April 10, 1956 B. W. FREEMAN ET AL 2,740,976

SHOE SHAPER

Filed Aug. 26, 1954 4 Sheets-Sheet 1

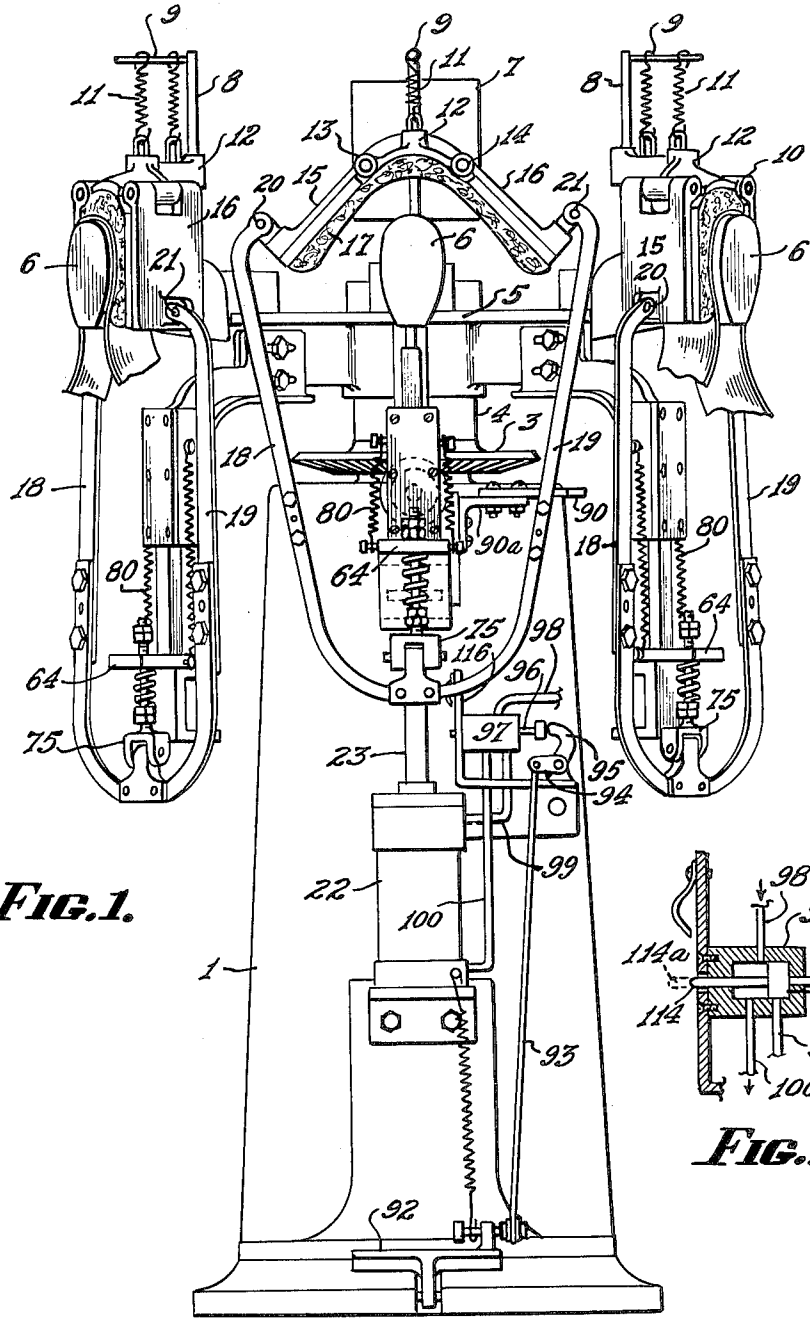


FIG. 1.

FIG. 2.

INVENTORS.
BENJAMIN W. FREEMAN
AND CLARENCE M. VIERLING,
BY
Allen & Allen
ATTORNEYS.

April 10, 1956 B. W. FREEMAN ET AL 2,740,976

SHOE SHAPER

Filed Aug. 26, 1954 4 Sheets-Sheet 2

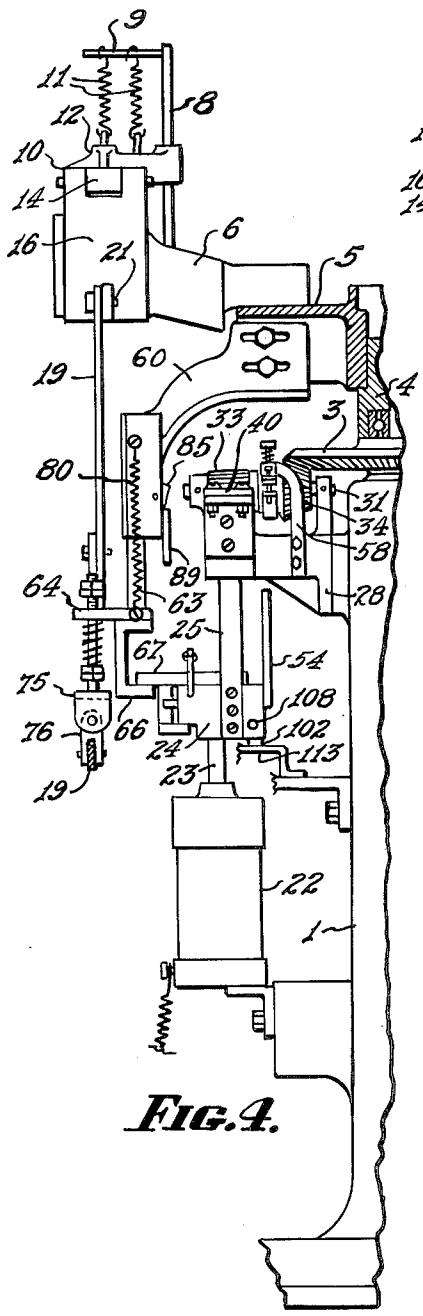


FIG. 4.

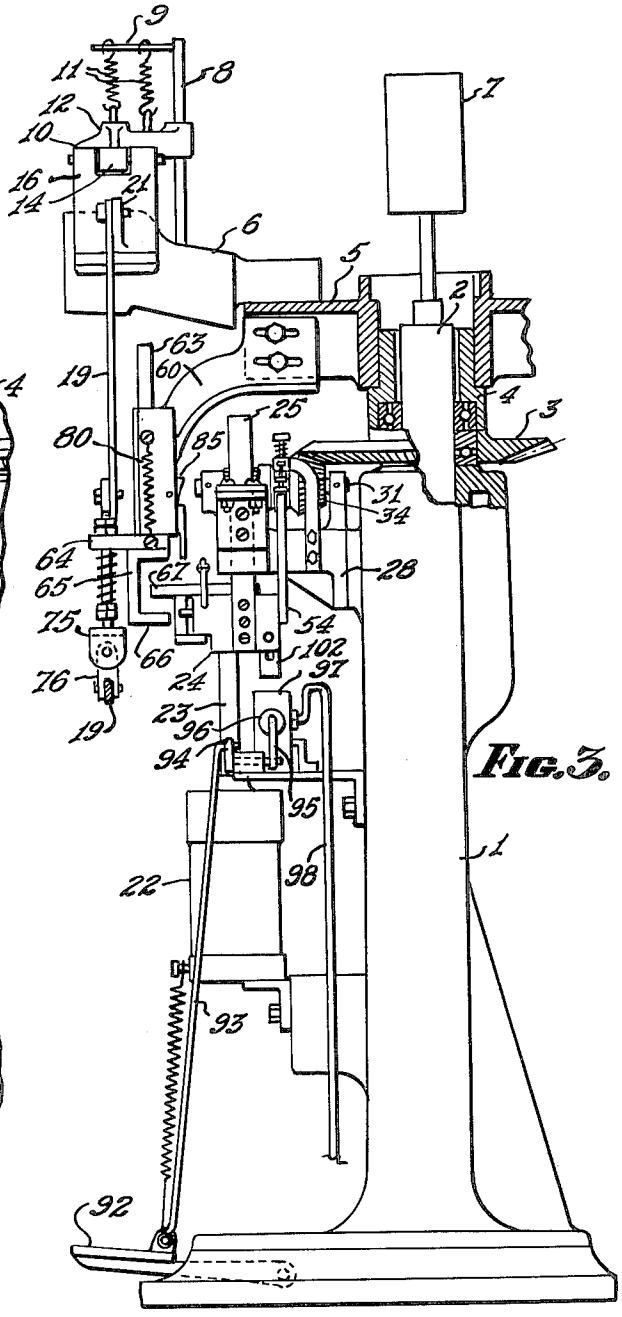


FIG. 3.

INVENTORS.
BENJAMIN W. FREEMAN
AND CLARENCE M. VIERLING,
BY
Allen & Allen
ATTORNEYS.

April 10, 1956 B. W. FREEMAN ET AL 2,740,976

SHOE SHAPER

Filed Aug. 26, 1954 4 Sheets-Sheet 3

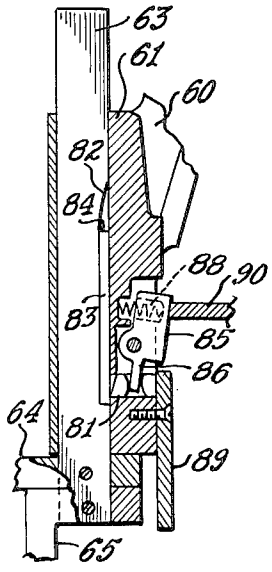


FIG. 7.

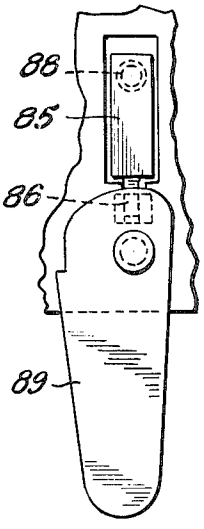


FIG. 6.

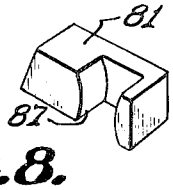


FIG. 8.

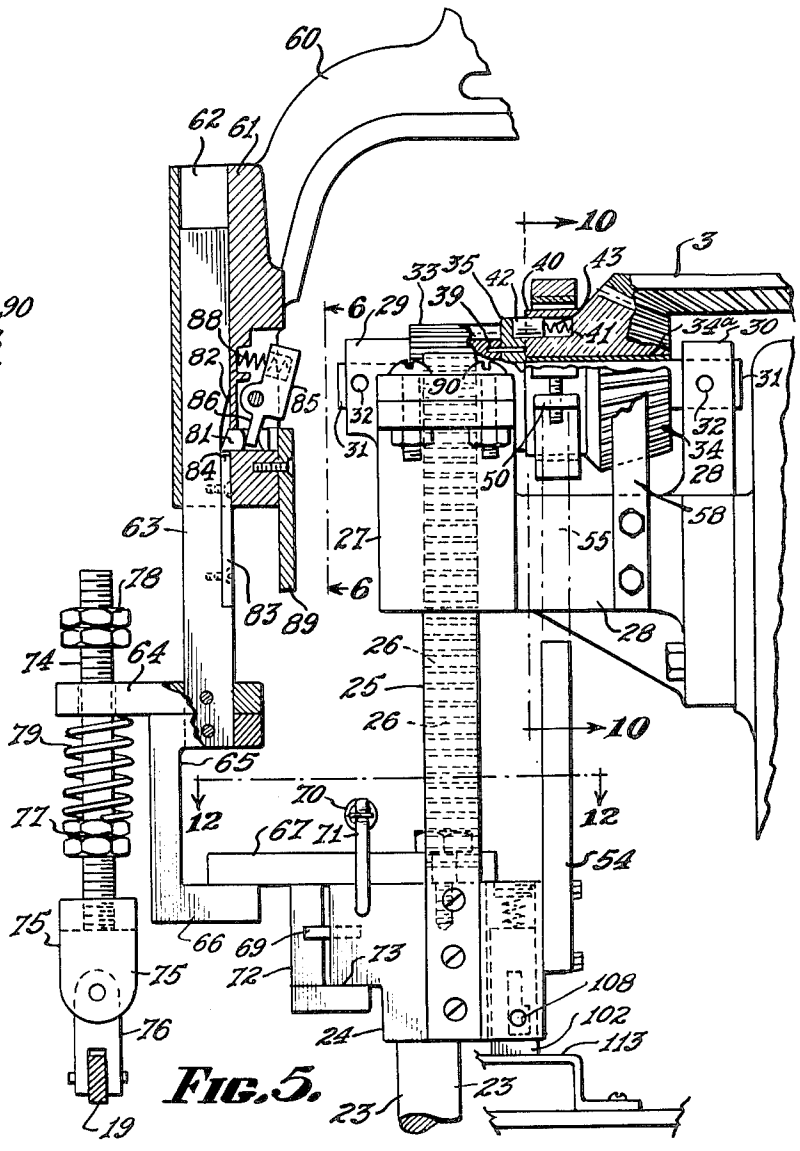


FIG. 5.

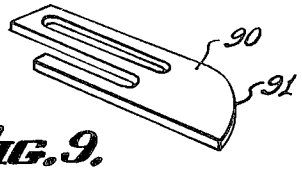


FIG. 9.

INVENTORS.
BENJAMIN W. FREEMAN
AND CLARENCE M. VIERLING,
BY
Allen & Allen
ATTORNEYS.

April 10, 1956 B. W. FREEMAN ET AL 2,740,976

SHOE SHAPER

Filed Aug. 26, 1954 4 Sheets-Sheet 4

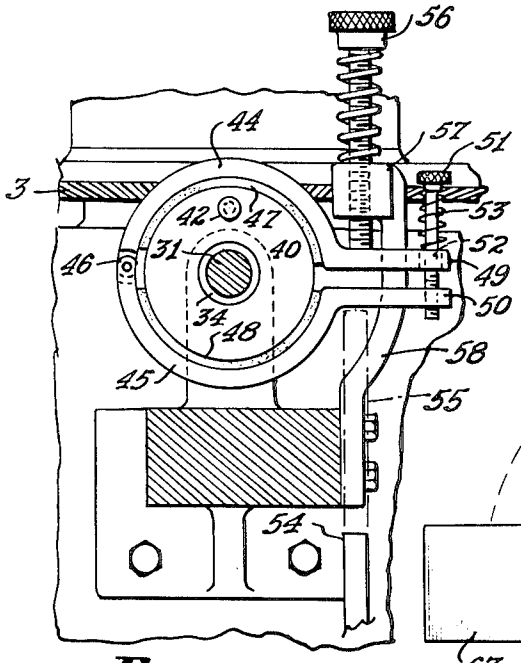


FIG. 10.

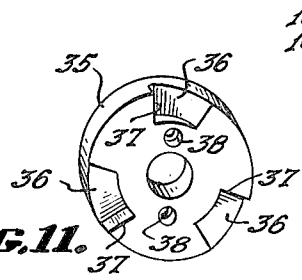


FIG. 11.

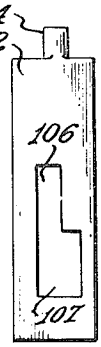


FIG. 16.

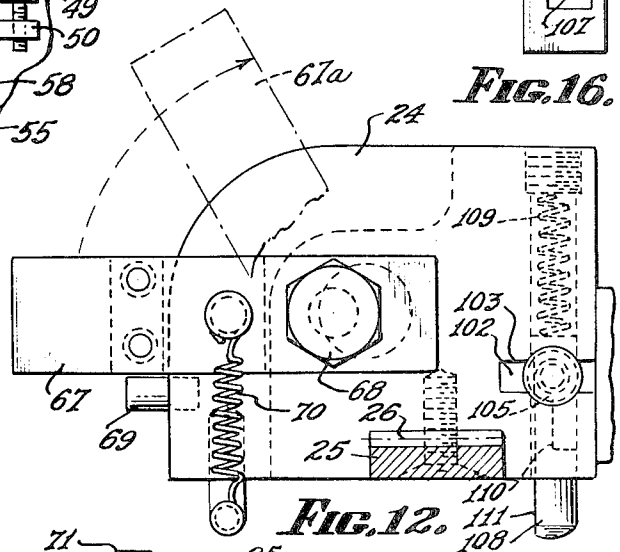


FIG. 12.

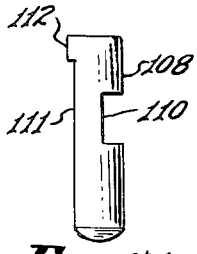


FIG. 17.

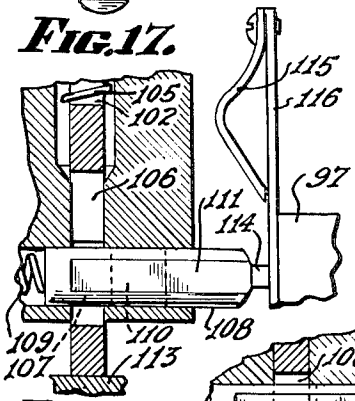


FIG. 14.

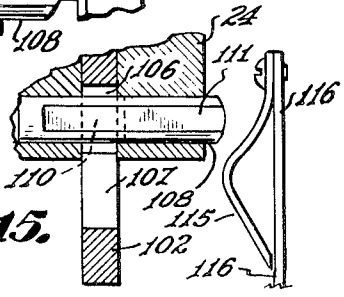


FIG. 15.

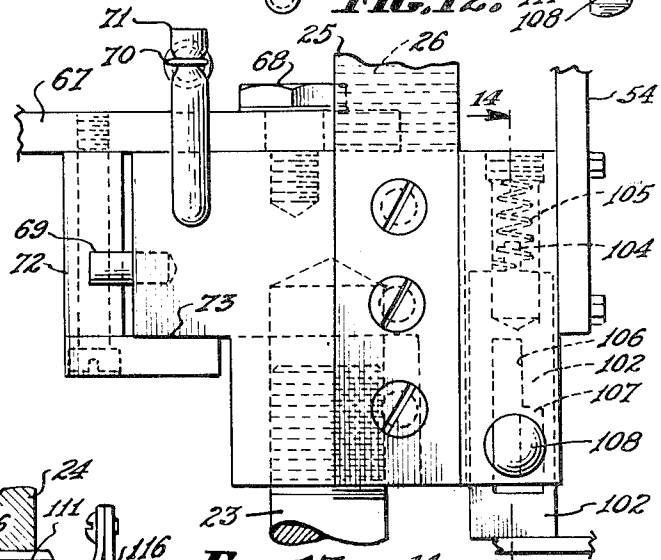


FIG. 13.

INVENTORS.
BENJAMIN W. FREEMAN
AND CLARENCE M. VIERLING,
BY
Allen & Allen
ATTORNEYS.

United States Patent Office 2,740,976 Patented Apr. 10, 1956

2,740,976

SHOE SHAPER

Benjamin W. Freeman and Clarence M. Vierling, Cincinnati, Ohio, assignors to The Louis G. Freeman Company, Cincinnati, Ohio, a corporation of Ohio

Application August 26, 1954, Serial No. 452,418

24 Claims. (Cl. 12—51)

Our invention relates to shoe shapers and more particularly to a machine for shaping shoe uppers.

In the manufacture of shoe uppers, it has been found desirable to press or mold the parts against a heated form in order to secure the desired shape and appearance. For example, prior to assembling a shoe upper with its last, it is desirable to shape the back part of the shoe so as to clearly define the rear portion of the upper and to flatten the back-seams of the quarter and of the lining especially at the top of the back-stay or back-seam. Similarly, it has been found of great assistance in making a well-shaped shoe to press the shoe upper around the heel end after completion of the shoe and the withdrawal of its last, thereby eliminating the wrinkled and unsightly appearance which oftentimes occurs particularly in less expensive shoes.

A principal object of our invention is the provision of an automatic multiple station upper shaping machine for producing uniform work of highest quality.

Another object of our invention is to provide a shaping machine having a rotatable head carrying a plurality of forms adapted to be sequentially presented to the operator for insertion of the piece of work, whereupon the form is automatically closed and the head rotated to present the next form to the operator.

Yet a further object of our invention is the provision of a device of the character described incorporating novel features of construction which prevents jamming of the machine and the breakage of parts should the operating parts of the machine became misaligned.

Still a further object of our invention is the provision of novel means for actuating the machine and for controlling the movement of the forms through their rotative cycle.

These and other objects of our invention which will appear hereinafter or which will be apparent to the skilled worker in the art upon reading these specifications, we accomplish by that construction and arrangement of parts of which we shall now describe an exemplary embodiment.

Reference is now made to the figures of the drawings wherein:

Figure 1 is a front elevational view of a machine in accordance with my invention.

Figure 2 is an enlarged diagrammatic view of the piston actuating mechanism.

Figure 3 is a side elevational view of the machine with parts in section.

Figure 4 is a side elevational view similar to Figure 3 but with the form in the closed position.

Figure 5 is an enlarged elevational view with parts in section of the actuating mechanism for the machine.

Figure 6 is an elevational view taken along the line 6—6 of Figure 5.

Figure 7 is a view of a portion of the device illustrated in Figure 5 but with parts in an alternate position.

Figure 8 is a perspective view of one of the elements of the form locking device.

Figure 9 is a perspective view of the cam member for releasing the form locking device.

Figure 10 is a sectional view taken along the line 10—10 of Figure 5 and illustrating the brake for the rotatable head.

Figure 11 is a perspective view of a ratchet disc for controlling movement of the rotatable head.

Figure 12 is a sectional view taken along the line 12—12 of Figure 5.

Figure 13 is an elevational view of the means illustrated in Figure 12.

Figure 14 is a sectional view taken along the line 14—14 of Figure 13.

Figure 15 is a fragmentary view similar to Figure 14 illustrating the parts in an alternative position.

Figure 16 is a front elevation of the latch plate for the cylinder actuating mechanism.

Figure 17 is an elevational view of a latch pin for the cylinder actuating mechanism.

For a more complete understanding of our device, reference is now made to Figures 1, 3 and 4 of the drawings, wherein we have shown a machine frame 1 having vertically extending stub shaft 2 extending upwardly therefrom. The stub shaft is fixed against rotation relative to the machine frame. A large bevel gear 3 is rotatively mounted on the stub shaft 2, the bevel gear including a hub 4 having shoulders which support a rotatable head 5. Mounted on the rotatable head are a plurality of shoe forms 6 in which electrical heating units (not shown) are mounted, the heating units being controlled by means of a control unit 7 conveniently mounted on the top of the stub shaft 2. The forms, it will be understood, constitute inside forming members about which the uppers are fitted for pressing and forming.

Each of the forms 6 carries a vertically extending rod 8 having a horizontally disposed arm 9 from which a shaping member, indicated generally at 10, is suspended by means of springs 11. The forming members each comprise a saddle piece 12 supported by the springs 11 and journalled for sliding movement long the rod 8. The saddle piece is provided with ears 13, 14 to which are pivotally connected side saddle-pieces 15 and 16, respectively. The inner surfaces of the saddle piece 12 and the side saddle pieces 15, 16 are lined with suitable padding 17 formed from flexible material and conforming to the configuration of the shoe form 6. It will be understood that the shaping member serves as an outer pressing member, coacting with the form 6 to press the shoe upper therebetween when the shaping member is closed about the form. The shaping member 10 is actuated by means of arms 18 and 19 pivotally connected, as at 20 and 21, to the free ends of the side saddle pieces 15 and 16. Actuation of the arms 18, 19 will cause the shaping member to move from the open position, best seen in Figure 1 wherein the side saddle pieces are spread outwardly away from the form 6 and the saddle piece 12 lifted upwardly under the influence of the spring 11, to the closed position also illustrated in that figure wherein the saddle pieces are moved downwardly and inwardly into contacting relation with the form.

The machine is driven through its operating cycle by an air cylinder 22 mounted in a vertical position on the machine frame 1. The cylinder has a plunger 23 extending upwardly therefrom to the upper end of which is secured a rack block 24 to which is fixedly secured the elongated rack 25 having teeth 26 extending therealong, as best seen in Figure 5. The upper end of the rack is slidably received in the block 27 supported by an arm 28 fixed to the machine frame beneath the bevel gear 3. The block 27 carries an ear 29, and a similar ear 30 is carried by the arm 28, there being a shaft 31 extending between the two ears and fixedly secured thereto, as by

means of pins or the like indicated at 32. A pinion gear 33 is rotatably mounted on the shaft 31, and the teeth of the rack 25 engage this pinion gear. Thus, as the rack is reciprocated by reciprocating movement of the plunger 23, the pinion gear will be caused to rotate.

The bevel gear 3 and hence rotatable head 5 are arranged to be driven by the pinion gear 33 acting upon a bevel gear 34 also rotatably mounted on the shaft 31. It will be apparent that a direct connection between the pinion gear 33 and the bevel gear 34 would result in a reciprocating movement of the head 5, whereas it is necessary that the head rotate in but one direction. To this end the bevel gear is driven from the pinion 33 by means of a ratchet disc 35. This disc is illustrated in Figure 11 of the drawings, wherein it will be seen that the disc is provided at spaced intervals with inclined faces 36 defining shoulders 37. The disc is provided with counterbored openings 38 which receive pins 39 serving to secure the ratchet disc to the face of the pinion 33. The ratchet disc 35 abuts against a hub 40 forming an integral extension of the bevel gear 33. A bore 41 is provided in the hub 40 into which depressible pins are fitted, one of these pins being seen at 42 in Figure 5, the pin being urged outwardly by a spring 43. This arrangement permits the pins to engage the shoulders of the ratchet disc as the pinion gear 33 is rotated in one direction, whereas when rotated in the opposite direction, the pins will ride up the inclined faces 36 of the ratchet disc without coupling the pinion 33 and the bevel gear 34 for joint movement. The arrangement is such that the pinion gear 33 and the bevel gear 34 will be connected together for joint movement upon the up-stroke of the rack 25, whereas upon the down-stroke of the rack the bevel gear will remain stationary and only the pinion gear will rotate, the pins in this instance riding over the face of the ratchet disc.

We have found it desirable to provide brake means acting upon the bevel gear 34 to arrest its movement at the end of the up-stroke of the rack 25, and we prefer to provide a brake which remains in light rubbing contact with the bevel gear at all times, thereby maintaining the rotary head in fixed position particularly during the down-stroke of the rack. The brake can be best seen in Figure 10 of the drawings wherein the upper shoe 44 and the lower shoe 45 are pivotally connected together at 46 and provided with suitable linings 47 and 48 adapted to engage the periphery of the hub portion 40 of the bevel gear 34.

The shoes 44, 45 are provided, respectively, with extending arms 49, 50 aligned in the manner illustrated in Figure 10, and the two extensions are connected together by an adjustment screw 51. The adjustment screw passes through an enlarged opening 52 in the extension 49 and is threaded into the extension 50. The two extensions are biased toward each other by a compression spring 53 surrounding the adjustment screw, the arrangement being such that the spring will be compressed as the screw is tightened, thereby tightening the shoes 44 and 45 about the hub 40. The adjustment screw will be set to provide light rubbing contact of the shoes with the hub at all times, as already indicated.

Positive braking action on the bevel gear 34 is effected at the end of the up-stroke of the rack 25 by means of the bar 54, best seen in Figure 5 of the drawings, which is fixed at its lower end to the rack block 24. As the block 24 and rack 25 travel upwardly under the influence of the plunger 23, the upper end of the bar 54 is brought into contact with the under surface of the extension 50 of brake shoe 45, in the manner illustrated in dotted lines at 55 in Figure 10. Rotation of the entire brake shoe assembly about the hub 40 is prevented by set screw 56 which contacts the extension 49 and holds it against counterclockwise movement. The set screw 56 is threaded in a hub 57 carried on a supporting arm 58 mounted on the arm 28 fixed to the machine frame. The bar 54 thus serves to force the shoes 44 and 45 into tight gripping engagement with the hub of the bevel gear 34, thereby arresting the movement of the bevel gear. Upon the down-stroke of the rack, the bar 54 will be removed from contact with the extension 50 and hence the positive braking pressure will be released. At all times, however, the bevel gear will be under the influence of the light braking action of the shoes 44 and 45 as created by the adjustment of the screw 51.

Returning again to Figure 5 of the drawings, the actuating mechanism for the shaping member 10 is supported from the rotatable head 5, there being a supporting arm 60 for each of the shaping members, the supporting arms each carrying at their lower end a body member 61 having a vertical channel 62 therein for slidably receiving an elongated bar 63. At its lower end the elongated bar carries a foot 64 and a member 65 having a laterally extending tongue 66 adapted to be engaged by the contact bar 67 carried by the rack block 24.

As best seen in Figure 12, the contact bar 67 is pivotally secured to the rack block by means of a pivot pin 68. The contact bar 67 is normally biased against the stop 69 by means of the tension spring 70 which is secured at one end to the contact bar and at the other end to an upstanding finger 71. The contact bar is, however, capable of being pivoted to the position illustrated in dotted lines at 67*a* should it be struck by the tongue 66, as will be hereinafter explained. We have found it desirable to reinforce the contact bar 67 by means of the L-shaped member 72 the foot of which engages beneath the under cut portion 73 of the rack block.

The foot 64 connected to the lower end of the elongated bar 63 carries a threaded rod 74 to the lower end of which is secured swivel 75. A link 76 is pinned to the swivel and the link receives the lower ends of the actuating arms 18 and 19 for opening and closing the saddle pieces of the shaping member 10. Adjustment of the connection may be made by means of the nuts 77, 78 on the threaded rod, and a compression spring 79 is provided between the nut 78 and the foot 64. It will be understood that downward movement of the elongated bar 63 will cause the actuating arms 18, 19 of the shaping member to be moved downwardly, thereby closing the saddle-like pieces about the shoe form 6.

The elongated bar 63 is normally biased to its uppermost position by means of springs 80, as seen in Figures 3 and 4, but when the bar has been moved downwardly it will be locked in the lower position by means of a latch pin 81 (Figures 5 and 8). To this end the bar 63 is recessed at 82 and provided with an insert 83 forming an abutment edge 84. Movement of the latch pin 81 is controlled by the catch 85 having an extension 86 which engages in a slot 87 in the latch pin. A spring 88 normally biases the catch 85 to the position illustrated in Figure 5, thereby urging the latch pin in the direction of the bar 63. It will be apparent that once the bar 63 has been depressed and the latch pin moved into the recess 82, the abutment edge 84 will prevent the bar 63 from moving upwardly until the latch pin is positively moved rearwardly out of the recess. Consequently, until the bar 63 is released, the shaping members will be locked about the form in the closed position.

Should it be desired to lock the latch pin in the inoperative position, this can be conveniently done by means of the lever 89, best seen in Figure 6 which, when pivoted to the horizontal position, will engage the bottom edge of the catch 85 pivoting it upwardly and thereby causing the latch pin to be removed from the recess 82 and the bar 63 freed for return movement under the influence of the springs 80. Normally, however, the bar 63 will not be released until just prior to the return of the form to the position in front of the operator. As the form completes its cycle of rotation and returns to the operator, the catch 85 is contacted by a cam bar 90 (Figure 9) fixed to the machine frame by means of a bracket 90*a* (Figure 1).

The cam bar **90** has a curved surface **91** which contacts and depresses the catch **85** thereby releasing the bar **63** and with it the parts of the shaping member **10**.

The actuation of the machine is by means of a foot treadle **92** under the control of the operator. A single touch of the foot treadle serves to actuate the machine and send it through its operating cycle. When the foot treadle **92** is depressed by the operator, the link **93** acting through lever **94** causes finger **95** to push the plunger **96** of control valve **97** inwardly, thereby permitting air under pressure to be introduced into the cylinder **22** from air line **98**.

From the control valve the air under pressure is fed to the cylinder **22** through the conduits **99** and **100**, the conduit **99** entering the cylinder at its top and the conduit **100** at the bottom.

As best seen in Figure 2, the piston **101** in the control valve will be in the rightmost position covering the conduit **99**. This permits compressed air to flow through the conduit **100** to the bottom of the cylinder, thereby maintaining the plunger **23** in its uppermost position, in which position the shaping member presented to the operator is in the open position. When the operator has fitted the shoe upper on the form **6**, he then depresses the treadle **92** which actuates the finger **95** and causes the piston **101** to move to the left, thereby shutting off the supply of air to the lower end of the cylinder and opening the conduit **99** to supply air to the upper end of the cylinder. The air introduced into the upper end of the cylinder forces the plunger **23** downwardly.

As the plunger moves downwardly, it carries with it the rack block **24** and the contact bar **67**. As the contact bar moves downwardly it engages the tongue **66** of member **65** carried by the elongated bar **63**, thereby closing the shaping member **10** about the form. During the downward movement of the plunger, it will be understood that the pinion **32** actuated by the rack **25** will idle and consequently the rotatable head **5** will remain stationary.

When the plunger **23** reaches the bottom of its stroke, the control valve is automatically returned to its initial position by means hereinafter described, thereby shutting off the supply of air to the top of the cylinder and again supplying air through the conduit **100** to the bottom of the cylinder to cause the cylinder to return to its starting position. To this end, the rack block **25** carries a latch plate **102** (Figures 13 and 16) vertically movable in a slot **103** in the rack block. The latch plate **102** has a stud **104** at its top end for receiving one end of a compression spring **105** arranged to bias the latch plate to its lowermost position. The latch plate has an elongated slot **106** therein having an enlarged portion **107**.

A latch pin **108** (Figure 17) is fitted into the rack block, extending at right angles to the latch plate **102** and passing through the slot **106** therein. The latch pin is normally biased outwardly by means of a compression spring **109**. The latch pin has a slot **110** therein, and the side of the pin opposite the slot is flattened, as at **111** and provided with an extending tip **112**.

When the rack block **24** is in its uppermost position, the latch plate **102** and the latch pin **108** will be in the position illustrated in Figure 15, wherein the latch pin is held in retracted position by the slot in the latch plate engaging the slot **110** in the latch pin. In this position, it will be understood that the latch plate **102** is urged downwardly under the influence of spring **105**. As the rack block descends to its lowermost position, the downwardly extending latch plate **102** contacts an abutment **113** (Figure 5) fixed to the machine frame. This abutment causes the latch plate to move upwardly in the slot **103** against the pressure of spring **105**, thereby bringing the enlarged portion **107** of the slot **106** into alignment with the pin **108**. The pin is thus released for outward movement under the influence of spring **109** until the tip **112** contacts the plate **102** adjacent the side edge of the slot **106**. The latch plate and latch pin thus assume the position illustrated in Figure 14 of the drawings.

The arrangement of parts is such that, as the latch pin **108** is released for outward movement, it will lie adjacent the control valve **97**, and upon outward movement, the latch pin will contact an extension **114** of the plunger **96**. It will be understood that as the plunger **96** is moved to the left, as seen in Figure 2, the extension **114** will be projected outwardly, as indicated in dotted lines at **114***a*. Consequently, when the extension **114** is contacted by the outwardly moving latch pin **108**, the extension will cause the piston **101** to be moved to its rightmost position, thereby shutting off the supply of air fed to conduit **99** and opening conduit **100** to supply air to the lower end of the cylinder **22** for return of the plunger **23** to its uppermost position. As the plunger starts its upward movement, the extending latch pin **108** will be contacted by a cam surface **115** supported on a post **116**. The contacting of the latch pin **108** with the cam surface **115** occurs simultaneously with the removal of the latch plate **102** from contact with the abutment **113**, so that as the latch pin is depressed, the latch plate, under the influence of its spring, will move downwardly and the slot **106** will be engaged in the slot **110** of the latch pin, thereby cocking the latch pin for subsequent release the next time the rack block is lowered.

In the operation of our device, it will be understood that, as the head is rotated, the forming units will be sequentially brought into alignment with the actuating mechanism, with the contact bar **67** carried by the rack block overlying the tongue **66** of each forming unit. As will be apparent from Figure **2**, considerable tolerance is allowed between the contact bar and the tongue to compensate for vertical misalignment of the tongue should the elongated bar **63**, for example, fail to return to its uppermost position. Should the member **65** carrying the tongue **66** become misaligned to a degree greater than the tolerance between the contact bar **67** and the tongue, serious damage to the operating parts could result by reason of the contact bar being struck by the misaligned member **65**. To eliminate this hazard the contact bar is pivotally mounted on the rack block and should it be struck by the member **65**, it will pivot out of the way, being returned to its original position by the spring **70** when the obstruction has been removed from its path. We have found this construction to be invaluable in preventing damage to the operating parts of the machine.

In the normal operation of the machine, the down stroke of the plunger **23** will serve to close the saddle pieces about the form, and the forming mechanism will be locked in the closed position by means of the catch **85**. When the plunger has reached the bottom of its stroke, the latch pin **108** will serve to throw the control valve to introduce air into the bottom of the cylinder and thereby start the plunger on its upward movement. It is upon the upward movement of the plunger that the pinion gear **33** acts through the ratchet disc **35** to drive the bevel gear **4** and rotate the head. The extent of the driven movement of the head is such that, when the rack **25** driving the pinion gear **33** reaches its uppermost limit, the head will have been rotated sufficiently to present the next forming unit to the rack block and contact bar. It will be understood that as the shaping units are rotated they remain in the closed or locked condition until just prior to their return to the operator's station, being released at that point by the cam bar **90** which contacts catch **85** to thereby release the shaping mechanism.

Modifications may, of course, be made in our invention without departing from the spirit of it.

Having, however, described our invention in an ex-

emplary embodiment, what we desire to secure and protect by Letters Patent is:

1. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said forms, reciprocating power means, drive means connecting said head and said power means and acting to effect intermittent rotation of said head in one direction only, means operable by said power means for closing each of said shaping members about its co-acting form at a predetermined position in the cycle of rotation of said head, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said power means to move through a single cycle of reciprocation.

2. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said forms, a fluid actuated reciprocating power means, drive means connecting said head and said power means, said drive means constituting said reciprocating movement a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head intermittently in one direction only, means actuated by said power means during said idling movement for enforcing the closure of each of said shaping members about its co-acting shoe form when sequentially presented at a predetermined position, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said power means to move through a single cycle of reciprocation.

3. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said form, a fluid actuated reciprocating power means, drive means connecting said head and said power means, said drive means constituting said reciprocating movement a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head intermittently in one direction only, braking means effective at the end of said driving movement to arrest the rotation of said head at predetermined positions, means actuated by said power means during said idling movement for enforcing the closure of each of said shaping members about its coacting shoe form when sequentially presented at a predetermined position, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said power means to move through a single cycle of reciprocation, said actuating means including valve means effective to supply fluid under pressure to said power means.

4. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said forms, power means comprising a fluid actuated cylinder having a vertically reciprocating plunger, drive means connecting said head and said plunger, said drive means constituting the reciprocating movement of said plunger a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head in one direction only during said driving movement, means actuated by said plunger during said idling movement for enforcing the closure of each of said shaping members about its co-acting shoe form when presented sequentially at a predetermined position, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said plunger to move through a single cycle of reciprocation.

5. The machine claimed in claim 4 wherein said drive means includes a drive shaft having a pinion gear fixed thereto and adapted to be rotated by a rack operatively connected to the free end of said plunger.

6. The structure claimed in claim 5 wherein a bevel gear is rotatably mounted on said drive shaft, wherein a ratchet disk is mounted on said shaft between said pinion gear and said bevel gear and fixedly secured to said pinion gear, and wherein said bevel gear includes a spring pressed pin adapted to contact said ratchet disk, the face of said ratchet disk adjacent said pin including a plurality of shoulders adapted to be engaged by said pin, whereby to effect joint movement of said pinion and bevel gears upon driving movement of said plunger.

7. The structure claimed in claim 6 wherein said first named bevel gear serves to drive a second bevel gear fixed to said head, wherein said first named bevel gear includes a neck portion, and wherein brake means are provided engageable with said neck portion.

8. The structure claimed in claim 7 wherein said rack is operatively connected to said plunger by means of a rack block, and wherein said rack block carries means effective at the end of the driven movement of said plunger to engage said brake means so as to arrest the rotation of said head.

9. The structure claimed in claim 8 wherein said brake means includes a plurality of shoes at least one of which is at all times in rubbing contact with said neck portion and another of which is directly responsive to said brake actuating means.

10. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shoe shaping members co-acting therewith and adapted to be closed about said forms, power means comprising a fluid actuated cylinder having a vertically reciprocating plunger, drive means connecting said head and said plunger, said drive means constituting the reciprocating movement of said plunger a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head in one direction only during said driving movement, means actuated by said plunger during said idling movement for enforcing the closure of each of said shaping members about its co-acting shoe form when presented sequentially at a predetermined position, said last named means including a contact bar operatively connected to the free end of said plunger and adapted to engage tongue-like members operatively connected to said shaping members, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said power means to move through a single cycle of reciprocation.

11. The structure claimed in claim 10 wherein said contact bar is pivotally secured to a block carried on the free end of said plunger, and wherein said contact bar is free to pivot should it be accidentally struck by the tongue carried by any of the shaping members.

12. The structure claimed in claim 11 including spring means for normally biasing the pivoted contact bar in operative position.

13. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said forms, power means comprising a fluid

actuated cylinder having a vertically reciprocating plunger, drive means connecting said head and said plunger, said drive means constituting the reciprocating movement of said plunger a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head in one direction only during said driving movement, means actuated by said plunger during said idling movement for enforcing the closure of each of said shaping members about its co-acting shoe form when presented sequentially at a predetermined position, said means including a pair of arms connected to each of said shaping members at one end and at the other end to an elongated bar slidably mounted in a channeled body member fixed to the machine frame, said elongated bar carrying a tongue at one end thereof adapted to be engaged by a contact bar operatively connected to said plunger when said shaping members are sequentially presented to said predetermined position, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said power means to move through a single cycle of reciprocation.

14. The structure claimed in claim 13 wherein said elongated bar is moved relative to said channeled body upon idling movement of said plunger, wherein said latch means includes a spring biased latch pin mounted in said channeled body and adapted to engage a detent in said elongated bar presented to said latch pin upon movement of the shaping member to the closed position.

15. The structure claimed in claim 14 wherein said latch pin is adapted to be retracted by means of a catch, and wherein said automatically acting release means comprises a cam bar adapted to contact said catch.

16. The structure claimed in claim 15 including a lever arm adaptable to engage said catch so as to move said latch pin to the inoperative position, whereby any one of said forming members may be rendered inactive during the rotative cycle of said machine.

17. In a multiple station shoe shaping machine, a rotatable head carrying a plurality of shoe forms and shaping members co-acting therewith and adapted to be closed about said forms, power means comprising a fluid actuated cylinder having a vertically reciprocating plunger, drive means connecting said head and said plunger, said drive means constituting the reciprocating movement of said plunger a driving movement in one direction and an idling movement in the opposite direction so as to rotate said head in one direction only during said driving movement, means actuated by said plunger during said idling movement for enforcing the closure of each of said shaping members about its co-acting shoe form when presented sequentially at a predetermined position, latch means for maintaining said shaping members in closed position throughout a substantial portion of the cycle of rotation of said head, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for causing said plunger to move through a single cycle of reciprocation, said actuating means including a control valve for supplying fluid under pressure to said cylinder, said control valve having a first position in which fluid under pressure is applied to one end of the cylinder so as to cause the driving movement of said plunger, and a second position in which fluid under pressure is supplied to the opposite end of the cylinder to cause idling movement of said plunger.

18. The structure claimed in claim 17 wherein said control valve is moved from the first to the second position by means of a treadle, and wherein automatically acting means are provided for returning the control valve to the first position upon the closing of a given shaping member about its form.

19. The structure claimed in claim 18 wherein said plunger carries a block on its free end, and wherein said automatically acting means for returning the control valve to the first position are carried on said block.

20. The structure claimed in claim 19 wherein said automatically acting return means comprises a normally retracted spring loaded pin held in retracted position by means of a latch plate, and wherein means are provided to slide said latch plate so as to release said pin for outward movement upon termination of the idling movement of said plunger, said control valve including a plunger arm adapted to be contacted by said pin upon outward movement thereof.

21. The structure claimed in claim 20 including means for returning said pin to its retracted position as said plunger starts its driving movement.

22. In a multiple station shoe shaping machine, a plurality of shoe forms and shaping members coacting therewith and adapted to be closed about said forms, a travelling means mounting said forms and shaping members for movement in an annular path of travel, driving means acting to effect intermittent movement of said travelling means in one direction, means for closing each of the shaping members about its coacting form at a predetermined position in the path of travel of said travelling means, said last named means comprising a movable contact bar, a tongue-like member operatively connected to each of said shaping members and adapted to be juxtaposed to said contact bar upon presentation of said shaping members to said predetermined position, whereby movement of said contact bar will cause it to engage said tongue-like member and move it to form engaging position, latch means for maintaining said shaping members in closed position throughout a substantial portion of their path of travel, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for sequentially presenting said shoe forms and shaping members to said predetermined position.

23. In a multiple station shoe shaping machine, a plurality of shoe forms and shaping members coacting therewith and adapted to be closed about said forms, a traveling means mounting said forms and shaping members for movement in an annular path of travel, driving means acting to effect intermittent movement of said travelling means in one direction, means for closing each of the shaping members about its coacting form at a predetermined position in the path of travel of said travelling means, said last named means comprising a movable contact bar, a tongue-like member operatively connected to each of said shaping members and adapted to be juxtaposed to said contact bar upon presentation of said shaping members to said predetermined position, whereby movement of said contact bar will cause it to engage said tongue-like member and move it to form engaging position, latch means for maintaining said shaping members in closed position throughout a substantial portion of their path of travel, automatically acting release means for opening each of said shaping members prior to its return to said predetermined position, and actuating means for sequentially presenting said shoe forms and shaping members to said predetermined position, said contact bar being pivotally mounted for movement in a plane substantially parallel to the path of travel of said shaping members, whereby said contact bar is free to pivot should it be struck by the tongue-like portion of the shaping member as the shaping member is presented to said predetermined position.

24. In a multiple station shoe shaping machine, a plurality of shoe forms and shaping members coacting therewith and adapted to be closed about said forms, a travelling means mounting said forms and shaping members for movement in a predetermined path of travel, reciprocating power means, drive means connecting said travelling means and said power means and acting to effect in-

termittent movement of said travelling means along said path of travel, means operable by said reciprocating power means for closing each of said shaping members about its coacting form at a predetermined position in the path of travel of said travelling means, latch means for maintaining said shaping members in closed position throughout a substantial portion of their path of travel, automatically acting release means for opening each of said shaping members prior to its return to said predetermined

position, and actuating means for causing said power means to move through a single cycle of reciprocation.

References Cited in the file of this patent

UNITED STATES PATENTS

1,891,259	Duplessis	Dec. 20, 1932
2,235,363	Freeman	Mar. 18, 1941
2,274,063	Hazelton	Feb. 24, 1942