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MOLDS FOR THE PRODUCTION OF SHOES

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FIG. 1

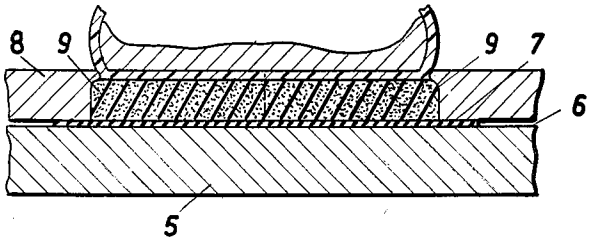
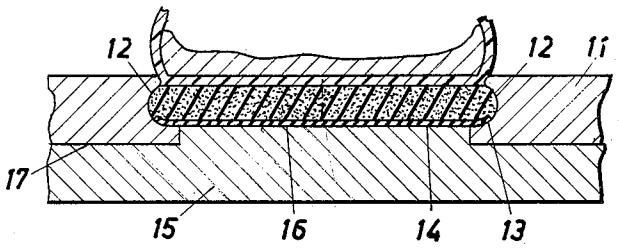


FIG. 2



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MOLDS FOR THE PRODUCTION OF SHOES

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This invention relates generally to the manufacture of shoes, and specifically to molds for the production of shoes having rubber or synthetic soles.

Heretofore, the attachment of unvulcanized or only preliminarily vulcanized rubber or synthetic soles to an upper upon a last and sewn to an insole has been effected by the use of heated molds, which molds consist of a heated sole plate, a frame to be disposed on the sole plate and corresponding to the outer form of the sole edge, and a clamping connection between the sole plate and the last. The last is inserted in the hinge connection, the outer sole, which is stamped out approximately 1 cm. larger than its final form, is positioned on the sole plate with the frame removed, and the frame is placed over the outer sole. The position of the frame relative to the sole plate is determined by suitable guides, and an intermediate sole or a corresponding mixture which is unvulcanized or only preliminarily vulcanized, such as a sponge rubber mix, is placed into the frame which is closed at the bottom by the outer sole. The mold is then closed by clamping the last with the upper and inner sole in position upon the same, with the frame being thus sealed at the top by the upper, and the vulcanization is then effected.

This known technique is objectionable in that the outer sole, which serves to a certain extent as a seal between the sole plate and the frame and which projects laterally completely around and beyond the frame subsequently requires that the lateral projection beyond the intermediate sole formed thereabove must be removed by trimming or the like. Hence, the known method thereby involves additional steps, time and costs as well as waste of material which material can only be re-used as reclaimed rubber since the vulcanization has already been completed. Most important, however, by virtue of the subsequent trimming of the outer sole, the solidified edge structure of the intermediate sole is damaged at least at the juncture between the two sole parts, and through this, the likelihood of an easy separation of the outer sole from the intermediate sole is possible since the intermediate sole is more sensitive to mechanical stresses.

If, on the other hand, the lateral projection of the outer sole is insufficiently trimmed, there arises the serious possibility of the sole being "torn-off." Lastly, in the manufacture of shoes, there is a considerable wastage due to faulty trimming.

A further disadvantage of the known method is that it is not possible to depart substantially from a sole form which in cross-section is sharp edged as is given by the flat edged outer sole and the edge of the intermediate sole which latter sole generally extends perpendicularly upwardly from the outer sole, which sectional form per se is apt to cause damage.

Thus, it is known in the art that it is not possible to imitate particular and known shoe constructions, such as the turn shoe, which is made by a totally different method, according to which a very light sole is sewn to a very light upper wrong side out and then reversed providing a final article with a rounded sole edge. To provide an imitation visually at least of the turn shoe, with an article not adapted for such reverse handling, namely a shoe having a sole which is too stiff for such action as well as an upper likewise unsuited for such reversal and which may also be stiffened with a toe

puff and/or a heel stiffener, it would be necessary to produce a specially shaped sole which would materially augment the cost of production. If, however, it was desired to form the round edge form on the known shoe above referred to by subsequent operations, a milling procedure would be necessary. The solid edge structure of the intermediate sole formed by the vulcanization would be damaged by this procedure thereby considerably reducing the strength of the shoe. Furthermore, it would be necessary to provide an extra covering subsequently on the edge, such as lacquering or the like to afford the shoe a pleasant appearance as well as to protect the same.

The salient object of this invention is to provide means constituting a simplified procedure enabling the resistant rounded sole edge of the turn shoe to be provided in a vulcanization method and to avoid the trimming of the outer sole.

The invention is directed to the concept that the internal surface of the vulcanizing mold, i.e., the frame is provided in the area of the sole edge with a rounding through which the sole edge merges without a step into the surface of the sole plate.

The outer sole can now be cut or stamped in its final form, and experience has demonstrated that the danger heretofore feared respecting a lateral displacement or an uneven positioning of the outer sole in the mold formed by the sole plate and the frame does not in fact exist. Repeated tests have, on the contrary, indicated that when the outer sole is placed into the mold, by virtue of the rounded edge formation of the mold, the sole centers itself.

The advantage of this invention consists in the first place that subsequent action on outer sole previously stamped out to size is no longer necessary and the shoe leaves the mold in final form. Another advantage is that the sole cannot separate from the intermediate sole as was heretofore the situation as the lateral edges of the outer sole are anchored in the intermediate sole by the vulcanization. In addition, the partial and local damage to the solidified edge structure of the sponge rubber sole brought about by the trimming no longer occurs since no subsequent operation on the shoe is required.

While the above describd turn shoe form predicated on a quite different manufacturing method can only be used for this very light shoe construction, it is now possible to employ this form for shoes with thicker and more sturdy shoes, even those having a pronounced heel. While heretofore, the turn shoe could only be used as a house shoe, by reason of its sensitivity to moisture, a corresponding shoe according to the invention can be made water tight thereby enlarging the use of the shoe.

It is further known in the art to make shoes by the vulcanization method above mentioned wherein subsequent action on the finished shoe is not required. However, it was necessary first to make a hollow sole corresponding to the finished form of solid rubber before this could be secured to the shoe in any fashion. This cost of this technuique is materially higher than is the case of a shoe having a previously stamped outer sole. Furthermore, the molded sole had to be processed after its production and this action causes more wastage than the trimming step of the stamped outer sole so there was no saving in material or operational time.

An object of this invention is to produce a turn shoe form employing the known simple method of an outer sole previously stamped from calendered sheet and not following the more complex method requiring a premolded solid rubber sole.

It is also known to "stick" soles to the bottom of previously completed shoes, in which situation, a rounded edge could be obtained. However, this procedure is not

a vulcanization method but merely adhering one element to another, and a rigid vulcanization mold is not used but rather a resilient pressure membrane which presses the outer sole from below against the shoe. Such a mold cannot be employed for the vulcanization method, and, in addition, this procedure is not concerned with a shoe including an outer sole, an intermediate sole and an inner sole. Also, and of primary importance, in this known arrangement, the rounded form of the outer sole is only obtained if the existing shoe has a rounded form. Thus, the outer sole easily separates from the shoe since the sole is not anchored at the edges in the intermediate sole as is the case of the present invention. With this type of shoe not only is it necessary to stamp out the sole but the edges also must be provided whereas in the instant invention, it is sufficient to use a previously stamped outer sole which has square edges, which during vulcanization are vulcanized into the intermediate sole.

From a study of the ensuing description, the objects and advantages of the invention will become apparent and with the above and other objects in view, the invention consists in the details of construction, and in the combination of the parts now to be more fully described and claimed.

The invention will be further explained with reference to an illustrated embodiment shown in the attached drawings, and in which:

FIG. 1 shows the prior form of sole plate and frame end,

FIG. 2 is a fragmental sectional view of the present invention.

In FIG. 1, it will be seen that the known form includes a sole plate **5** having a planar upper surface **6** and outer sole **7** is placed upon such surface whereupon it is covered by a frame **8**. Inner edge surface **9** of the frame **8** which surrounds the outer edge of the finished shoe sole extends approximately perpendicularly to the planar surface **6** of the sole plate so that the frame can be in one piece. The outer sole functions to some extent as a seal between the frame and the sole plate and projects beyond the edge **9** of the frame about the entire perimeter thereof. The intermediate sole or a filling of unvulcanized sponge rubber is placed into the frame **8** and the upper surface is then closed from above by means of a last over which the shoe upper has been drawn, and to which the inner sole has already been attached by sewing.

With reference to FIG. 2 depicting the present invention, a frame **11** is provided on its inner edge with a rounding or a curved surface **13** which merges without a step into flat upper surface **14** of sole plate **15** and outer sole **16** stamped from unvulcanized sheet rubber corresponding to its final form is positioned in the frame and on the sole plate. Gap **17** between the frame and the sole plate preferably emerges within the under surface of the outer sole **16**, with the sole plate being formed with a suitable cutaway portion into which fits the bottom of the frame **11**. The rounded surface **13** extends into a flat surface on a narrow edge portion of the frame **11** which lies in the cutaway portion whereby this flat surface is in the same plane as the flat upper surface **14**. It is not essential that the two members fit tightly together as the seal is effected by means of the outer sole per se.

It will be noted that the point of connection between the sole plate and the frame is along the underside of the outer sole and that the area of the sole plate supporting the outer sole is of lesser area than the under surface of the outer sole.

The invention is not to be confined to any strict conformity with the showing in the drawing, but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as set forth in the appended claims.

I claim:

1. In a vulcanization mold structure, a first mold component having an upper outer sole supporting surface adapted to support at least the major transverse extent of a prevulcanized, preformed outer sole, mold side wall defining means directly engaging said first mold component, said side wall defining means having an interior surface provided with an internal recess therein to define the marginal edges of a shoe sole, the distance between the recess at opposite sides of the mold being greater than the transverse extent of the upper outer sole supporting surface of the first component, and a last adapted to carry an upper and inner sole closing the upper end of the recess whereby with a prevulcanized, preformed outer sole of greater dimensions than the upper outer sole supporting surface disposed on said surface and covered by a moldable intermediate sole located in the recess and said mold subjected to vulcanization, the marginal edge of the outer sole is anchored in the body of the intermediate sole above the wear face of the outer sole and the intermediate sole secures the outer sole to the upper and inner sole.

2. A vulcanization mold structure as claimed in claim 1, in which said internal recess defining the marginal edges of a shoe sole is rounded and merges with the plane of the upper outer sole supporting surface.

3. A vulcanization mold structure as claimed in claim 1, in which said upper outer sole supporting surface is defined as a projection extending beyond the plane of the first mold component and said mold side wall defining means adjacent said internal recess having tongue means engaging the walls of said projection.

4. A vulcanization mold as claimed in claim 1 wherein the point of connection between the first named mold component and the side wall defining means extends longitudinally of the mold and is along the underside of the outer sole.

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