Nov. 29, 1960 J. W. STEWART 2,961,707

MOLD FOR MAKING SHOES

Filed Oct. 29, 1957

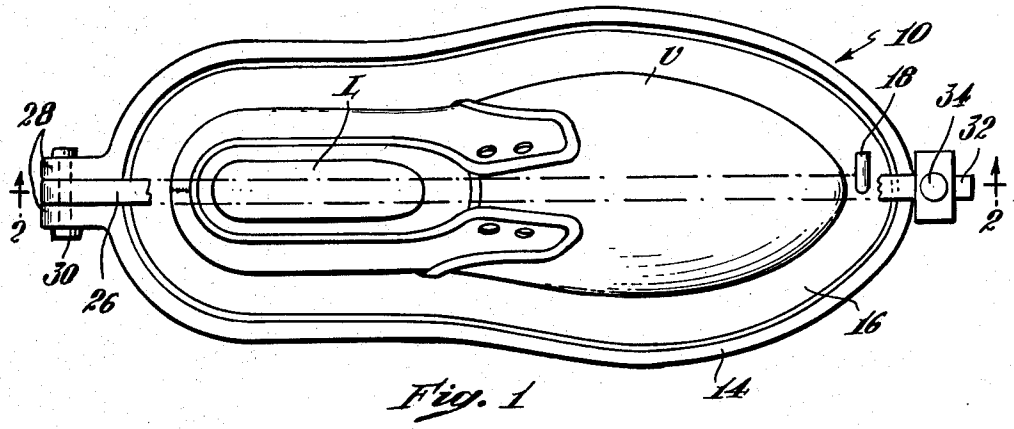


Fig. 1

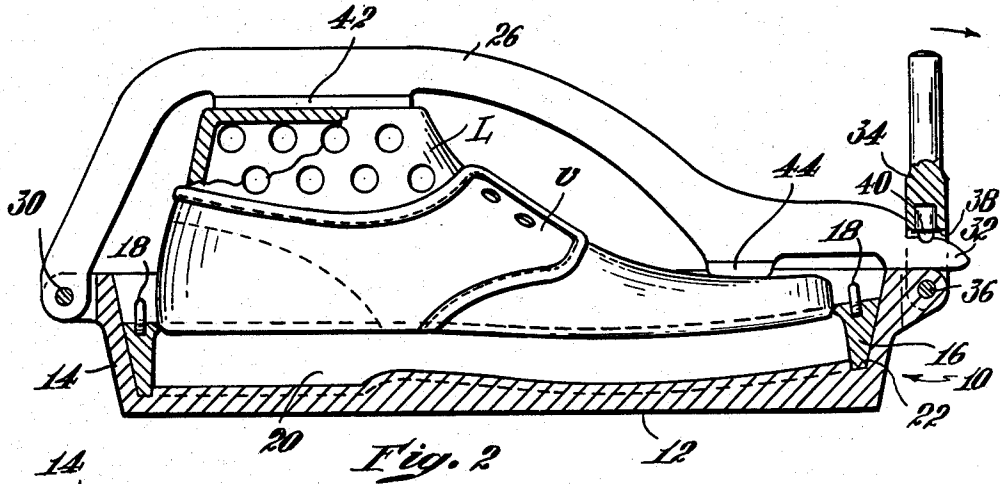


Fig. 2

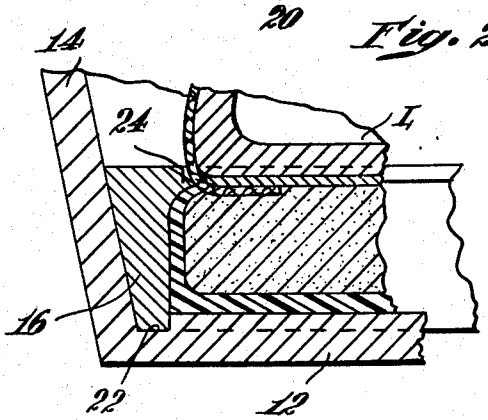


Fig. 3

Inventor
James W. Stewart
by Roberts, Cushman & Grover
Attys

United States Patent Office 2,961,707
Patented Nov. 29, 1960

2,961,707

MOLD FOR MAKING SHOES

James W. Stewart, Providence, R.I., assignor to Marbill Company, Providence, R.I., a corporation of Rhode Island

Filed Oct. 29, 1957, Ser. No. 693,153

1 Claim. (Cl. 18—34)

This invention relates to apparatus for making shoes having bottoms composed of plastic composition which are attached to the bottoms of lasted uppers by fusion and more especailly to a mold for use in making such shoes according to the method described in my pending application Serial No. 689,733, filed October 11, 1957.

As shown therein a series of empty molds are moved by conveyor means along a predetermined path relative to several operating stations. At the successive stations the bottom is formed in situ, a lasted upper is brought into engagement with the bottom contained in the mold, the assembled parts are heated to effect fusion of the bottom to the upper, then cooled to consolidate the bond and finally the finished shoe is stripped from the mold. Objects of this invention are to provide a mold for use in carrying out the aforesaid method which is designed to be passed through a water bath for cooling without danger of wetting the upper, which has removable parts so constructed as to facilitate stripping the finished shoe from the mold when the latter has been completed without having to interrupt the continuous movement of the conveyor, which is designed to prevent leakage of the bottom forming compound around the shoulder of the lasted upper during fusion and which has special securing means which may be moved into and out of operative position while the mold is in motion.

As herein shown, the mold is a boat having a bottom and peripheral wall within which there is removably fitted a ring. The ring and bottom in conjunction form a bottom cavity below the top of the boat which is of a shape and thickness corresponding to the bottom of the shoe that is being made. The peripheral wall of the boat exceeds in height the wall of the ring so as to extend upwardly beyond the junction of the bottom and upper to protect the upper and its inner side slopes downwardly and inwardly. The bottom has a groove peripherally thereof, next to the wall and the ring has a downwardly tapering wall for engagement with the downwardly sloping wall of the boat and a lower edge adapted to fit into the groove. A clamp in the form of a bale is pivotally connected at one end to the boat and is held down at its opposite end by a latch at that end. There are spaced bosses on the bale adapted to have contact with the neck of a last and the toe of an upper assembled thereon, resting on the edge of the ring with its bottom surface in contact with the bottom member situated in the bottom cavity to hold the latter clamped against the ring.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a plan view of the mold;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary vertical section to larger scale showing the cross-section of the wing at its upper edge.

Referring to the drawings, the mold comprises a boat 10 having a bottom 12 and an upstanding peripheral wall 14 within which there is removably fitted a ring 16.

The inner side of the peripheral wall of the boat slopes downwardly and inwardly and the outer peripheral wall of the ring 16 has a corresponding slope, so that the ring fits snugly into the boat but may readily be removed therefrom by lifting upwardly, the slope being such that the ring can be easily disengaged from the boat. To facilitate such removal handles 18—18 are screwed into the top of the ring at opposite ends. The inner side of the ring and the upper surface of the bottom 12 form a bottom cavity 20, within which a bottom may be formed or placed for molding and for attachment to a lasted upper and to this end is of a shape and thickness corresponding to a conventional bottom member having heel, shank and sole areas and a peripheral edge shaped to merge with the upper at the shoulder.

According to the method of making the bottom member a predetermined quantity of liquid bottom forming composition is deposited in the bottom cavity after the mold has first been heated to a uniform temperature, whereupon the mold is rocked by suitable mechanical means to cause the entire quantity of the composition to be distributed uniformly over the bottom and inner wall of the ring to form a shell. To prevent the liquid from getting under the ring and causing it to adhere to the bottom and also to secure a sharp line at the intersection of the tread surface of the bottom with the outer surface of the peripheral wall, a groove 22 is formed around the entire bottom of the wall next to the wall and the lower part of the ring 16 is shaped to set closely into the groove.

After the initial distribution of the plastic in the mold so as to form a uniform wall on the bottom and inside of the ring a filler is deposited therein and activated so as to form an inner sponge layer which rises to a level corresponding substantially to the rim of the initially formed shell within the mold close to the top of the ring. A lasted upper U is now placed bottom down in contact with the rim of the ring 16, as shown in Fig. 2, so that the inturned margin of the upper has contact with the upper edge of the shell and the sponge filling. In order to make a substantially leak-tight line contact between the upper at the shoulder of the last and the bottom, the inner side of the ring is beveled to provide a sharp lip 24 (Fig. 3). When the lasted upper is placed in engagement with the top of the ring the shoulder rests within the depression of the bevel on the edge of the lip and by applying pressure to the lasted upper, as will hereinafter appear, the latter may be caused to press itself into the surface of the upper at the shoulder, so that there is no danger of the bottom composition squeezing out during the bonding operation onto the upper material.

The last L on which the upper is lasted is preferably a hollow aluminum casting having perforations through it for ventilation so that it will not hold heat unduly.

To hold the lasted shoe in this position a bale 26 is mounted lengthwise of the boat 10 with one end pivotally connected between a pair of ears 28 on a pin 30. The other end of the bale has a nose 32 which is adapted to engage the top edge of the boat and to be secured in place by a latch bar 34. The latch bar is pivotally connected to the boat by a pin 36 so that it may be swung from a nearly horizontal position to a substantially vertical position and contains a longitudinally arranged slot 38 which passes over the nose 32 when the lever is swung to its vertical position to hold the latter down. A spring pressed ball 40 is mounted in the upper end of the slot so as yieldably to engage a depression in the nose 32.

The bale has on it on its underside spaced bosses 42 and 44 for engagement respectively with the neck of the last L and the toe of the upper to clamp the lasted margin of the upper against the lip of the ring.

As previously pointed out, the molding device herein described is especially designed for use in practice of the method disclosed in my pending application, wherein molds are moved by an endless convyeor relative to a series of operating stations, at which stations various shoe making operations are performed. At one of the stations as therein described, the mold is passed through a water bath to consumate the union between the bottom and the upper after fusing and to cool the mold down so that at the subsequent station the shoe may be stripped from the mold. Movement of the mold through the water bath of course produces turbulence in the water and in order to eliminate any danger of wetting the upper the walls of the boat, as heretofore related, are made much deeper than the thickness of a mold which would be required for the thickness of the sole being attached to the shoe and as herein shown extends above the top of the ring by an amount almost equal to the thickness of the bottom. Thus the boat protects the shoe from wetting during the cooling period.

When the completed shoe reaches the stripping station it must be removed from the conveyor and preferably without stopping the latter. Because of the fact that the bottom member at its peripheral edge bulges somewhat and the mold wall is undercut or re-entrant to provide for this contour, it is evident that in order to strip the shoe the sole must be compressed somewhat to pull it free and since the conveyor does not stop the stripper may have difficulty in removing the shoe or may in his attempt to remove it quickly damage the shoe. This danger is minimized by the above construction because the operator removes both the shoe and the ring **16** at the same time, the latter being pulled free by lifting on the shoe or if this does not suffice by lifting on the handles **18—18**. A new ring may then be dropped in place and the empty mold may continue along in readiness for the next operation. Thus the operator has an opportunity to disengage the shoe from the ring without being hurried by the motion of the carrier.

The latch **34**, through to which clamping is effected, is designed so that it can be swung into and out of operative position while the mold is moving.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claim.

I claim:

A mold for attaching shoe bottoms to uppers wherein a liquid coolant is employed to accelerate the cooling of

the mold following attachment of the bottom, comprising a deep wall receptacle having an integral bottom, a part of the surface of the bottom corresponding in shape to the tread surface of the bottom to be attached to the upper, and a groove in the bottom bounding said part corresponding to the tread surface, the bottom of the groove being below said part, said wall constituting the outer side of the groove and sloping upwardly and outwardly therefrom to a level above the normal thickness of the bottom to be attached to the upper, so as to form a circumscribing coolant guard about the upper, a mold ring of tapering cross-section having an inner side corresponding in shape to the side wall of the bottom to be attached to the upper, a lip at its upper edge adapted to project beneath the shoulder of the upper, an outer side for engagement with the sloping wall of the receptacle, and a lower edge adapted to fit into the groove, said ring being disposed in the receptacle and providing, in combination with the bottom, a bottom cavity, handles at the ends of the ring by means of which it may be lifted from or inserted into the receptacle, a clamping element pivotally connected at one end to one end of the receptacle, said element extending lengthwise of the receptacle and having bearing parts spaced lengthwise thereof for engagement with the neck and toe of a last disposed with its bottom in engagement with the top of the molding ring to hold the last against the ring, a nose at the distal end of the clamping element containing a depression, a latch member pivotally mounted at the opposite end of the receptacle adjacent the nose of the clamping element, said latch member being swingable from a vertical position to a horizontal position and having an opening adapted, by swinging of the latch to a vertical position, to pass over the nose at the end of the clamping element, and a spring-pressed pin mounted on the member within the opening for yielding engagement with the depression in the nose to lock the latch in operative position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,830,324	Farmer et al.	Apr. 15, 1958

FOREIGN PATENTS

590,537	Belgium	Aug. 26, 1952
1,012,471	France	July 10, 1952
1,104,176	France	Nov. 25, 1955
1,104,977	France	June 22, 1955
335,190	Italy	Feb. 3, 1936