Dec. 8, 1959 P. LAURETTI 2,915,765

SHOE UPPER SHAPING MACHINE

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Fig. 1

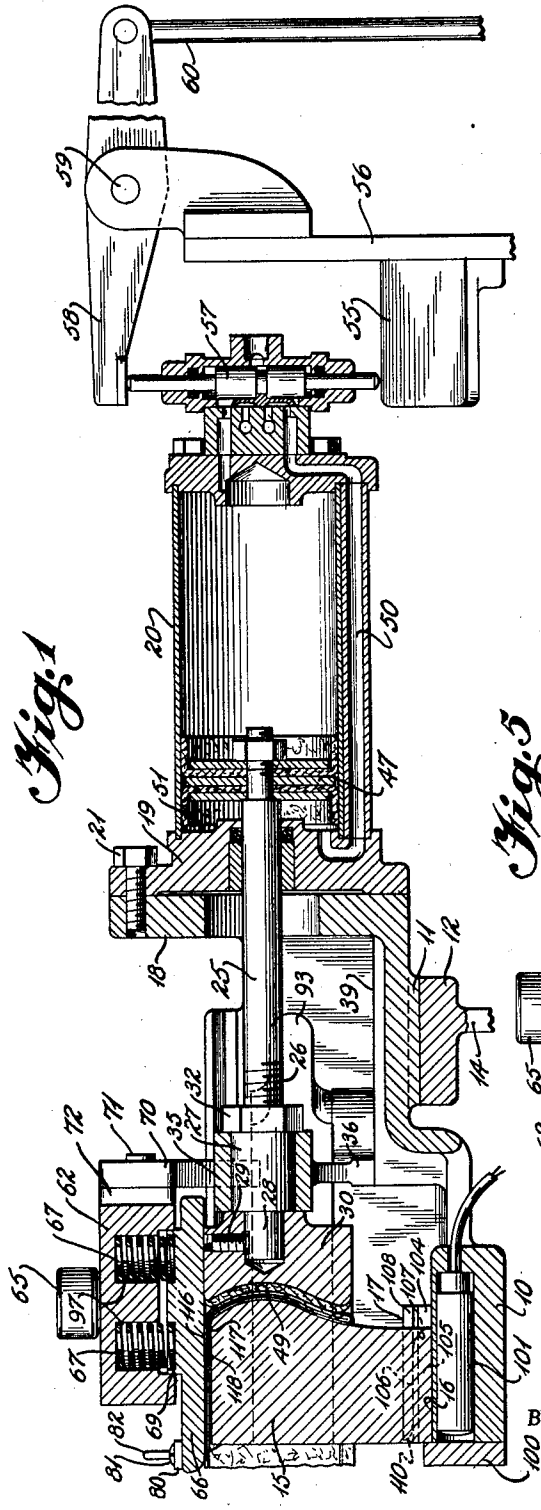


Fig. 6

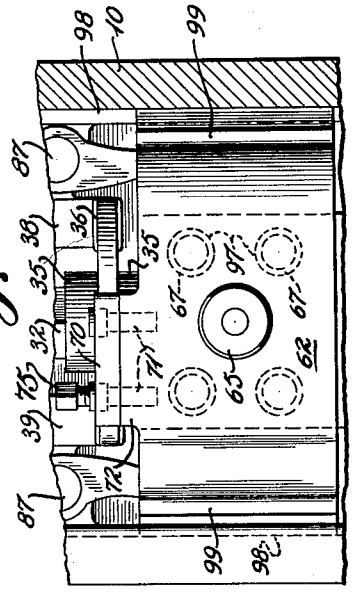
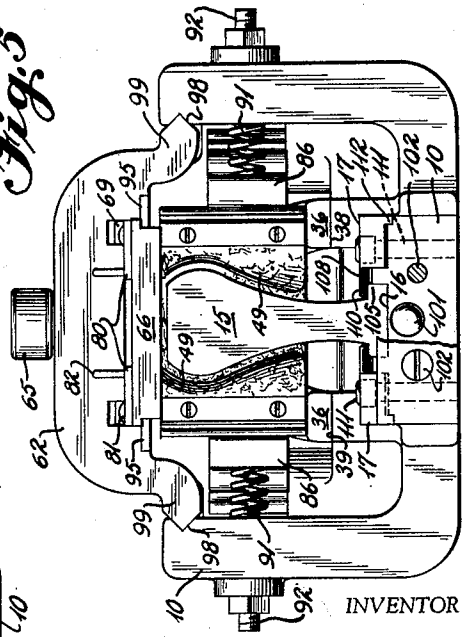


Fig. 5



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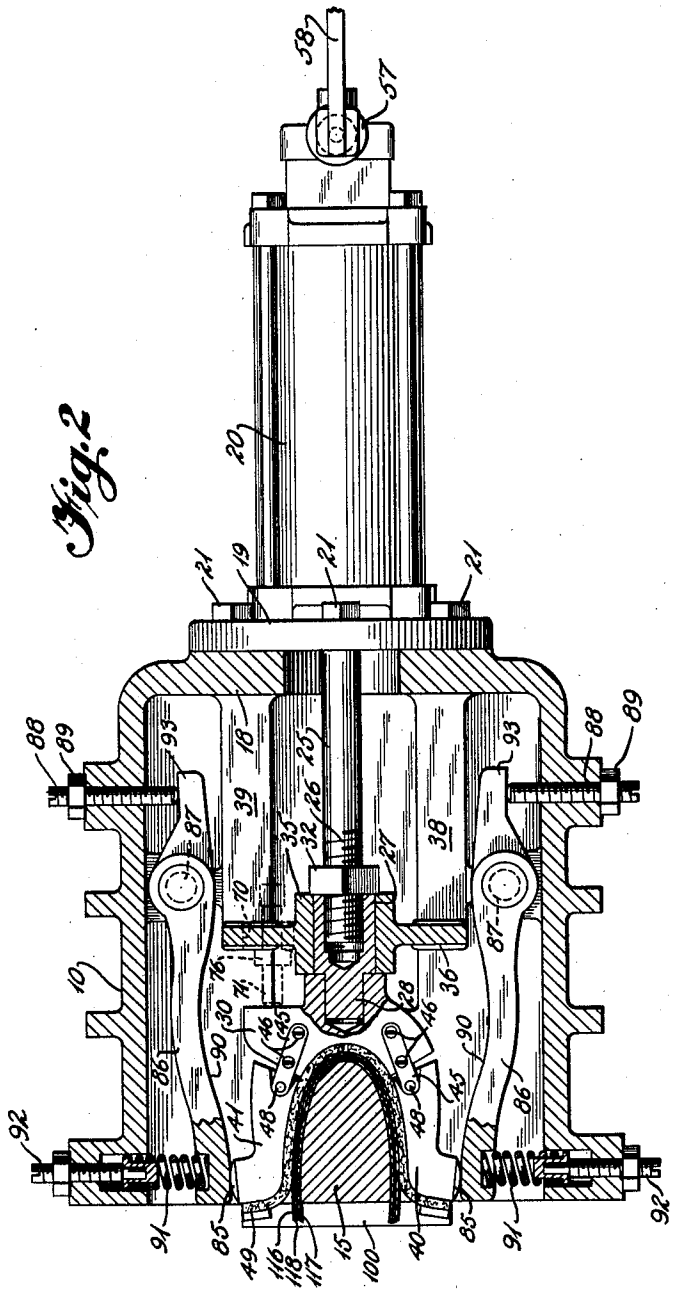
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SHOE UPPER SHAPING MACHINE

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Fig. 2



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Fig. 3

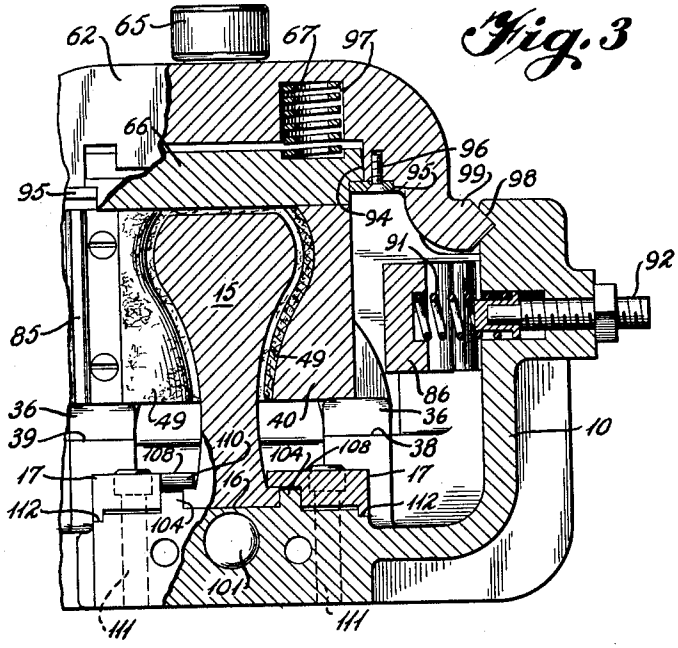
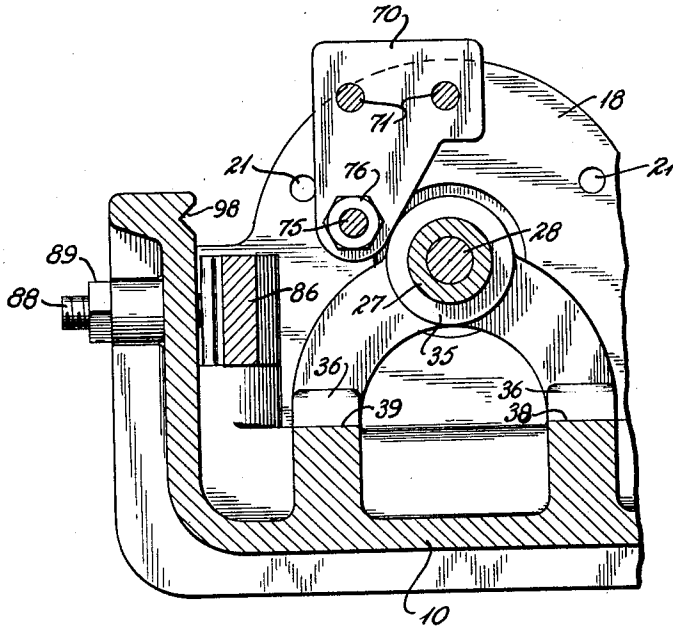


Fig. 4



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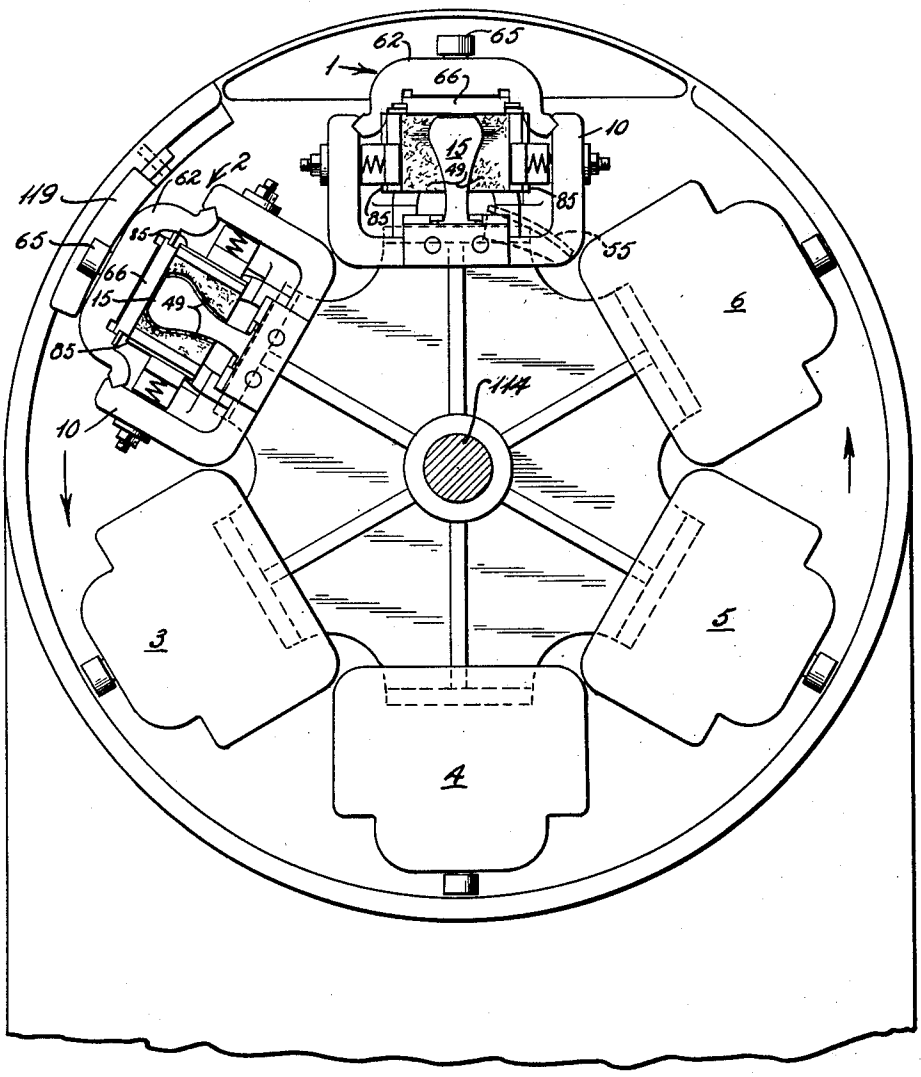


Fig. 7

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SHOE UPPER SHAPING MACHINE

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Application October 4, 1956, Serial No. 613,963

13 Claims. (Cl. 12—97)

This invention relates to the shaping of shoe uppers and has for its principal object the provision of mechanism for simultaneously shaping the shoe upper and a flat blank to form a counter stiffener, usually called merely a "counter," in such manner as to equal the smoothness of hand work when operating upon leathers of varying qualities.

An important feature of the invention lies in the provision of means whereby the pressure on the upper, with or without the counter, by the outer mold and against the inner mold or form will be independently applied at the back, at each of the two sides, and also at the top of the unit, whereby the shoe part when flanged will fit the last snugly and smoothly and thus facilitate the making of an attractive shoe.

An object of the invention is to provide a quarter-forming unit in which all danger of cutting the upper, because of irregularities in seams or in the thickness or stiffness of the leather, is eliminated by providing for a yielding of the outside mold against the plug or shaping form, not only at the rear but also at each of the two sides, and also by the use of a pressure plate moving generally horizontally but urged downwardly by a plurality of special springs so that this plate may tilt to accommodate unevenness.

Another object of the invention is to provide a turret mechanism revolving on a horizontal axis in which each of the several units, here shown as six in number, will automatically be operated. In the initial position the outside shaping mechanism is moved against the shaping form; in the second position the wiper carriage moves forward; and at the sixth position just prior to reaching the initial position, the outside mold moves rearward out of the way, carrying with it the independently movable wiper carriage.

In the drawings:

Figure 1 is a central vertical section through a unit.

Figure 2 is a central horizontal section partly in plan and indicating the location of the bracket at the rear of the wiper carriage by dotted lines.

Figure 3 is a half vertical transverse section through the inside and outside molds.

Figure 4 is a half vertical section showing particularly the stabilizer yoke.

Figure 5 is a front elevation, with the front plate omitted:

Figure 6 is a plane view of the wiper carriage.

Figure 7 is an elevation on a smaller scale primarily to show the locations of the cams.

The large jack casting **10** supports the unit, having a base **11** which is replaceably mounted on one of the six or more platforms **12** of a spider **14** powered to turn about a horizontal axis and moving in successive steps. The shaping form or plug **15**, which is the inside mold member, rests in adjusted position on a smooth flat surface **16** of the casting, being held in fixed position by a pair of hold-down clamps **17**, but quickly and easily replaceable by a plug of different size or style.

At its rear upstanding wall **18** the casting supports the head **19** of a cylinder **20** as by the bolts **21**. The piston rod **25** is threaded as at **26** into the larger diameter **27** of a steel turning, the integral smaller diameter **28** of which enters rather snugly into a recess in the rear element **30** of a three piece outside mold. A set screw **29** threaded in element **30** engages the smaller diameter portion **28** of the steel turning for quick removal of the outside mold when nut **32** is loosened. The larger diameter portion **27** is held firmly against the rear section **30** of the inside mold by a lock nut **32** which likewise binds the hub **35** of a stabilizer yoke having two widely spread feet **36** sliding freely on polished runways **38** and **39**, thus guiding the outside mold assembly and preventing any tilting of the outside mold with respect to the inside mold or shaping form **15**.

A pair of side members **40** and **41** (Fig. 2) forming the forward portions of the outside mold are each separately pivoted to the rear mold section **30** by means of two recessed brackets **45**, each bracket of the pair being nearly flush with the upper or the lower face of the outside mold. Each of the four brackets **45** is bolted as at **46** to the rear section **30** and has no movement with respect to such rear section, but the four forwardly extending ends of the brackets each carry a pin **48** (one above and one below) which coaxial pins form the pivots upon which the side members of the outside mold turn through a small angle. The outside mold carries the usual leather facing **49** which engages the outside of the shoe upper to be shaped.

All of the parts in Figures 1 and 2 are shown in forward position. The outside mold assembly moves rearwardly with the piston **47** whenever air is admitted through passage **50** to the front end **51** of cylinder **20**, this taking place only between the 6th or last dwell position and the 1st or initial position. A cam **55** mounted on the frame **56** of the machine is tilted so as to move valve **57** upwardly from the position shown in Figure 1 to the position it assumes in the initial stage. The forward movement of the unit mechanism is caused by a lever **58** pivoted as at **59** to the frame **56**, this lever being operated through a vertical rod which is manually controlled by a pedal, not shown. The lever **58** is at the extreme top of the machine and just behind the mold unit or jack which is in uppermost or initial position.

A wiper carriage **62** (Fig. 3) slides forward and backward in the mold unit casting **10**. Movement in the forward direction, toward the operator, is caused by engagement of roller **65** centrally mounted on the top of the carriage with a cam to be described later. Movement in the rearward direction is caused by engagement, as later explained, with the retreating outside mold assembly. The wiper carriage carries a wiper plate **66** pressed downward by four spaced springs **67**, the wiper plate which is rectangular in form sliding smoothly up and down in a correspondingly shaped recess **69** in the wiper carriage **62** but having ample clearance to tilt to the slight degree necessary to provide for inequalities.

A bracket **70** bolted as at **71** (Figure 4) to an extension **72** of the wiper carriage carries a wiper carriage return screw **75**, omitted in Figure 1 but its location is shown in Figure 2 by dotted lines. This screw is threaded in the lower end of the bracket **70** and is locked in adjusted position by the nut **76** so that when the piston and its rod **25** move rearwardly, the wiper carriage will move with the outer mold section because of the engagement of the flat face of rear section **30** with the screw **75**.

A pair of guide fingers **80** (Figures 1 and 5) mounted on the forward end of wiper plate **66** are secured in place by holding screws **81** and each carries a pin **82** to prevent turning of the fingers. Generally these fingers **80** are in engagement with the plate **66** but may be moved

upward by inserting one or more shims underneath them, the purpose of the fingers merely being to enable the operator to determine the width of the flange to be wiped on the shoe upper and counter.

Referring now to Figure 2, each of the L-shaped forward or side members of the inside mold has an outwardly extending rounded projection 85, to engage the camming surface of a pressure lever 86 pivoted as at 87 and having a stop screw 88 threaded in the casting 10 and secured by a lock nut 89. At the front end of each pressure lever 86 the camming surface 90 is held against the extension 85 by a strong spring 91, the compression of which may be adjusted by turning screw 92. The two pressure levers 86 may obviously be independently controlled, both as to the amount of pressure exerted by the springs 91 and by the location at which the short rear ends 93 engage the stop screws 88.

The form of the wiper carriage is probably best seen in Figures 3 and 5. The wiper plate 66 slides freely up and down in the recess formed by the transverse surfaces 69 and the longitudinal surfaces 94. Steel plates 95 held by screws 96 form the lower limit of travel of the plate 66 as independently urged downward by the four springs 67, each in a well 97 in the wiper carriage. The two side walls of the casting 10 have 90° grooves 98 in which elongated side guides 99 of the carriage slide snugly but freely. The longitudinal dimension of the wiper carriage is about half of the transverse width between the ends of the guide portions 99. A short extension 72 (Figure 6) provides a base to which the bracket 70 is secured.

In the front elevation of Figure 5 the front plate 100 secured by bolts 102 is omitted in order to show the heating unit 101 and the curved surfaces facilitating replacing of the plug or inside shaping form 15. This inner mold portion 15 slides snugly between two longitudinal ridges 104 in the casting 10, and the two side flanges 105 at the bottom of the form 15 engage these ridges. As shown by the dotted line 106 in Figure 1, each of the side flanges 105 is curved as at 107 at its rear. The overhanging ledges 108 of the hold-down clamps 17 are curved at their fronts by curved surfaces 110 (Figure 3) which cooperate with curves 107 to aid in quick and easy assembly of a shaping form with its unit. The hold-down clamps 17 are secured by screws 111 which extend into the casting 10 for some distance. By merely loosening the screws 111 the sharp edge at the rear of curve 107 will readily slide in the sharp curve at the front of curved surface 110, and the inside mold or shaping form will thus readily move right into place and can then be moved forward against the plate 100, after which the screws 111 can again be tightened. I prefer that each of the two side clamp plates 17 shall have engagement at the bottom with only a small portion of the smooth surface of the casting. To this end I form a short longitudinal rib 112 at the outside of each clamp and the clamp therefore rocks about this narrow rib 112 to give a much firmer engagement between the overhanging ledge 108 and the side flange 105 of the inside mold. The operation is as follows:

The general form of the machine itself is shown in Figure 7, the initial position of each shaping unit being uppermost and the vertically arranged turret moving by power means in step by step fashion about horizontal main shaft 114, the units and their spider 14 moving in counter-clockwise direction, as seen in this figure. When a shaping unit arrives at the upper or initial dwell position, the moving parts of the shaping mechanism are retracted; the operator places a shoe upper 116, preferably carrying a lining 117, forming a pocket in which is placed a blank counter 118. The workman places this partially formed shoe part on the shaping form 15 in the usual manner, bringing the shoe part into light contact with the locating fingers 80. The workman now presses the pedal (not shown) which operates lever 58 and this lowers valve 57, and the piston therefore moves forward carrying with it the outside mold assembly and the stabilizing yoke which slides on smooth surfaces 38 and 39, thus preventing any side-to-side tilting of the inside mold. As the parts move forward, the curved outwardly extending ends 85 of the outside mold side pieces ride on the cam surfaces 90 of the pressure levers 86, tending to move the forward ends of these levers away from each other and the rear ends 93 away from the stop screws 88. Each side of the shoe part is therefore independently resiliently pressed against the shaping form 15 as each of the forward side members of the inside mold may turn freely about its pivot 48 in the brackets 45 at both top and bottom of the inside mold. The shoe part is locked in position when the outside mold is in forward position and the turret moves in counter-clockwise direction, with the shoe upper, the lining, and the counter blank all extending well above the top of the shaping form 15. On approaching the second position, to the left of initial position in Figure 7, the roller 65 mounted on wiper carriage 62 is engaged by cam lever 119 and the wiper carriage is therefore moved forwardly or from back to front. This movement brings the wiper plate 66 into firm but yielding contact with the upper, its lining, and the counter which has been covered with cement on both sides. During the dwell at the second position the parts are in the position shown in Figures 1 and 2. The cement is partly setting and will be firmly set by the heat supplied by heater element 101 when this shaping unit arrives at the sixth dwell position, i.e. just before the initial position. Dwell positions 3, 4, 5, and 6 are idle positions but the sloping cam 55 which operates the valve to move the piston rod 25 rearward is located between dwell positions 6 and 1. The pressed quarter and vamp is removed from shaping form 15 at the initial position and another shoe part including quarter, lining, and counter blank is inserted in its place. The term "non-resilient pressure" is used in the claims to denote a yielding pressure not such as exerted by springs but rather a constant pressure as carried by a direct rigid member connected to a piston such as rod 25 and piston 17.

What I claim is:

1. In combination, a shaping form, an outside mold comprising a center section and two side sections pivoted thereto, means for pressing the center section toward the rear of the shaping form, centrally pivoted spring pressed camming levers engaging the forward ends of the two side mold sections, adjustable tension spring means at one side of the pivots for urging the levers to move the side sections toward the shaping form, and adjustable means on the opposite sides of the pivots for limiting the movement of the levers under urge of the spring means.

2. In a machine for shaping a shoe upper, a casing having a guiding surface, a piston rod moving parallel to said surface, an outer mold section connected to said rod and a stabilizer yoke moving with the piston rod and the outer mold section, said stabilizer yoke having spaced legs engaging the guiding surface to prevent tilting of the mold section.

3. In a shoe upper shaping machine unit, a supporting structure adapted to be carried by a rotating carrier, a shaping form secured to the supporting structure, an outside mold movable on the supporting structure, a wiper carriage, means for moving the wiper carriage parallel to forward movement of the outside mold, and a depending bracket carried by the wiper carriage for engagement by the mold whereby return movement of the mold returns the wiper carriage to initial position.

4. In a machine for forming shoe uppers, a machine frame, a rotating spider mounted thereon and having a plurality of platforms, a plurality of units mounted on the several platforms, reciprocating means movable to

position to hold a shoe upper for formation of the usual flange, a reciprocating wiper carriage carrying a tiltable wiper plate, a roller centrally mounted on the top of the carriage, and a cam lever on the machine frame for engaging said roller and moving the wiper carriage and its plate across the shoe upper to form said flange.

5. In a machine for shaping shoe uppers, a frame, a horizontal main shaft thereon, a spider rotatably supported on said shaft and having a plurality of radially disposed platforms, means for turning the spider in step by step manner, and a unit on each platform, each unit comprising an inner mold or shaping form, an outer mold, means for reciprocating the outer mold including a cylinder, a piston therein and a valve for admitting fluid alternately to the two sides of the piston, a wiper carriage slidable in the unit and carrying a roller, a manually operated lever on the frame to shift the valve to advance the piston and the outside mold, a cam lever on the frame to engage said roller to advance the wiper carriage, a sloping cam on the machine frame to shift the valve to return the piston and outside mold to initial position, and means carried by the wiper carriage in the path of movement of the retreating outside mold for returning the wiper carriage to initial position.

6. Means for permitting quick securing of a shaping form in a shoe upper shaping machine, comprising a base having a flat supporting surface bounded at its sides by parallel upstanding flanges and by a transverse stop member at the front, a shaping form having side flanges at its bottom to slide between the flanges of the base, said side flanges having a greater height than the parallel upstanding flanges, a clamp on each side of the form including means to bind the clamps to the base to hold the form in place, the rear of each form flange and the front of each clamp flange having tapered cooperating surfaces ending in sharp edges whereby the form may readily be inserted over the stop member and under the clamps when the binding means are loosened, slid rearwardly until it rests upon said supporting surface and finally be moved forwardly so that its front end engages the stop member and the clamp then be tightened.

7. A wiper mechanism comprising a reciprocating carriage having a recess, a rigid wiper plate slidable in the recess, means limiting movement of the plate out of the recess, and a plurality of pairs of springs in the wells pressing directly upon the wiper plate to urge the plate toward the limiting means.

8. In combination, a shaping form, a reciprocating outer mold, means for pressing the mold against the form, and means resiliently engaging the forward ends of the mold to urge said ends against the form, said means including curved pressure levers having limiting stops to control the pressure at the ends of the mold.

9. Means for securing a shaping form in a shoe upper shaping machine comprising a base having a smooth supporting surface bounded by parallel upstanding flanges, a shaping form having side flanges at its bottom to slide between the flanges of the base, said side flanges having a vertical depth exceeding the height of the base flanges, a clamp mounted on the base at each side of the form outside of the flanges including means to bind the clamps to the base, each clamp comprising a body having a face parallel with the proximate face of a side flange, an elongated longitudinal rib at the bottom of the body on the outside about which the clamp pivots on the base as it is being secured thereto, and an inwardly extending flange on each clamp engaging the top of the proximate form flange and clearing the shaping form base flange.

10. In a shoe upper shaping machine unit, a supporting structure adapted to be carried by a rotating carrier, a shaping form secured to the supporting structure, an outside mold movable on said supporting structure, a wiper carriage, means for moving the wiper carriage parallel to forward movement of the outside mold, a cam fixed with respect to the rotating carrier, a roller carried by the wiper carriage to engage said cam to move the wiper carriage parallel to the forward movement of the mold, and means depending from the wiper carriage into the path of the rearwardly moving mold for returning the wiper carriage when the mold is returned.

11. A wiper carrier having in one face thereof a recess with walls perpendicular to said face, a rigid wiper plate loosely fitting said walls with its outer surface extending beyond said face, a plurality of spaced resilient means between the carrier and the inner surface of the wiper plate to urge the wiper plate away from the wiper carriage, and means to limit movement of the wiper plate out of said recess, said resilient means being so positioned that the rigid wiper plate may tilt universally with respect to said face.

12. In a machine for shaping shoe uppers, a frame, a main shaft in said frame, a rotatable spider on said shaft, means for turning the spider in step-by-step manner with dwells at each step, a plurality of spaced similar units in excess of three carried by the spider, each unit including an inner mold, a reciprocating outer mold and a wiper carriage, means for reciprocating each outer mold including a cylinder, a piston therein and a valve for admitting fluid alternately to the two sides of the piston, means operable when a unit has come to rest in initial position to shift the valve to advance the piston and the outside mold, means located at a point where a unit has left the initial position for advancing the wiper carriage, and means located between the initial position and the position preceding the initial position for moving the valve to retract the piston, the outside mold and the wiper carriage, whereby when the shoe upper is clamped by the inner mold, the outer mold and the wiper carriage of one unit it will remain so clamped until the end of the cycle and until the valve is shifted by the first mentioned valve shifting means.

13. In a machine for assembling a shoe upper and a flat counter blank, the combination of two molds with means for holding the upper and the blank in assembled relation between said two molds with a portion of the upper and the blank free of the molds, means exerting an initial and continuous non-resilient clamping pressure at the rear of the upper, so that the upper cannot shift, and independent means for subsequently progressively exerting yielding pressure at the two sides of the upper, whereby to stress the upper in a direction forwardly with reference to the heel while the heel end is clamped.

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