Aug. 11, 1942. C. H. DANIELS 2,292,930

MACHINE FOR AND METHOD OF PRE-MOLDING HEEL POCKETS IN SHOE UPPERS

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Fig. 1

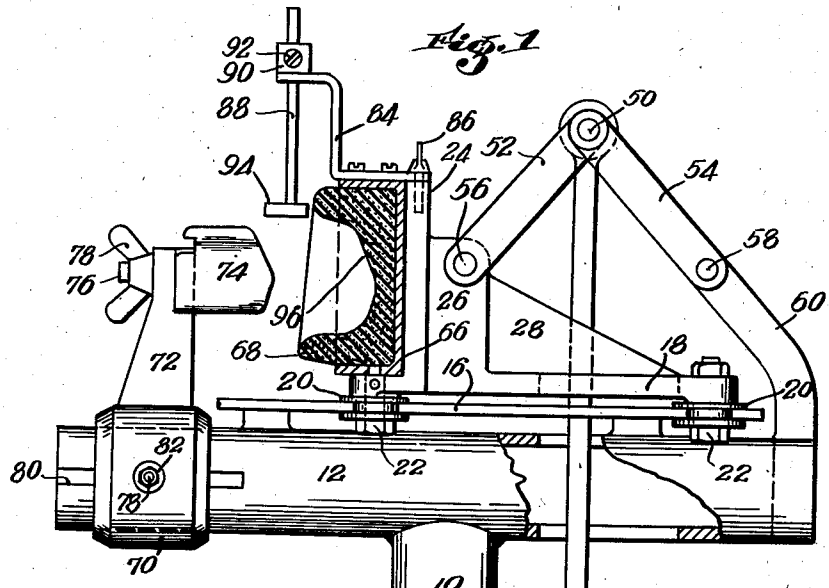


Fig. 2

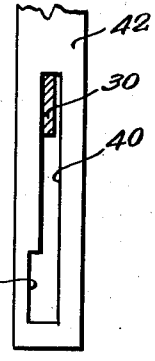


Fig. 3

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Fig. 4

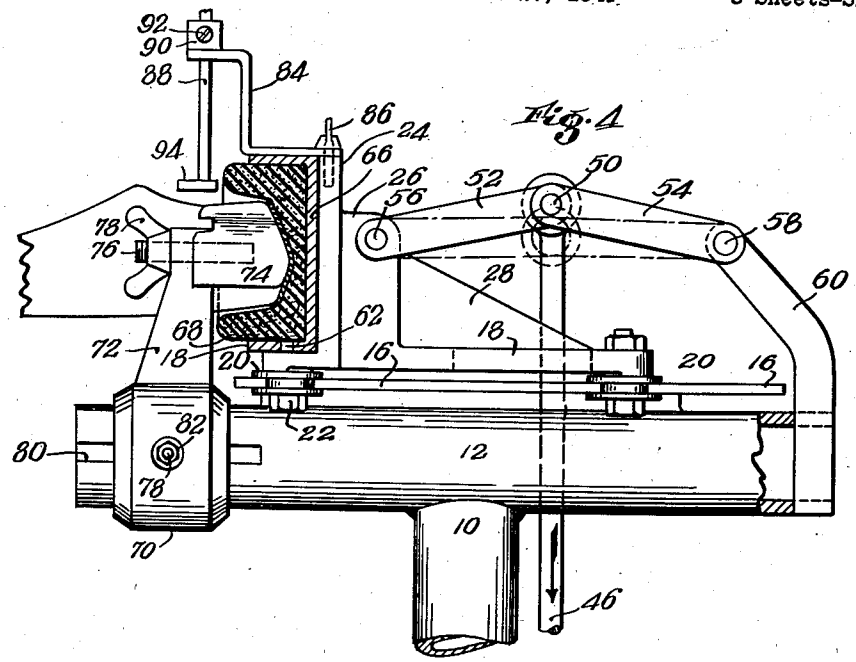


Fig. 5

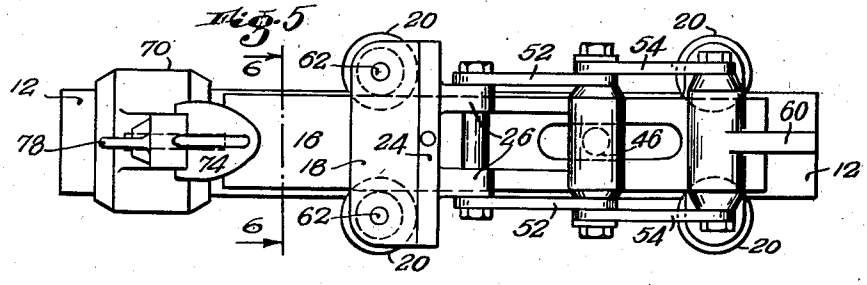


Fig. 6

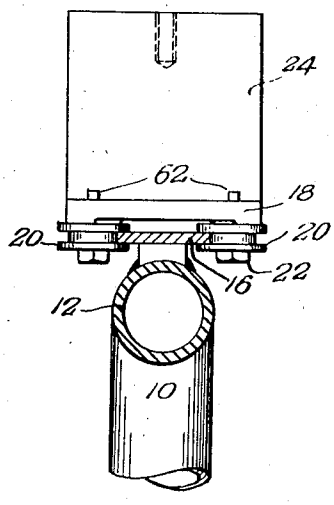
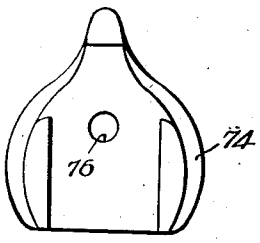


Fig. 7



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MACHINE FOR AND METHOD OF PRE-MOLDING HEEL POCKETS IN SHOE UPPERS

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Fig. 8

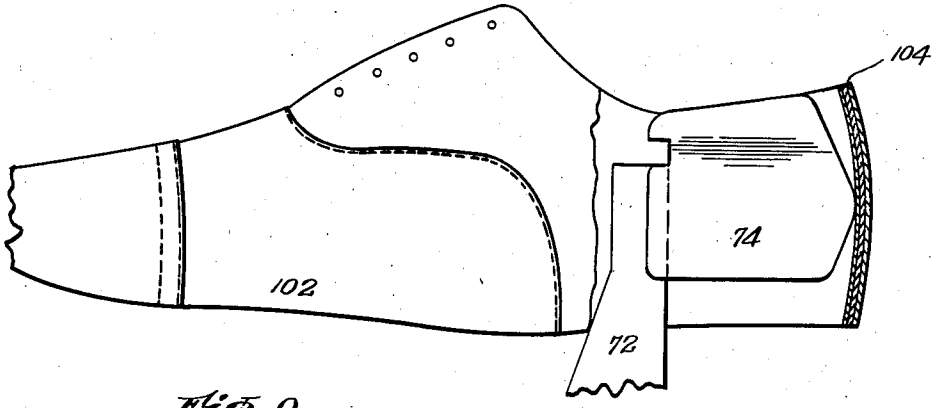


Fig. 9

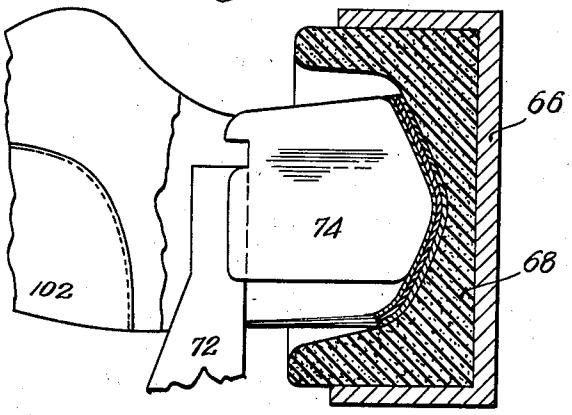


Fig. 12

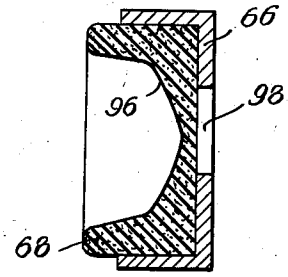


Fig. 13

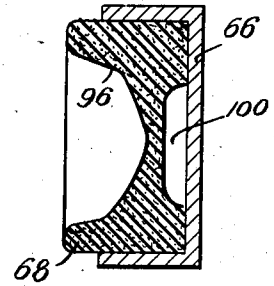


Fig. 10

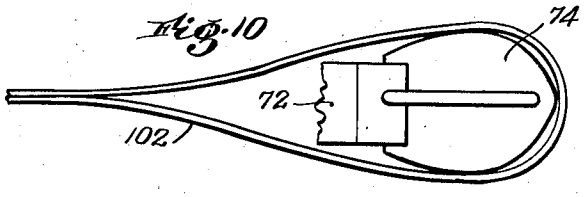
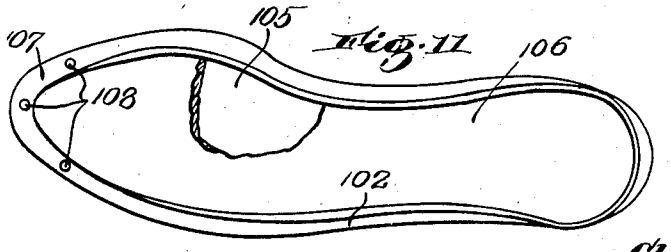


Fig. 11



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UNITED STATES PATENT OFFICE

2,292,930

MACHINE FOR AND METHOD OF PRE-MOLDING HEEL POCKETS IN SHOE UPPERS

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Application January 27, 1941, Serial No. 376,057

8 Claims. (Cl. 12—51)

This invention relates to improvements in the manufacture of shoes and more particularly to improvements in a machine which is used to pre-shape or pre-mold the back portion or quarter of a shoe upper prior to assembly of the shoe upper upon the last; also to improvements in methods of assembling and lasting shoe uppers in which the first step involves pre-shaping or pre-molding the back of the shoe upper before it is assembled upon the last.

In the usual method followed in the manufacture of shoes, the upper is presented to the assembler who inserts the counter stiffener and places the upper on the last and tacks the upper to the last at the back. Usually one tack is placed towards the top of the back of the upper and two tacks are driven to attach the bottom of the upper at the insole to the heel. The assembled upper is then ready to have the toe stiffener inserted and to be pulled over the last. After a pre-molded counter has been inserted in which the counter flange has been turned, corrections for improperly fitted counters cannot readily be made since the position of the counter with respect to the upper will be determined by the counter flange and if the counter is too high, the back of the upper will be correspondingly too high on the back of the last. Furthermore, since it is customary to drive several tacks at the back of the upper to temporarily secure the upper to the last and to the heel portion of the insole, the back of the upper cannot be adjusted with respect to the last during the pulling-over operation even though the counter flange has not been turned. Prior to the side lasting operation the operator may attempt to make some adjustment of the upper with respect to the last, but as indicated above, the counter flange and the tacks at the back of the upper prevent proper adjustment. The tack holes in the back of the upper are objectionable in a finished shoe. In one method of current practice, the quarter portions of the uppers are pre-molded in counter molding machines with metal male and female molds, the female mold being in two parts which results in pinch marks remaining at the back of the upper. If such pre-molded uppers, after being placed on the last, are presented to a heel seat lasting machine, a second line may appear where the flange of the upper is turned over the heel seat as it is practically impossible for the machines to take the exact line of the pre-molding operation in turning the counter flange.

It is an object of my invention to provide an improved machine for pre-shaping or pre-molding the back of a shoe upper but without turning the counter flange to any material extent and without forming pinch marks as the result of the molding.

It is a further object of my invention to provide an improved machine which will stretch and pre-shape or pre-mold the back of a shoe upper adjacent the back seam so as to form the heel pocket to conform to the contour of the rear end of the last.

It is a further object of my invention to provide a machine for pre-shaping or pre-molding the back of a shoe upper as above described prior to assembly of the upper upon the last, which machine is designed to apply a cushioning pressure in stretching and shaping the upper instead of by squeezing the upper to shape between rigid male and female molds, and it is a part of my invention to employ as one of the parts of the mold, material that will yield as the upper is pressed to shape.

More specifically it is an object of my invention to provide a machine having a rigid male mold member shaped to the contour of the back of the last whereby the operator may place the upper over the mold and hold it in correct position while a yielding pressure or resistance is applied to the outer surface of the upper so that the material which forms the layer of the upper is stretched and shaped without injury thereto.

It is a further object of my invention to pre-shape or pre-mold the heel pocket in the back of a shoe upper approximately to the contour of the last by cushioning or yielding pressure and without forming a flat counter flange, then to place the upper upon the last, pulling the upper over the last and temporarily tacking at the forepart but without tacking the back of the upper to the last, then, if necessary, to adjust the back of the upper with respect to the last to the correct position before side lasting, and finally to complete the lasting in any desired manner, including the forming of the heel seat.

Finally it is an object of my invention to provide a machine and method of manufacturing shoes which may result in the production of finished shoes in which the heel portions are properly fitted to the last; in which the top of the back of the upper is at the correct height; in which objectionable tack holes and pinch marks are eliminated; in which the back seams, if present, are straight; in which the feather at the heel seat is properly formed and does not show

marks caused by shaping the heel seat flange at a different line from that of a preliminary molding operation; and to enable the production of such shoes at a lower cost and without expensive molding equipment.

Further objects and advantages of my improvements will be more readily apparent from the following description of a preferred embodiment thereof as disclosed in the attached drawings in which:

Fig. 1 is a side elevation of the machine for shaping heel pockets partially shown in vertical section;

Fig. 2 is a vertical section taken on the plane indicated 2—2 in Fig. 1;

Fig. 3 is a detail side elevation of the rubber shaping member and holder therefor;

Fig. 4 is a side elevation of the top part of the machine in Fig. 1 showing the parts in operative position;

Fig. 5 is a plan view of the top of the machine as shown in Fig. 4, the female die member being removed;

Fig. 6 is a vertical section taken on the plane indicated 6—6 in Fig. 5;

Fig. 7 is an end view of the male mold member;

Fig. 8 is a diagrammatic view partially in section showing the manner in which the upper is held with respect to the male mold member prior to applying pressure thereto;

Fig. 9 is a view similar to Fig. 8 but showing the female mold in section as pressure is applied;

Fig. 10 is a diagrammatic plan view showing the association of the upper with the male mold member as in Fig. 8;

Fig. 11 is a bottom view showing the upper assembled on the last pulled over the insole and tacked at the toe but not at the back; and

Figs. 12 and 13 are sectional views taken through the female mold member and holder therefor showing modified constructions.

The machine as shown in Fig. 1 has a T-shaped pipe frame formed by the vertical member 10 and the horizontal member 12. Suitable legs 14 are fixed to the member 10 to constitute a base for the machine. Fixed to the top of the horizontal pipe 12 is a plate 16 which guides the movement of a carriage 18 through spool rollers 20 fixed to the carriage 18 by bolts 22. The carriage has a vertical plate 24 braced in back by the boss 26 and the web 28. A foot lever 30 is pivoted to one of the legs at 32 and normally returned to a raised position by a spring 34 fastened at 36 to the lever 30 and to a hook 38 which is carried by the vertical support 10. The lever 30 moves in a slot 40 formed in the guide member 42 which is fastened to the support 10. The lower end of the slot 40 is enlarged at 44 to permit the lever 30 to be locked and temporarily held in position while pressure is applied as subsequently described.

The lever 30 is pivotally connected at 48 to a rod 46 which extends to a pivotal joint 50 between a pair of toggle links 52 and 54. The link 52 is pivoted at 56 to the carriage 18, and the link 54 is pivoted at 58 to a bracket 60 fastened to one end of the horizontal support 12. By depressing the foot lever 30 the carriage will be moved to the position shown in Fig. 4. The carriage is provided with locating pins 62 which enter openings 64 formed in the bottom of a holder 66 for supporting the female mold member 68. The horizontal support 12 has mounted thereon a slidably adjustable collar member 70 having an upstanding bracket 72 adapted to mount the male die member 74 which has a fastening bolt 76 secured by the wing nut 78. The slidable support for the male mold member is fixed in adjusted position and held against rotation with respect to the horizontal support 12 by the provision of a bolt 78 engaged in a slot 80 cut in the tubular support 12. A nut 82 serves to tighten the bolt 78.

The carrier 24 has attached thereto a bracket 84 secured by a wing nut 86 to the slider, the bracket 84 serving as a support for a rod 88 adjusted in position with respect to the bracket 84 by the collar 90 and set screw 92. The rod 88 carries at its lower end a guide or locating member 94 the purpose of which will be later described.

The male mold member 74 is preferably of rigid material such as metal, wood, semi-hard rubber or plastic and is designed to shape or mold the back of the shoe upper having an assembled counter stiffener or an upper without a counter substantially to the contour of the last. It is not intended to shape the entire area of the quarter which includes the counter stiffener but to mold the area in which the material must be stretched to some extent to correspond to the vertical and horizontal curvature at the middle of the back of the last. The operation might be termed forming a heel pocket at the back of the shoe upper. The shape of the mold 74 may be somewhat exaggerated to allow for the tendency of the material to spring back after molding. Since only a relatively small area is molded, it is not necessary to have a large number of male dies or molds for every size shoe.

If in shaping the upper the material in the upper is gripped between the male mold member and a rigid female mold, the material is not free to slip and stretch. In the usual counter molding machine the female mold member is in two parts and has a clam-shell action in applying pressure to the male mold. The separation of the female mold member into two parts has a tendency to leave pinch marks at the middle of the back of the quarter which is objectionable. An important feature of my machine and method resides in the use of a female mold member which is yieldable and tends to apply a cushioning pressure against the outside of the upper material which will allow the upper material to stretch and form the pocket. The female mold member may comprise a block of rubber, sponge rubber, or rubber and cork composition, or other material that is not rigid but will yield under pressure. It might be possible to use a female mold member 68 which is not formed with a cavity, since the male mold member will press the upper material into the yieldable female mold, but I prefer to form a cavity such as the cavity 96. The yieldable mold member 68 must be rigidly held such as by the holder 66 so that at least the sides of the female mold member 68 are securely held but the thickness of the rubber or other yieldable material axially with respect to the male mold member should be sufficient to permit yielding so that the upper material is not tightly gripped. I have shown in Fig. 12 a modification in which the holder 66 is provided with an opening 98 in the middle thereof so that the center of the cavity 96, formed in the rubber member 68, is free to stretch into the opening 98. Another arrangement might be as illustrated in Fig. 13 in which the holder 66 is made the same as in Fig. 1 but the rubber member 68 having a

front cavity 96 is also provided with a cavity 100 in the back thereof to permit the central portion of the rubber member 68 to stretch as pressure is applied.

The closed upper 102 is placed in position with respect to the male mold member 74 as shown in Fig. 8, the top edge 104 at the back of the upper being positioned by the locating member 94 adjacent the top of the male mold member 74. The operator, by pulling on the toe portion of the upper, is able to center the back of the upper with respect to the male mold member. Then by stepping on the pedal 30 pressure is applied by movement of the carrier for the female mold member towards the male mold member and the back of the upper is shaped as shown in Fig. 9.

After the upper has been pre-shaped by the machine, it is ready to be assembled on the last 105 with the insole 106 as illustrated in Fig. 11. The upper is pulled over the insole and the margin 107 at the toe tacked in position such as by the tacks 108, but the back or heel portion of the upper is left free with respect to the last. The upper will tend to seat itself in the correct position on the last because of forming the heel pocket, but before the side lasting operation a slight adjustment may be made necessary.

Although my machine and method has been described and is particularly suitable for working upon closed uppers, it will be understood that separate quarter portions could be similarly pre-shaped or pre-molded before being attached to the forepart of the upper. The quarters of complete uppers may have assembled counter stiffeners and it may be desirable to place the counter stiffeners in temper before molding. It will be noted that in the pre-molding operation the counter flange is not turned flat so as to make a sharp break, but it may be desirable to turn the flange somewhat so as to make it easier to finally form a flat heel seat by the heel seat lasting operation. After the upper has been placed on a last, pulled over and temporarily tacked, it is ready to be side lasted and the operator of the side laster may adjust, if necessary, the back of the upper with respect to the last so that it will be at the correct height. After the upper has been side lasted, the toe and heel may then be lasted in any desired manner. Since the back of the upper is not tacked to the last it is easier to complete the lasting while keeping the back seam, if there is a back seam, straight. The finished appearance of the shoe is improved since there are no tack holes in the back of the upper, the molding does not leave pinch marks and the heel seat flange will be properly turned.

The effective molding or shaping to pressure may be adjusted by changing the position of the normally stationary male mold member with respect to the frame. Adjustments may be made to suit the particular character of the materials which make up the upper and the type and thickness of the counter stiffener.

Although I have disclosed a manually operated machine it will be understood that the machine could readily be designed for power operation. For increased production the head of the machine could be in the form of a turret so that uppers are held under pressure while other uppers are being placed in position or taken off the machine. The machine may be used to mold quarter blanks separate from the forepart and such blanks may be flat or rolled before being shaped or molded by my machine.

I claim:

1. In a machine for pre-shaping the back of a shoe upper prior to lasting, a stationary male mold member of rigid material over which the back of an upper may be placed and held by the operator during molding, a compressible female mold member having a cavity therein, means for moving said female mold member against the outer surface of the back of the upper positioned around said male mold member, the center portion of the cavity of said female mold member being free to stretch and yield as pressure is applied to the sides thereof.

2. In a machine for pre-shaping the heel pocket in a shoe upper, a frame, male and female mold members mounted on said frame for relative movement with respect to each other, and means for closing the molds under pressure to shape the heel pocket in a shoe upper inserted between the molds, the female mold member comprising a block of resiliently yieldable material, said block being larger than said male mold member and having a cavity formed therein to receive and enclose the male mold member, and means for confining said block at the sides thereof.

3. In a machine for pre-shaping the heel pocket of a closed shoe upper prior to lasting, a frame, an upright support for a male mold member adjustably fixed in position on said frame, a relatively hard male mold member removably carried by said support, a flat guide plate mounted on said frame, a carrier slidably associated with said guide plate, said carrier having a box-shaped holder facing towards said male mold member, a pair of toggle members pivotally attached to the frame and the carrier and to each other, a foot pedal pivotally mounted on said frame, a link extending from said foot pedal to said toggle members whereby operation of said foot pedal serves to move the carrier towards the male mold member, and a block of relatively soft material fitted in the box-shaped holder of said carrier, said block being wider and higher than said male mold member and having a cavity formed therein adapted to receive and enclose the male mold member, said box-shaped holder serving to confine said block against spreading at the sides thereof.

4. In a method of manufacturing shoes the steps which consist in pre-shaping and unifying the back of a shoe upper having a counter stiffener adhesively united to the quarter prior to lasting but without materially turning the counter flange, then assembling the upper and insole on the last, then pulling the upper over the insole and temporarily tacking at the toe but not at the heel portion whereby the heel portion is free to be adjusted with respect to the back of the last, then lasting the shoe in the usual manner.

5. In a machine for pre-shaping a part of a shoe upper to the approximate contour of a part of a last before the upper has been applied to the last comprising relatively movable male and female mold members, the male member being composed of metal the effective working surface of which is shaped to the approximate curvature horizontally and vertically of the part of the last, the female member comprising a block of resiliently yieldable rubber-like material having a pre-formed cavity shaped to receive the male member and a rigid holder for said block, said holder engaging the block around the sides thereof to resist lateral spreading, the center portion of said block at the bottom of the cavity therein

being free to stretch as the male and female members are moved into association whereby the compression against the part of the shoe upper confined between the male and female members is produced by the resilient stretching of the center portion of said block.

6. In a machine for pre-shaping the back of a shoe upper to the approximate contour of the rear end of a last before the upper has been applied to the last comprising relatively movable male and female mold members, the male member being composed of metal the effective working surface of which is shaped to the approximate curvature horizontally and vertically of the rear end of the last, the female member comprising a block of resiliently yieldable rubber-like material having a pre-formed cavity shaped to receive the male member and a rigid holder for said block, said holder engaging the block around the sides thereof to resist lateral spreading, said holder having an opening in the back thereof to permit the center portion of said block to stretch into said opening as the male and female members are moved into association whereby the compression against the back of the shoe upper confined between the male and female members is produced by the resilient stretching of the center portion of said block.

7. In a machine for pre-shaping the back of a shoe upper to the approximate contour of the rear end of a last before the upper has been applied to the last comprising relatively movable male and female mold members, the male member being composed of metal the effective working surface of which is shaped to the approximate curvature horizontally and vertically of the rear end of the last, the female member comprising a block of resiliently yieldable rubber-like material having a pre-formed cavity shaped to receive the male member and a rigid holder for said block, said holder engaging the block around the sides thereof to resist lateral spreading, said block having a second cavity formed in the back thereof to permit the center portion of said block between the cavities to stretch as the male and female members are moved into association whereby the compression against the back of the shoe upper confined between the male and female members is produced by the resilient stretching of the center portion of said block.

8. In a method of manufacturing shoes the steps which consist in forming a closed upper, inserting a counter stiffener between the quarter and the lining at the rear of the upper, applying adhesive for the purpose of securing the counter to the quarter and lining, then applying a molding pressure to the rear portions only of the assembled quarter, counter and lining to unify said parts together and to shape said parts to the approximate contour of the rear end of the last, then loosely inserting a last having an insole temporarily secured thereto into the closed shoe upper, then pulling the upper at the toe over the insole and temporarily tacking while the rear portion of the upper is assembled on but unsecured to and free to slip with respect to the rear end of the last, then after pulling, adjusting the rear part of the upper to the proper height with respect to the last if necessary and finally lasting the shoe in the usual manner.

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