Dec. 23, 1947. M. L. DODGE 2,433,266

SHOE UPPER SHAPING AND SMOOTHING MACHINE

Original Filed June 14, 1944 2 Sheets-Sheet 1

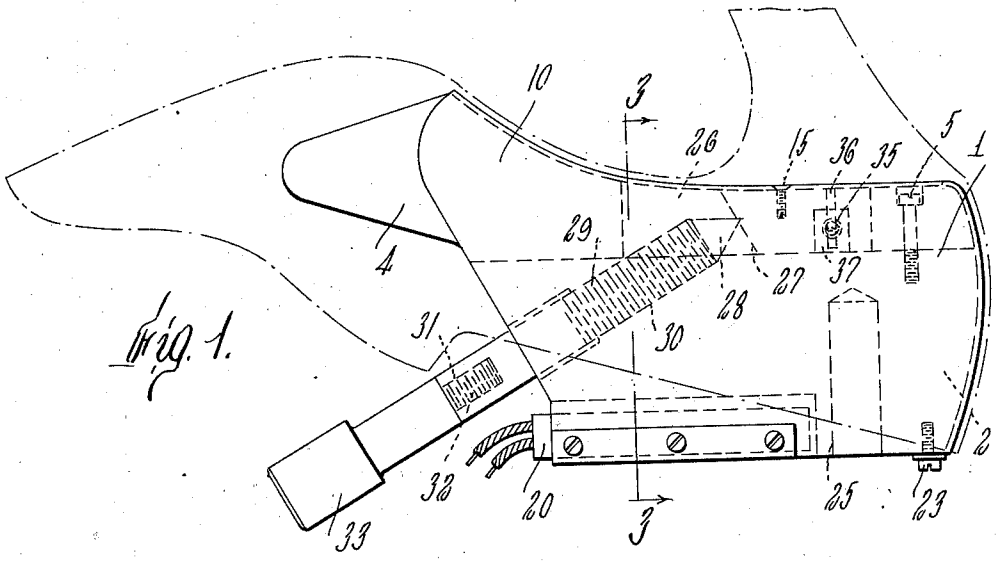


Fig. 1.

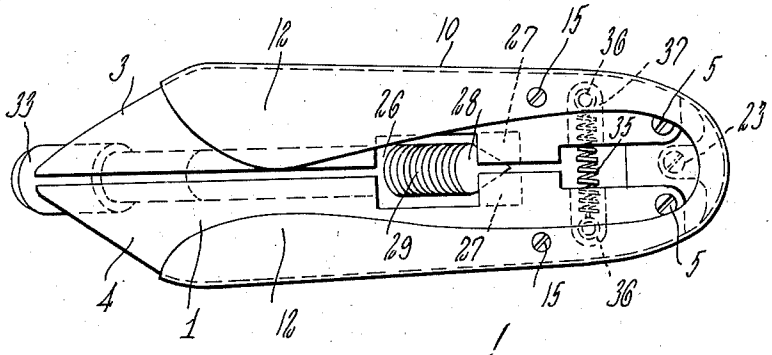


Fig. 2.

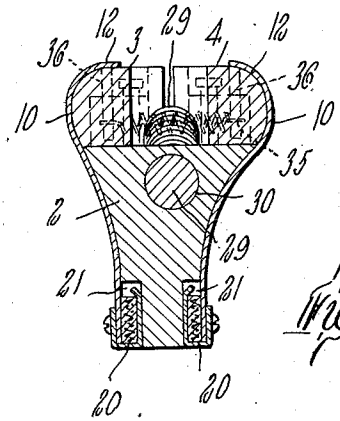


Fig. 3.

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SHOE UPPER SHAPING AND SMOOTHING MACHINE

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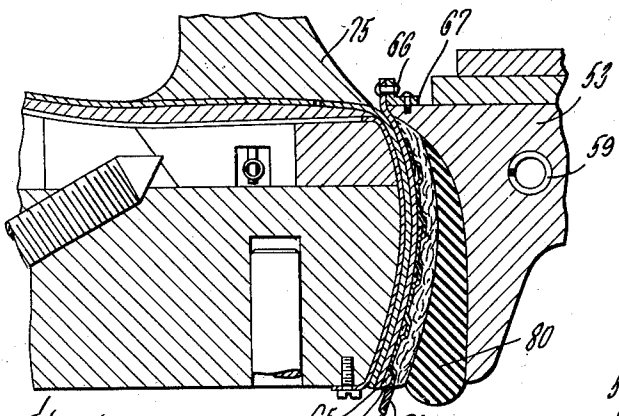


Fig. 4.

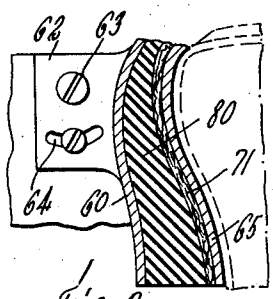


Fig. 6.

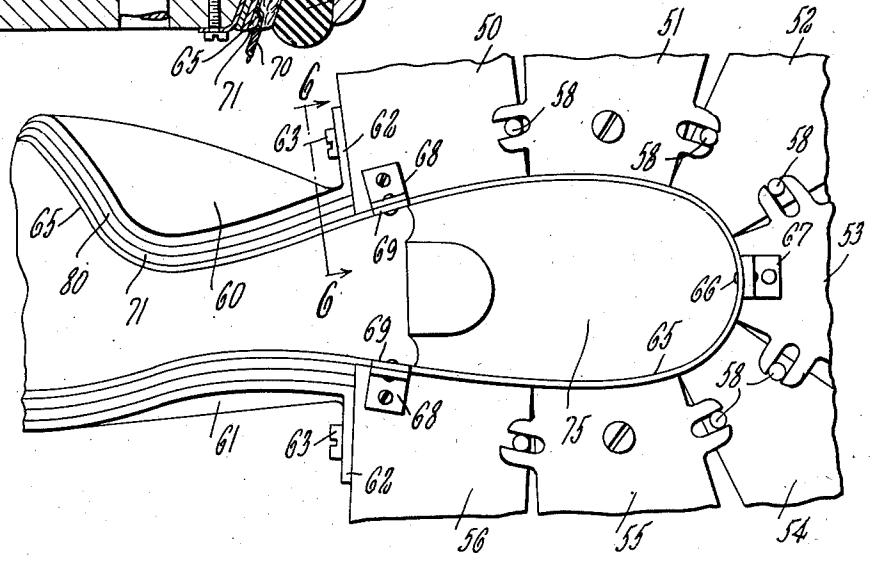


Fig. 5.

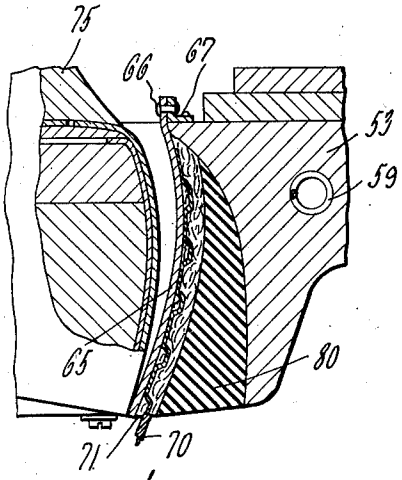


Fig. 7.

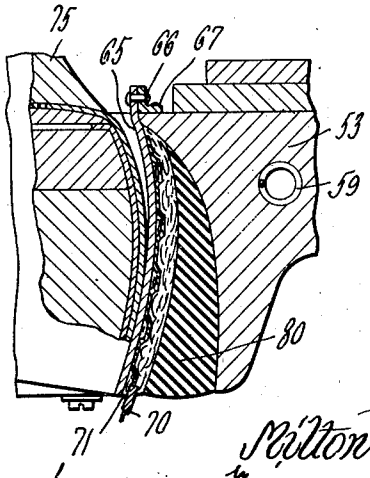


Fig. 8.

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2,433,266

UNITED STATES PATENT OFFICE

2,433,266

SHOE UPPER SHAPING AND SMOOTHING MACHINE

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Original application June 14, 1944, Serial No. 540,209. Divided and this application June 22, 1945, Serial No. 600,924

8 Claims. (Cl. 12—51)

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This invention relates to machines for shaping and smoothing the uppers of shoes, and more especially as applied to shoes having heels of the wood heel type.

It has for one object to shape the upper adjacent to the heel so that its contour merges with the contour of the heel adjacent thereto.

A further object of the invention is to smooth out both the lining and the upper around the heel end of the shoe and well into or even throughout the shank portion of the shoe.

Still another object is to turn in the upper and narrow the rear portion of the rim of the shoe opening, improving the appearance and fit of the shoe.

Another object is to produce all of these desirable actions on the shoe in a single operation.

A further object is to produce a form for holding the shoe, the form having means for facilitating the various operations.

This application is a division of my application Serial Number 540,209, filed June 14, 1944, for Shoe upper shaping and smoothing machine.

For a complete understanding of this invention, reference may be had to the accompanying drawings in which

Figures 1 and 2 are side and top plan views, respectively, of a form for supporting a shoe, the position of a shoe supported thereon being shown in broken lines in Figure 1.

Figure 3 is a detail sectional view on line 3—3 of Figure 1.

Figure 4 is a fragmentary central vertical sectional view through the form and a shoe thereon and an outer pressing element in full pressing position.

Figure 5 is a fragmentary top plan view of the parts shown in Figure 4 and also showing the side pressing elements in pressing position.

Figure 6 is a detail sectional view on line 6—6 of Figure 5.

Figures 7 and 8 are views somewhat similar to a portion of Figure 4, but showing earlier and successive stages in the pressing and forming operation.

Referring first to Figures 1, 2 and 3, a shoe supporting form 1 is shown comprising a central section 2 of the general shape of the rear portion of a last and including the upper portion of the last against which the top edge of the shoe upper

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may engage. This section 2 terminates short of the sole face of the form which is composed of a pair of sections 3 and 4. Each of the sections 3 and 4 is pivoted to the section 2 adjacent to its rear end as on the pivot screws 5, so that by separating the forward ends of the sections 3 and 4, the sides of the form may be expanded and by pushing them toward each other they may be contracted. Forms 1 may be made in rights and lefts.

In order to present a smooth surface to the inside of a shoe placed on the form and for other purposes, as will later appear, a sheet material cover 10 encloses the sections 2, 3 and 4. This sheet cover, which is preferably but not necessarily copper or other metal of good heat conductivity, has its top edges inwardly turned as at 12 to overlie the sole faces of the pair of sections 3 and 4 and to these faces these overlying portions are secured toward the rear ends of the sections 3 and 4 as by screws 15. Opposite edges of the cover 10 which overlie the side faces of the section 1 have attached thereto electric heating elements 20, these elements being attached to the inner face portions of the sheet metal cover 10 on the inside and being received in recesses 21 in the section 1 adjacent to its edge. The sheet metal casing 10 is also secured centrally adjacent to its rear end to the exposed face of the section 2 as by a screw 23. The central section 2 is also provided with a jack pin hole 25 so that the form may be mounted sole-side up on any suitable form or jack to present a shoe placed thereover with its sole face uppermost.

The forward portions of the sections 3 and 4 may be forced apart, thus to expand the form, the casing 10 being free to conform generally thereto, and more particularly when the upper of a shoe supported on the form is pressed thereagainst, being unattached thereto forwardly of the screws 15 and 23, and for this purpose the confronting faces of the sections 3 and 4 are recessed as at 26, the rear face of the recess being beveled rearwardly as shown at 27 in Figure 1. Against this beveled face and between the sections 3 and 4 may be positioned a conical point 28 of an expanding screw 29 which extends upwardly and rearwardly through a threaded hole 30 in the section 2. This screw 29 may be provided with a threaded socket 31 in its outer end

for the reception of a threaded element 32 of a handle 33. This handle 33 is preferably made of some heat insulating composition, such as one of the synthetic resins, so that it may be turned by the fingers of the operator as desired without becoming uncomfortably hot from the effect of the electric heaters 20. By turning the screw 29 inwardly so that its point 28 is pressed against the adjacent edges of the walls 27, the sections 3 and 4 may be forced apart at their forward ends. By relaxing this screw, these forward ends are pulled together as by a coil spring 35 engaged at opposite ends with pins 36 as secured in the sections 3 and 4 and projecting into recesses 37 therein within which the spring ends are engaged therewith.

The sheet metal covering 10 provides a smooth exterior surface for engagement with the inside of the shoe upper placed over the form and bridges across the junctures between the elements 2, 3 and 4, regardless of the widthwise adjustment of the sections 3 and 4. As shown, also, this metal cover extends substantially throughout the shank portion of the form so as to engage throughout substantially the entire heel end and shank portion of a shoe placed thereover. By reason of the heating of this metal cover, the entire inner face of the shoe throughout the heel end and preferably also substantially throughout the shank portion, is subjected to heat which thus shrinks the lining and as the shoe upper is pressed thereagainst, as will later appear, irons out any wrinkles which may be present therein when the shoe upper is treated. The expansion and contraction widthwise of the form makes it possible to treat shoes of considerable variation in size and width on the one form.

The shoe receiving form is not per se claimed herein, but forms subject matter of the parent application Serial No. 540,209 to which reference has been made.

In order to provide for the desired contouring and smoothing of the outer face of the shoe upper while the lining is being shrunk and smoothed, provision is made for clamping the shoe upper against the form throughout substantially its entire extent around the heel end of the shoe and well into or through the shank portion. The mechanism for accomplishing this pressing may be in part similar to that shown in my Patent No. 2,293,282, granted August 18, 1942, for Method and machine for shaping the heel portions of shoes, but preferably the pressing means is extended further forwardly than shown in this patent in order to treat the shoe upper throughout substantially the entire shank portion. The actuating mechanism for tightening the presser means around the shoe may be the same as that shown in my Patent No. 2,293,282, so that it is not again illustrated. The presser means, as shown, comprises a plurality of presser blocks 50, 51, 52, 53, 54, 55 and 56 arranged in a continuous series jointed together in such a manner, as by pin and slot connections 58, so that they may be given simultaneous controlled motions to wrap around the heel end of a shoe on the support of Figures 1, 2 and 3, or release the shoe therefrom. These blocks may be held assembled by the coil spring 59 extending through holes through the intermediate blocks and anchored in the end blocks 50 and 56 as shown in my patent. In order to carry the pressure into the shoe shank, however, the forward blocks 50 and 56 have extended forwardly therefrom a pair of pressing elements 60 and 61. As shown best in Figure 6, these

presser elements may have outwardly turned flanges 62 at their rear ends which may be secured to the forward faces of the blocks 50 and 56, as by a pivot screw 63 and a screw and slot connection at 64. When the elements 60 and 61 have been adjusted to the desired angular position about the axis of the screw 63, they may be tightened in that position, or if desired, they may be allowed to pivot freely about the screw 63 so that they may be automatically conformed about axes generally parallel to the length of the shoe to the outer faces of the shoe shank on opposite sides, this motion tending to rub out wrinkles in the shank portion of the shoe. In view of the differences in opposite sides of right and left shoes forwardly of the heel seat portion, these elements 60 and 61 are shaped as rights and lefts. The inner faces of the blocks 50 to 56, inclusive, and the elements 60 and 61, are provided with a continuous, smooth liner 65 which may well be of sole leather. This liner presents an unbroken surface to the shoe upper around the heel end of the shoe and forwardly throughout the shank portion on opposite sides, and this continuous surface prevents pressure of the pressing means on the outer face of the shoe upper from marring the surface.

The liner 65 may be secured in position on the inner faces of the pressing elements, and for this purpose it may have its upper edge upwardly extended at the center of the heel end where it may be riveted or otherwise attached as at 66 to an angle bracket 67 secured to the top face of the rear presser block 53. The forward presser blocks 50 and 56 may likewise be provided with angle brackets 68 to which upstanding edge portions 69 of the liner 65 may be similarly secured.

For the purpose of this invention, it is desirable that the liner be heated, and to this end an electric heating element 70 suitably encased on one or both faces by a protective fireproofing material such as asbestos at 71 may be placed directly back of the liner 65 and may be extended as far as desired forwardly.

In order to conform the heel seat portion of a shoe so that it merges with a smooth contour with the adjacent faces of a heel 75 of the wood heel type as shown in Figure 4, it is necessary that considerable pressure be exerted on the shoe since not only must the shoe upper be shaped to the desired contour, but commonly the heel end of the shoe is provided with a counter stiffener which also must be more or less conformed. However, the heel seat contours about the margin of the shoe heel do not vary greatly as between different sizes of shoes throughout a considerable range. The shapes of the side walls of the shoes, particularly in the shank portion and over the cuboid bone of the foot vary considerably, however, between different sizes and styles of shoes, and in order that the liner 65 may conform automatically to these varying dimensions, the liner is backed up between it and the blocks 50 to 56 by yieldable material such as rubber as shown at 80. This cushioning material is therefore tapering in thickness, being much thicker remote from the heel 75 and tapering off to a very small thickness, or none at all, opposite to the edge of the heel seat of the shoe. Thus as the outer presser mechanism is moved in against the shoe and wrapped therearound, the line 65 first engages the shoe adjacent to its top opening as shown in Figure 7, and as it closes against the shoe, the area of contact between the liner 65 and the shoe is extended toward the heel seat until finally, as

shown in Figure 4, the liner engages the outer of the shoe upper throughout its entire height and substantially to the forward end of the shank portion, the upper edge of the shoe being given a relatively light pressure due to the considerable thickness of yielding material 80 back of it, while that portion adjacent to the shoe heel seat gets the more direct and heavy pressure. It is preferable that this rubber be protected from the heat from the heating unit, and this may be done by the protective material 71, as hereinbefore described. The heating of the inner and outer forms tends to shrink the upper materials and thus pull out any wrinkles which may be present therein.

Thus, in the final pressing position shown in Figure 4, the upper portion of the liner 60 is brought in against the upper of the heel around the heel seat and presses the shoe upper heavily into a contour merging that of the adjacent face of the shoe heel 75. This heel being of the wood heel type, rests directly against the upper of the shoe around the heel seat so that smooth contouring of the shoe upper to produce a good appearance to the shoe is of great importance.

The inner and outer pressing mechanisms are so shaped that in full pressing position of the outer presser members, the shoe at its opening is substantially narrowed as disclosed in my Patent No. 2,197,208, granted April 16, 1940, for Method of shaping a shoe upper, and the pressure, together with the heat, shrinks the lining and turns the upper edge of the outer over the edge of the lining and into substantial contact with the inner form, so that the appearance of the shoe is much improved.

From the foregoing description of an embodiment of this invention, it will be understood by those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention.

I claim:

1. In combination, means for supporting a shoe provided with a heel, said supporting means presenting a continuous smooth surface throughout at least the heel portion to the inner face of the shoe upper, and means for pressing the shoe upper against said surface first toward the upper edge of the shoe and progressively toward the sole thereof, said pressing means being contoured and constructed adjacent to the heel seat to merge with the contour of the adjacent portion of the heel.

2. In combination, means for supporting a shoe provided with a heel, said supporting means presenting a continuous smooth surface throughout at least the heel portion to the inner face of the shoe upper, and means for pressing the shoe upper against said surface, said pressing means being shaped to first engage the outside of the shoe upper adjacent to its top edge and being supported to yield under pressure so that pressure is progressively applied nearer to the sole of the shoe as well as at said top edge and finally including the heel seat margin to press said margin into a contour merging with the contour of the heel adjacent thereto.

3. In combination, means for supporting a shoe provided with a heel, said supporting means presenting a continuous smooth surface throughout at least the heel portion to the inner face of the shoe upper, means for pressing the shoe upper against said surface first toward the upper edge of the shoe and progressively toward the sole thereof and to a contour about the heel seat merging with the contour of the adjacent portion of the heel, said presser means having a continuous smooth surface portion for engagement with the shoe upper, an expansible and contractible portion outwardly of said smooth surface portion, yieldable material between said portions, and means for contracting and expanding said contracting and expanding portion.

4. In combination, means for supporting a shoe provided with a heel, said supporting means presenting a continuous smooth surface throughout at least the heel portion to the inner face of the shoe upper, means for pressing the shoe upper against said surface first toward the upper edge of the shoe and progressively toward the sole thereof and to a contour about the heel seat merging with the contour of the adjacent portion of the heel, said presser means having a continuous smooth surface portion for engagement with the shoe upper, an expansible and contractible portion outwardly of said smooth surface portion, and yieldable material between said portions, and means for contracting and expanding said contracting and expanding portion, said yieldable material being thicker opposite to the top edge of a shoe supported on said form and thinner toward the sole portion, and said smooth surface portion being contoured, when said yielding material is free, to first engage a shoe on said form adjacent to its top edge as said expansible and contractible portion is contracted about a shoe on said form and thereafter to expand its area of contact on the shoe toward the sole portion of the shoe and finally to press the shoe upper around the heel seat into a contour merging with the adjacent surface portion of the heel.

5. A shoe pressing mechanism, comprising a series of elements, means jointing said elements together to a generally U shaped contour for engagement about the sides and rear end of the heel of a shoe, forward elements having their opposed faces shaped to the general contours of the sides of the shank of a shoe and secured to the end elements of said series, a continuous facing for the elements of the series and said forward elements, and yieldable material between said elements and facing.

6. A shoe pressing mechanism, comprising a series of elements, means jointing said elements together to a generally U-shaped contour for engagement about the sides and rear end of the heel of a shoe, forward elements having their opposed faces shaped to the general contours of the sides of the shank of a shoe and secured to the end elements of said series with a freedom for rocking about axes generally parallel to the length of the shoe when the elements of the series are closed about the shoe a continuous facing for the elements of the series and said forward elements, and yieldable material between said elements and facing.

7. A shoe pressing mechanism, comprising a series of elements, means jointing said elements together to a generally U shaped contour for engagement about the sides and rear end of the heel of a shoe, forward elements having their opposed faces shaped to the general contours of the sides of the shank of a shoe and secured to the end elements of said series, a continuous facing for the elements of the series and said forward elements, and yieldable material between said elements and facing, said yieldable material being of greater thickness remote from that portion of the mechanism engageable with the shoe adjacent to the heel seat thereof than at said portion.

8. A shoe pressing mechanism, comprising a series of elements, means jointing said elements together to a generally U shaped contour for engagement about the sides and rear end of the heel of a shoe, forward elements having their opposed faces shaped to the general contours of the sides of the shank of a shoe and secured to the end elements of said series with freedom for rocking about axes generally parallel to the length of the shoe when the elements of the series are closed about the shoe, a continuous facing for the elements of the series and said forward elements, and yieldable material between said elements and facing, said yieldable material being of greater thickness remote from that portion of the mechanism engageable with the shoe adjacent to the heel seat thereof than at said portion.

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