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METHOD AND MEANS FOR USE IN POSITIONING SHOES

Filed May 24, 1941
This invention relates to the positioning of shoes in shoe machines relatively to means for operating on the shoes. The invention is herein illustrated with reference to the positioning of shoes in a lasting machine relatively to toe-lasting means, but it will be understood that it is not thus limited in its applicability.

Shoes have been positioned heretofore in shoe machines by the use of a plurality of pins extending through holes formed in each insole in a definite relation to its edge contour before the insole is mounted on a last and extending also into corresponding holes provided in the bottom of the last. Each shoe is thus accurately positioned in predetermined relation to the operating means lengthwise, laterally and angularly, the term "angularly" being used herein with reference to orientation of the shoe about an axis extending heightwise thereof. The positioning of shoes in this manner in a toe-lasting machine is illustrated, for example, in a copending application of mine, Serial No. 377,347, filed on February 4, 1941.

An object of the present invention is to obtain the advantages thus obtained heretofore with respect to accuracy in the positioning of shoes, without the necessity of providing positioning holes in the lasts. A further object is to position shoes even more satisfactorily than heretofore in some machines in lasting machines which operate on the upper materials.

To the above and other ends, the invention, in one aspect, provides a novel method whereby shoes are properly positioned by the use of positioning recesses formed in the insoles. Preferably these recesses extend only part way through the insoles from their bottom faces, so that they are not visible on the inner faces of the insoles. As herein illustrated, each insole is provided with two such recesses by means of which the position of the shoe lengthwise, laterally and angularly may be determined, the recesses being formed by round punches having conical ends. Consistently, however, with some of its objects and advantages, the invention is not limited to the use of recesses of this character or to the use of a plurality of recesses in each insole. The recesses are preferably formed in the insoles after the insoles have been mounted on lasts and secured in their assembled relative to the lasts, the locations of the recesses being determined partly at least by the contours of the lasts. The locations of the recesses relative to the lasts are, therefore, not affected by possible variations in the positioning of the insoles on the lasts. In accordance, moreover, with the practice herein illustrated, although not necessarily, the recesses are located as determined by reference to the outer faces of uppers also mounted on the lasts and partially shaped over the lasts. An advantage of this procedure, especially in positioning shoes relatively to toe-lasting means or other means acting on the uppers, is that the thickness of the upper materials is a factor in determining the positions of the shoes.

The invention further provides novel means for positioning shoes in shoe machines in the practice of the above method, the construction shown comprising a shoe rest formed to engage the bottom face of an insole to position the shoe heightwise and, having thereon spurs arranged to enter the above-mentioned recesses in the insole to position the shoe lengthwise, laterally and angularly.

One manner of practicing the novel method and one form of means for positioning shoes in a shoe machine in the practice thereof will now be more particularly described with reference to the accompanying drawings, after which the invention will be defined by the claims.

In the drawings,

Fig. 1 illustrates the formation of recesses in the insole of a shoe for purposes of the invention by the use of an insole-punching machine disclosed in a copending application of mine, Serial No. 395,036, filed on May 24, 1941, the shoe being shown in plan as positioned relatively to punching tools by means engaging the outer face of the upper;

Fig. 2 is a view partially in elevation and partly in section, showing portions of the insole-punching machine and further illustrating how the recesses are formed in the insole;

Fig. 3 is a section on the line III—III of Fig. 2 on an enlarged scale, better illustrating the relation of the punches to the insole;

Fig. 4 is a view partly in elevation and partly in section widthwise of the shoe, illustrating how the shoe is positioned in a toe-lasting machine of the character disclosed in my above-mentioned application Serial No. 377,347 by the use of the positioning recesses provided in the insole by this invention;

Fig. 5 is a plan view illustrating the relation of the shoe thus positioned to the toe-lasting means at a certain stage in the lasting operation, the shoe-positioning means being omitted; and

Fig. 6 is a view mainly in vertical section lengthwise of the shoe, further showing how
the shoe is positioned and illustrating its relation to the lasting means at the end of the lasting operation.

In accordance with the present illustrative disclosure, a pair of positioning recesses 2 (Fig. 5) are formed in the forepart of an insole 3 after the insole has been mounted on a last 4 and fastened to the last in the customary manner, as by temporary tacks 5 and after an upper 6 on the last has been pulled over and has been lasted along its ball and Shank portions, but while it is still unlastr at the toe portion. These recesses are formed by punches 7 which are parts of the insole-cutting machine more fully shown and described in application Serial No. 395,036, the punches having conical ends which do not penetrate entirely through the insole, as illustrated particularly in Fig. 5. The punches are controlled by an equalizing lever 8 mounted above them, so that they apply substantially equal forces to the insole and penetrate substantially the same distances into the insole while adjusting themselves to the contour of the shoe bottom. The position of the shoe lengthwise relative to the punches is determined by an end gage 9 which engages the outer face of the upper at the end of the toe and against which the operator presses the shoe in presenting it to the machine. Its position laterally and angularly is determined by two pairs of side gages 10 and 12 which are moved equal distances toward each other to position and clamp the shoe after the shoe has been presented against the end gage 9, the side gages being provided with flexible leather strips 12 which engage the upper to prevent any danger of marking the upper by the pressure of the gages thereon. It will thus be seen that the position of the shoe relatively to the punches lengthwise, laterally and angularly is determined from the outer face of the upper. After the shoe has thus been positioned it is forced upwardly by a toe rest 14 to cause the punches to punch the holes in the insole, its upward movement being limited by a member 16 against which the operator initially presents the bottom face of the toe end of the insole. This member is vertically movable in a block 18 and carries a screw 20 lying in a slot 22 in the block to limit upward movement of the member with the shoe, as illustrated in Fig. 2. After the punching of the holes the parts return to their starting positions and the shoe is removed.

In further accordance with the illustrative disclosure, the shoe is thereafter presented to a toe-lasting machine constructed generally as shown and described in application Serial No. 377,347. This machine is provided with toe-lasting instrumentality comprising grippers 24 (Fig. 5) which grip and pull the margin of the toe-end portion of the upper materials, a toe former 26 which embraces the upper about the toe and is moved upwardly to wipe the upper to the edge of the insole while its margin is held by the grippers, and wipers 28 which after moving upwardly with the toe former and perform an upper-trimming operation not herein illustrated, wipe the margin of the outer layer of the toe end of the upper materials inwardly over the insole as shown in Fig. 6. The position of the shoe heightwise relatively to the lasting instrumentality is determined by positioning a casting 32 which is fixed during the operation of the machine and in the construction herein shown is provided with two members 34 and 36 arranged to engage the bottom face of the forepart of the insole at different distances from the end of the toe respectively. The member 34 is fast on the casting 32 and the member 36 is adjustable relatively to the casting about a pin 38 extending laterally of the shoe. The adjustment is effected by a screw 40 which is threaded in the casting 32 and bears on the member 36 in a location higher than the pin 38, the screw acting in opposition to a spring 42 which controls the member 36 by engaging it lower than the pin. By this means the relation of the shoe to the plane of the wipers may be varied. The position of the shoe lengthwise, laterally and angularly when it is presented to the machine by the operator is determined by two spurs 44 extending downwardly from the member 34 in fixed relation thereto and arranged to enter the recesses 2 formed in the insole in the manner above described. The shoe is clamped against the members 34 and 36 in the position determined by these members and by the spurs 44 at the beginning of the operation of the machine by an upper-most movable toe rest 45. Preferably also a heel rest such as shown in application Serial No. 377,347 is moved into engagement with the heel-end face of the shoe to assist in preventing any displacement of the shoe lengthwise in the lasting operation.

It will thus be seen that by this invention shoes mounted on ordinary lasts are positioned lengthwise, laterally and angularly, as well as heightwise, in accurately predetermined relation to the means which operates therein, thus insuring satisfactory results in the operation of shoe materials on each shoe and uniform results in operating on a plurality of shoes. With reference to toe-lasting operations such as herein disclosed, satisfactory results are further insured by reason of the fact that the locations of the positioning recesses in the insoles are determined by reference to the outer faces of the uppers on which the lasting instrumentality are to operate, thus avoiding such possible variations in the results obtained in lasting different shoes as might be due to variations in the thickness of the upper materials.

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

1. That improvement in methods of positioning shoes in shoe machines, which consists in providing the insoles of shoes after the insoles have been mounted on lasts and secured in their assembled relation to the lasts with positioning recesses located as determined partly at least by the contours of the lasts and adapted for use to determine the positions of the shoes lengthwise, laterally and angularly, and engaging the insoles thereafter in said recesses thus to determine the positions of the shoes in a shoe machine.

2. That improvement in methods of positioning shoes in shoe machines, which consists in providing the insoles of shoes with positioning recesses mounted on the toes of the lasts from their bottom faces and adapted for use to determine the positions of the shoes lengthwise, laterally and angularly, and engaging the insoles in said recesses thus to determine the positions of the shoes upon presentation of the shoes to a shoe last.

3. That improvement in methods of positioning shoes in shoe machines, which consists in providing the insoles of shoes after the insoles
have been mounted on lasts and secured in their assembled relation to the lasts each with a plurality of positioning recesses located as determined partly by the contour of the last and adapted for use to determine the position of the shoe lengthwise, laterally and angularly, and engaging each insole in said recesses thus to determine the position of the shoe thereafter in a shoe machine.

4. That improvement in methods of positioning shoes in shoe machines, which consists in providing the insoles of shoes after the insoles have been mounted on lasts and secured in their assembled relation to the lasts each with a plurality of positioning recesses located as determined partly by the contour of the last and extending only part way through it from its bottom face, and engaging each insole thereafter in said recesses to determine the position of the shoe lengthwise, laterally and angularly in a shoe machine.

5. That improvement in methods of positioning shoes in shoe machines, which consists in providing insoles after they have been assembled with uppers on lasts with positioning recesses located as determined by reference to the outer faces of the uppers, and engaging the insoles in said recesses to position the shoes upon presentation of the shoes thereafter to a shoe machine.

6. That improvement in methods of positioning shoes in shoe machines, which consists in providing insoles after they have been assembled with uppers on lasts and after the uppers have been partially shaped over the lasts with positioning recesses located as determined by reference to the outer faces of the uppers and adapted for use to determine the positions of the shoes lengthwise, laterally and angularly, and engaging the insoles in said recesses to position the shoes thereafter in a shoe machine.

7. That improvement in methods of positioning shoes in shoe machines, which consists in providing insoles after they have been assembled with uppers on lasts each with a plurality of positioning recesses located as determined by reference to the outer face of the upper, and engaging each insole in said recesses to determine the position of the shoe lengthwise, laterally and angularly upon presentation of the shoe thereafter to a shoe machine.

8. That improvement in methods of positioning shoes in toe-lasting machines, which consists in providing insoles after they have been assembled with uppers on lasts and after the uppers have been partially shaped over the lasts each with a plurality of positioning recesses in its forepart located as determined by engagement with the outer face of the upper at the end of the toe and the sides of the forepart, and engaging each insole thereafter in said recesses to determine the position of the shoe lengthwise, laterally and angularly in a toe-lasting machine.

9. In a shoe machine, a shoe rest comprising members arranged to engage the bottom face of the forepart of an insole of a shoe on a last at different distances respectively from the end of the toe to position the shoe heightwise, said members being relatively adjustable heightwise of the shoe and one of them having thereon a plurality of spurs arranged to enter corresponding recesses previously provided in the insole to determine the position of the shoe lengthwise, laterally and angularly.

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