and its last, and also a forwardly acting component which tends to force the shoe into articulated members and thus increases the action of the springs 38 to hold the flanges 22 against the upper in the angle between feather and rib. The rod 60 serves as a catch bar to prevent a shoe from dropping to the floor, should it become accidentally dislodged from the abutment and supporting roll.

The frame shown in Figs. 1 and 2 is similar to a conventional shoe rack, and, in fact, it is within the purview of this invention to install the abutments 10 and supporting rolls 62 on such a rack. While only two abutments are shown in

Fig. 2, it will be understood that the length of the frame structure is such as to accommodate many more, and that several vertical sets of abutments and supporting rolls may be provided. This frame may have casters or other suitable wheels to facilitate its being moved about from place to place, as, for example, from the bed laster to the inseaming machine, or it may be fixed to the floor adjacent to the bed laster. In any event, there will be on it enough abutments and supporting rolls, so that each shoe can be certainly subjected to a clamping pressure at its toe end for a long enough period to assure that the upper materials will become wholly set in lasted position.

As explained above, this setting of the upper materials in place will, under ordinary conditions, be accomplished in about three minutes. The usual time taken by a skilled operator in bed lasting a shoe is approximately one minute. Hence, a minimum of four abutments and associated supporting rolls would be sufficient. Of course, where the whole rack is filled, a much longer period of auxiliary pressing will be obtained and, where the rack is to be permanently located adjacent the laster, it is thought that a minimum number of six or eight abutments and associated supporting rolls should be provided.

In Fig. 4, an alternative type of supporting structure is shown, and one which is especially well adapted to be located adjacent to the bed laster. In this device, the abutments **10**, of which there may be preferably eight, are mounted on radial arms **70** extending outwardly from a hub **72**. This hub is mounted for rotation on the upper end of a standard **74** of convenient height and which, below the arm **70**, is provided with pairs of radial arms **76**. The rolls **62** are carried between the arms **76** and the springs **66** and **68** are secured to these arms in the manner shown. At their outer ends, the arms **76** are connected by means of rods **78**, which serve the same purpose as the rods **60** in the structure shown in Figs. 1 and 2. With this arrangement, shoes from the bed laster are placed against the abutment, the operator turning the hub to bring the abutments successively into loading position, until all eight of the abutments have been filled. Now, as a shoe is taken from the bed laster, the shoe, which has been longest under pressure in this auxiliary apparatus, is removed and returned to the shoe rack, and the just lasted shoe is put in its place. In this way, each shoe is held under auxiliary clamping pressure for at least eight minutes, a period sufficient to assure the setting in place of even the heaviest upper materials.

Having 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 lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe into lasted position by means of a machine having lasting instrumentalities, removing the shoe from the influence of said lasting instrumentalities and from the machine with said upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing said clamping pressure until the upper materials have set.

2. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe into lasted position by means of the wipers of a bed-lasting machine removing the shoe from the influence of said wipers and from the machine with said upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing said clamping pressure until the upper materials have set.

3. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe into lasted position upon the feather and against the rib of the insole by means of a machine having lasting instrumentalities, removing the shoe from the influence of the lasting instrumentalities and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until the materials have set.

4. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe into lasted position upon the feather and against the rib of the insole by means of the wipers of a bed-lasting machine, removing the shoe from the influence of said wipers and from the machine with the upper in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until the materials have set.

5. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, which have been subjected to heat and vapor treatment, into lasted position by means of a machine having lasting instrumentalities, removing the shoe from the influence of the lasting instrumentalities and from the machine with said upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing said clamping pressure until the materials have set.

6. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, which have been subjected to heat and vapor treatment, into lasted position by means of the wipers of a bed-lasting machine, removing the shoe from the influence of said wipers and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing said clamping pressure until the materials have set.

7. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, which have been subjected to heat and vapor treatment, into lasted position upon the feather and against the rib of the insole by means of a machine having lasting instrumentalities, removing the shoe from the influence of the lasting instrumentalities and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until the materials have set.

8. That improvement in methods of lasting the

toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, which have been subjected to heat and vapor treatment, into lasted position upon the feather and against the rib of the insole by means of the wipers of a bed-lasting machine, removing the shoe from the influence of said wipers and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until the materials have set.

9. That improvement in methods of lasting the toe end of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, including an adhesive toe stiffener that extends into the lasting margin, into lasted position upon the feather and against the rib of the insole by means of a machine having lasting instrumentalities, removing the shoe from the influence of the lasting instrumentalities and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until said materials have set.

10. That improvement in methods of lasting the toe ends of welt shoes which comprises the steps of working the upper materials at the toe end of the shoe, including an adhesive toe stiffener and which have been subjected to heat and vapor treatment, into lasted position upon the feather and against the rib of the insole by means of the wipers of a bed-lasting machine, removing the shoe from the influence of said wipers and from the machine with the upper materials in unfastened condition, immediately subjecting the lasted upper materials to clamping pressure for holding said materials in lasted position, and continuing the clamping pressure until said materials have set.

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