

July 26, 1938.

M. CUOZZO

2,124,545

ATTACHING HEELS TO SHOES

Filed May 22, 1936

3 Sheets-Sheet 1

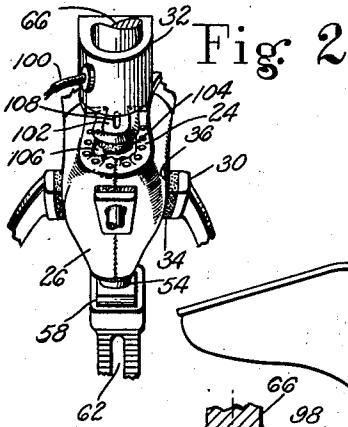


Fig. 2

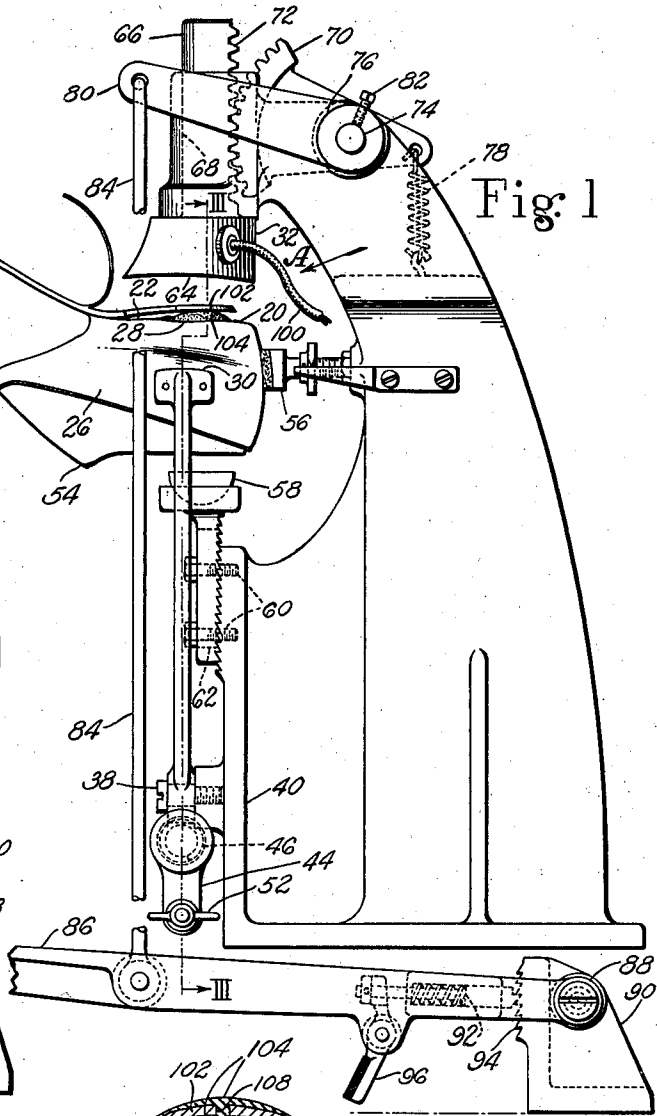


Fig. 1

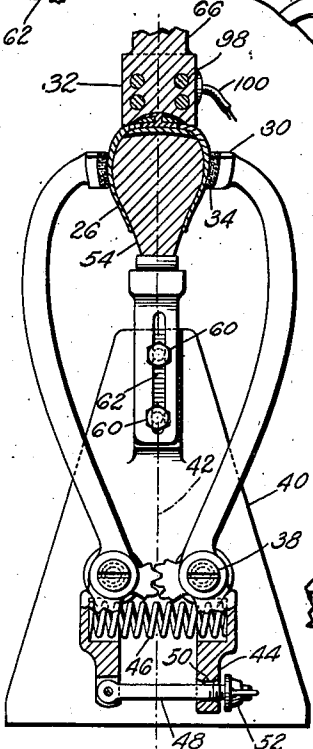


Fig. 3

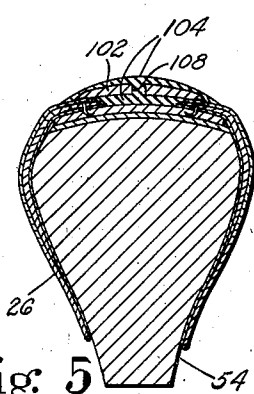


Fig. 5

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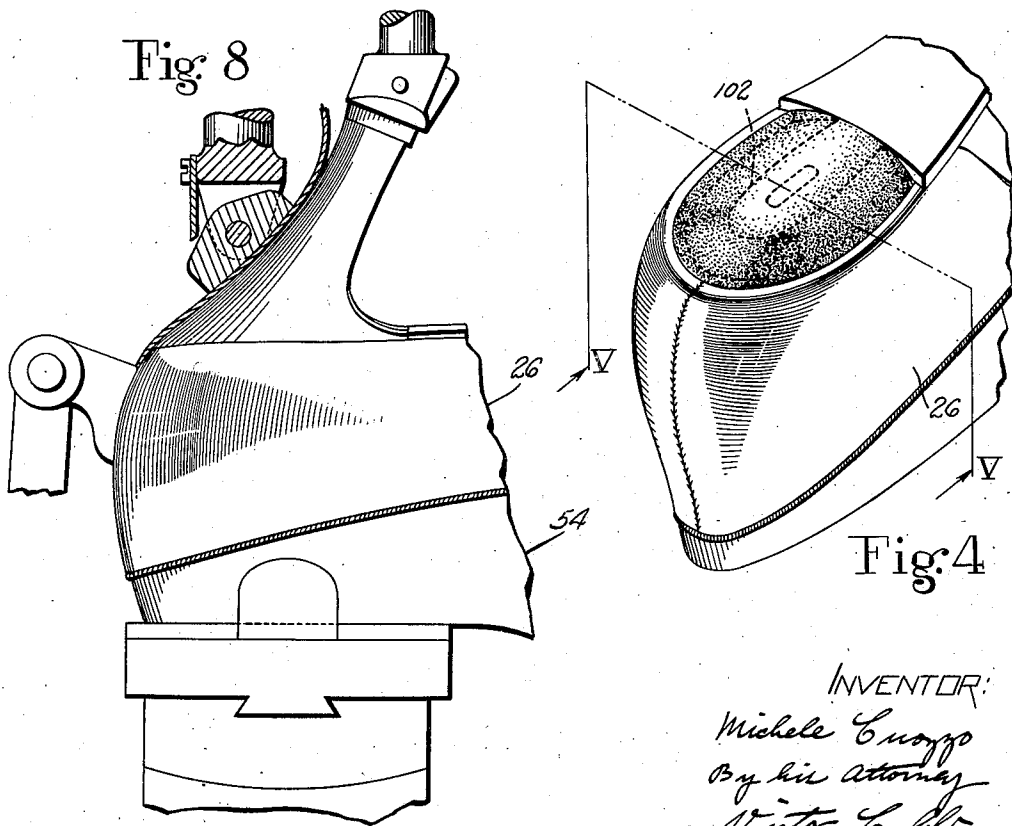
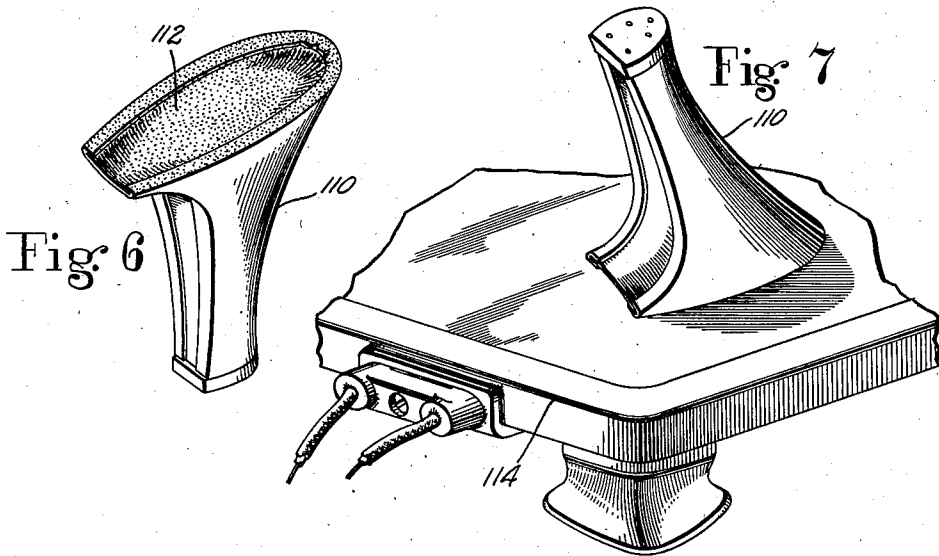
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3 Sheets-Sheet 2



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ATTACHING HEELS TO SHOES

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3 Sheets-Sheet 3

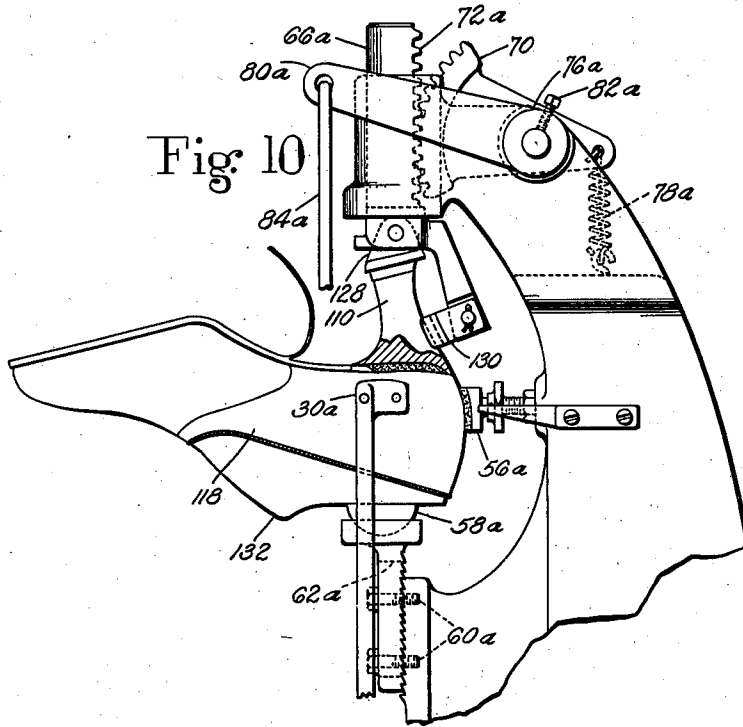


Fig. 10

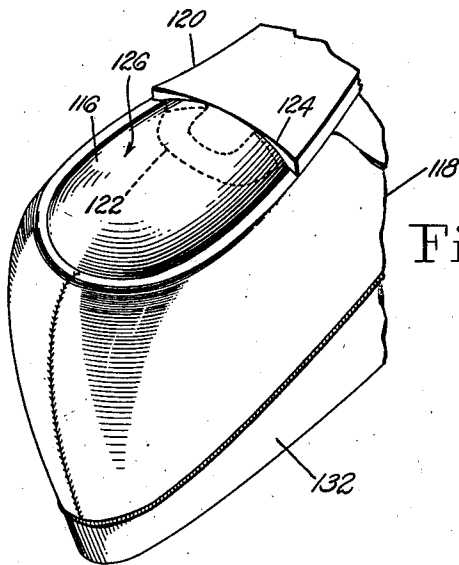


Fig. 9

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UNITED STATES PATENT OFFICE

2,124,545

ATTACHING HEELS TO SHOES

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Application May 22, 1936, Serial No. 81,306

12 Claims. (Cl. 12—147)

This invention relates to the manufacture of shoes and is illustrated with reference to a method of shaping the heel seats of shoes for the reception of heels.

5 The front and rear ends of the overlasted counter portion of a woman's shoe are commonly higher than the sides of the overlasted counter portion of the shoe with the result that a heel attached to the shoe bridges the sides of the heel seat, thereby forming gaps between the rim of the heel and the sides of the counter portion of the shoe. Such a condition is objectionable since it is desirable that the entire rim of the attaching face of the heel shall snugly engage the counter portion of the shoe, thereby insuring that the side and rear faces of the heel merge attractively with the counter portion of the shoe.

10 In accordance with a feature of this invention I propose to wipe limited areas of the sides of the counter portion of a shoe mounted upon a last toward the heel seat of the shoe by the use of yieldable supports, while a mold or a heel which is to be adhesively secured to the shoe is forced against the heel seat, and then to apply heavy molding pressure against the heel seat through the mold or the heel while maintaining the supports in clamped relation with the sides of the counter portion of the shoe, thereby insuring that in the finished shoe gaps such as above mentioned shall not be formed between the rim of the heel and the sides of the counter portion of the shoe.

15 In accordance with another feature of the invention I propose to provide upon the heel seat of the shoe a thick molded mass of adhesive material the exposed surface of which is complementary to the attaching face of a heel to be attached to the shoe, and then to force the heel with clamping pressure against the heel seat. By providing a heel seat such as above described the heel may be attached to the shoe without danger of it becoming loose during the subsequent finishing operations and until the heel has been permanently attached to the shoe by screws or nails which are driven from the inside of the shoe after the last has been pulled.

20 The invention will be better understood and appreciated from the detailed description thereof read in connection with the accompanying drawings, in which

25 Fig. 1 is a side elevation partly broken away of a heel-seat molding machine in which a shoe is positioned, preparatory to operating upon the same;

Fig. 2 is a perspective view of the machine and the shoe illustrated in Fig. 1 as viewed in the direction indicated by arrow A of Fig. 1;

Fig. 3 is a sectional view taken along line III—III of Fig. 1 after a heel-seat forming mold of the machine operating against the heel seat of the shoe has forced a last upon which the shoe is mounted, with considerable pressure against an abutment of the machine;

Fig. 4 is a perspective view showing the molded heel-seat portion of the shoe illustrated in Fig. 3;

Fig. 5 is a transverse section taken along the line V—V of Fig. 4;

Fig. 6 shows in perspective a heel the attaching face of which has been covered with a thin film of thermoplastic cement;

Fig. 7 is another perspective view showing the heel of Fig. 6 placed attaching face downwardly upon a stove;

Fig. 8 is a side view, partly in section, of a portion of a heel-attaching machine in the process of applying the heel shown in Fig. 6 to the heel seat of the shoe shown in Fig. 4;

Fig. 9 is a perspective view of the rear end of a shoe the heel seat of which has been built up by a piece of adhesive pre-formed prior to its application to the shoe; and

Fig. 10 is a side view of a heel-attaching machine equipped with counter wiping mechanism such as illustrated in Figs. 1 and 3, in the process of attaching the heel of Fig. 6 to the heel seat of the shoe illustrated in Fig. 9.

As above stated, the rear and forward parts 20, 22 (Fig. 1) respectively, of the overlasted counter portion 24 (Fig. 2) of a shoe 26 are commonly higher than the sides 28 (Fig. 1) of the overlasted counter portion with the result that in the finished shoe the rim of the attaching face of the heel of the shoe bridges the sides of the overlasted counter portion and is therefore slightly spaced therefrom. Such a condition mars the general appearance of the shoe since it is desirable that the side and rear faces of the heel shall merge attractively with the counter of the shoe. In order to insure that gaps shall not be formed between the rim of the attaching face of the heel and the sides of the counter portion of the shoe, the illustrated heel-seat molding machine is provided with wipers 30 which are movable away from each other and yieldingly support the shoe 26 against downward pressure exerted by a heel-seat forming mold 32. The wipers 30 comprise pads 34 shaped to engage limited areas 36 (Fig. 2) of the sides of the counter portion of the shoe. The

wipers 30 are pivoted upon screws 38, respectively, secured to the frame 40 of the machine and are geared together for movement toward and away from a central plane 42 (Fig. 3) of the machine. Depending extensions 44 (Figs. 1 and 3) of the wipers 30 are recessed to house the respective ends of a spring 46 which normally urges the wiper pads 34 toward each other. In order to limit movement of the wiper pads 34 toward each other under the action of the spring 46 there is provided a bolt 48 (Fig. 3) one end of which is pivotally secured to one of the extensions 44 and the other end of which passes through an opening 50 of the other extension and is in threaded engagement with a nut 52.

The operator grasps the forepart of the inverted shoe 26 mounted upon a last 54 or upon another suitable form and places the heel end of the shoe upon the wipers 30, the rear end of the shoe being moved into engagement with a back gage 56 (Fig. 1) which has been previously adjusted lengthwise of the shoe. When the shoe is first placed upon the wipers 30 the last 54 is spaced from an abutment 58 (Fig. 1) which may be located in different heightwise positions with relation to the frame of the machine, in accordance with the height of the last. Screws 60 which are in threaded engagement with the machine frame and pass through an elongated opening 62 in a shank of the abutment 58 serve to secure the abutment in different adjusted positions to the machine frame.

The mold 32 has an operating face 64 (Fig. 1) which is substantially a counterpart of the attaching face of a heel to be attached to the shoe, and comprises a shank 66 shaped to fit within a vertical guideway 68 (Fig. 1) of an overhanging portion of the machine frame. In order to raise or lower the mold 32 along the guideway 68 there is provided a segmental gear 70 which meshes with a rack portion 72 of the shank 66 of the mold and is secured to a shaft 74 mounted in bearings 76 of the machine frame. A spring 78 connected to an extension of the segmental gear 70 normally urges the mold 32 to its raised position against the frame of the machine.

A lever 80 is secured by a screw 82 to the shaft 74, the forward end of the lever being pivotally connected to a rod 84. The lower end of the rod 84 is pivotally connected to a treadle 86 swiveled upon a screw 88 carried by a block 90. When the treadle 86 is depressed the mold 32 is forced against the heel seat of the shoe yieldingly supported by the wipers 30 until the cone of the last 54 engages the abutment 58. Further downward movement of the treadle 86 causes the heel seat of the shoe to conform to the operating face 64 of the mold 32.

In order to retain the mold 32 in clamped relation with the molded heel seat for a short period, the treadle 86 is locked in its lowered position through the provision of a pawl 92 which is slidingly mounted in the treadle and engages a serrated face 94 of the block 90. In order to release the treadle 86 to cause the mold 32 to be raised away from the shoe under the action of the spring 78 the operator presses a release pedal 96, thereby causing the pawl 92 to be moved away from the serrated face 94 of the block 90. To expedite the heel-seat forming operation the mold 32 is provided with a resistance unit 98 connected by lead wires 100 to a suitable source of electricity.

It is common practice to secure the heel temporarily to the shoe by adhesive until the various

shoe-finishing operations have been performed, the heel being permanently attached to the shoe by screws or nails driven from the inside of the shoe after the last has been pulled. It is also common practice to secure a tab or tongue formed at the rear end of the sole, to the heel end of the shoe by a plurality of tacks, a filler such, for example, as a piece of leather, having been inserted beneath the tab in order to fill the cavity formed by the insole of the shoe and the margins of the overlapped counter portion of the shoe. It frequently happens that the tacks do not effectively secure the tab to the shoe upper, and under such conditions the adhesive bond between the heel and the margin of the heel seat of the shoe is frequently not sufficient to retain the heel in position upon the shoe between the temporary and permanent heel-attaching operations. With the foregoing in view, I propose to insert beneath a tab 102 (Figs. 1 and 2) a mass of moldable adhesive 104 such, for example, as thermoplastic cement, preparatory to molding the heel seat by the use of the above machine. When the heated mold 32 is forced against the heel seat of the shoe the adhesive 104, after filling up the cavity 106 (Fig. 2) beneath the tab 102, flows through a slot 108 formed in the tab and over the top of the tab, thereby providing a heel seat (Figs. 4 and 5) the exposed surface of which is substantially complementary to the operating face 64 of the mold and to the attaching face of a heel 110 (Figs. 6 and 9) to be secured to the shoe. The adhesive, in addition to building up the heel seat of the shoe to the proper shape, effectively secures the tab 102 to the upper.

In accordance with a preferred practice, before the heel 110 is placed upon the heel seat of the shoe, a thin film of adhesive 112 (Fig. 6) is applied to the attaching face of the heel, the heel then being placed attaching face downwardly upon a stove 114 until it is ready to be attached to the shoe by the use of a machine (Fig. 8) such, for example, as disclosed in United States Letters Patent No. 2,076,537, granted April 13, 1937, on an application filed in the name of Lewis J. Bazzoni.

The adhesive may be preformed before its application to the heel seat of the shoe. In Fig. 9 there is illustrated a preformed piece of thermoplastic adhesive 116 which has been positioned upon the heel seat of a shoe 118 having a short outsole 120, a tab 122 of which extends a short distance rearwardly of the heel-breast line 124 of the sole. The exposed face 126 of the piece of thermoplastic adhesive 116 is substantially complementary to the attaching face of a heel to be attached to the shoe and is sufficiently plastic to insure that the heel is effectively secured to the shoe after being forced with clamping pressure against the heel seat of the shoe. In order to insure that the thermoplastic adhesive 116 placed upon the heel seat shall remain heated to the proper temperature until the heel is applied to the shoe, the heel end of the shoe may be temporarily placed in a suitable oven.

In Fig. 10 there is illustrated a heel-attaching machine comprising wipers 30a which are identical with the wipers 30, the sides of the counter of the shoe 118 being wiped upwardly against the sides of the rim of the attaching face of the heel 110 at the same time that the heel is attached to the shoe, thereby insuring that the above-mentioned gaps shall not be formed between the sides of the counter portion of the shoe and the rim of the attaching face of the heel. As tread and

back blocks 128, 130 (Fig. 10) respectively force the heel against the heel seat of the shoe, the wipers 39a yieldingly force the sides of the counter portion of the shoe against the rim of the attaching face of the heel. When a last 132 upon which the shoe is mounted engages an abutment 58a further downward pressure of the heel causes the heel to be securely attached to the shoe, the wipers during the attaching operation remaining in clamped relation with the counter portion of the shoe. Since the abutment 58a, the back gage 56a, and mechanism for operating the tread and back blocks 128, 130 are substantially identical to corresponding portions of the molding machine illustrated in Fig. 1 it will not be necessary to describe the construction and operation of these members in detail. Accordingly, the parts of the heel-attaching machine (Fig. 10), which are substantially identical to corresponding parts of the heel-seat molding machine (Fig. 1), have been given respectively the same numerals, each with an exponent *a*.

Although the thermoplastic adhesive may be molded under pressure of the heel as above described, it is preferable to use a heated mold the operative face of which is substantially the counterpart of the attaching face of the heel to be applied to the shoe, since the molding operation relieves to a considerable extent the strain upon the heel, which strain may be excessive when a very heavy molding pressure is exerted against the heel in distributing the thermoplastic adhesive over the heel seat. Whether the heel seat is molded under pressure of the mold or under pressure of the heel it is usually advantageous first to apply a thin film of tacky thermoplastic adhesive to the attaching face of the heel as above described.

In accordance with one method of procedure the operator, after adjusting the abutment 58 (Fig. 1) and the back gage 56, inserts a mass of moldable thermoplastic adhesive 104 beneath the tab 102 and positions the shoe 26 upon the wipers 30. The treadle 86 is then depressed to move the heated mold 32 downwardly against the heel seat of the shoe. As the mold 32 is lowered the wipers 30 are forced apart against the action of the spring 46, the sides 36 (Fig. 2) of the counter of the shoe being wiped upwardly against the lateral edges of the operating face 64 of the mold, thereby insuring that when the heel 110 is attached to the shoe no gaps shall be formed between the counter of the shoe and the sides of the rim of the attaching face of the heel. Final forming pressure of the mold 32 against the heel seat is applied after the last 54 has been moved into engagement with the abutment 58, the wipers 30 effectively holding the sides of the counter against the mold during the molding of the heel seat. As above stated, the treadle 86 is retained in its lowered position by the engagement of the pawl 92 with the serrated face 94 of the block 90. After a short dwell the trip lever 96 is swung rearwardly to move the pawl 92 away from the block 90, the mold being raised under the action of the spring 78. The heel 110, the attaching face of which has been coated with thermoplastic adhesive 112 heated until it is tacky, is then attached to the shoe by a suitable heel-attaching machine (Fig. 8).

The illustrated machine by the use of which the above method may be practiced is disclosed and claimed in application for United States Letters Patent Serial No. 118,625, filed December 31, 1936 in my name.

It has been found that certain adhesives have a tendency to stick to the mold. Such a tendency may be reduced to a minimum by providing an aluminum mold or by occasionally applying oil to the operating face of the mold.

Although the shoe (Fig. 4) is illustrated as having a large tab 102 which overlaps the overlasted counter portion 24 of the shoe, it will be understood that the shoe may be provided with a short outsole 120 having a tab 122 (Fig. 10) or may be provided with a short outsole which terminates at the heel-breast line of the shoe.

Having fully described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. The method of attaching a heel to a shoe which comprises, providing upon the heel seat of the shoe a thick molded mass of adhesive material the exposed surface of which is complementary to substantially the entire attaching face of the heel, and thereafter forcing the heel with clamping pressure against the heel seat of the shoe.

2. The method of attaching a heel to a shoe which comprises, placing upon the heel seat of the shoe a quantity of adhesive material the exposed surface of which is approximately complementary to the cavity of the attaching face of the heel, thereafter positioning the heel upon the shoe, and pressing the positioned heel with clamping pressure against the heel seat of the shoe.

3. The method of attaching a heel to a shoe which comprises, placing upon the heel seat of the shoe a quantity of adhesive material, acting upon the material to force it into the extremities of the cavity of the heel seat of the shoe and to impart to its outer surface a shape corresponding to that of the attaching face of the heel, thereafter positioning the heel upon the shoe, and forcing the positioned heel with clamping pressure against the heel seat of the shoe.

4. The method of attaching a heel to a shoe which comprises, providing upon the heel seat of the shoe a thick mass of adhesive material the exposed surface of which is complementary to the attaching face of the heel, applying a thin film of heated adhesive to the attaching face of the heel, and thereafter forcing the heel with clamping pressure against the heel seat of the shoe.

5. The method of attaching heels to shoes which comprises, providing a shoe an attached sole of which has a heel-seat tab provided with a slot, placing a mass of moldable adhesive beneath the tab, forcing a mold against the heel seat of the shoe to shape the overlasted counter portion of the shoe and to force the tab against the adhesive thereby causing the same to be distributed around the tab, positioning a heel upon the heel seat of the shoe, and forcing the positioned heel with clamping pressure against the heel seat to attach the heel to the shoe.

6. The method of operating upon shoes which comprises, placing a mass of moldable adhesive upon the heel seat of a shoe, forcing a mold against the heel seat of the shoe to shape the same in accordance with the shape of the mold, applying a thin film of adhesive to the attaching face of the heel, heating the attaching face of the heel, and applying the heel under clamping pressure to the molded heel seat of the shoe while the adhesive on the heel seat is readily moldable.

7. The method of operating upon shoes which comprises, supporting a shoe mounted upon a last by engagement with the sides only of the counter portion of the shoe, forcing a mold

against the heel seat of the shoe while the sole is so supported thereby wiping the sides of said counter portion against the mold, and thereafter supporting the shoe through the last and forcing the mold with heavy pressure against the heel seat while retaining the sides of the counter in engagement with the mold thereby insuring that gaps shall not be formed between the counter portion of the finished shoe and the rim of the attaching face of a heel secured to the shoe.

8. The method of attaching a heel to a shoe which comprises, simultaneously molding the heel seat of the shoe and forcing the central portions of the sides of the counter portion of the shoe toward said heel seat without forcing the front and rear ends of said counter portion toward the heel seat, and thereafter attaching the heel to the shoe.

9. The method of attaching a heel to a shoe which comprises, moving the central portions of the sides of the counter portion of the shoe but not the front and rear ends of said counter portion toward the heel seat of the shoe to insure that the sides of the heel seat shall be raised to the general level of the front and rear ends of the heel seat, molding the heel seat of the shoe under heavy pressure for a short period while the sides of the counter portion of the shoe are

forced toward the heel seat of the shoe, and attaching a heel to the heel seat of the shoe.

10. The method of operating upon shoes which comprises, interposing adhesive between the heel seat of a shoe and a heel, forcing the heel with initial pressure against the heel seat while forcing wiping members against opposite sides of the counter portion of the shoe thereby raising the sides of the heel seat with relation to other portions of the heel seat, and forcing the heel under heavy molding pressure against the heel seat while supporting the shoe through the last and while the wiping members are forced against the sides of the counter portion of the shoe.

11. A shoe having a sole provided with a tab at its rear end, a mass of molded material above and below the tab, the heel-engaging surface of said material being convex, and a heel having its concave attaching face seated on said convex surface.

12. A shoe having a sole provided at its rear end with a tab having an opening extending through it, a mass of molded material above and below the tab and filling the opening, the heel-engaging surface of said material being convex, and a heel having its concave attaching face seated on said convex surface.

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