Jan. 21, 1936. A. F. PYM 2,028,167

MACHINE FOR SHAPING SHOE UPPERS

Filed Dec. 31, 1934 3 Sheets-Sheet 1

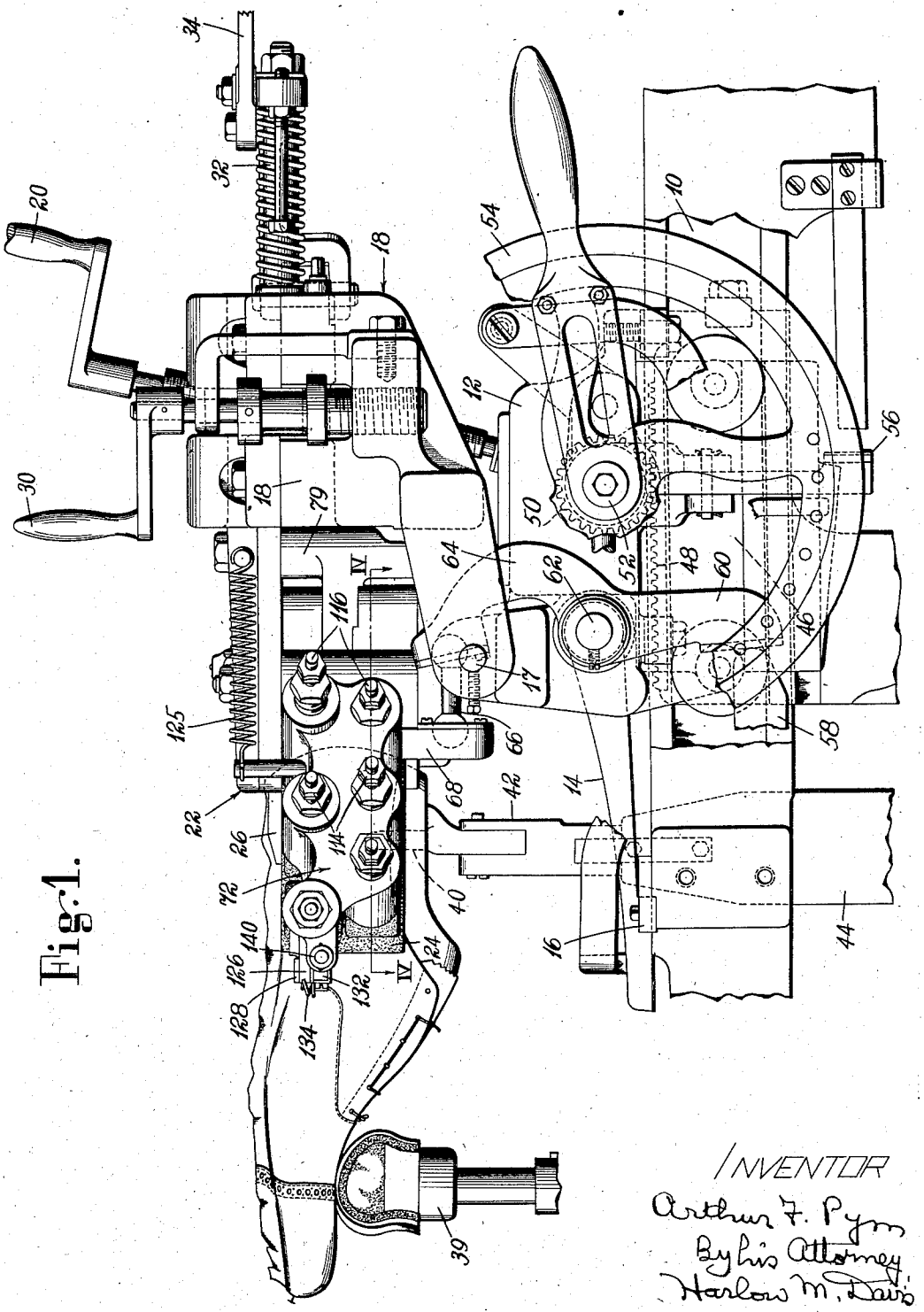


Fig. 1.

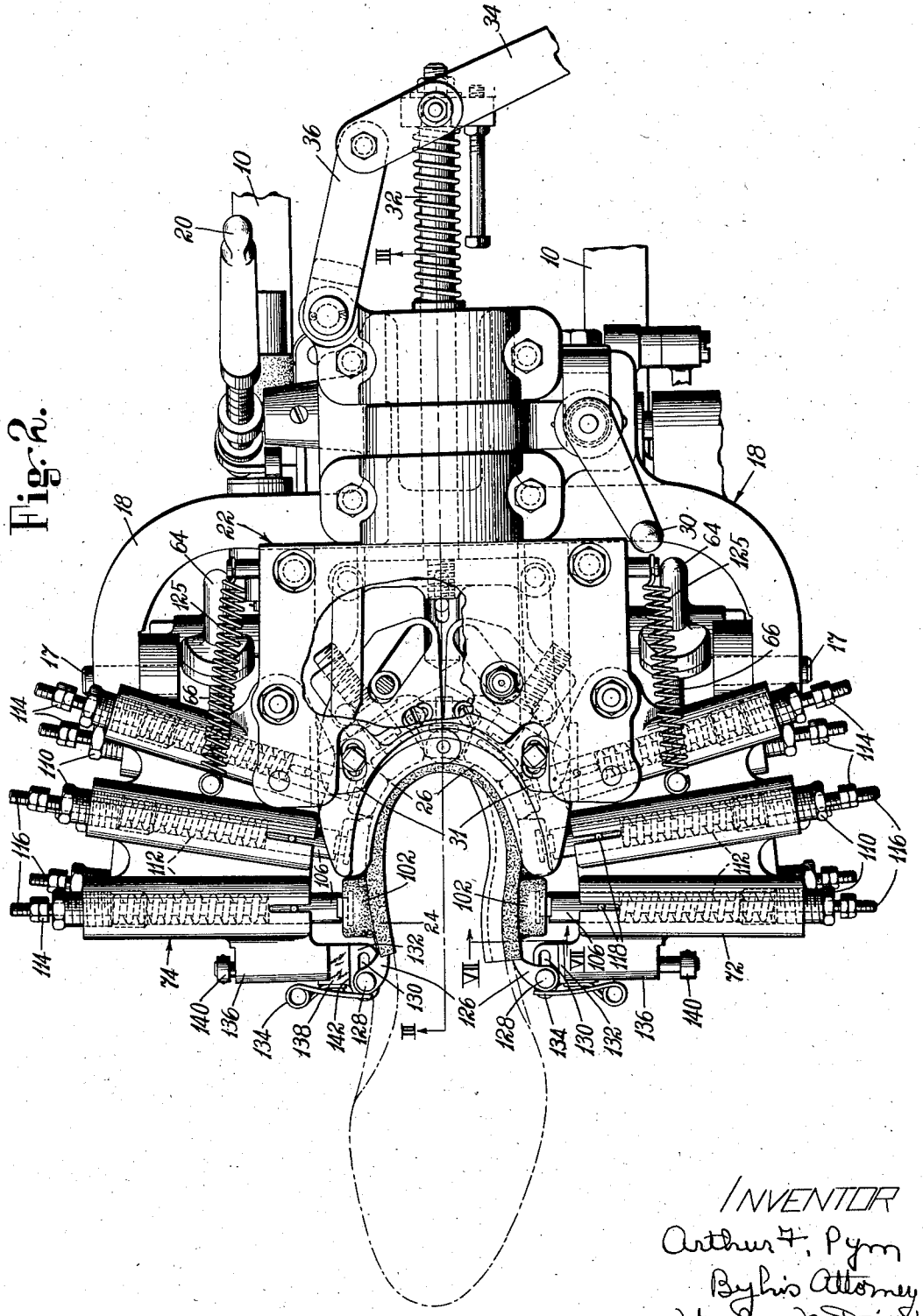
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MACHINE FOR SHAPING SHOE UPPERS

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Fig. 2.



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MACHINE FOR SHAPING SHOE UPPERS

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Fig. 3.

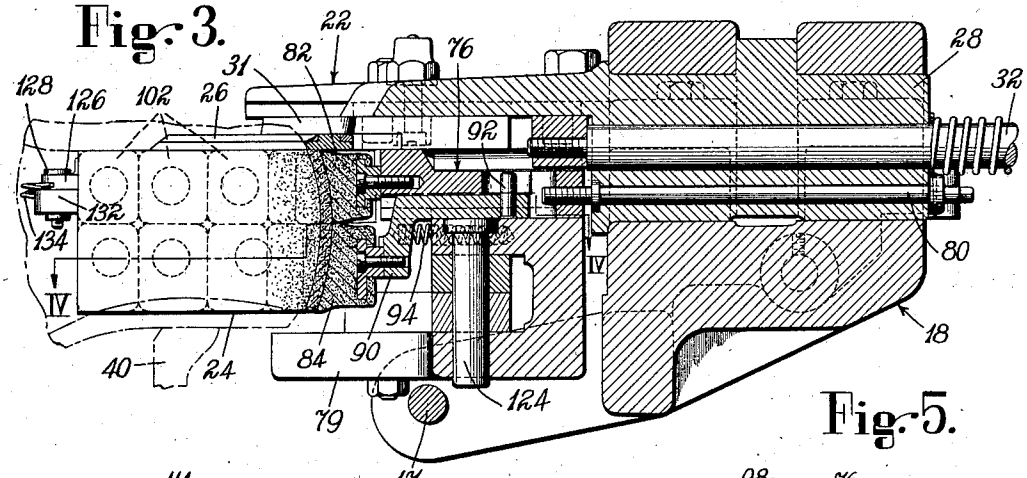


Fig. 5.

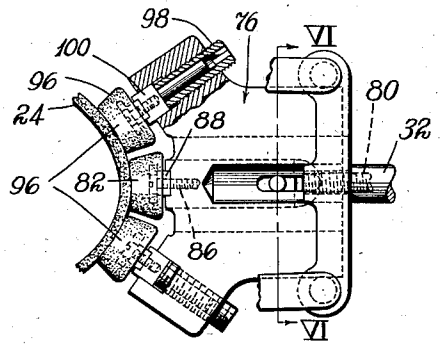


Fig. 4.

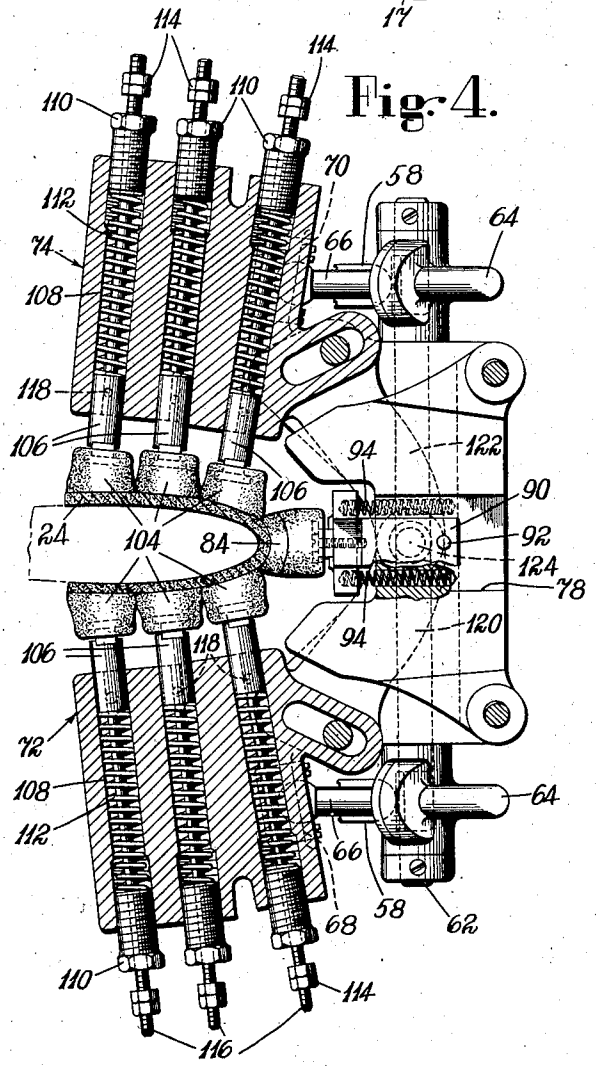


Fig. 6.

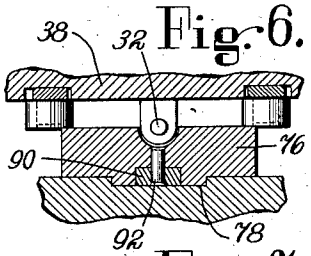
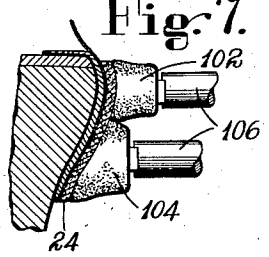


Fig. 7.



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Patented Jan. 21, 1936 2,028,167

UNITED STATES PATENT OFFICE

2,028,167

MACHINE FOR SHAPING SHOE UPPERS

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Application December 31, 1934, Serial No. 759,849

38 Claims. (Cl. 12—14.1)

This invention relates to machines for use in the manufacture of shoes and more particularly to upper-shaping means. The invention is herein illustrated in its application to means for pressing the heel portion of a shoe upper into conformity to an upper-shaping form or last in the lasting of the heel end of a shoe; but it is to be understood that the invention is not limited to means for operating upon that particular portion of a shoe or to machines for lasting shoes.

In the use of some machines for shaping shoe upper materials into conformity to a last or other form, pressure is commonly applied to the heel end in order not only to impart to the upper materials the shape they are to have in the finished shoe but also to resist any tendency in wiping the margins of the upper materials over the edge of the bottom of the last or form to pull the upper materials out of their desired position. That is, if the upper at certain localities, especially those near the edge of the last bottom, is not pressed against the last during the wiping operation, such unpressed parts may be unduly stretched and hence tend to become distorted themselves or to distort the shoe when it is removed from the last. Accordingly, an important desideratum of such a pressing operation is that pressure shall be exerted against all parts of the upper which otherwise might be unduly stretched.

The object of this invention is generally to provide improved upper-pressing means to accomplish the desired result referred to above.

In view of the foregoing, this invention in one aspect provides improved upper-pressing means comprising a plurality of pressing members of yielding material disposed in superimposed rows extending from one side of the last to the other about its heel end, these members being expansible into contact with each other in response to upper-shaping pressure exerted against them by the last. As a result of this construction, insurance is afforded that there will not be any interruption in the application of pressure between adjacent pressing members; and further continuity in the application of upper-shaping pressure by the pressing means is secured by the ability of the pressing members, being formed of a yielding material, to be deformed in response to upper shaping pressure into conformity to the respective portions of the upper upon which the pressing members act.

In order to provide for the separation of the pressing means from the upper for the purpose of allowing the operator to substitute a shoe to be treated for one already operated upon, the pressing means may, as herein illustrated, comprise a plurality of pressing devices one of which is disposed opposite to the heel end of the form and others which are mounted at the sides of the form for movement laterally thereof in such directions that when the pressing devices are in their pressing position their fields of action are contiguous. This construction affords a pressing surface which is uninterrupted between different pressing devices and which extends substantially continuously about the heel end of the form from one side to the other.

In accordance with another feature of the invention, the pressing elements as herein illustrated in the pressing devices at the sides of the form are constituted by plungers the ends of which are directed toward the form and carry yielding pads between which normally there is a slight clearance space but which, in response to the upper-shaping pressure, are expanded into contact with each other as above described. Provision for adapting the pressing devices for operating upon shoes having different shapes is also made by mounting the plungers to slide in the pressing devices, the sliding movements being yieldingly resisted and subject to adjustment whereby the pressure of different pressing members or plungers can be made the same or regulated at the will of the operator regardless of the size or type of shoe to be operated upon. As herein illustrated, the pressing members or plungers, as stated above, are disposed in superimposed rows. The pressing members in one of these rows act upon the portion of the upper which borders on the edge of the last bottom and the remainder of the pressing members are paired heightwise of the last with those of the first-mentioned row and are arranged to act upon the upper nearer the top of the last than the first-mentioned members.

Since the heel portions of lasts of different styles and sizes are curved in much greater degree at the end than at the sides, the pressing device opposite to the end of the last must be capable of accommodating itself to rather widely varying curvatures. To this end, the pressing members of this device, in the row which act upon the margin of the upper contiguous to the edge of the last bottom, are mounted for adjustment relatively to each other in different directions normal to the surface of the end portion of the form opposite thereto.

When pressing means of the above character are embodied in a machine having a heel band and/or wipers for wiping the marginal portion

of the heel end of an upper over an insole on a last or form, the pressing device opposite to the heel end of the form acts as an abutment for limiting the movement of the form toward the wipers so as definitely to position the bottom of the last with respect to the field of action of the wipers. In this connection the invention also contemplates mounting the abutment for adjustment longitudinally of the form and, as herein illustrated, provides means for effecting this adjustment.

These and other features of the invention will be hereinafter described in connection with the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a view in front elevation of a part of the machine in which the invention is illustrated as embodied, with parts broken away;

Fig. 2 is a plan view of the upper-forming mechanism illustrated in Fig. 1, the mechanism and a shoe indicated in dotted lines being shown in their pressing relation;

Fig. 3 is a sectional view in elevation, the section being taken along the line III—III of Fig. 2, showing parts of the upper-forming mechanism;

Fig. 4 is a sectional plan view, a portion of a shoe on a last being indicated in dotted lines, the section being taken along the line IV—IV of Fig. 1;

Fig. 5 is a plan view of the upper-pressing members of the abutment which supports the rear end of a heel band;

Fig. 6 is a sectional view in elevation, the section being taken along the line VI—VI of Fig. 5; and

Fig. 7 is a sectional view in elevation illustrating the pressing action of the pressing members and heel band on the side of a shoe upper, the section being taken along the line VII—VII of Fig. 2.

The invention is illustrated herein as embodied in a bed-lasting machine of a well-known type, features of the general organization of which are disclosed in various prior United States Letters Patent, including Letters Patent No. 1,018,477, granted on February 27, 1912, and Letters Patent No. 1,417,493, granted on May 30, 1922, both in the name of Matthias Brock. Only such features, therefore, of the general organization as it is necessary to refer to for an understanding of this invention are herein shown and will be described in detail.

Machines of this type include means for lasting both the toe and heel end of a shoe, but since the invention is exemplified herein with reference only to the heel-end portion of the shoe, it is unnecessary to illustrate or to describe the toe-lasting means. The heel-lasting mechanism includes a horizontal yoke 10 mounted to swing in a horizontal plane about a stud (not shown) on the frame to allow the mechanism to be properly adjusted for operating on right and left shoes, as illustrated and explained in the aforesaid Letters Patent. Supported in the yoke 10 for movement in direction lengthwise of the shoe is a heel-head carriage 12 which occupies initially a position near the outer end of the yoke 10 and is moved by the operator from that position to an operative position in which it is retained by a latch 14 which engages a plate 16 on the yoke. Pivoted at 17 on the carriage 12 is a heel head 18 which supports the heel-lasting instrumentalities and which is adjustable about the axis at 17 extending laterally of the shoe by a hand crank 20. Mounted on the head 18 is a holder 22 which indirectly supports a heel band 24 for embracing the upper about the heel end of a last and wipers 26 for wiping the margin of the upper inwardly over the bottom of the last. The heel band 24 may be made of stiff leather, such as sole leather, and it is herein shown as shaped to extend around the end and along the sides of the heel-end portion of the upper and also to conform substantially to the heightwise contour of this portion of the last, although it is sufficiently flexible to permit it to be both closed and opened widthwise of the last, and to conform under pressure to variations in the contours of right and left lasts as well as lasts of different sizes. The holder 22 has a cylindrical extension 28 (Fig. 3) mounted in a bearing in the head 18 to turn about an axis extending lengthwise of the shoe and is adjustable about this axis by means of a hand crank 30. The wipers 26, which are carried by cam plates 31 slidingly mounted at the upper part of the holder 22, are advanced and closed over the heel-seat portion of the shoe by mechanism including a plunger 32 operated by a hand lever 34 pivoted at its rear end on a link 36 carried by the head 18.

The last and shoe are supported for the lasting operation at the toe end on a rest 39 and at the heel end on a last pin 40 carried by a slide 42 vertically movable in one arm of a U-shaped support 44 (Fig. 1), the other arm of which has a horizontal extension 46 mounted to slide in a rectilinear path in a guideway in the carriage 12. The extension 46 has rack teeth 48 engaged by a pinion 50 on a shaft 52 mounted in bearings in the carriage 12, the shaft having fixed thereon a hand wheel 54. By means of this hand wheel, after the approximate proper relative heightwise positioning of the shoe and the heel band 24 has been effected by a treadle in a well-known manner and as described in the above noted Letters Patent, and after the carriage 12 has been moved to its operating position so as to cause the latch 14 to overlie the plate 16 as illustrated in Fig. 1, the operator imparts to the shoe support movement to carry the shoe lengthwise into position for its heel end to be embraced by the heel band 24 and to force its heel-end face firmly against the heel band. To hold the shoe support against return movement, a latch member 56 is provided for engaging teeth (not shown) on the rear side of the hand wheel 54.

In order to cause the shoe upper to be pressed into conformity to the shape of the last not only at the end of the heel portion but also at the sides thereof, pressure is imparted to the heel band 24 continuously from each end of the heel band near the junction of the shank and the heel portion of the shoe around the heel end. Such pressure is imparted to the heel band by connections operated by a plunger 58 which, as illustrated herein, corresponds to the rod 120 shown in the previously mentioned Letters Patent No. 1,417,493 which may be referred to for a description of the means which operates this rod. The connections which are operated by the plunger 58 comprise an arm 60 which is fixed to a shaft 62 rotatably mounted in the heel-head carriage 12. There are fixed to the ends of the shaft 62 arms 64, 64 having spherical cavities arranged to receive the ends of ball-ended links 66, 66, the opposite ends of which are received in spherical cavities in lugs 68, 70 which extend downwardly from pressing devices 72, 74 respectively.

The construction thus far briefly outlined, except for the pressing devices 72 and 74 themselves, is substantially like what has been used heretofore in machines of the type illustrated herein and in view of the disclosures in the Letters Patent mentioned above no further description of these parts will be required.

Acting upon the heel band 24 over its area at the heel end not acted upon by the pressing devices 72 and 74 is another pressing device or abutment 76 which resists the rearwardly directed force of the shoe imparted by the shoe support 44. In lasting the heel end of the shoe it is desirable to apply pressure uniformly along the sides and about the heel end of the upper over a substantial area extending heightwise of the upper from the edge of the bottom of the last to and including the cone portion thereof. Such pressure holds the upper materials at the side and end surfaces of the last immovable against the action of the wipers in wiping the marginal edges of the upper materials over the last bottom and makes the upper materials conform closely to the shape of the last. This pressure is exerted against the upper materials by the heel band 24 which is acted upon by a plurality of pressing members, some of which are carried by the pressing devices 72 and 74 and others carried by the abutment 76, which members in their pressing positions are mounted and adapted to present a unified pressing surface to the upper and heel band throughout their field of action, as will now be described.

The abutment 76 is mounted for adjustment longitudinally of the last in a slideway 78 (Figs. 4 and 6) formed in the top surface of the horizontal web of a base 79 of the holder 22 and can be thus adjusted by turning a rod 80 which is prevented from moving axially in the extension 28 but has threaded engagement with the rear portion of the abutment 76. The abutment 76 both makes the heel end portion of the upper conform to the shape of the last as a result of the last being moved toward the abutment and also limits the rearward movement of the last so as properly to position the margin of the shoe bottom, over which the upper materials are to be wiped, with respect to the travel of the wipers 26. To this end, the abutment 76 carries upper and lower pressing members 82 and 84 formed respectively of yielding material, arranged one above the other and disposed opposite to the back seam area of the shoe upper. The member 82 is mounted on a screw 86 threaded into the abutment 76 and a square key 88, the latter being seated in complemental recesses in the abutment 76 and the pressing member 82 so as to prevent the latter from being twisted from the screw 86. The pressing member 84 is similarly secured to a slide 90 arranged to have sliding movement longitudinally of the last which is limited by a pin 92 received in a slot in the abutment 76. The slide 90 is normally urged toward the heel band 24 by a pair of springs 94, 94 which cause the pressing member 84 to be held against the rear end of the heel band 24 at all times and yet allow the latter to be moved rearwardly in response to pressure of the upper until pressure is received by the pressing member 82. In order to adapt the abutment 76 for use in operating on lasts of different sizes and shapes, one of the major differences between which at the heel end is in the curvature of the edge of the bottom, it is provided with a pair of pressing members 96 one of which is mounted at each side of the pressing member 82 on a rod 100 received within a sleeve 98 which is threaded for adjustment in the abutment 76 in directions extending directly toward and away from the surface of the last opposite thereto. The rods 100 have square heads which are received in complemental holes in the abutment 76 so as to allow the pressing members 96 to be adjusted in the manner referred to above but to prevent their being rotated. The end of the sleeve 98 is perforated so as to receive a socket wrench for the purpose of making the aforesaid adjustment.

Each of the pressing devices 72 and 74 comprises a series of pressing members 102 which, considered with the pressing members 96 and 82, are arranged in a row so as to act upon the area of the shoe upper adjacent to the edge of the shoe bottom along the sides of the upper and around its end. This row of pressing members also acts upon an area of the shoe upper extending heightwise substantially from the edge of the shoe bottom to a locality where the width of the heel end of the last is greatest, as indicated in Fig. 7. Each of the pressing devices 72 and 74 also has a series of pressing members 104 likewise of yielding material forming with the lower pressing member 84 of the abutment 76 a horizontal row which extends along the sides of the cone of the last and about its end. Successive pressing members 102 are paired heightwise with corresponding successive pressing members 104 and all are so shaped and spaced as to be separated from each other by a small clearance space when in their normal inoperative positions. However, since all of the pressing members in the pressing devices 72 and 74 and the abutment 76 are made of a yielding material, such as rubber, they are deformed into conformity to the shape of the last in response to upper shaping pressure. This compression of the pressing members 102 and 104 results in their being expanded widthwise into contact with each other when in their pressing positions in which they present a continuous pressing surface to the heel band throughout the entire area up which they act. Similarly, the pressing members 82, 84 and 96 are so shaped and mounted with respect to each other as to be expanded not only into contact with each other but also into contact with the adjacent pressing members 102 and 104 when they are in pressing positions. The pressing members 102 and 104 are supported in juxtaposition to one another on slides 106 mounted for movement in directions substantially normal to the portion of the surface of the last opposite thereto in bores 108 in the outer end of each of which is screwed an adjustable bushing 110. Springs 112 are received within the bores 108 and bear against the slides 106 and the bushings 110 so as to urge the pressing members 102 and 104 carried thereby toward the last. By means of the bushings 110 each spring 112 can be so positioned preliminary to a pressing operation as to cause the pressing members 102 and 104 to impart substantially the same pressures or any desired different pressures to different lasts regardless of their widths. Movements of the pressing members 102 and 104 toward the last are limited, when the pressing members 72 and 74 are moved away from the last, by check nuts 114 which are threaded on rods 116 fixed to the slides 106 and arranged to slide freely within the bushings 110. The pressing members 102 and 104 are also prevented from rotating in the bores 108 by pins 118 carried by the slides 106 and received in slots formed in the pressing devices 72 and 74. The pressing devices 72 and 74 are carried by

arms 120 and 122 respectively which are pivoted on a common stud 124 so situated in the base 79 of the holder 22 as to cause the pressing members 102 and 104 adjacent to the abutment 76 to be moved into juxtaposition to the pressing members on this abutment when swung into operating position, as illustrated in Figs. 2 and 4. Springs 125, 125 connecting the holder 22 and the pressing devices normally urge them away from the last when the upper shaping pressure is relieved.

The heel band 24 is mounted at its ends on the pressing devices 72 and 74 so as to have limited movement relative to the pressing devices both laterally and longitudinally of the shoe, to facilitate its being pressed evenly against the upper, but not heightwise thereof to insure against interference with the wipers 26. The connections between the heel band 24 and the pressing devices 72, 74 are similar in both instances, and hence will be described with reference only to the pressing device 74. A hinge member 126 which is riveted to an end of the heel band 24 is mounted on a stud 128, the latter being received in a slot 130 extending longitudinally of the last in a slide 132 so as to allow the heel band certain freedom of movement in accommodating itself to a shoe upper held thereagainst. A spring 134, one end of which is fixed to the slide 132 bears at its other end against the member 126 so as to urge the heel band 24 toward the abutment 76. The slide 132 may have limited movement with respect to the pressing device 74 laterally of the shoe both to allow the pressing device 74 to move inward relatively to the heel band without causing any pressure to be imparted directly to the heel band through the slide 132 and also for the purpose of accommodating various widths of lasts and to prevent excessive flexing of the heel band 24 when the pressing devices 72 and 74 are swung away from the last toward their inoperative positions. To this end, the slide 132 is mounted to slide laterally of the last in a boss 136 extending from the end of the pressing device 74, the boss being bifurcated to receive a flattened portion 138 of the slide 132 and thus to prevent it from being rotated. A collar 140 and a shoulder 142 on the slide 132 cooperate with opposite extremities of the boss 136 to limit the movement of the slide 132.

The operation of a machine embodying this invention will now be summarized. The toe rest 39 and the last pin 40 having been adjusted relatively to each other in a manner well known to an operator skilled in the use of a bed-lasting machine of the type illustrated, so that the bottom of a shoe supported thereby will be in proper relation to the lower surfaces of the wipers 26, the carriage 12 is moved bodily to the left (Fig. 1) in the yoke 10 until the hooked end of the latch 14 engages the plate 16. If necessary, a final alinement of the wipers and the bottom of the heel end of the shoe may be effected at this stage by the use of the hand cranks 20 and 30. The hand wheel 54 is then turned in a counterclockwise direction (Fig. 1) so as bodily to move the support 44 and the shoe toward the holder 22 to cause the rear end of the heel band 24 closely to embrace the corresponding portion of the upper and last. This movement is resisted first by the pressing member 84 of the abutment 76, the slide 90 being moved in its slideway 78 toward the right-hand end of the machine until the force of the shoe against the heel band 24 is sufficient to cause the pressing members 82 and 96 to be compressed at least until they are expanded widthwise in contact with each other, so that they shall present a unified pressing surface to the rear portion of the heel band 24. The abutment 76 also serves a further purpose, namely, that of variably limiting the rearward movement of the shoe with respect to the path of the wipers 26. To this end the abutment 76 is adjusted longitudinally of the shoe by turning the rod 80 between successive trial movements of the shoe, as described above, until it is found that the wipers 26 have the desired amount of overtravel across the margin of the shoe bottom. In operating upon a shoe in a machine which has already been adjusted in the foregoing manner, the operator will next operate the wipers 26 once or twice barely across the edge of the last bottom partially to bend the marginal portions of the upper materials about the last corner preliminarily to clamping the heel band 24 against the sides of the shoe upper and wiping the margin of the upper materials about the entire heel end of the last.

The pressing devices 72 and 74 are next brought into action by operating a knee pad (not shown) at the front of the machine which actuates mechanism described in Letters Patent No. 1,417,493 for causing the plunger 58 to move to the right (Fig. 1) and hence to operate connections between it and the pressing devices 72 and 74 to cause the latter to swing toward the shoe about the center of the stud 124 as an axis. This movement of the pressing devices 72 and 74 results in the pressing members 102 and 104 first being brought into engagement with the heel band 24 and then the springs 112 being compressed sufficiently to exert such pressure upon the pressing members 102 and 104 as to cause them to be compressed and expanded widthwise into contact with each other whereby they, like the pressing members of the abutment 76, also present a continuous pressing surface to that area of the heel band upon which they act. It is apparent that the bushings 110 can be so positioned by a preliminary adjustment that when the pressing devices 72 and 74 are in their pressing relation, the pressure of the pressing members 102 and 104 against the heel band can be made either uniform or graduated in accordance with the requirements of the work in hand. For example, it is usually desirable to apply greater pressure to the side of the upper adjacent to the bottom of the shoe than elsewhere and as the pressing members 102 can easily be made to exert more pressure than the pressing members 104 it is apparent that the illustrated construction lends itself readily to these requirements.

Ordinarily it is desirable, in operating a machine of the type disclosed herein, that the pressing devices 72 and 74 shall apply their pressure to the heel band progressively from the area acted upon by the abutment 76 toward the forward ends of the heel band. To this end, the check nuts 114 are to be adjusted on the rods 116 so that the pressing members 102 and 104 extending from the abutment 76 toward the forward ends of the heel band are brought into play in succession as the pressing devices 72 and 74 are moved into their pressing relation.

After the heel band 24 has been pressed against the upper so as to make it conform to the shape of the last in the above-described manner, the operator then, in accordance with usual lasting procedure, operates the wipers 26 several times back and forth across the marginal portion of the shoe bottom and then drives a row of tacks into the bottom of the heel end of the shoe in order to hold the upper materials in their lasted

position. The pressing devices 12 and 14 are then separated from each other, and the holder 22 is moved away from the shoe support 44 to facilitate the substitution of a shoe to be lasted for that already operated upon.

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

1. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being relatively movable into and out of pressing relation, said pressing means comprising a plurality of pressing members arranged in series extending horizontally from one side of the last to the other about the heel end, the ends of said members being directed toward the last and being expansible into contact with one another in response to upper shaping pressure exerted thereagainst by the last.

2. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being movable relatively to each other into pressing relation, said pressing means comprising a plurality of pressing members paired heightwise of the last and arranged in series extending horizontally about the heel end of the last from one side to the other, the ends of said members being formed of yielding material and shaped and arranged to be expansible into contact with adjacent pressing members in response to upper-shaping pressure exerted thereagainst by the last.

3. In a lasting machine, a support for a last, and means for pressing an upper on said last into conformity to the side and end surfaces of the last, said means comprising pairs of pressing members arranged to act upon the upper from the edge of the shoe bottom to the top edge of the upper, said members of each pair being expansible heightwise into contact with each other in response to upper-shaping pressure thereby to provide a pressing surface which is continuous heightwise of the upper, said pairs also being arranged in a series extending along the sides of the last and around the end and being expansible into contact with each other thereby to afford a pressure surface extending continuously along the sides and around the end of the last.

4. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the shape of the side and heel end surfaces of the last, said means comprising pressing members of yielding material in superimposed rows extending from one side of the last to the other about the heel end thereof, said members being expansible into contact with one another in response to upper shaping pressure exerted thereagainst by the last, the ends of said pressing members being directed toward the last to present a continuous pressing surface throughout the extent of the pressing members heightwise and longitudinally of the upper.

5. In a lasting machine, a support for a last, means for pressing a shoe upper on said last into conformity to the shape of the side and heel end surfaces of the last, said pressing means comprising a plurality of pressing members paired heightwise of the last and arranged in series which extend horizontally about the heel end of the last from one side to the other, yielding means associated with each of said pressing members against the resistance of which said members are relatively movable, and means for adjusting said yielding means individually whereby the pressures of said pressing members can be regulated.

6. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being movable relatively to each other into pressing relation, said pressing means comprising a plurality of pressing members mounted for adjustment toward and away from the last and arranged in series extending about the heel end of the last from one side to the other, the ends of said pressing members being directed toward the last and being expansible into contact with one another in response to upper-shaping pressure exerted thereagainst by the last.

7. In a lasting machine, a support for a last, means for pressing a shoe upper on said last into conformity to the contour thereof, said support and means being movable relatively to each other into pressing relation, said pressing means comprising pressing members arranged in a plurality of series extending about the heel end of the last from one side to the other, said members being directed endwise toward the last, and means for adjusting the positions of said pressing members individually in said pressing means.

8. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being relatively movable into and out of pressing relation, said pressing means comprising a plurality of members arranged in series extending horizontally from one side of the last to the other about the heel end, the ends of said members being directed toward the last and carrying yielding pads shaped and arranged so as to be expanded into contact with one another in response to upper-shaping pressure exerted thereagainst by the last.

9. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being relatively movable into and out of pressing relation, said pressing means comprising plungers mounted for adjustment toward and away from the last, the ends of said plungers being formed of yielding material and shaped and arranged to be expanded into contact with each other in response to upper-shaping pressure exerted thereagainst by the last.

10. In a lasting machine, a support for a last, means for pressing a shoe upper on said last into conformity to the contour thereof, said support and pressing means being relatively movable into and out of pressing relation, said pressing means comprising a plurality of plungers mounted for endwise adjustment toward and away from the last, said plungers being paired heightwise of the last and arranged in series extending horizontally about the last from one side to the other, each of said plungers carrying at its end adjacent to the last a yielding pad shaped and arranged to be expanded into contact with an adjacent pad in response to upper shaping pressure exerted thereagainst by the last.

11. In a lasting machine, a support for a last, means for pressing a shoe upper on the last into conformity to the contour thereof, said means comprising a plurality of pressing members having ends formed of yielding material and directed toward the respective portions of the last opposite thereto, means for relatively moving

said support and pressing means toward each other into pressing relation thereby to cause said pressing means to act upon the upper and the yielding ends of said pressing members to be expanded into contact with each other, and means against the resistance of which said pressing members yield bodily as the support and pressing means are moved into their pressing relation.

12. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the contour thereof, said means comprising a plurality of yieldingly mounted pressing members arranged in two horizontally extending series, the ends of said members being directed toward the heel end of the last and being expansible into contact with one another in response to upper-shaping pressure exerted thereagainst by the last.

13. In a lasting machine, a support for a last, means for pressing an upper on said last into conformity to the contour thereof, said means comprising a plurality of yieldingly mounted pressing members arranged in rows extending from one side of the last to the other about the heel end thereof, the ends of said members directed toward the last being formed of yielding material, and means for relatively moving said support and pressing means toward each other thereby to cause said members yieldingly to press the upper against the last and to be expanded into contact with one another.

14. In a lasting machine, a support for a last, means for pressing an upper on the last into conformity to the contour thereof, said means comprising a plurality of pressing members mounted yieldingly to act upon portions of the upper opposite thereto, the ends of said pressing members carrying yielding pads, adjacent pads being in juxtaposition, and means for relatively moving said support and pressing means toward each other thereby to cause said members to act on the respective portions of the upper opposite thereto and to be expanded into contact with one another.

15. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the shape of the side and heel end surfaces of the last, said means comprising a plurality of devices movable laterally of the last and having pressing members mounted therein for movement relatively to each other in response to pressure exerted thereagainst from the upper, the ends of said members being directed toward the last and expansible into contact with each other in response to said pressure exerted thereagainst.

16. In a lasting machine, a support for a last, and means for pressing a shoe upper on said last into conformity to the shape of the side and the end surfaces of the last, said means comprising pressing devices mounted for movement toward and away from the support, each device having yieldably mounted therein a plurality of pressing members the ends of which are directed toward the last and carry yielding pads which are expansible into contact with each other in response to upper-shaping pressure exerted thereagainst by the last.

17. In a lasting machine, a support for a last, means for pressing a shoe upper on said last into conformity to the shape of the side and heel end surfaces of the last, said means comprising pressing devices mounted at opposite sides of the last for movement toward and away therefrom, each of said pressing devices carrying a plurality of pressing members mounted to yield with respect to each other in response to upper-shaping pressure exerted thereagainst by the last, yielding means associated with each of said pressing members against the resistance of which said members are relatively movable, and means for adjusting said yielding means individually whereby the yielding pressure of any of said members can be regulated with respect to that of the other members.

18. In a lasting machine, a support for an upper shaping form, pressing members of yielding material the ends of which are directed toward an end of the form and are shaped to press the end portion of an upper on said form into conformity to the shape thereof, said pressing members also being mounted for adjustment in directions substantially normal to the end surface of the form opposite thereto, and means for pressing the upper into conformity to the sides of the form having a plurality of yielding members paired heightwise of the form and disposed in series extending longitudinally of the form so as to act upon the side portions of the upper extending from the area at the end thereof acted upon by said first-mentioned pressing members toward the waist portion of the upper.

19. In a lasting machine, a support for an upper-shaping form, means for pressing an upper on said form into conformity to the shape of the side and end surfaces of the form, said means comprising a device having a pressing member disposed opposite to the extreme end portion of the form and a pressing member at each side of said first-mentioned pressing member mounted for adjustment in directions substantially normal to the surface of the form opposite thereto, and a pressing device at each side of said form having a plurality of pressing members arranged to act upon the side portions of the upper extending from the area at the end thereof acted upon by the first-mentioned device toward the waist portion of the upper.

20. In a lasting machine, a support for an upper-shaping form, means for pressing an upper on said form into conformity to the shape of the side and end surfaces of the form, said means comprising a device having pressing members mounted for adjustment relatively to each other in different directions normal to the surface of the end portion of the form opposite thereto, and a pressing device at each side of said form having a plurality of pressing members paired heightwise of the form and disposed in series extending longitudinally of the form, said members being adapted to be deformed into conformity to the shape of the form and expanded into contact with one another in response to upper-shaping pressure imparted by the form.

21. In a lasting machine, a support for a last, means for pressing the heel end of a shoe upper on said last into conformity to the end thereof comprising a pressing device having fixed and yieldingly mounted members adapted and arranged to operate upon the back seam area of the upper, a pressing member at each side of said fixed member mounted for adjustment toward and away from the last in directions substantially normal to the portion of the surface of the last opposite thereto, and a pressing device at each side of the last constructed and arranged to exert pressure against portions of the upper extending from the area acted upon by said first-mentioned device along the sides of the heel end of the last.

22. In a lasting machine, a support for a last,

means for pressing the heel end of a shoe upper on said last into conformity to the shape of the end thereof comprising a pressing device opposite to the heel end of the last and mounted for adjustment longitudinally thereof, said device comprising a plurality of pressing members mounted for adjustment toward and away from the last in different directions substantially normal to the portion of the last opposite thereto and a yieldingly mounted pressing member adapted and arranged to operate upon the back seam area of the upper, and pressing devices mounted for movement widthwise of the last to cause pressure to be exerted against portions of the upper extending from the area acted upon by said first-mentioned device along the sides of the heel end of the last.

23. In a lasting machine, a support for a last, means for pressing the heel end of a shoe upper on said last into conformity to the end thereof comprising fixed and yieldingly mounted pads and a pad at each side of said fixed pad mounted for adjustment toward and away from the last, and pressing devices mounted for movement widthwise of the last to exert pressure against portions of the upper extending from the area acted upon by said pads along the sides of the heel end of the last.

24. In a lasting machine, a support for an upper-shaping form, means for pressing an upper on said form into conformity to the shape of the side and end surfaces of the form, said means comprising a pressing device mounted for adjustment longitudinally of the form and having fixedly mounted thereon opposite to the heel end of the form a yielding pad, a yielding pad at each side of said first-mentioned pad and mounted for adjustment in directions substantially normal to the surface of the form upon which it acts, and a pressing device at each side of said form having a plurality of pressing members arranged to act upon the side portions of the upper extending toward the waist portion thereof from the area acted upon by said first-mentioned pressing device.

25. In a lasting machine, a support for a last, means for pressing a shoe upper on said last into conformity to the shape thereof, said support and pressing means being movable toward each other into pressing relation, said pressing means comprising a pressing device having an upper and a lower pressing member opposite to the back seam area of the shoe upper, the latter of which pressing members is arranged to yield in response to pressure imparted by the last until pressure is also received by the former of said pressing members, said pressing device also comprising a pressing member at each side of said upper pressing member and mounted for adjustment normal to the surface of the last opposite thereto, and a pressing device at each side of said form having pressing members paired heightwise of the form and arranged in series extending when in pressing position from the area at the end of the upper acted upon by said first-mentioned pressing device toward the waist portion thereof.

26. In a lasting machine, a support for a last, means for pressing an upper on said last into conformity to the shape thereof comprising a pressing device opposite to an end of the last and a pressing device at each side thereof, said last and pressing devices being relatively movable toward each other into pressing relation, said pressing devices having a plurality of pressing members arranged in a series extending about the end of the upper toward the waist portion at each side thereof arranged to act upon the portion of the upper contiguous to the edge of the shoe bottom, said pressing devices also having a row of pressing members paired heightwise with the adjacent members of said first-mentioned series arranged to act upon the area of the upper contiguous to the top edge thereof, all of said pressing members being adapted to be deformed when in their pressing positions into conformity to the shape of the respective portions of the last opposite thereto and to be expanded into contact with one another thereby to present a unified pressing surface to the upper throughout the area acted upon by said members.

27. In a lasting machine, a support for a last, a flexible member for conforming a shoe upper to an end and adjacent side portions of the last, means for pressing said flexible member against the upper comprising a plurality of pressing members arranged in series extending horizontally from one side of the last to the other about the heel end, the ends of said members being directed toward the last and being formed of yielding material, and means for moving said support and pressing means toward each other thereby to cause said pressing members to press said flexible member against the upper and to cause the ends of the flexible members to be expanded into contact with one another thereby to present a continuous pressing surface to said flexible member.

28. In a lasting machine, a support for a last, a flexible member for conforming a shoe upper to the heel end and adjacent side portions of the last, and means for pressing said flexible member against the upper comprising pressing members of yielding material disposed in rows extending from one side of the last to the other about the heel end thereof, said members being deformable into conformity to the shape of the portion of said flexible member opposite thereto and expansible into contact with one another in response to pressure exerted thereagainst by said flexible member.

29. In a lasting machine, a support for a last, a flexible member for conforming a shoe upper to the heel end and adjacent side portions of the last, means for pressing said flexible member against the upper comprising a plurality of pressing members arranged in series extending horizontally about the heel end of the last from one side to the other, yielding means associated with each of said pressing members against the resistance of which said members are relatively movable, and means for adjusting said yielding means individually whereby the pressure of said members against said flexible member can be rendered uniform.

30. In a lasting machine, a support for a last, a heel band for conforming a shoe upper to the heel portion of the last, means for pressing said heel band against the upper comprising a plurality of plungers the ends of which directed toward the heel band are formed of yielding material, yielding means associated with each of said plungers against the resistance of which they are relatively movable in response to pressure exerted by the heel band, and means for adjusting said yielding means individually whereby the pressures of said plungers against the heel band can be rendered uniform.

31. In a lasting machine, a support for a last, a heel band for conforming a shoe upper to the

heel end of the last, and means for pressing the heel band against the upper comprising a plurality of pressing members arranged in rows extending horizontally from one side of the last to the other about the heel end, the ends of said pressing members carrying yielding pads arranged and adapted to be expanded into contact with one another in response to pressure exerted against them by the heel band.

32. In a lasting machine, a support for a last, a heel band for embracing the heel end of an upper on the last, and means for pressing said heel band against the upper comprising a plurality of pressing members arranged in rows one of which is arranged to act upon the portion of the heel band opposite to the portion of the upper contiguous to the edge of the shoe bottom, the pressing members in another of said rows being mounted and arranged to press against the heel band from the area acted upon by said first-mentioned row of pressing members toward the top edge of the heel band, each of said pressing members being adapted to be deformed into conformity to the shape of the portions of the heel band opposite thereto and to be expanded into contact with the adjacent pressing members in response to the pressure of the heel band thereagainst.

33. In a lasting machine, a support for an upper-shaping form, a heel band for embracing the heel end of an upper on the form, means for pressing said heel band against the upper comprising a device having pressing members mounted for adjustment relatively to each other in different directions normal to the surface of the end portion of the form opposite thereto, and a pressing device at each side of said form having a plurality of members paired heightwise of the form and disposed in series extending longitudinally thereof, said members being adapted to be deformed into conformity to the shape of the portions of the heel band upon which they act in response to pressure imparted by the heel band.

34. In a lasting machine, a support for a last, a heel band for embracing the heel end of an upper on said last, means for pressing the heel end of the heel band against the upper comprising fixed and yieldingly mounted pads disposed opposite to the back seam area of the upper and a pad at each side of said fixed pad mounted for adjustment toward and away from the last, and pressing devices mounted for movement widthwise of the last into engagement with the heel band from the area acted upon by said pads along the sides of the heel end of the last.

35. In a lasting machine, a flexible member for conforming a shoe upper to the heel portion of a last, means for pressing said flexible member against the upper comprising a pressing device at each side of said last having plungers arranged in a series of pairs extending along the sides of the last toward the extreme heel end, the ends of said plungers being directed toward the last and carrying yielding pads which are expansible into contact with each other in response to pressure of the flexible member thereagainst thereby to afford a continuous support for the latter, and a pressing device for acting upon that area of said flexible member between said pads at the end of the last comprising a yielding pad mounted for adjustment longitudinally of the last and a yielding pad at each side thereof mounted for adjustment in directions substantially normal to the surface of the last opposite thereto.

36. In a lasting machine, a support for a last, wipers for wiping the margin of the heel end of an upper on said last inwardly over the bottom thereof, means for pressing said upper into conformity to the shape of the heel end of the last comprising a device arranged to position the last with respect to the field of action of said wipers having a pressing member disposed opposite to the extreme end portion of the last and a pressing member at each side of said first-mentioned pressing member mounted for adjustment in directions substantially normal to the surface of the last opposite thereto, and a pressing device at each side of said last having a plurality of pressing members arranged to act upon the side portions of the upper extending from the area thereof acted upon by the first-mentioned device toward the waist portion of the upper.

37. In a lasting machine, a support for a last, wipers for wiping the margin of the heel end of an upper on said last inwardly over the bottom thereof, means for pressing the heel end of the upper into conformity to the end thereof comprising a pressing device having fixed and yieldingly mounted members adapted and arranged to operate upon the back seam area of the upper and to position the last longitudinally thereof with respect to the field of action of said wipers, a pressing member at each side of said fixed member mounted for adjustment toward and away from the last in a direction substantially normal to the portion of the surface of the last opposite thereto, and a pressing device at each side of the last mounted and arranged to exert pressure against portions of the upper extending from the area acted upon by said first-mentioned device along the sides of the heel end of the last.

38. In a lasting machine, a support for a last, wipers for wiping the margin of the heel end of an upper on said last inwardly over the bottom thereof, means for pressing the heel end of the upper into conformity to the shape of the last and for positioning the latter with respect to the field of action of the wipers comprising a pressing device opposite to the heel end of the last and mounted for adjustment longitudinally thereof, said device comprising a plurality of pressing members mounted for adjustment relatively to each other toward and away from the portion of the last adjacent to the edge of the bottom in different directions substantially normal to the respective portions of the last opposite thereto, and pressing devices mounted and arranged to exert pressure against portions of the upper extending from the area acted upon by said first-mentioned device along the sides of the heel end of the last toward the waist portion.

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