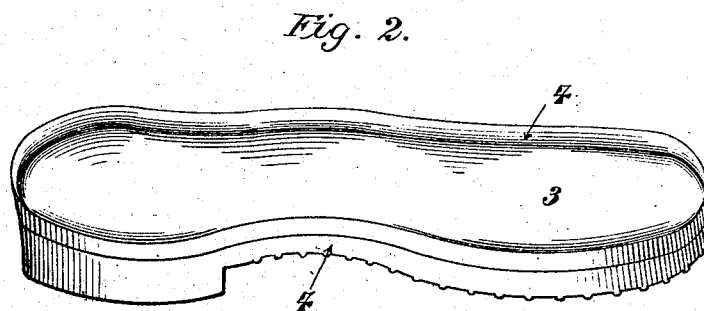
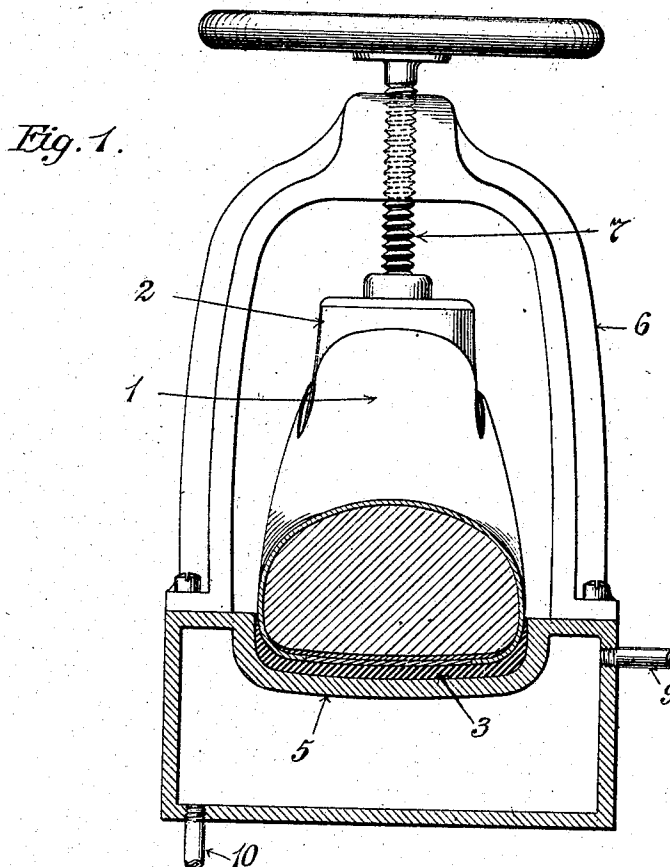


E. A. SAUNDERS.
 APPARATUS FOR APPLYING RUBBER SOLES TO BOOTS AND SHOES.
 APPLICATION FILED JAN. 10, 1907.

939,330.

Patented Nov. 9, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

EMMETT A. SAUNDERS, OF SOUTH BEND, INDIANA.

APPARATUS FOR APPLYING RUBBER SOLES TO BOOTS AND SHOES.

939,330.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed January 10, 1907. Serial No. 351,634.

To all whom it may concern:

Be it known that I, EMMETT A. SAUNDERS, a citizen of the United States, residing in South Bend, State of Indiana, have invented a certain new and useful Improvement in Apparatus for Applying Rubber Soles to Boots and Shoes, of which the following is a specification.

This invention has relation to an improved form of apparatus whereby rubber bottoms may be applied by vulcanization under pressure to shoes and boots of all kinds.

The improved apparatus herein claimed is shown and described in my pending application Serial Number 247101, filed February 24th, 1905 and is primarily designed to carry out the process therein set forth, although it is suitable for applying rubber soles, foxing and heels to shoes made of other than rubber, as for instance canvas shoes. To the extent of the disclosures in my said pending application this is a continuation thereof.

My improved apparatus in one preferred form is shown in the accompanying drawing wherein—

Figure 1 is a cross section of the mold with a shoe in it and Fig. 2 is a perspective view of the combined sole, foxing and heel which may be vulcanized on to a shoe by one form of my invention.

In using my improved mold and press for making rubber footwear I prefer to proceed as follows: The body of the shoe, including the inner sole as shown at 1 in Fig. 1, is built up in the usual manner on a last 2, being constructed of properly shaped parts cemented together temporarily. The thick outer rubber sole 3 is separately prepared, being either formed green or partly vulcanized in a press in a well known manner. The sole shown in Fig. 2 is a typical example of this part as prepared for application to the shoe. It is concave in transverse section to fit the convexity of the shoe body, and is preferably provided with an upturned edge 4, which is adapted to fit closely all around the lower edge of the shoe body. The form of sole illustrated is not essential to my invention the scope of which covers the use and application of a mere tap sole or of a heel alone. The shoe body and the thick lower part to be applied thereto having been thus separately pre-

pared, the latter is placed in a mold 5 into which it fits snugly, which mold is combined with means for pressing the shoe body, while still on the last, down onto the sole in said mold. In the illustrative form of apparatus shown in the drawings, this takes the shape of an arch 6 fitted with a screw 7 having a hand wheel 8. The last with the shoe body upon it is placed upon the sole 3 so as to fit within the upturned edge 4 and the screw 7 is turned down hard upon it. The action of the convex body when thus forced down into the concave sole when in the mold 5 is to create a pressure between the soft meeting surfaces at all points, and thus the sole is pressed upon the shoe body, not only on the under surface, but horizontally along the entire length of the upturned edges 4. These upturned edges 4, being thus subjected to pressure where the edges of the lower part of the mold approach very close to the body 1 of the shoe, form a foxing which is vulcanized in place under pressure as follows: In order to carry out my process, the mold must be heated to a proper vulcanizing temperature and this may be accomplished in any manner desired. In the apparatus shown in the drawing the mold 5 is hollow as shown and the heat is supplied by steam entering for instance at 9 and returning at 10. By the means above described there is created a strong continuous pressure which is preserved during the period of vulcanization of the lower shoe body and joined surfaces, or until this process has been carried so far that the material is able of its own resistance to suppress all formation of sponginess under the further influence of heat. When the heating under pressure has been thus carried on for a sufficient time to produce the desired degree of vulcanization the shoe is removed from the mold and is complete at this stage, if the uppers are of other substance than rubber, as for instance canvas. Where the uppers are made of "green" rubber, as above described, however, a further vulcanization without pressure is necessary, as described in my pending application aforesaid.

When the sole is formed onto the shoe in a mold under great pressure, the inner sole, filling-sole, lapping portion of the vamp, outer sole, (made plastic by the heat,) and the foxing are all compressed and vulcanized together into practically one solid piece

handsomely finished and making it practically impossible for the parts to separate or become detached one from the other.

Among the essential features of my device
5 are the following: first, that means are provided for forming a heel, sole, and foxing portion complete all in one piece in a mold: second, that the said mold is formed
10 in only one piece, and therefore the expense of manufacturing the same is greatly reduced; third, more particularly in the making of rubber shoes these heels, soles, and foxing may be molded and partially vulcanized separate and independent of the
15 upper and the whole then completely vulcanized in the usual way by placing them in an oven without the use of pressure. This method of molding and semi-vulcanizing the sole, heel, and foxing separately from the
20 upper has its special and important advantages over the old way of making the shoe wholly by hand, one advantage being that the shoe when completed has a perfect shape and a finished appearance the same as a
25 wholly-molded shoe. Then, again, by molding the heel, sole, and foxing into one piece it is naturally much stronger, and as the greatest wearing strain comes on this portion of the shoe the wearing life of the whole
30 shoe is greatly increased. Again, varnish applied to a rubber shoe that is subsequently vulcanized without being molded will keep its luster much longer than when the shoe is formed in a mold, as by this method the
35 varnish is baked into the shoe and cannot be easily removed.

The above is a most simple, practical, inexpensive, and efficient manner of applying rubber soles to canvas shoes or the like,
40 as the vulcanizing may be accomplished by the use of a last, mold, and steam-chest and the pressure applied by any ordinary screw-press, if desired. The expense of manufacturing is greatly facilitated over the ordinarily complicated and expensive means
45 heretofore employed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

50 1. In a device of the character described, a mold adapted to form the heel, sole and foxing portion of a shoe from rubber or other plastic material, means for applying heat to said mold for vulcanizing its con-

tents, means for applying pressure to said mold while vulcanizing, and means for causing resistance to the plastic material so the same will be forced into the pores of the upper. 55

2. In a device of the character described, 60 a mold adapted to form the heel, sole and foxing portion only of a shoe, a last adapted to fit into said mold and assist in the formation of said heel, sole and foxing portion therein, said mold being so formed as 65 to closely engage the foxing-line of said last to cause a resistance and prevent the free flowing of the material therefrom, and means for applying heat and pressure to the material. 70

3. In a device of the character described, a mold adapted to form the heel, sole and foxing portion of a shoe, a last over which a shoe may be formed the same being adapted to fit the mold and assist in the formation 75 of the heel, sole and foxing therein, means for applying heat and pressure to the material, and means in said last and mold for causing resistance to the plastic material so that the same will be formed into the pores 80 of the upper.

4. In a device of the character described, a mold adapted to form the heel, sole and foxing portion of a shoe, a last over which a shoe may be formed the same being adapted to fit the mold and assist in the formation 85 of the heel, sole and foxing therein, said mold being so formed as to closely fit the upper on the last at the foxing-line thereof to cause a resistance and insure the plastic 90 material being formed into the pores of the upper, and means for applying heat and pressure to the material.

5. In a device of the character described, a mold adapted to form the heel, sole and 95 foxing portion of a shoe from rubber or other plastic material, means for applying heat to said mold for vulcanizing its contents, a last or form to assist in the formation of the heel, sole and foxing portion, 100 means for applying pressure to said mold while vulcanizing, and means engaging the foxing-line to better retain the material while under pressure.

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