Feb. 6, 1951 P. W. SENFLEBEN 2,540,217

SHOEMAKING APPARATUS

Filed May 3, 1946 3 Sheets-Sheet 1

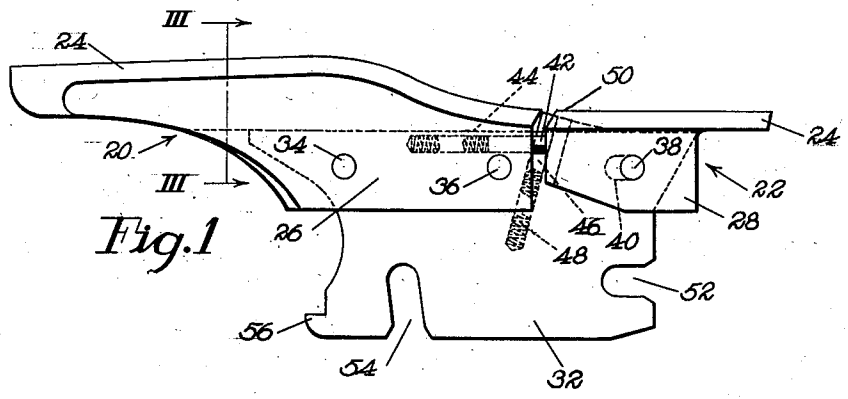

Fig.1

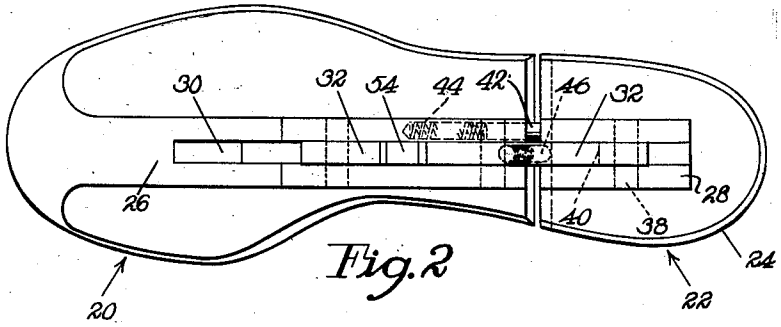

Fig.2

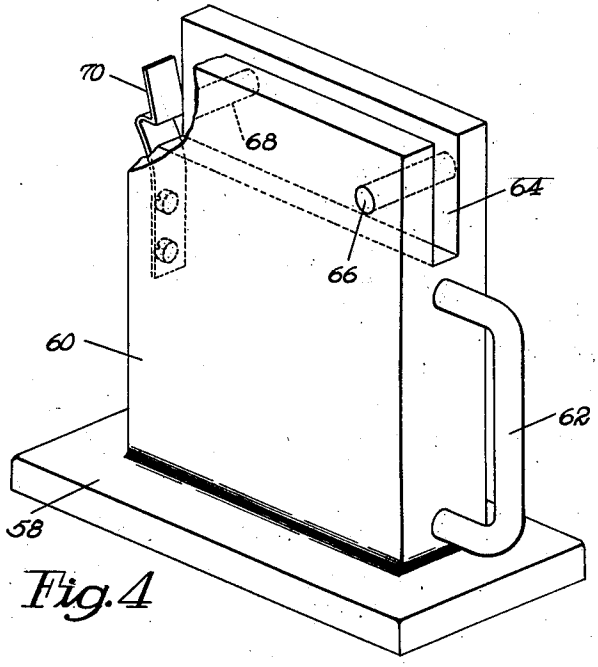

Fig.4

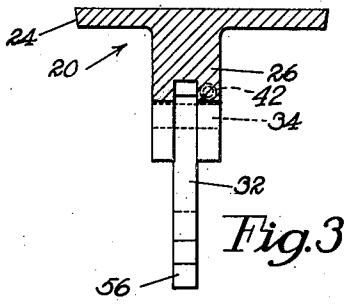

Fig.3

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Feb. 6, 1951 P. W. SENFLEBEN 2,540,217

SHOEMAKING APPARATUS

Filed May 3, 1946 3 Sheets-Sheet 2

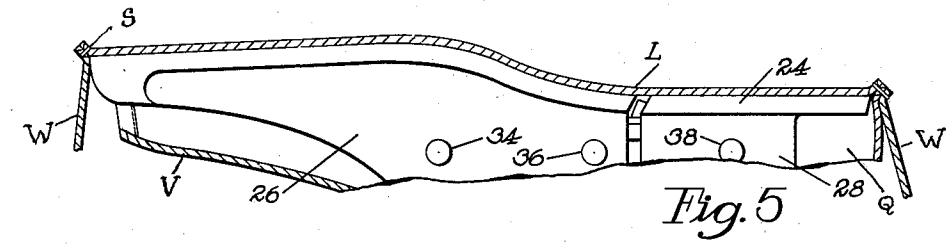

Fig. 5

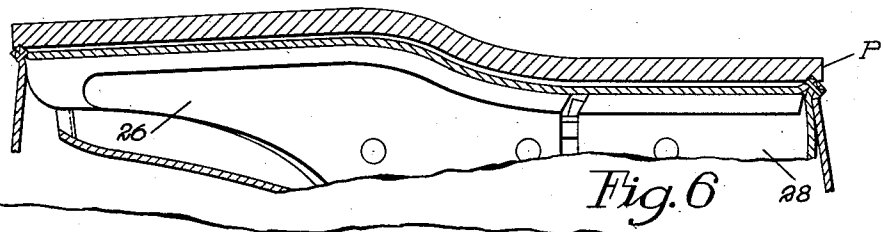

Fig. 6

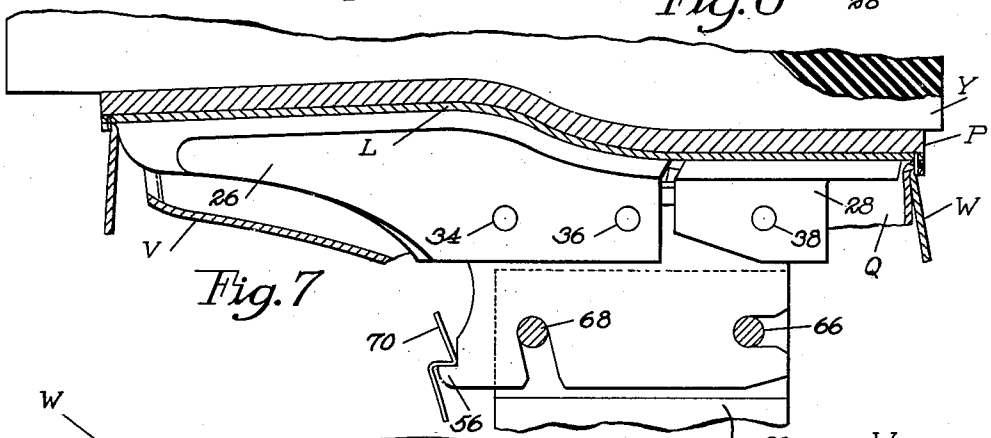

Fig. 7

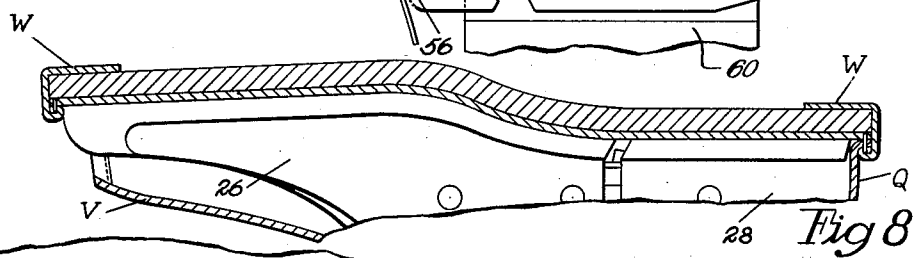

Fig 8

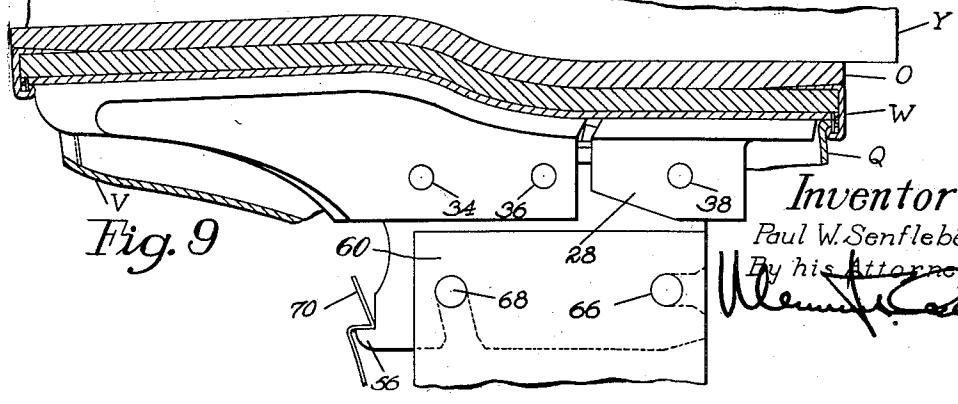

Fig. 9

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SHOEMAKING APPARATUS

Filed May 3, 1946 3 Sheets-Sheet 3

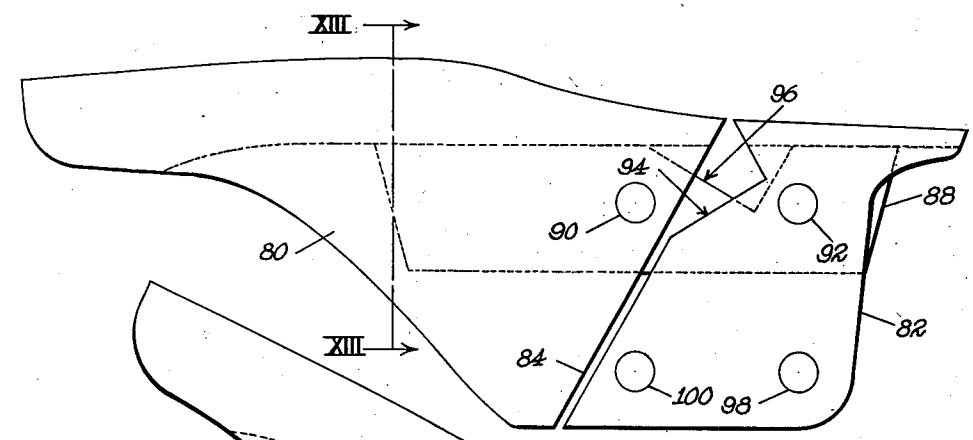

Fig.10

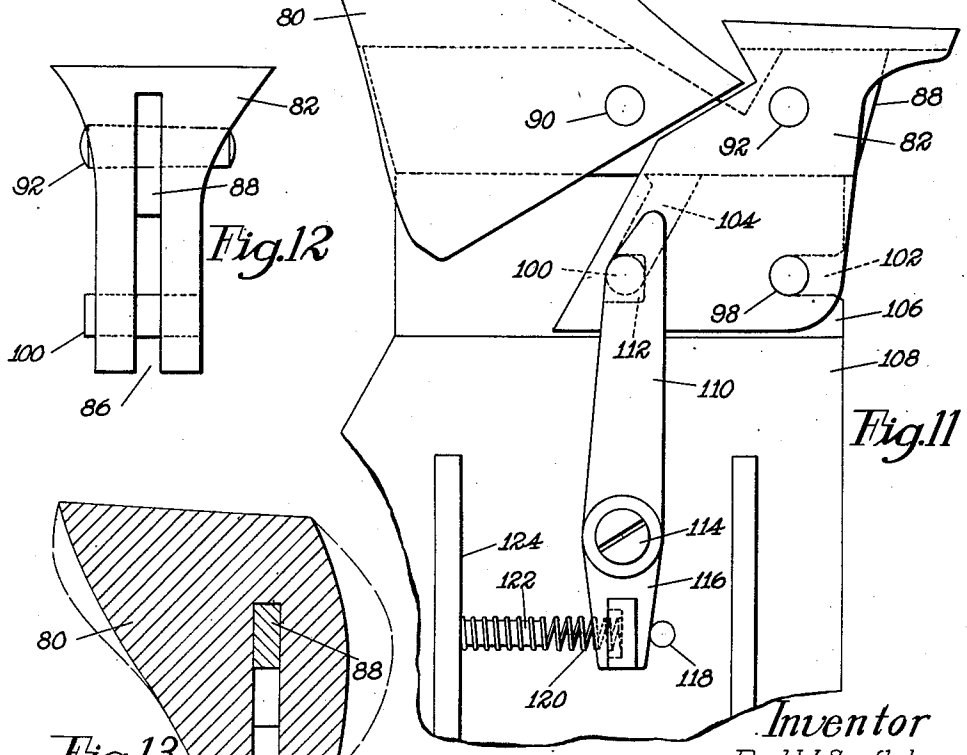

Fig.11

Fig.12

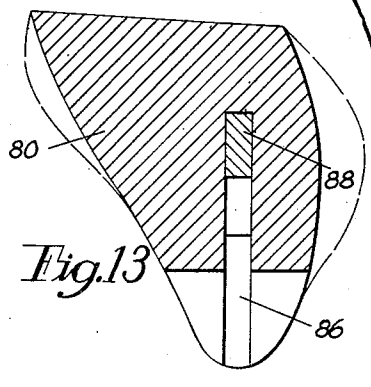

Fig.13

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UNITED STATES PATENT OFFICE

2,540,217

SHOEMAKING APPARATUS

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Application May 3, 1946, Serial No. 667,187

2 Claims. (Cl. 12—124)

1

This invention relates to apparatus for making shoes, particularly slip-lasted shoes.

In the manufacture of slip-lasted platform shoes, for example, a precut upper and sock lining are provided with seam allowances only and are sewed together close to their edges, a platform wrapper being either included in the same seam or attached by a separate sewing operation.

The flexible enclosure so formed is then drawn over a shaping last. By the term "shaping last" is meant a usual last designed to give the proper shape to a shoe upper of a given size. When a slip-lasted upper is drawn over a shaping last of proper size, as it should be, considerable difficulty is experienced not only in getting the shoe over the last, but particularly in shifting the shoe on the last to aline the seam with the edge of the last bottom, as should be done to give the shoe its proper edge contour and to condition it to receive a platform sole.

Objects of this invention are to avoid the above-indicated difficulties and to facilitate the manufacture of shoes of this type by either dispensing with the shaping last entirely or deferring its use to a late stage in the manufacture of the shoe.

To this end, a feature of the invention consists in a form, in place of the shaping last, which does not fill the shoe but has a bottom portion corresponding to the bottom of the shaping last that would normally be used. Preferably the toe end of the form retains the shape of the usual last, though, if desired, its heightwise dimension may be reduced so that, if used in making shoes with open toes, the form will not extend too far through the toe opening. Elsewhere, however, except at or adjacent to the bottom, the form has girth dimensions so much smaller than those of the corresponding shaping last that the form can be easily introduced into the shoe, its bottom, however, being of the same shape and size as the sock lining exclusive of its seam allowance, holds the sock lining properly extended and renders the alinement of the seam with the edge contour of the bottom of the form an easy matter.

In order to facilitate the introduction of the form, it is provided with a hinge or joint adjacent to the heel end to permit it to be broken, thereby foreshortening the form and permitting the heel end of a closed upper to be easily slipped over the heel end of the form.

For the best results a form should be provided for each full size of shoe. A form intended for a given shoe size may be adapted for use on a shoe a half size smaller by so constructing the

2

form that it may be shortened one-half a shoe size, the form being preferably held to its full size by yielding means. For the sake of lightness and to withstand the heavy pressure applied to the form in laying the insoles, the form is made of light metal, for example aluminum alloy, and either the form or the support is provided with a steel connecting and supporting plate having two slots, one extending horizontally and the other substantially vertically. Two transverse pins are so arranged that the form, when one pin is engaged with the horizontal slot, may be rotated about that pin to cause the other pin to engage the vertical slot, the form being then sustained in horizontal position to receive pressure on its bottom and being disengageable from the support by a reverse rotary and lifting movement. In one embodiment the form has a vertical slot extending lengthwise thereof in which is a steel plate extending below the body and provided with a horizontal slot near the rear end and a vertical slot nearer the front end. Since the form is designed to withstand sole-attaching pressure, the form is provided with a support comprising a flat base and an upstanding column provided at its upper end with a slot to receive the steel plate, across which slot are two pins the spacing of which is equal to the space between the ends of the slots in the above-mentioned plate. The form is mounted on its support by engaging the horizontal slot of the plate with the rear pin on the support and swinging the form about that pin as a center until the vertical slot engages the other pin.

In another embodiment of the invention the form is so shaped that patterns therefor may be turned in a last lathe. In this form the shape, size and longitudinal contour of the bottom of the shaping last are retained on the form and also the shape, if desired, of the toe end. The remainder of the form is reduced in girth dimensions on smooth lines with no sharp reentrant angles or curves so that the pattern for the form may be turned on a last lathe and the patterns graded up or down for a series of forms for a run of shoe sizes.

In order that the upper part of the form, in this embodiment, may have more nearly the shape of the usual last although of reduced dimensions, except at the bottom and toe portions, it is desirable to reverse the manner of mounting it upon the support. That is, the upper portion of the form is provided with a deep longitudinal slot in which is a steel plate upon which the rear portion of the form is rigidly mounted

and to which the forepart is hinged, the upper portion of the slot being provided with two transverse pins adapted to engage an upstanding steel plate mounted on the support and provided with a horizontal slot and a substantially vertical slot, the bottoms of which are spaced apart the same distance as the pins. The form is mounted on the support by engagement of one of the pins with the horizontal slot, and turning the form will cause the other pin to engage the vertical slot. The form, thus supported, will withstand pressure applied to its bottom, and the forepart is adapted to be raised on its pivot pin to effect foreshortening of the form in order to facilitate the placing of a shoe thereon and removing it therefrom. In either construction of the form, a latch is provided to hold the form upon its support.

The described forms are for use in making slip-lasted platform shoes. The upper, after its attachment to the sock lining and platform wrapper, as above indicated, is placed over a form of either of the constructions described, the form being broken at its joint to facilitate this operation if desired. The form is then placed on its support and the alinement of the seam with the edge of the last bottom is easily accomplished by shifting the upper, or parts of it, with respect to the form, there being no interference with this operation because the form fits the shoe only on the bottom and about its periphery. A platform sole is laid on the shoe bottom and pressure applied thereto by pressing thereon a yielding pad, any suitable form or sole press being employed. After this operation, the form and shoe may be removed from the support and the shoe presented on the form to a wrapper "lasting" machine by which the wrapper is tensioned, laid over and caused to adhere to the bottom of the platform. The shoe and form may then be replaced upon the support, an outsole spotted thereon, and pressure again applied to cause adhesion of the outsole to the overlaid portion of the wrapper and to the platform if desired.

The shoe having thus been substantially completed without the use of a regular or shaping last, such a last may be inserted to perfect the shaping of the shoe and to support it for subsequent finishing operations.

In the drawings:

Fig. 1 is a side elevation of a novel shoe form for use in making slip-lasted shoes;

Fig. 2 is a bottom plan view of the form shown in Fig. 1;

Fig. 3 is a section on the line III—III of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a perspective view of a support for the form;

Fig. 5 is a view, in side elevation, of a portion of the form showing in section a slip-lasted shoe placed thereon;

Fig. 6 is a view similar to Fig. 5 showing the platform sole located in the shoe;

Fig. 7 is a side elevation of the form on its support with a shoe and sole thereon, as shown in Fig. 6, and with pressure being applied to the sole by a yielding pad;

Fig. 8 is a view similar to Fig. 6 showing the shoe after the lasting of the platform wrapper;

Fig. 9 is a view similar to Fig. 7 showing pressure being again applied to attach an outsole to the shoe;

Fig. 10 is a side elevation of a modified construction of a form adapted for the same purpose;

Fig. 11 is a side elevation of the form of Fig. 10 mounted upon a support and having the forepart raised;

Fig. 12 is a rear elevation of Fig. 10; and

Fig. 13 is a section on the line XIII—XIII of Fig. 10, looking in the direction of the arrows.

In the manufacture of slip-lasted shoes, the patterns for the upper and sock lining are only a seam allowance larger than the size necessary to cover the shaping last for which the patterns were made, the patterns, of course, being graded up or down for a run or shoe sizes corresponding in style to the given last.

After the upper and sock lining are connected by a seam, the insertion of a shaping last is not easy, particularly if the girth of the shoe and last at the ball portion is greater, as is often the case, than the girth of the shoe and last in the waist back of the ball. Furthermore, after the last is inserted in the shoe, the seam is seldom in exact alinement with the edge of the last bottom, as it should be, and to shift the shoe on the last to secure such alinement is difficult in proportion to the desired closeness of fit between the shoe and last.

To avoid this difficulty of inserting the last, the present invention provides a form having only the desired characteristics of the last properly to support the sock lining and to locate the seam during the attachment of the sole to the shoe bottom, the bottom of the form corresponding accurately to the bottom of the shaping last from which the patterns were made. Preferably the toe end of the form is similar to the toe end of the last, so that when used for making open-toe shoes the form will not extend too far through the opening. If desired, the heightwise dimension of the toe form may be somewhat reduced relative to that of the corresponding last.

Referring to Figs. 1 and 2, the form has a body portion in two parts, namely, a forepart and shank portion **20** and a heel portion **22**. These parts together have the size and shape of the bottom of a shaping last, the longitudinal contour being shown in Fig. 1 and the peripheral shape in Fig. 2. The side portions **24** of the form, except at the toe, are very narrow, extending only about one-quarter of an inch from the bottom and making an acute angle therewith. Extending longitudinally of both parts of the form are heightwise extending portions **26, 28** having side walls perpendicular to the bottom of the form. In the portions **26, 28** a deep groove **30** is formed to receive a steel plate **32** which is secured to the forepart of the form by two pins **34, 36**. The heel part **22** is secured to the plate **32** by a pin **38** which extends through a slot **40** in the plate, the slot extending lengthwise of the form. The parts **20, 22** are normally separated at the breast line by a space equal to half the distance between shoe sizes, that is, $1/6$ of an inch. The heel part **22** is held in the position shown in Fig. 1 by a plunger **42** engaging the rear part and mounted in a hole drilled in the portion **26**, the plunger being backed by a compression spring **44**. The rear part **22** may be pressed forwardly against the plunger **42** to take up the space between the parts **20, 22** of the form and thus shorten the form to adapt it to receive a shoe a half size smaller than that for which the extended form is adapted.

To facilitate putting the form in a shoe, it may be foreshortened by turning counterclockwise the rear part **22** on the pin **38**. The heel part is restored to normal position by a plunger **46** mounted in a hole drilled in the plate **32** and backed by a compression spring **48**, the plunger engaging a

lip 50 on the breast edge of the rear part 22 in both adjusted positions of the rear part. The part 22 is cut away along the dotted line adjacent to the lip 50 to permit some counterclockwise movement of the part 24 about the pin 38, thus shortening the over-all length of the last.

The plate 32 is provided with a horizontal slot 52, with a substantially vertical slot 54 and with a locking projection 56.

The from support shown in Fig. 4 comprises a flat base 58 and an upright portion 60 having a handle 62. The upper end of the upright 60 is slotted at 64 to receive the plate 32 of the form and has two transverse pins 66, 68 spaced from each other the distance between the ends of the slots 52, 54. The form is mounted upon the support by first engaging the slot 52 with the pin 66 and rotating the form about that pin until the slot 54 engages the pin 68. The locking projection 56 is then engaged by a spring catch 70 secured to the upright 60.

In Figs. 10 to 13 is illustrated a form of modified construction having the desired characteristics of the form above described. That is, the bottom has the size and contours of the shaping last, the angle between the bottom and sides being acute for most of the periphery, and the toe end being substantially the same as that of the shaping last. The form is much less in girth than the shaping last, as indicated in the sectional view of Fig. 13 where the dotted lines indicate the section of the shaping last as compared with that of the form. The pattern for making the castings for this form may be turned in a last lathe and the patterns for a run of sizes may be graded up or down from a master pattern, as is usually done in making lasts.

This form has a forepart and shank member 80 and a heel member 82 which may be cast in one piece and separated, for example, by a saw-cut in a plane 84 starting at the breast line and extending downwardly and forwardly (Fig. 10). The members 80 and 82 are slotted, as indicated at 86 in Fig. 13, to receive a plate 88 to which the forepart member is pivoted by a pin 90. The heel member 82 is fixed to the plate 88 by a tapered pin 92, a slight space being left between the two members to compensate for the kerf of the saw by which they were separated. The heel member is notched at 94 to permit the forepart to turn on the pin 90, and the plate 88 is notched at 96 on its upper edge for the same purpose. Two transverse pins 98, 100 extend across the slot 86 in the heel member 82 and coöperate with slots 102, 104 in a plate 106 secured to the top of a support 108 (Fig. 11). The pin 98 is first engaged with the slot 102 and then, by turning the form about that pin, the pin 100 is brought into the slot 104 where it is secured by a latch 110 in which is a recess 112 to receive the end of the pin 100 which projects outwardly from the form (Fig. 12). The latch 110 is pivoted between its ends at 114 to the support 108 and its lower arm 116 is urged against a stop 118 by a spring 120 having one end seated in a recess in the arm 116 and the other end engaging a pin 122 mounted in a projecting portion 124 of the support. The forepart member 80 may be turned about its pivot 90, as shown in Fig. 11, to foreshorten the last for greater ease in putting the shoe on or removing it from the form. When the forepart is swung down, the upper edge of the plate 88 engages the bottom of the slot 86 in the forepart, thus firmly sustaining the form against pressure applied to its bottom.

The preferred manner of using the first-described form is as follows: A slip-lasted shoe, comprising a vamp V, a quarter Q, a sock lining L and a platform wrapper W attached by a seam S is put on the form 20, 22, the part 22 being rotated about its pivot 38 to foreshorten it if desired. The form is connected as described to the support 60 and the seam S is alined with the acute angle at the edge of the last bottom, as shown in Fig. 5. This operation is greatly facilitated because the form, while it has the last-bottom shape, does not fill the shoe and the fuller toe end of the form prevents the form from projecting too far through the open end of the vamp V if, as shown, it has an open toe. A platform sole P (Fig. 6) is now placed in proper position on the shoe bottom (Fig. 6) and the support moved by its handle 62 under a yielding pressure-applying pad Y which, by relative heightwise movement of the pad and support, presses the sole P upon the shoe bottom, suitable cement being, of course, used to secure its adhesion to the shoe.

The shoe and form may be removed from the support, the platform wrapper W tensioned and laid over the bottom of the platform, as in Fig. 8. For this purpose, a machine of the type disclosed in Letters Patent of the United States No. 2,411,827, granted November 26, 1946, upon an application of Joseph Fossa, may be used.

The form and shoe may now be placed again upon the support, an outsole O spotted on the shoe, and pressure again applied by the yielding pad Y. The form may now be removed from the shoe and a heel attached to the shoe, for example, by inside nailing. The shoe is thus substantially completed off a last. If desired, however, in order to improve the shape of the shoe and to support it for further finishing operations, a suitable shaping last may be inserted.

It will be understood that the form and support shown in Figs. 10 to 13 may be utilized in a manner similar to the procedure above described in connection with Figs. 5 to 9.

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

1. A form for use in making slip-lasted shoes having a forepart, a shank portion, a separate heel portion mounted upon a transverse pin which is movable with respect to the forepart to shorten the last and about which it is movable to foreshorten the last, a first spring plunger for normally holding the bottom of said heel portion in alinement with the bottom of the shank portion, and a second spring plunger acting independently of the first to hold the last normally extended.

2. A form for use in making open-toed slip-lasted shoes having fully shaped bottom portions corresponding exactly to the bottom of a shaping last suitable for the given shoe, said bottom meeting the sides of the form at an abrupt angle and having a toe portion of sufficient heightwise extent to prevent the form from extending too far through the toe opening, the remainder of the form having sufficiently less girth than the shaping last to permit shifting of the upper with respect to the form to aline the seam connecting the upper and sock lining with the periphery of the bottom of the form, said form having a heel part constructed and arranged to move one-half a shoe size only toward the toe to adapt the form for an upper one-half size smaller than the extended form, a spring plunger for holding

the last fully extended, said heel part being pivoted on a transverse axis located near the bottom of the form, and a spring plunger for holding the bottom of the heel part in the plane of the adjacent portion of the last bottom and permitting movement of the heel part about said axis to foreshorten the form and facilitate mounting of the upper thereon.

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