Oct. 6, 1953 A. R. RIDDERSTROM 2,654,103

MACHINE AND PROCESS FOR MAKING PLATFORM SOLES OR SHELLS

Filed Aug. 2, 1950 3 Sheets-Sheet 1

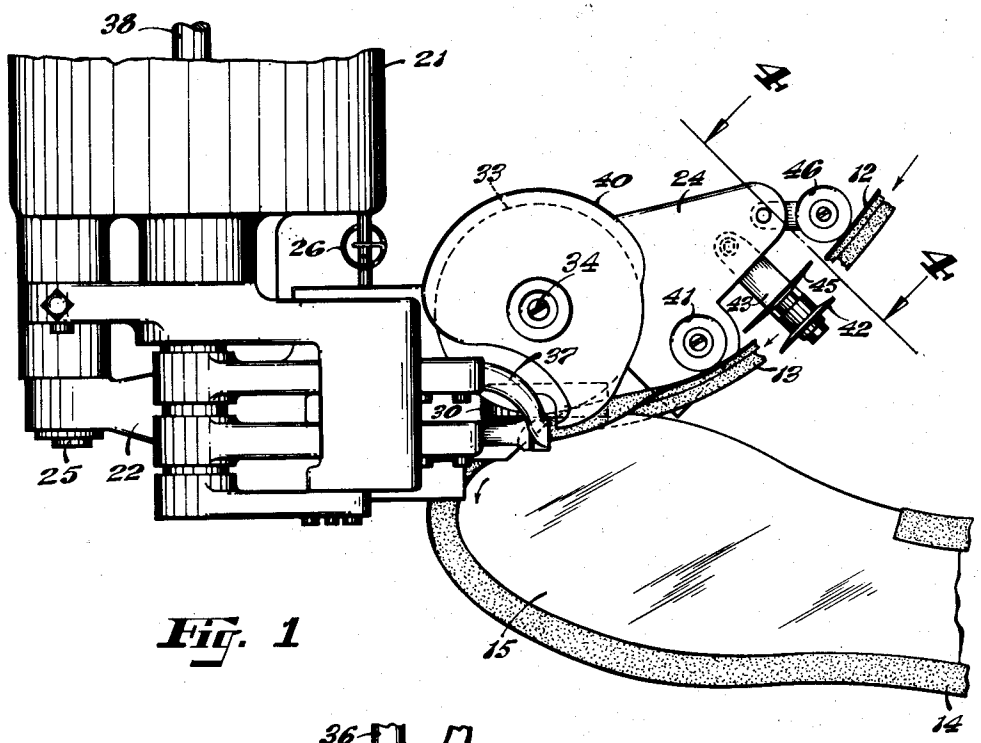


Fig. 1

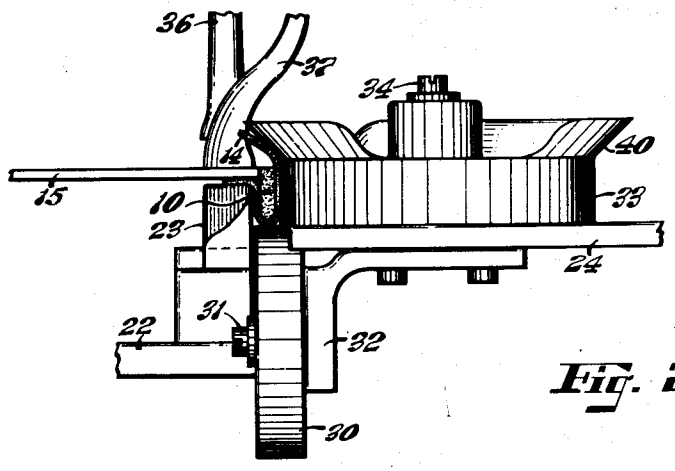


Fig. 2

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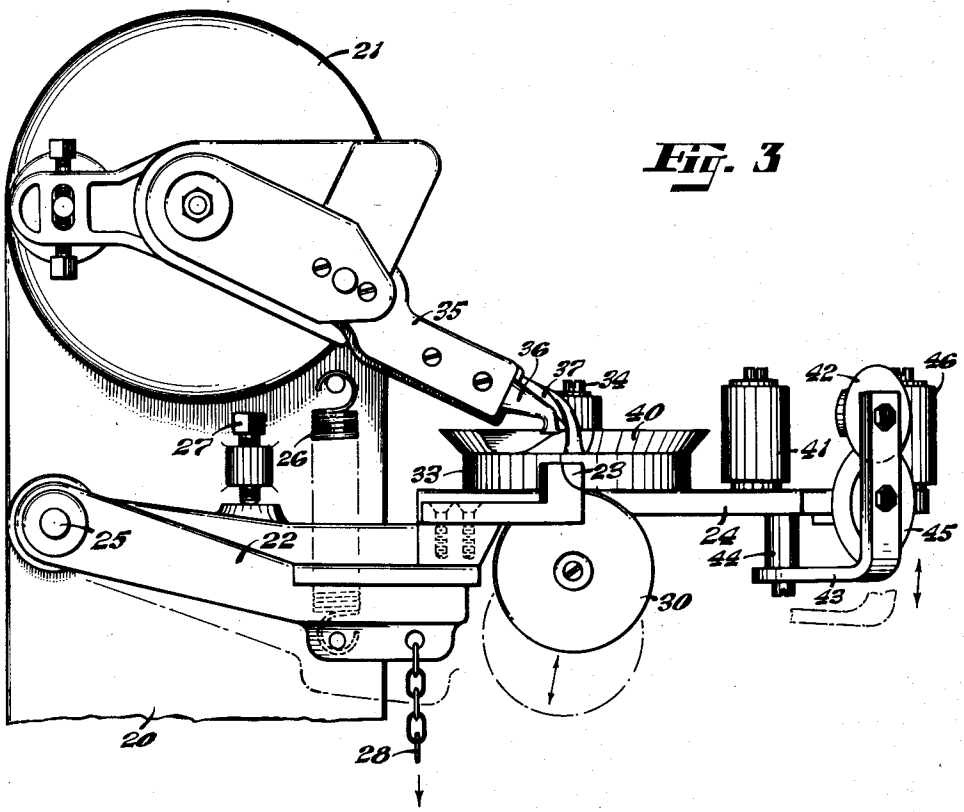


Fig. 3

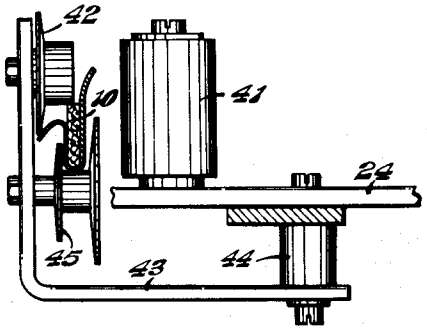


Fig. 4

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MACHINE AND PROCESS FOR MAKING PLATFORM SOLES OR SHELLS

Filed Aug. 2, 1950 3 Sheets-Sheet 3

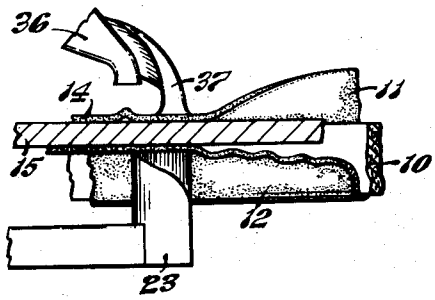


Fig. 5

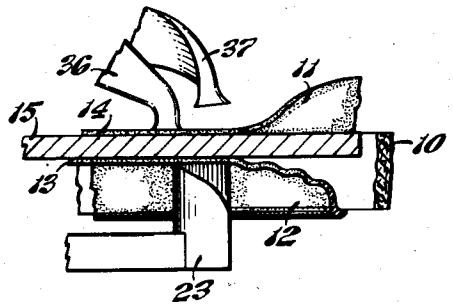


Fig. 6

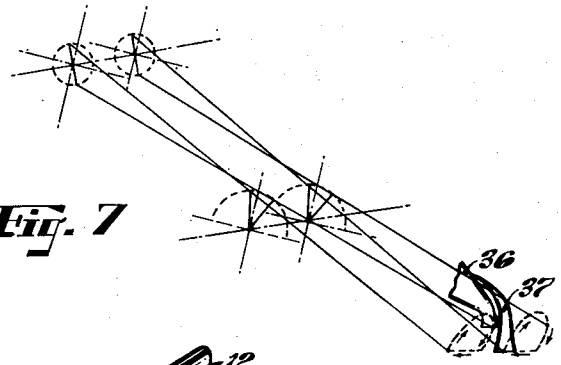


Fig. 7

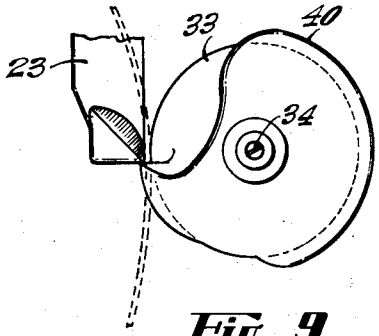


Fig. 9

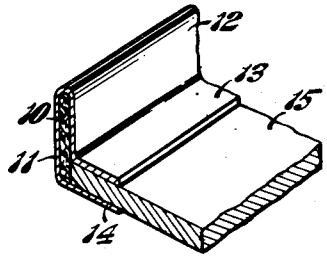


Fig. 8

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UNITED STATES PATENT OFFICE

2,654,103

MACHINE AND PROCESS FOR MAKING PLATFORM SOLES OR SHELLS

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Application August 2, 1950, Serial No. 177,187

10 Claims. (Cl. 12—24.5)

1

This invention comprises a new and improved machine for making platform soles or shells of the general type disclosed in my co-pending application Ser. No. 139,025, filed January 17, 1950. The invention also includes within its scope the process herein disclosed of making such soles or shells.

An important field of use for the machine of my invention is in making a platform shell comprising a sole blank having an upstanding self-sustaining wall secured about its marginal edge and surrounding a sole-shaped area. The sole blank may be of inexpensive material, for example, fibreboard approximately 3 irons thick. The preferred procedure for erecting the upstanding wall is to provide a binding strip having a stiff but flexible ribbon-like core partially enclosed in an adhesive cover of sheet material. The core is brought progressively into contact with the sole blank and at substantially right angles thereto, and the margins of the cover are then turned inwardly and adhesively secured to the opposite flat faces of the sole blank.

The machine of my invention comprises a support for a flat sole blank and means for directing continuously to the sole blank a binding strip having an adhesive cover on both sides and including means for simultaneously laying marginal portions of the cover upon the opposite faces of the sole blank and for pressing them into adhesive union with the blank. Preferably and as herein shown, automatic means are provided for feeding the sole blank and these are utilized to effect the pressing operation.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings, in which:

Fig. 1 is a plan view of the operative parts of the machine showing a platform shell in process of construction,

Fig. 2 is a view in elevation on a somewhat larger scale showing the operative instrumentalities of the machine,

Fig. 3 is a view in elevation corresponding to Fig. 1 but omitting the work,

Fig. 4 is a fragmentary view in elevation, partly in section, on the line 4—4 of Fig. 1,

Figs. 5 and 6 are enlarged fragmentary views showing the work feeding and cover pressing elements of the machine,

Fig. 7 is a diagrammatic view of the work feeding and pressing members,

Fig. 8 is a fragmentary view showing a portion of the completed platform shell, and

Fig. 9 is a fragmentary plan view showing the anvil at the working point in the machine.

The construction of the platform shell produced by the process and machine of my invention is best shown in Fig. 8 in which is represented a binding strip comprising a core 10 of stiff but flexible ribbon-like material. This may be formed of several plies of strong tough paper or fibreboard folded and cemented together, or of an integral strip of any other fibrous material having the desired characteristics. In one satisfactory form the core is about ½" in depth or height, and $\frac{1}{16}$" in thickness. The core 10 is enclosed in a flexible cover of thin leather or plastic or textile material, one face of which has been coated with an adhesive that may be activated by heat or pressure as desired. The binding is supplied to the manufacturer with the outer portion 11 of the cover adhesively attached to one face of the core and extending beyond it, while the inner portion 12 of the cover is adhesively attached to the other face of the core throughout a portion only of its depth and is then folded upwardly so that a portion of the core is exposed which approximates the thickness of the sole blank 15 with which it is to be assembled. It will be seen that the binding thus provided presents a finished surface that is free of adhesive while the other face of the binding, as indicated in Fig. 1, has a coating of latent adhesive.

In constructing the platform sole or shell, the exposed portion of the core 10 is brought progressively into contact with the marginal edge of the sole blank 15 disposed at right angles thereto and in flush relation with the lower face of the blank. As this relation of core and blank is established, the lower margin of the outer portion 11 of the cover is folded inwardly over the bottom face of the sole blank 15 and adhesively attached thereto, and simultaneously the lower margin 13 of the inner portion of the cover is conformed and adhesively secured to the upper face of the sole blank as indicated in Fig. 8. The binding strip as a whole is thus very securely attached to the sole blank and provides an upstanding wall which is stiff, somewhat resilient and self-sustaining, and which in the finished platform shell encloses a sole-shaped area accurately determined by the contour of the sole blank 15.

The machine of my invention is designed for making rapidly and accurately the platform shell above described, or shells of that general type, without requiring any undue skill on the part of the machine operator. The machine as herein disclosed comprises an upright column or frame 20 supporting a head 21, and an arm 22 carrying an anvil 23 and a normally horizontal plate 24 mounted upon a horizontal stud 25 for swinging movement. It is normally maintained in operative position by a tension spring 26 connected at its upper end to the frame 20 and at its lower end to a pin projecting from the arm 22. The arm is provided with a boss having a finished

surface which is engaged with an adjustable stop 21 threaded into a lug projecting outwardly from the frame 20. Treadle connections 28 extend from the arm 22 by which the arm and the elements mounted thereon may be temporarily depressed against the tension of the spring 26 by the operator to facilitate presentation of the work. The dot and dash line position of the arm 22 in Fig. 3 indicates a lowered position of the arm.

A core supporting roll 30 is mounted for free rotation about a horizontal axis on a stud 31 carried by a bracket 32 secured to the bottom of the plate 24, and this roll is so arranged as to support the bottom edge of the binding strip at the operative point of the instrumentalities of the machine thereby accurately determining its vertical position with reference to the sole blank at the point of application as clearly indicated in Fig. 2. The sole blank 15 is supported in horizontal position by the anvil 23, and the anvil and roll 30 are so located with respect to each other that the uppermost edge of the core 10 is brought just flush with the uppermost face of the sole blank.

An edge gauge roll 33 is mounted to rotate about a vertical axis on a stud 34 projecting upwardly from the plate 24. Its work engaging face is located above the roll 30 and opposite to the inner side face of the anvil 23, as best shown in Fig. 2. In this position it engages the outer face of the binding strip at the point of application and presses it against the inner face of the anvil 23. The anvil has part of its front wall shaped to deflect the inner portion 12 of the cover so as to form the flange 13. The vertical portion 12 of the cover is pressed into firm engagement with the core 10 by the cooperaive action of the inner face of the anvil and the edge roll 33, while the flange 13 is pressed into adhesive engagement with the lowermost face of the sole blank 15 by the cooperative action of the top face of the anvil and the feed feet 36 and 37. These are mounted in a casing 35 carried by the head 21 of the machine and operated by eccentrics on a shaft 38 in the machine head. They are given a cooperating feeding and pressing movement as indicated in Fig. 7; that is to say, they are lifted from the anvil one after another in elliptical paths, then returned to engagement with the work, and then moved horizontally or toward the left as herein shown in pressing engagement with the flange 14 of the cover, thus pressing it into adhesive engagement with the uppermost face of the sole blank and at the same time advancing the work. The mechanism by which the desired movement of the feed feet is brought about is not herein described since it forms the subject-matter of my prior Patent No. 1,794,204, February 24, 1931, to which reference may be had for a full and clear description of this part of the present machine.

The binding strip with its edge-free cover is directed to the point of application by means which will now be described. The edge roll 33 is provided with an upwardly flaring circular deflector 40 mounted upon the stud 34 and shaped to turn over the upstanding marginal portion 14 of the binding strip cover, bringing it into range of the feed foot 37.

The plate 24 also carries an elongated vertical guide roll 41 which directs the binding strip to the edge roll 33. A flanged guide roll 42 rotatable about a horizontal axis is mounted

on an angular bracket 43 connected to the underside of the plate 24 by a spacer 44 as shown in Fig. 4. The roll 42 cooperates with a lower flanged guide roll 45 also mounted on the bracket 43. The core 10 of the binding strip is engaged between the hubs of the guide rolls 42 and 45 and thus accurately positioned for height, while the flange of the roll 42 deflects the edge-free margin of the cover 12 preparatory to its shaping by the inner corner of the anvil 23. Finally, a second elongated vertical guide roll 46 is mounted upon an arm projecting outwardly from the plate 24 and to this the binding strip is passed from the supply roll.

In applying the binding strip to the edge of the sole blank by the machine herein disclosed, the operator will first depress the arm 22 with the anvil 23 and the parts carried thereby so that the sole blank 15 may be presented upon the anvil 23 with its margin resting against the top side face of the core 10, the binding strip having been previously threaded in position against the edge roll 33. When the treadle connection 28 is released, the anvil and the work are at once returned to the proper operative position as determined by the adjustment of the stop 21 and thus adequate pressure of the feed feet 36 and 37 upon the work is insured. The machine is now set in operation and the sole blank is advanced progressively to the point of application of the cover strip while the edge-free margins of the cover are turned over the opposite faces of the sole blank and caused to adhere thereto by the pressing or hammering action of the feed feet. The exposed portion of the core is meanwhile pressed firmly against the marginal edge of the sole blank by the action of the edge roll 33. The line of feeding action is offset with respect to the point of contact of the edge roll 33 with the work, so that in the continuous feeding movement the contour of the sole is accurately and rapidly followed without requiring any attention on the part of the operator. When the entire periphery of the sole has been bound, the machine is stopped, the binding strip severed, and the tag end thereof brought into place, making continuous the upstanding wall of the platform shell. It will be apparent that in rounding the toe of the sole the inside flange 13 of the cover will be somewhat pleated as indicated in Fig. 5. The pleats formed in this manner are hammered flat by the action of the feed foot 36 which operates on the stock after it has been passed along to it by the feed foot 37.

The anvil 23 is given a special plow shape to facilitate the formation of the pleats and to tuck the material of the cover firmly into the vortex of the right angle between the sole blank and the upright core. As best shown in Fig. 9 the face of the anvil which meets the work is curved as a horn or plow and cooperates with the edge roll 33 to provide a narrow opening or gate for the passage of the wall as it is formed along the marginal edge of the sole blank. The rear face of the anvil is given a convex curvature and its forward face a concave curvature of less radius, the two curves converging to a thin pointed working edge. An anvil of this shape has been found particularly useful in sweeping the material of the attaching flange 13 into a series of substantially uniform pleats about the toe portion of the sole. These are immediately hammered flat by the action of the feed feet.

One form of binding strip with edge-free cover suitable for use in connection with the machine

herein described is disclosed and claimed in my prior Patent No. 2,343,226, February 29, 1944, although the stitching shown in that patent is not usually necessary since the adhesive alone has been found entirely adequate.

Having thus disclosed my invention and described in detail a preferred machine for carrying it out, I claim as new and desire to secure by Letters Patent:

1. A machine for applying to a sole blank a binding strip having an edge-free adhesive cover of sheet material, comprising an anvil for supporting a sole blank, a rotary support adjacent to the anvil and located at a level below the anvil for supporting the binding strip, the anvil being shaped to lay one margin of the cover on the lowermost face of the sole blank, and a feed foot acting to lay the other margin of the cover on the uppermost face of the blank.

2. A machine for applying to a sole blank a binding strip having a core and an edge-free adhesive cover, comprising an anvil having a supporting face and a cover deflecting face, a support located at one side of the anvil and in position presenting the upper edge of the core flush with the uppermost face of the sole blank, and a feed foot movable to feed the blank and to press one margin of the cover upon the uppermost face of the blank while the anvil lays the other margin on its lowermost face.

3. A machine for applying to a sole blank a binding strip having an edge-free cover, comprising an anvil having a face for supporting the margin of a sole blank in horizontal position and an adjacent vertical face, a roll rotatable about a vertical axis and having a cylindrical vertical face cooperating with the vertical face of the anvil to present a binding strip in vertical position to the edge of the sole blank, together with work feeding and cover pressing feet.

4. The process of making platform shells which includes the steps of progressively presenting to the edge of a sole blank a binding strip having an exposed stiff, resilient core substantially wider than the thickness of the sole and an edge-free adhesive cover, pressing the core against the edge of the sole blank, and simultaneously folding the marginal portions of the cover over the opposite faces of the sole blank securing them thereto and tucking the cover into an angle vertex between the lowermost face of the sole and the wall of the core.

5. The process of making platform shells which includes the steps of progressively presenting to the edge of a sole blank a binding strip of substantially greater width than the thickness of the blank and having an edge-free cover, one edge of the binding strip being located flush with one face of the sole blank, then simultaneously folding one marginal portion of the cover across the binding strip and over one face of the blank and folding the other marginal portion of the cover into the angle between the other face of the blank and the inner wall formed by the binding strip.

6. In a machine for attaching to a flat sole blank a binding strip having a cover of edge free adhesive material; an edge gauge and an anvil spaced to provide a gate for the passage of the binding strip, the anvil having an upper sole-supporting face with an edge inclined with respect to the binding strip at the point of contact and acting to pleat and tuck one edge of the cover into the vortex of the angle formed by the binding strip, and means cooperating with the anvil for feeding the blank and pressing the pleated edge of the cover.

7. A machine of the class described having, in combination, sole feeding devices, a cooperating sole support having a plow face located beneath the sole, and a flat roll mounted for free rotation and having its rim located below the sole support in position to support a wide covered binding strip with its upper edge flush with the uppermost face of the sole and a vertically disposed upright portion depending below the sole, the plow face of the support acting to tuck the cover of the binding strip into an angle vertex against the lower face of the sole and the upright wall of the binding strip.

8. A machine of the class described having, in combination, sole feeding feet operating in a fixed path at a predetermined level, a depressible frame carrying a sole support located beneath the feeding feet, a flat roll mounted for free rotation about a horizontal axis with its rim disposed below and at one side of the sole support, and an edge roll mounted for free rotation about a vertical axis with its rim spaced from the sole support to receive the upright body of a binding strip depending below the lowermost face of a sole resting on the sole support.

9. A machine for applying to a sole blank a wall-forming binding strip having an edge-free adhesive-coated cover, the machine comprising an anvil having a horizontal sole-supporting face and a vertical side face, a rotary edge gauge roll having a cylindrical strip-engaging face that extends below the plane of the horizontal face of the anvil and in spaced relation to the vertical side face of the anvil whereby the binding strip may be presented to the edge of a sole on the anvil in right angular relation and disposed entirely below the plane of the uppermost surface of the sole, the said anvil having its front face shaped to present a horn for tucking the edge-free cover of the binding strip into the angle between the lowermost face of the sole and the body of the binding strip, and work-feeding means cooperating with the anvil.

10. A machine for applying to a platform sole blank a stiff flexible upstanding wall, the machine including in its organization an anvil having a horizontal upper face, a vertical side face and a front face curved as a plow, feed feet cooperating with the horizontal face of the anvil to feed the work, a roll mounted to rotate about a vertical axis and having a cylindrical face extending below the plane of the horizontal face of the anvil and in spaced relation to its said side face, and a supporting roll rotatable about a horizontal axis with its cylindrical surface located substantially below the upper face of the anvil whereby the body of a binding strip may be advanced in a path below the uppermost face of the sole blank on the anvil.

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