(Model.) 4 Sheets—Sheet 1.

M. BROCK & E. WOODWARD.

Machine for Attaching Outsoles.

No. 234,167. **Patented Nov. 9, 1880.**

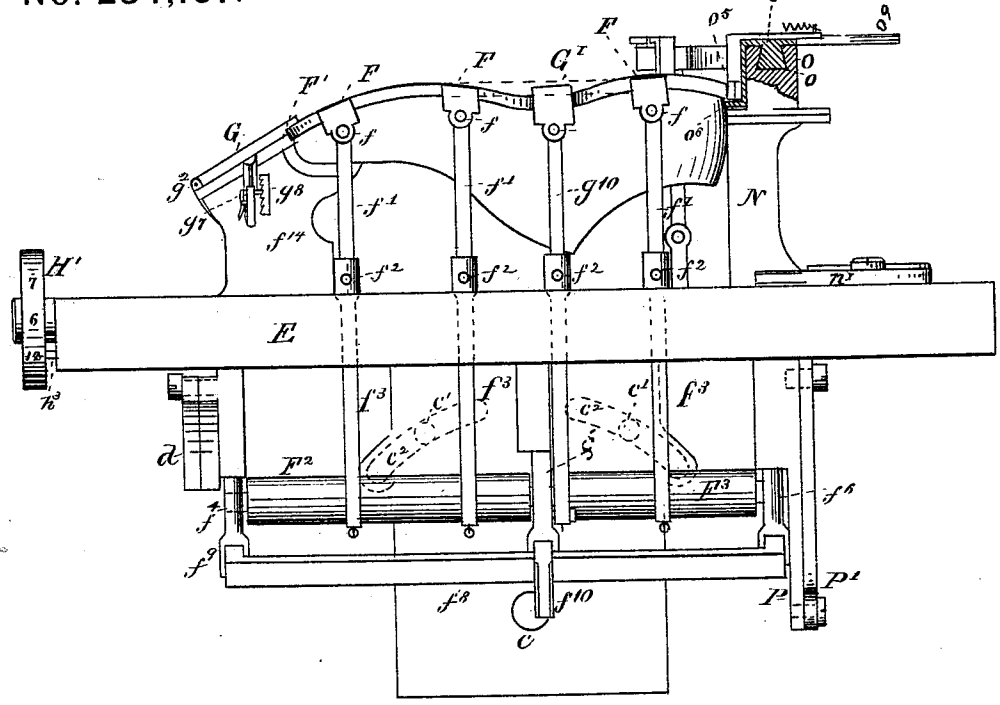


Fig. 1.

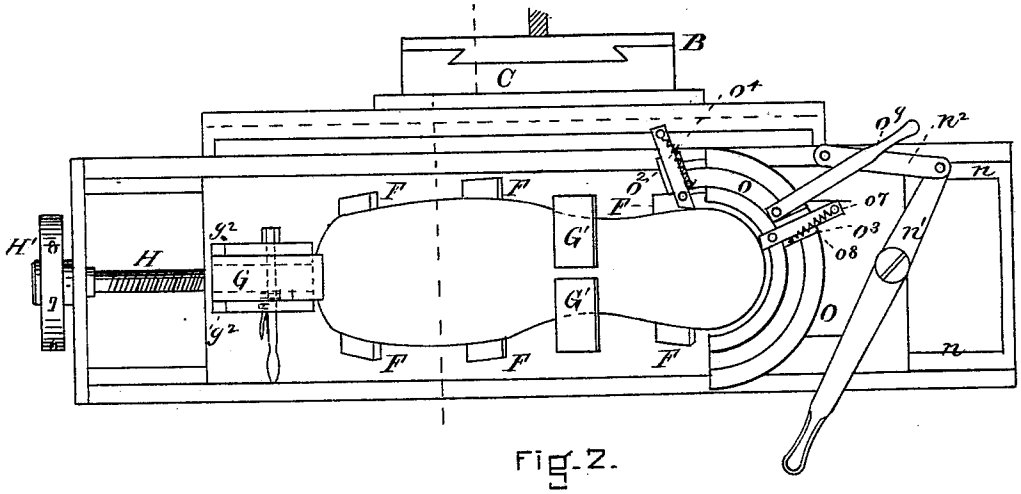


Fig. 2.

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INVENTORS:
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Erastus Woodward,
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(Model.) 4 Sheets—Sheet 2.

M. BROCK & E. WOODWARD.

Machine for Attaching Outsoles.

No. 234,167. **Patented Nov. 9, 1880.**

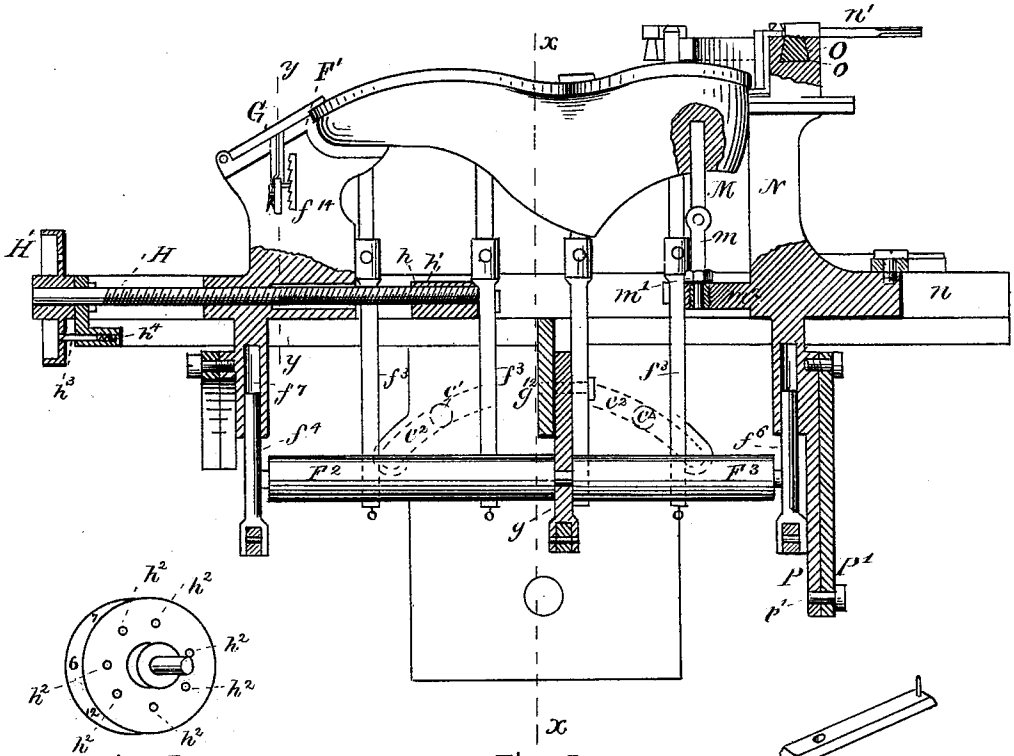


Fig. 3.

Fig. 8.

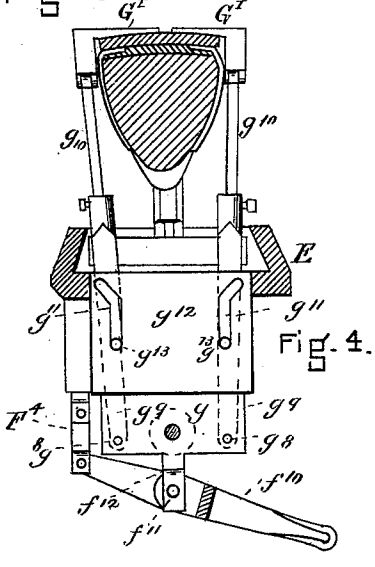


Fig. 4.

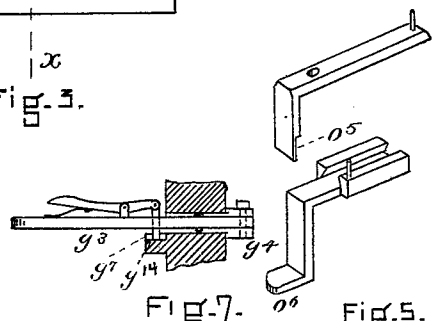


Fig. 7. Fig. 5.

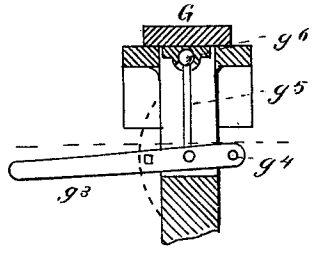


Fig. 6.

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(Model.) 4 Sheets—Sheet 3.

M. BROCK & E. WOODWARD.

Machine for Attaching Outsoles.

No. 234,167. **Patented Nov. 9, 1880.**

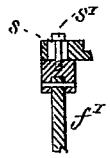


Fig. 10.

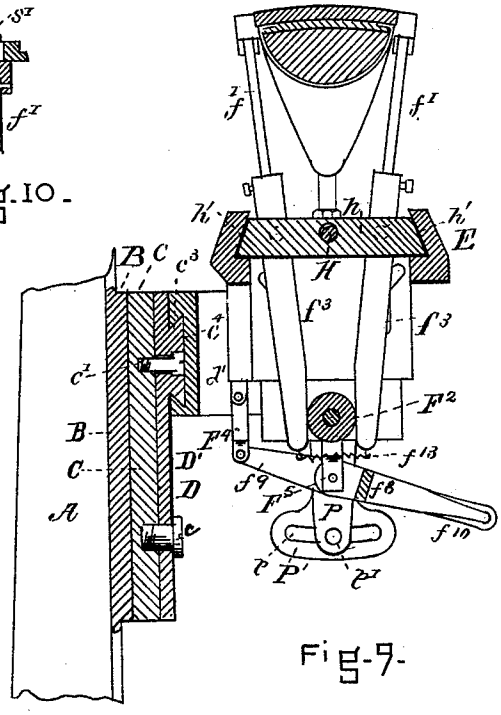


Fig. 9.

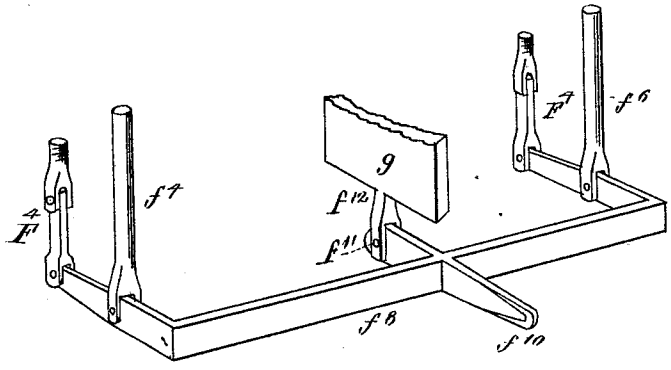


Fig. 11.

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(Model.) 4 Sheets—Sheet 4.

M. BROCK & E. WOODWARD.

Machine for Attaching Outsoles.

No. 234,167. **Patented Nov. 9, 1880.**

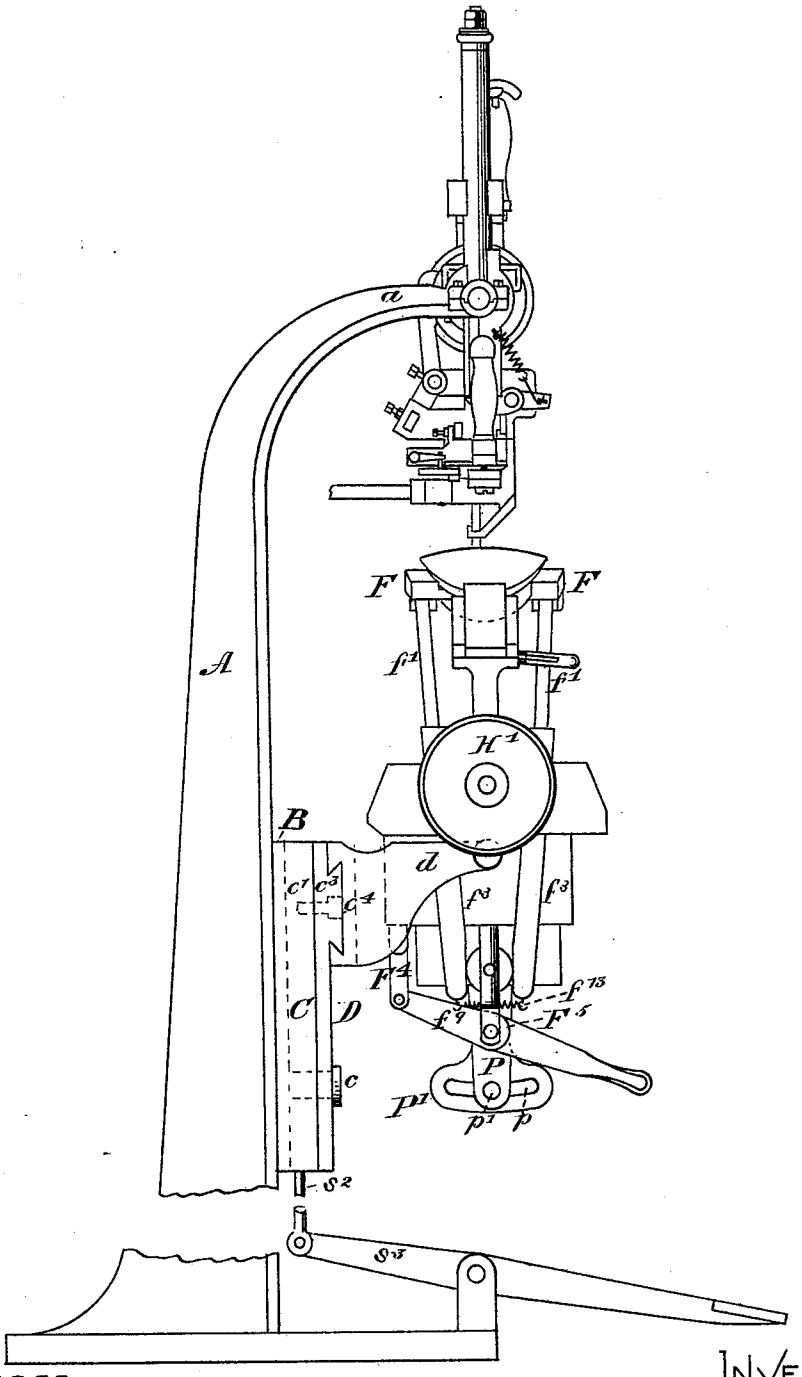


Fig. 12.

WITNESSES:
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INVENTORS:
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UNITED STATES PATENT OFFICE.

MATTHIAS BROCK AND ERASTUS WOODWARD, OF BOSTON, ASSIGNORS TO GEORGE W. COPELAND, OF MALDEN, AND PETER W. FRENCH, OF EAST WEYMOUTH, MASSACHUSETTS.

MACHINE FOR ATTACHING OUTSOLES.

SPECIFICATION forming part of Letters Patent No. 234,167, dated November 9, 1880.

Application filed May 20, 1880. (Model.)

To all whom it may concern:

Be it known that we, MATTHIAS BROCK and ERASTUS WOODWARD, both of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented an Improvement in Machines for Attaching Outsoles, of which the following is a specification.

This invention has for its object the following-described improvement in machines for fitting and temporarily fastening outsoles to the upper and insole after the lasting of the upper, but before the final fastening of the outsole to the insole.

It consists in devices for supporting the shoe and last after lasting in a suitable position to receive the outsole, and in appliances for gaging the position of the outsole relatively to the edge of the last, for drawing the outsole down upon the insole, and for trimming the heel end of the sole, and for driving a sufficient number of tacks or pegs for the purpose of holding the outsole to the insole sufficiently firmly to enable the shoe to be presented to the mechanism which is used in permanently uniting the outsole to the insole.

The devices for holding the last and outsole in position thereon must necessarily have a number of adjustments in relation to the mechanism for driving the tacks or pegs, and we have given the said devices provision for vertical adjustment in relation to the pegging or tacking mechanism for horizontal adjustment in relation thereto, for an oscillating or tipping movement for varying the inclination of the shoe lengthwise, either by lifting the toe or lowering the heel or raising the heel and lowering the toe, and also a tipping movement for varying the inclination of the shoe and outsole sidewise, or transversely to the longitudinal tipping movement, whereby one side is lifted and the other depressed, and vice versa.

In the drawings, Figure 1 represents a front elevation of a portion of our mechanism. Fig. 2 represents a plan thereof. Fig. 3 represents a view, part in section and part in elevation. Fig. 4 represents a vertical section on the line *x x* of Fig. 3. Fig. 5 is a detail view, representing a portion of the mechanism for trimming the heel of the sole. Fig. 6 is a detail view upon the line *y y* of Fig. 3. Fig. 7 is a cross-section on the dotted line of Fig. 6. Fig. 8 is a perspective view of the wheel used in operating the toe-carriage, as hereinafter described. Fig. 9 is a vertical section on the dotted lines of Fig. 2. Fig. 10 is a representation, in section, of a detail in construction, hereinafter explained. Fig. 11 is a view, in perspective, of a portion of the operative mechanism. Fig. 12 is an end elevation of the complete machine.

A represents the standard, curved at its upper end, *a*, adapted to support the power pegging-machine described in Letters Patent granted us dated August 5, 1879, and numbered 218,354, by means of a yoke similar to the yoke S described in said patent, or in any other desirable way.

There is fastened to the front of the post A a plate, B, upon or in which the plate C, supporting the last-holding devices hereinafter described, is provided with a vertical movement. The connection between the two may be a dovetail, as shown, or it may be of any description which shall permit the sliding movement of the plate C in relation to the post. The plate C has secured to it, by the bolt *c*, which acts as a pivot, and by the pins *c'*, which enter the slots c^2, the plate D, from which the brackets *d d'* project, and the brackets *d d'* and their connecting-pins have a horizontal movement upon the plate D by means of the dovetail c^3 and dovetail recess c^4. The brackets *d d'* support the frame-work E of the last-holding mechanism.

The devices for holding the last and the lasted upper in place for the reception of the outsole consist of the side-pressers F and the toe-presser F'. The side-pressers F are pivoted at *f*, by horizontal pivots, to the spring-rods *f'*, and each of these rods, in turn, is pivoted at f^2 to the levers f^3. The pivotal connection *f* enables the pressers to be automatically adjusted as to the longitudinal inclination of their upper surface, and the pivotal connection f^2 allows the automatic movement of the pressers, by which the working-face of the pressers are conformed to the vertical sides of the last.

The pressers are provided with a movement to and from the last, which may be horizontal, or which may be on the arc of a circle, as herein described, by means of the rolls F^2 F^3, the first of which serves to operate the ball and toe side-pressers, and the last of which the heel-pressers.

The roll F^2 has a bearing in the rod f^4 at the toe end and in the rod f^5 at the center, and the roll F^3 has a bearing in the rod f^5 at the center and rod f^6 at the heel end, and the rods f^4 f^6 are adapted to slide in the hollow posts f^7, depending downwardly from the main part of the frame.

The rolls are given a vertical movement by means of the bar f^8, whose ends f^9 are pivoted to the lower ends of the links F^4, and the rods f^4 f^6, which are pivoted to said bar at F^5, as represented, and by the lever f^{10}, which is pivoted at f^{11} to the short arm f^{12}, projecting downwardly from the plate g. The inner side of the levers f^3 are held constantly in contact with the rolls by me. as of the springs f^{13}, which connect their lower ends.

It will be seen that by the upward movement of the rolls the lower ends of the levers approach each other and the pressers upon either side are moved away from the sides of the last, and that upon the descent of the rolls the pressers are moved toward the side surfaces of the last.

The toe-presser F' is arranged upon that portion of the face of the toe-carriage f^{14} which acts as a rest for the toe of the last.

The devices for supporting and adjusting the outsole upon the insole consist in the toe-plate G and the shank-plates G'. The toe-plate is hinged at g^2, and is raised and lowered by means of the lever g^3, pivoted at g^4, and rod g^5, which connects the lever by means of a universal joint, g^6, with the under surface of the plate. A stop, g^7, operated by a small lever upon the side of the lever g^3, and the notches g^{14} upon a bar fastened to the toe-carriage, serve to lock the toe-plate G' firmly upon the outsole, clamping it to the toe of the last.

The shank-plates G' have two movements in relation to the last—first, a closing movement upon a plane somewhat above the level of the last's bottom, and, second, a descending movement toward the last's bottom. These two movements enable the outsole to be laid upon the insole without interference with the plates, and then to be drawn down upon the insole in fitting it to the spring of the last between the ball and the heel. These movements are given the plates G' by means of the plate g, to which are pivoted, at g^8, the levers g^9, which support the rods g^{10}, bearing the plates G', the cam-slots g^{11} in the stationary plate g^{12}, and the cam-pins g^{13} upon the levers g^9, which enter the cam-slots g^{11}, and serve, when given a downward movement by the plate g, to provide the plates G' with closing and descending movements. Of course, upon the lifting of the plates g, the plates G' are lifted and opened.

The plate g is lifted and lowered by the lever f^{10}.

The plates G' have similar adjustment to those provided the pressers F.

In order to adjust the ball and toe side-pressers F and the toe-carriage horizontally in relation to each other, for the purpose of adaptation to different lengths of lasts, we employ a screw, H, which has a bearing in the frame E of the machine, and which passes through the toe-carriage, and the nut h, arranged to slide on ways h' in the frame E, to which ball-presser levers f^3 are pivoted. The screw is a differential one, and moves the toe-carriage with the levers supporting the toe side-pressers faster than the levers supporting the ball side-pressers.

The last is supported upon the toe-rest and the jointed spindle M. The lower joint, m, of the spindle is contracted somewhat, and shuts into a threaded sleeve, m', which may be adjusted vertically in the bracket m^2, attached to the frame E.

The heel-carriage N is provided with a horizontal movement upon the ways n to and from the heel of the machine by means of the lever n' and link n^2, connecting one end of the lever with a stationary part of the frame. This heel-carriage supports a curved block, O, which is provided with a curved recess, o, in its upper surface, that acts as a guide for the carriage o'. This carriage o' carries recessed blocks o^2 o^3, and the block o^2 supports the bar o^4, which has attached or formed upon its lower end a knife, o^5, the knife being formed upon or fastened to the vertical part of the bar, and also the guide o^6. The block o^3 supports a guide, o^6, and another knife-bar, o^7.

The knife-bars o^4 o^7 are each held against the edge of the sole by the spring o^8, one end of which is attached to the outer end of the horizontal part of the knife-bar, and the other end of which is attached to a stationary part of the machine.

The carriage o' and the knives and guides attached thereto are moved around the heel by means of the lever o^9. By the use of two knives it will be observed that the carriage o' need not be provided with so great a sweep as would otherwise be necessary, as one knife commences to act toward the shank end of the heel and the other at the back, and by turning the carriage a quarter the back knife is moved to a position at the commencement of the shank opposite the place where the first-named knife commenced to operate, while the first-named knife has been moved to the back of the heel only.

The frame E of the machine is supported upon the end of the brackets d d' in such a way that the frame and the mechanism which it supports may be swung a limited distance to and away from the post A, in order that one side of the last may be lifted and the other depressed. The extent of this movement is limited by the arm P, which is permanently

fastened to the frame E and projects downwardly therefrom, and the arm P′, which is fastened to the bracket and depends downwardly therefrom, and is provided with a slot, *p*, in which a pin, *p′*, attached to the end of the arm P projects, the ends of the slot, in connection with the pin, acting as stops in limiting the said tipping movement of the frame and its attendant mechanism. These adjustments of the devices for supporting the last are provided in order that the pegging devices may always have such relation to that part of the roll into which the peg is to be driven that the peg be driven on a line substantially at right angle to the surface of that portion of the outsole closely adjacent, and if these provisions were not made for the machine, or similar provisions given the pegging-machine, the position of the pegs in relation to the surface of the outsole would vary, in some points being substantially at right angles and at the other points being quite materially inclined from a right angle in relation thereto, and the outsole would not be attached to the insole with the precision necessary.

The side-pressers and toe-support, of course, may be lined with rubber or any other flexible material upon their contacting surfaces, if desired, and each of the side-pressers and shank-pieces may be adjusted horizontally to or from the last on its supporting-arm (or block carried thereby) by means of the slot *s* and set-screw *s′*.

The sliding plate (and the mechanism it supports) is operated by means of the rod s^2 and lever s^3; but any other suitable devices for raising and lowering it may be employed, and any other pegging mechanism may be employed in lieu of that referred to.

The wheel H′, for operating the differential screw H, is provided upon its inner face with the holes h^2, into which a pin, h^3, pressed outwardly from the frame by the spring h^4, is arranged to automatically close, and opposite each hole upon the periphery of the wheel is marked the number of the size, in length, of the last to which the machine is adjusted when the pin enters the hole, so that an operator, in adjusting the side-pressers and toe-support for varying lengths, can tell by the figure upon the periphery of the wheel when he has moved the same sufficiently to obtain the proper adjustment for the size of last which is about to be used.

The side-pressers F may be shaped upon their inner faces to conform to that portion of the side of the last against which they close only; or they may have additionally an upwardly-projecting portion which shall act as a gage in properly adjusting the outsole to the insole. The pressers shown in the drawings are provided with gages for this purpose.

It will be observed that while this machine bears, at first sight, some resemblance to machines for lasting the uppers of boots and shoes, yet it in no sense performs any function of a lasting-machine. Its office commences where that of a lasting-machine stops, and it operates to adjust the last and to hold the last and lasted upper in the machine, to adjust the outsole to the insole, to fit and temporarily fasten it thereto.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a machine for attaching outsoles, the combination of the spindle at the heel upon which the last may be swung laterally, the side-pressers F, provided with sole-edge guides adapted to be moved horizontally and to be held against the sides of the last, and the support for the toe of the last, all substantially as described.

2. In a machine for attaching outsoles, devices for adjusting the position of the last and lasted upper therein, and for placing and holding the outsole upon the bottom of the last or upon the insole, consisting of toe and heel supports and side-pressers, substantially as described, a toe-downhold adapted to bear upon the outsole at the toe, and shank-pieces or fingers G′, adapted to bear upon the outsole at the shank and to move it downwardly to conform it to the curvature of the bottom of the last or of the insole at the shank, all combined to operate substantially as and for the purposes described.

3. In a machine for attaching outsoles, devices for adjusting the position of the last in relation to the spindle and toe-support, consisting of the side-pressers F, provided with the adjustable sole-edge guides adapted to be moved horizontally and to bear against the sides of the last, substantially as and for the purposes described.

4. In a machine for attaching outsoles, the fingers or shank-pieces G′, having horizontal and vertical movements, and adapted to be closed upon the surface of the outsole at or near the shank and to draw or press the outer sole downwardly to the surface of the insole, substantially as and for the purposes described.

5. In a machine for attaching outsoles, the combination of toe and heel supports and the toe-downhold with a device for bearing upon the outsole at or near the shank for drawing or pressing the outer sole downwardly to the insole, consisting of the fingers or shank-pieces G′, having a horizontal closing movement and a descending movement, substantially as and for the purposes described.

6. In a machine for attaching outsoles, the combination of a support for the heel of the last, a support for the toe of the last, a toe-downhold, pressers for bearing against the sides of the last, having horizontal movements to and from the last, and the shank-pieces G′, having a closing and descending movement in relation to the last, substantially as and for the purposes described.

7. In a machine for attaching outsoles, the

toe plate or downhold G, hinged at g^2 to the toe-carriage, and operated by the lever g^3 and rod g^5, substantially as and for the purposes described.

8. The combination of the toe downhold or plate G, hinged at g^2, as described, the lever g^3, for operating the same, and a locking device for locking the lever in any desired position, as and for the purposes described.

9. In a machine for attaching outsoles, the combination of the toe and heel side-pressers F, the toe-carriage f'^4, and means for adjusting the same horizontally in relation to each other, whereby the distances between them are increased or decreased, substantially as and for the purposes described.

10. In a machine for attaching outsoles, the side-pressers F, provided with a horizontal movement upon the arms f', or blocks arranged thereon, to and from the last, substantially as and for the purposes described.

11. In a machine for attaching outsoles, the side-pressers F, in combination with the spring-arms f', levers f^3, and means for operating said levers, whereby the pressers are given a movement to and from the last, substantially as and for the purposes described.

12. In a machine for attaching outsoles, the pressers F, pivoted at f to the supporting-arms f', whereby a rocking movement is provided them, substantially as described.

13. A side-presser, F, provided with a lateral movement upon the vertical pivot f^2, whereby the face of the presser may automatically conform to the surface of the last and to the sole-edge when brought in contact therewith, substantially as and for the purposes described.

14. In a machine for attaching outsoles, the combination of the pressers F, their supporting-arms and levers f' f^3, rolls F^2 F^3, and means for lifting and lowering said rolls, substantially as and for the purposes described.

15. The combination of the shank-pieces G', their supporting-arms and levers g^9 g^{10}, the plate g, cam-slots g^{11}, cam-pins g^{13}, and means for moving said plate g vertically, substantially as and for the purposes described.

16. In a machine for temporarily attaching outsoles to uppers, the combination of devices for holding the last and the outsole thereon, substantially as described, with mechanism at the heel end of the machine for trimming the heel end of the sole, consisting of devices o^5 and means for moving the same around the heel, substantially as and for the purposes described.

17. In a machine for attaching outsoles, the combination of the pressers F, provided with upwardly-projecting gages, the toe abutment or presser F', and the knife or knives o^5, for trimming the heel end of sole, substantially as and for the purposes described.

18. In a machine for attaching outsoles, the combination of the last, means for holding the same upon the toe and heel supports, consisting of the toe downhold or plate and the shank-plates G', and the side-pressers F, with a device for trimming the heel end of the sole, substantially as and for the purposes described.

19. In a machine for attaching outsoles, the combination of the appliances for holding the last and for adjusting the outsole upon the last's bottom or insole, and for holding it thereon, with the carriage N, supporting a device for trimming the edge of the sole at the heel, and means for providing said carriage with a horizontal movement to and from the first-named devices, substantially as and for the purposes described.

20. In a machine for attaching outsoles, the combination of the block O, the carriage o', the blocks supporting the knives o^5 and the guides o^6, and means for moving said carriage upon said block O around the heel, substantially as and for the purposes described.

21. In a machine for attaching outsoles, a jointed spindle, M, in combination with the threaded sleeve m', substantially as and for the purposes described.

22. The combination, in a machine for attaching outsoles, of the devices, substantially as described, for holding the last and for adjusting an outsole upon and holding it on an insole, substantially as indicated, with mechanism for driving fastenings for temporarily attaching the outsole to the insole, all substantially as and for the purposes set forth.

23. In a machine for attaching outsoles, the combination of mechanism for driving fastenings with the appliances for holding a last, and for adjusting an outsole upon an insole and for holding it thereto, provided with horizontal and vertical movements in relation to the said device for driving fastenings, substantially as described.

24. In a machine for attaching outsoles, the combination of devices for driving fastenings with the appliances for holding a last, and for adjusting an outsole upon the insole or last's bottom and for holding it thereon, all provided with a rocking movement in relation to said device for driving fastenings, whereby one end of the last, with the outsole thereon, may be lifted and the other depressed, substantially as described.

25. In a machine for attaching outsoles, the combination of a device for driving fastenings with the appliances for holding a last for adjusting an outsole upon the insole or last's bottom, and for holding it thereto, all provided with a movement in relation to said device for driving fastenings, whereby one side of the last may be elevated and the other depressed, substantially as and for the purposes described.

26. In a machine for attaching outsoles, the combination of a device for driving fastenings with the appliances for holding a last for adjusting the outsole upon the insole or last's bottom, and for holding it thereto, all provided

with horizontal and vertical movements in relation to said device for driving fastenings, substantially as and for the purposes described.

27. In a machine for attaching outsoles, the combination of a device for driving fastenings with the appliances for holding a last for adjusting the outsole upon the insole or the bottom of the last, and for holding it thereto, all provided with horizontal and longitudinal rocking movements in relation to said device for driving fastenings, substantially as described, and for the purposes set forth.

28. In a machine for attaching outsoles, the combination of a device for driving fastenings with the appliances for holding a last for adjusting the outsole upon the insole or last's bottom, and for holding it thereto, all provided with horizontal and sidewise rocking movements in relation to said device for driving fastenings, substantially as described, and for the purposes set forth.

29. In a machine for attaching outsoles, the combination of a device for driving fastenings with the appliances for holding a last for adjusting the outsole upon the insole or the bottom of the last, and for holding it thereto, all provided with horizontal and longitudinal and sidewise rocking movements in relation to the device for driving fastenings, substantially as described, and for the purposes set forth.

30. The combination of the plate C, having a vertical movement upon the bracket A, with the plate D, supporting the appliances for holding a last and outsole, the said plate D being pivoted at *c* to the plate C, to move a sole, substantially as described.

31. The combination of the plate D, attached to the plate C, as specified, with the brackets *d d'*, for supporting the appliances for holding the last and outsole, the said brackets having a horizontal movement upon the plate D.

32. The combination of the frame E, pivoted to the brackets *d*, as described, with the arm P, pin *p'*, the arm P', and the slot *p*, all arranged substantially as and for the purposes described.

33. In a machine for attaching outsoles, the combination of the pressers F and the shank-pieces G' with the lever f^{10} and connecting mechanism, whereby the pressers are brought to bear against the sides of the last and the shank-pieces are closed and moved vertically, substantially as and for the purposes described.

34. The combination of the wheel H', bearing upon its periphery figures indicating varying lengths of lasts, having the holes h^2, corresponding in position with said figures, with a pin, h^3, or other locking device, whereupon the movement of said wheel and the engagement of said pin with a hole the extent of horizontal adjustment of the toe-carriage and toe and ball side-pressers is indicated, substantially as and for the purposes described.

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