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SOLE AND SOLE FITTING

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This invention relates to soles and sole fitting, and is herein illustrated and described with reference to insoles and to a method of and a machine for operating upon insoles.

Insoles are commonly provided with an outer lip formed by an edge cut and an inner lip formed by a face cut in the sole. These lips extend forwardly from about the breast line of the sole and are separated from each other by a relatively small width of uncut sole material, known as the "between substance". The lips are subsequently turned up and secured to each other back to back to form a rib. This operation is performed by a lip-setting machine which, for example, may be of the type disclosed in United States Letters Patent No. 1,213,770, granted January 23, 1917 upon an application of Albert E. Johnson.

Ordinarily, a transverse incision or scoring line adjacent to each margin of the sole is formed before the sole is channeled. These incisions indicate to the operator of the channeling machine the locality at which the channeling cut should terminate and they also provide a definite rearward limit to the upstanding rib formed by the lip-setting machine above mentioned. In practice the operator usually finds it difficult or impossible to stop the channeling cuts exactly at these transverse incisions and in consequence the channeling cuts are carried somewhat rearwardly of the incisions. It sometimes happens that in the operation of the lip-setting machine such rearward extensions of the lips will be picked up and cemented together to form an undesired extension of the rib. When the shoe is lasted with a portion of the rib extending rearwardly of the scoring line such rearwardly extending portion of the rib will be covered by the counter and will create an undesired bunching beneath the counter.

In order to avoid the difficulty above pointed out the present invention comprises a method which consists in making in an insole an incision of such a character that when the channeling cuts are made an end portion of one of the channel lips will be removed to avoid any danger of setting the lips at that locality. In carrying out the method, a novel product is produced, namely an insole having an incision of the character above referred to. In the illustrated sole the incision is T-shaped with the bar of the T extending transversely of the sole in the vicinity of the heel breast line and with the stem of the T extending rearwardly of the bar to cut through material which is to constitute the root of a

channel lip subsequently to be formed on the insole.

The invention also comprises a machine for carrying out the above-mentioned method and for forming the above-described product.

Referring now to the accompanying drawing, Fig. 1 is a view in perspective illustrating the step of forming incisions in the lips of an insole by a machine;

Fig. 2 is a view in perspective of a knife shown in Fig. 1; and

Fig. 3 is a plan view of the heel end of an insole in process of being channeled and illustrating the combined effect of the above-mentioned incisions and of the channeling cuts.

Fig. 1 illustrates the operating instrumentalities of a machine for forming the above-mentioned incisions. This machine consists of a frame 12 having a raised portion 14 which serves as a work support. The heel portion of a sole S is centered upon the work table 14 by a pair of gages 16 which may be controlled by mechanism similar to that disclosed in United States Letters Patent No. 1,113,544, granted October 13, 1914 upon an application of Miller Cook, Jr. As disclosed in that patent, the centering gages are mounted for transverse movement with respect to the center line of the machine, being connected by gearing in such manner as to insure that both gages are always at an equal distance from the center line and being urged toward the center line by a spring. For a more complete understanding of the mechanism for centering the gages 16, reference may be had to the above-mentioned Letters Patent No. 1,113,544.

Adjustably mounted on the work table 14 is a gage 18 for positioning the rear end of the sole. A bridge member 20 serves to hold the sole down against any tendency of the gages 16 to raise it. The machine is provided with a pair of knives 22 each having a cutting edge which is T-shaped, the bar of the T being indicated by the reference character 24 and the stem by the reference character 26. The knives 22 may conveniently be mounted and operated in the same manner as the knives disclosed in the above-mentioned Letters Patent No. 1,113,544.

In the operation of the machine, the heel end of the sole S is passed beneath the bridge 20 and between the gages 16 until the rear end of the sole abuts the gage 18. Upon starting the machine, the knives 22 descend and make their respective cuts. The position (forwardly or rearwardly) of these cuts is determined by the

adjustment of the gage 18. The knives may be lowered and raised continuously, or, if desired, the machine may be provided with a mechanism for stopping it automatically after each cycle of movement of the knives.

Referring to Fig. 3, it will be noted that each of the knives 22 will make a scoring cut in the sole S in the form of a T-shaped incision adjacent to each of the lateral margins of the heel portion of the sole S. The bar portion of each of the T-shaped incisions is indicated by the reference character 28 and the stem portion by the reference character 30. It will be noted that in the illustrated machine the knives are so arranged that the two cuts 28 will be colinear and that the cuts 30 extend rearwardly from and at right angles to the respective cuts 28. The cuts 28 are made approximately at the heel breast line and are similar to the cuts made by the machine disclosed in Letters Patent No. 1,113,544 above mentioned. Each of the cuts 30 is so positioned as substantially to coincide with the root of one of the channel lips subsequently to be formed, and it is long enough to extend at least to the point at which the channel will emerge from the sole. The illustrated machine is arranged to make the cut 30 in the root of the outer lip. The cuts 28 extend across both lips and also across the "between substance", and are of sufficient depth to extend through the lips.

Further referring to Fig. 3, a pair of channeling knives 32 and 34, respectively, are observed in the process of forming on the sole S an inner lip I and an outer lip O. The "between substance", indicated by the reference character B, is defined by a pair of parallel dotted lines. The line at which the outer channeling knife 34 enters the sole to form the outer lip is indicated by the reference character 36. As a result of the incision and of the channeling operation, and regardless of the order in which these operations are performed, a portion of the outer lip bounded by the cuts 28, 30, the line 36, and the edge of the lip will be removed so that it will be impossible for the lip-setting machine accidentally to cement the lips I and O together rearwardly of the cuts 28.

As above pointed out, each of the cuts 30 is so positioned as substantially to coincide with the root of the outer channel lip, the sole being gaged laterally in relation to the knives by the gages 16. Variations of width and of style in the soles call for corresponding variations in the positions of the cuts 30. While it would be a simple matter to provide for lateral adjustment of the knives 22 in the machine illustrated in Fig. 1, it has been found more convenient, in practice, to provide a series of knives in which the lateral position of the cutting edge 26 varies in relation to the shank of the knife. For all ordinary styles of soles it has proved satisfactory to make the cutting edge 26 at a right angle to the cutting edge 24; in designing the knife, however, this angle may be varied if unusual conditions should so require.

Having thus 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 fitting insoles which consists in making in an insole a channeling cut which emerges from the insole to leave an end of the channel lip disconnected from

the body of the insole, and in removing an end portion of the channel lip by making a scoring cut to incise the lip along a line extending inwardly from the edge of the lip and thence along the root of the lip to the disconnected end of the lip.

2. That improvement in methods of fitting insoles which consists in making a scoring cut to form an incision in an insole, and in forming a channel in the insole, said incision including a cut substantially coincident with the root of the channel and extending to the end of the channel and a cut extending across the channel lip and intersecting the first-mentioned cut at a locality spaced from the end of the channel, both of said cuts extending through the channel lip, the channel being formed by a cut which emerges from the insole at the end of the channel.

3. That improvement in methods of fitting insoles which consists in making a T-shaped incision in the insole, and in forming a channel in the insole by a cut which emerges from the insole, thereby leaving an end of the channel lip disconnected from the body of the insole, the stem of the T which represents the shape of the incision being substantially coincident with the root of the channel lip and extending to the detached end of the lip, and a portion of the bar of the T extending across the lip at a locality spaced from the disconnected end of the lip, said incision extending through the thickness of the lip to detach a portion of the lip.

4. That improvement in methods of fitting insoles which consists in first making a T-shaped incision in the insole, then cutting two channels in the insole, and cementing together in upstanding position the two channel lips, at least one of said channels being formed by a cut which emerges from the surface of the insole rearwardly of the bar of the T which represents the shape of the incision, the emergence of said cut leaving the end of the channel lip disconnected from the body of the insole, the stem of the T extending to said disconnected end of the channel lip and being positioned to cut through the material which is to form the root of the lip, and the bar of the T cutting across and through the material which is to form both lips and the between-substance, with the result that the portion of one of the lips rearwardly of the bar of the T will be cut out prior to the cementing, rendering impossible the accidental cementing together of the two lips rearwardly of the bar of the T.

5. An insole having a T-shaped incision in its margin, with the bar of the T extending transversely of the sole in the vicinity of the heel breast line and with the stem of the T extending rearwardly of the bar to cut through material which is to constitute the root of a channel lip subsequently to be formed on the insole.

6. A double-lipped insole having two T-shaped incisions, the bars of the T's being in alinement with each other and extending across the pair of lips and the between-substance adjacent to the margins of the sole in the vicinity of the heel breast line, and the stem of each T cutting through the root of one of the lips, a portion of the channel lip rearwardly of each of the cuts represented by the bars of the T's being cut out by the incision and the cut forming the channel.

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