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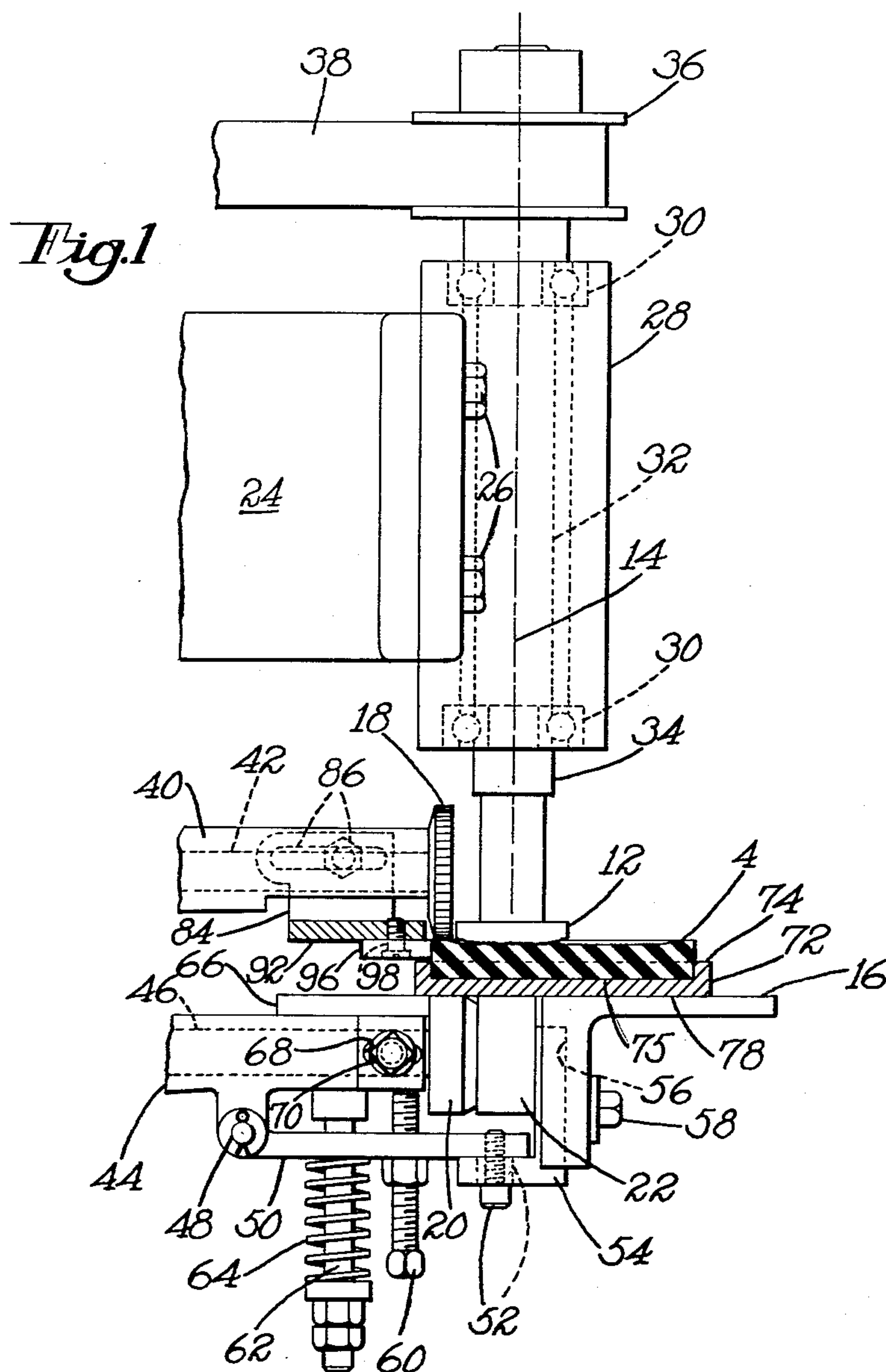
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2,994,893

MACHINES FOR ROUGHING OUTSOLES

Filed March 16, 1960

2 Sheets-Sheet 1



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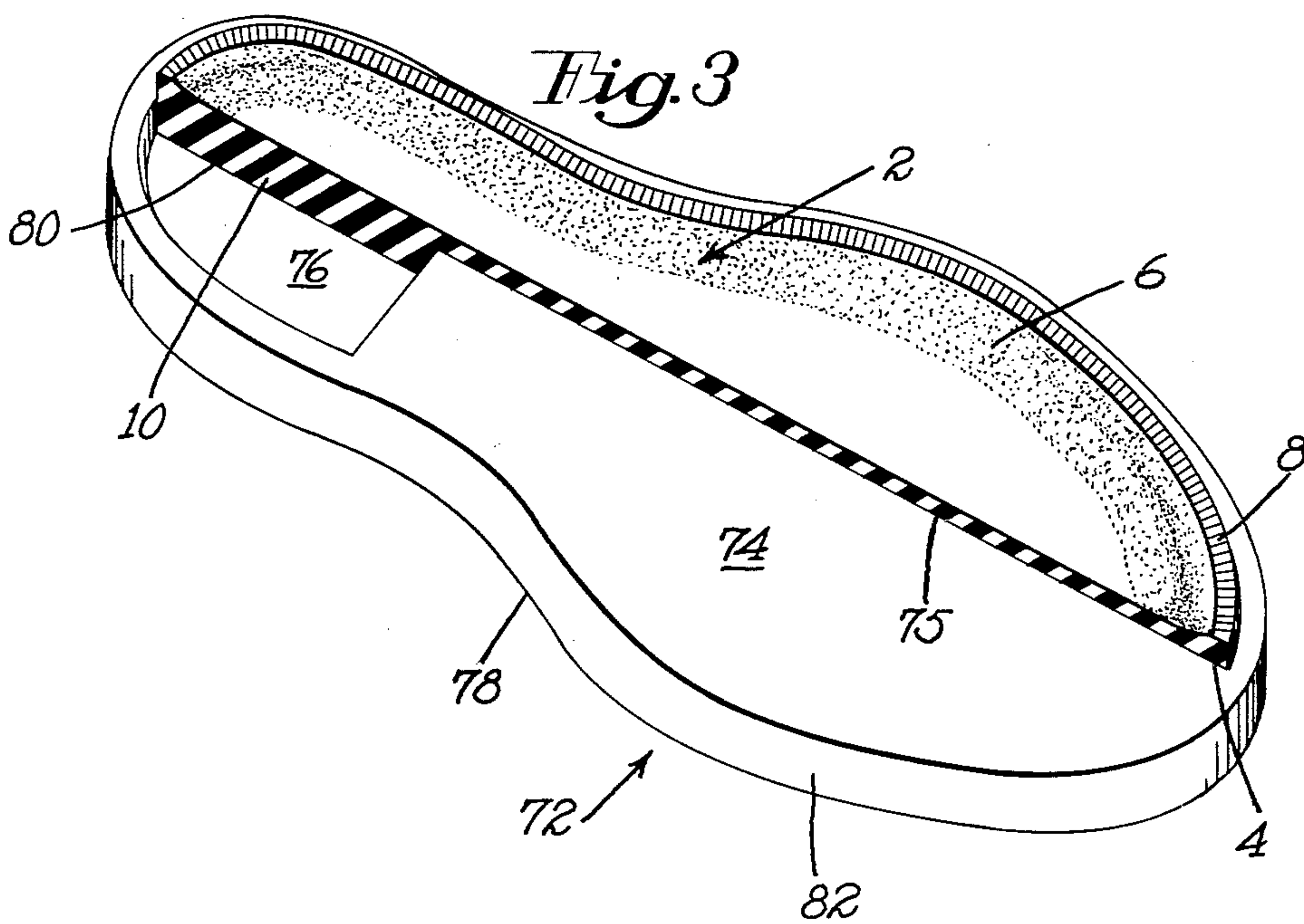
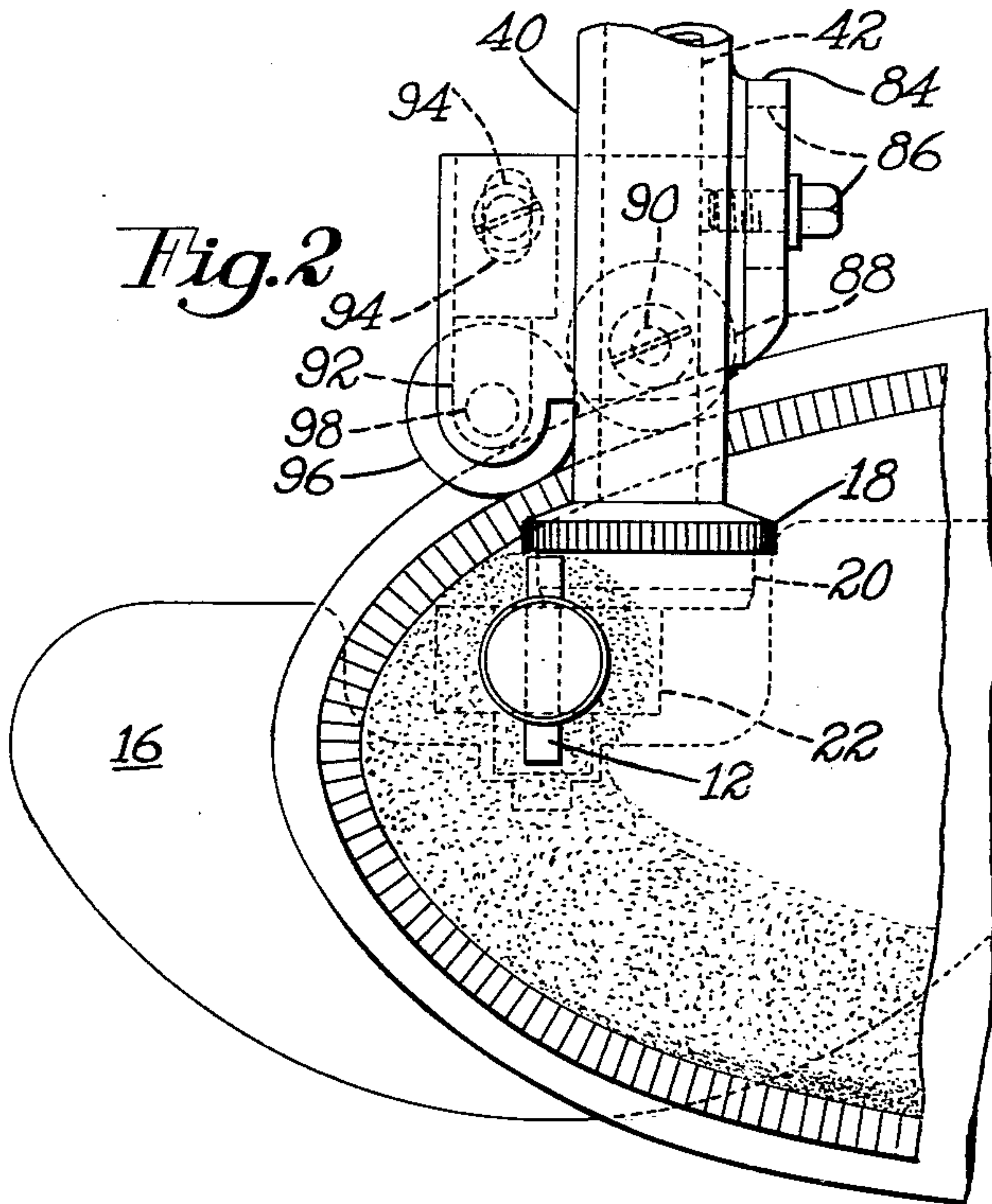
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MACHINES FOR ROUGHING OUTSOLES
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7 Claims. (Cl. 12-17)

This invention relates to machines for roughing the shoe attaching surface of rubber composition outsoles of the type which include a heel molded on the sole as an integral portion. In a copending application for United States Letters Patent Serial No. 8,890, filed February 15, 1960, in the name of Hans C. Paulsen, there is disclosed a machine for roughing the shoe attaching surface of outsoles of the type having a substantially uniform or flat tread surface, i.e. a surface without an integral heel. The reason for roughing a rubber outsole is to prepare it for attachment to the overlapped margin of a shoe upper. While the Paulsen machine is economical, efficient and works well with flat bottom soles, it is not suitable for operation upon a sole having an integral heel. The difficulty arises from the fact that the sole is supported on a substantially horizontal work table and is urged upwardly into engagement with a rotatable roughing tool under pressure. Under these conditions a sole having a heel bends excessively when the roughing tool presses down on the sole above the shank portion. At this time the sole is supported on the table by the ball and the heel with a bridge or gap between the table and the sole in the shank area just forward of the heel breast line where flexure is the greatest.

It is an object of this invention to provide an outsole roughing machine of a type similar to the Paulsen machine which is particularly adapted for roughing molded outsoles having integral heels.

The Paulsen machine is provided with a pair of edge gages which extend upwardly from the work table or support and engage the edge of the outsole while the sole is fed by a pair of gripping feed wheels. The gages normally contact the edge of the sole just above the tread surface. When a sole with an integral heel is presented, no difficulty is experienced as long as the forward or toe portion of the sole is in engagement with the gages but once the sole reaches a position where the gages begin to contact the shank portion, the sole, being elevated from the table at this point, moves out of engagement with the gages and rides over them, therefore rendering the machine ineffective.

Accordingly, it is another object of this invention to provide a roughing machine of the Paulsen type having one or more gages adapted to contact the edge of the sole at all times.

Still another difficulty is encountered in the Paulsen machine when roughing a sole having an integral heel. Soles are fed by a pair of power driven feed wheels which rotate about substantially horizontal axes and which are biased toward each other to grip the sole between them. As long as the sole is of relatively uniform thickness, there is no substantial movement of the wheels toward and away from each other when they operate about the margin of the sole. However, a sole having an integral heel presents an abrupt step to the cooperating feed wheels when the heel portion passes between them. In other words, a noticeable jump of the feed wheels takes place as the substantially thicker heel portion attempts to pass between them. Frequently, under these conditions control of the sole is momentarily lost. Also the edge gages, extending upwardly from the work table, interfere with the movement of the sole when the shank area is being operated on.

Still another object of this invention is to provide a

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machine of the Paulsen type which is adapted to rough outsoles having integral heels, which machine maintains complete feeding control of the sole at all times.

In accordance with these objects and as a feature of this invention there is provided a machine for roughing the shoe attaching surface of a rubber composition outsole having a roughing tool in the form of an end mill cutter rotatable about a substantially vertical axis, upper and lower cooperating feed wheels, a substantially horizontal work support or table and a pair of spaced gages adapted to contact the edge of the outsole above its tread surface. The gages are adjustably secured to the upper bearing housing which rotatably supports the upper feed wheel thereby assuring that the work table or support has no projecting gages to interfere with the movement of the sole. As another feature of this invention, there is provided a pallet or temporary supplemental sole portion which has a flat lower surface engageable with the work support and an upper surface or profile which is complementary to the tread surface of the outsole. The pallet or supplemental sole portion, when assembled with the outsole presents a combined work piece of uniform vertical thickness to the cooperating feed wheels. With the edge gages mounted and depending from the upper bearing housing they engage only the edge of the outsole adjacent the shoe attaching surface, which, due to the presence of the pallet, is of uniform height above the work support. The gages do not touch the lower edge adjacent the tread surface of the outsole which has, of course, two different thicknesses due to the integral heel. The pallet or temporary supplemental sole portion together with the outsole presents to both the feed wheels and the tool a work piece of uniform thickness and rigidity.

The above and other features of the invention including various novel details of construction and combinations of parts will now be more particularly described with reference to the accompanying drawings and pointed out in the claims. It will be understood that the particular machine embodying the invention is shown by way of illustration only and not as a limitation of the invention. The principles and features of this invention may be employed in varied and numerous embodiments without departing from the scope of the invention.

In the drawings,

FIG. 1 is a side view, partly broken away, of the operating head portion of a roughing machine embodying the invention, illustrating an outsole being operated upon;

FIG. 2 is a plan view of the portion of the machine shown in FIG. 1; and

FIG. 3 is a perspective view, partly broken away, of a pallet supporting a rubber composition outsole with an integral heel which sole has been roughened in the illustrative machine.

The machine is described with reference to removing material from the upper face or shoe attaching surface 2 of a molded rubber composition outsole 4 to form on the outsole a roughened band 6 of outsole material located just inside a simulated welt 8. The outsole is formed with an integral molded heel 10. The roughened outsole is subsequently secured to the lasted margin of a shoe upper by cement.

The illustrative machine comprises an end mill roughing of cutting tool 12 rotatable about a substantially vertical axis 14, a work table or support 16, oppositely disposed upper and lower feed wheels 18, 20. The wheels are adapted to feed the outsole past the end mill cutter or roughing tool 12. An idler roll 22 cooperates with the table 16 and the feed wheels 18, 20 to support and present the sole to the roughing tool.

The machine has a main frame, not shown, but located to the left of the portion of the machine shown in FIG. 1. A tilt bracket 24 is mounted on the main frame for up-

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ward yielding movement about a point also to the left of FIG. 1. The tilt bracket 24 has a forwardly projecting portion to which there is adjustably secured by screws 26, a housing 28 for ball bearings 30. Rotatably supported by the bearings 30 is a vertical spindle 32 on the lower end of which is mounted a holder 34 to which the end mill cutter 12 is secured in any convenient manner. A pulley 36 is operatively connected by a belt 38 to a pulley (not shown) secured to a shaft of a motor, likewise not shown, and adjustably secured to the main frame of the machine.

Also secured to the main frame is an upper horizontal bearing housing 40 having journaled in it a shaft 42 to the forward end of which the upper or first feed wheel 18 is secured. A second or lower bearing housing or bracket 44 is tiltably supported by the main frame and projects therefrom substantially parallel to the bearing housing 40. Journaled in the lower bearing housing 44 is a shaft 46 mounting on its forward end the lower feed wheel 20. The forward arm of the tiltable bearing housing 44 carries a pin 48 upon which is pivotally mounted an arm 50. Adjustably secured to the arm 50 by a slot and screw connection 52 is a lug 54 provided with a bearing for the idler roll 22. A depending portion of the table 16 has formed in it a rectilinear guideway 56 in which an upstanding portion of the lug 54 fits, a screw 58 passing through a bifurcated portion of the table being threaded into said lug for maintaining the table in different heightwise operating positions upon said lug. The arm 50 has threaded in it a stop screw 60 and the forward arm of the tiltable bearing bracket 44 has threaded into it a screw 62, a spring 64 being interposed between the arm 50 and a washer in engagement with a nut threaded onto the screw 62 and serving constantly to raise the arm to an idle position determined by the engagement of the stop screw 60 with the tiltable bearing housing 44. The idler roll 22 may be considered part of the table 16 and the table and roll together may be referred to as the support. The forward arm of the tiltable bearing bracket 44 has mounted on it a plate 66 which has a depending flange provided with a slot 68. A screw 70 passing through the slot 68 permits horizontal adjustment of the plate 66 toward and away from the lower feed wheel 20 and the main portion of the table 16.

The above described portions of the illustrative machine are identical with those shown in the above-identified Paulsen application which may be referred to for a more detailed description.

The composition outsole 4 with the integral heel portion 10 is carried in a pallet 72. The upper face of the pallet is complementary to the lower or tread surface of the outsole including the heel portion. The pallet has a flat upper portion 74 engageable with the lower tread surface 75 of the forepart of the outsole and a recessed portion 76 which receives the integral heel portion 10 of the outsole. The recessed portion 76 is of sufficient depth to engage firmly the lower tread surface 80 of the heel portion 10 while the tread surface 75 of the forepart of the outsole is in engagement with the surface 74. The pallet itself has a flat lower surface 78 engageable with the work table 16 and a continuous vertical edge 82 having the profile substantially the same as but slightly larger than that of the outsole carried by it.

A first edge gage bracket 84 is secured by a slot and screw connection 86 to the forward end of the upper bearing housing 40 for movement toward and away from the tool 12 and parallel to the axis of the feed wheel shaft 42. A first edge roll or gage 88 is journaled on a stud 90 in the bracket 84. A slide or second edge gage bracket 92 is also secured on the lower surface of the edge gage bracket 84 for movement toward and away from the tool by a slot and screw connection 94 for adjustment also parallel to the axis of the shaft 42. A second edge roll or gage 96 is journaled on the slide 92 by a screw 98. The gages 88 and 96 are adapted to engage the edge of the outsole above its tread surface.

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The machine operates in the following manner. An outsole with an integral heel is placed in the pallet 72, which is also known as a temporary supplemental sole portion, in the manner shown in FIG. 3. The heel portion 10 is firmly positioned in the heel recess 76 in engagement with its bottom and the remaining portion of the sole overlies the upper flat surface 74 of the pallet. The pallet is placed on the table and the treadle operated in the conventional manner to pivot the lower bearing housing and hence, the table 16 upwardly. Upward movement of the table positions the pallet with the outsole carried thereby yieldingly in engagement with the feed wheel 18 as shown in FIGS. 1 and 2. The edge gages or rolls 88 and 96 have been previously adjusted relatively to each other and to the feed wheel 80 so that they engage the edge or profile of the outsole adjacent its upper surface without touching either the heel portion 10 or the pallet 72. Note in FIG. 1 the clearance between the roll 96 and the upper surface 74 of the pallet. The lower driven feed wheel 20 forcibly engaging the bottom flat surface 78 of the pallet cooperates with the upper feed wheel 18 to impart a cross feed to the pallet and the sole carried thereby whereupon successive portions of the sole are presented to the rotating roughing tool 12 and the desired roughened band is formed on the upper face 2 just inside the inner edge of the simulated welt 8. Because the tread surface 75 of the outsole forepart is in firm engagement with the surface 74 of the pallet and likewise the tread surface 80 of the heel portion is in firm engagement with the bottom of the recessed portion 76 of the pallet, i.e. the depth of the recess and height of the heel are exactly the same, pressure applied by the cutter 12 and by the gripping feed wheels 18 and 20 at any point on the outside, including the shank area, will not cause deflection of the sole when it is being operated upon but rather the same resistance to deflection is offered around the entire sole. When the cycle has been completed, the treadle is released to lower the table 16 and the roughened outsole may be replaced in the pallet by another outsole or a new pallet having an outsole previously positioned therein may be placed in the machine and the cycle repeated.

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

1. In a machine for roughing the shoe attaching surface of a rubber composition outsole, an end mill roughing tool rotatable about a substantially vertical axis, a power driven feed wheel engageable with the shoe attaching surface of the sole, a bearing housing rotatably supporting the feed wheel, space gages adjustably mounted on the bearing housing and adapted to be engaged by the edge of the outsole above its tread surface, and a work support below the tool and the spaced gages.

2. In a machine for roughing the shoe attaching surface of a rubber composition outsole, an end mill roughing tool rotatable about a substantially vertical axis, a power driven feed wheel engageable with the shoe attaching surface of the sole, a bearing housing rotatably supporting the feed wheel, spaced gages on the bearing housing adapted to be engaged by the edge of the outsole above its tread surface, means mounting the edge gages for adjustment relatively to each other and to the axis of the tool, and a work support below the tool and said spaced gages.

3. In a machine for roughing the shoe attaching surface of a rubber composition outsole, an end mill roughing tool rotatable about a substantially vertical axis, a power driven feed wheel engageable with the shoe attaching surface of the sole, a bearing housing rotatably supporting the feed wheel, a pair of spaced edge gages adapted to engage the edge of the outsole above its tread surface, one gage being secured to a bracket mounted on the bearing housing for movement toward and away from the tool, the second gage being secured to a slide adjustably mounted on the bracket for movement to-

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ward and away from the tool whereby the gages are adjustable relatively to the tool and to each other, and a work support below the tool and the edge gages.

4. In a machine for roughing the shoe attaching surface of a rubber composition outsole having an integral heel portion, a pallet having a flat lower surface and an upper face complementary to and adapted to be engaged by the entire tread surface of the outsole including the heel portion, an end mill roughing tool rotatable about a substantially vertical axis, a first power driven feed wheel engageable with the shoe attaching surface of the outsole and a work support engageable with the flat lower surface of the pallet, and a second power driven feed wheel engageable with the flat lower surface of the pallet opposite to said first feed wheel.

5. In a machine for roughing the shoe attaching surface of a rubber composition outsole having an integral heel portion, a pallet having a flat lower surface and an upper face complementary to and adapted to be engaged by the entire tread surface of the outsole including the heel portion, an end mill roughing tool rotatable about a substantially vertical axis, a first power driven feed wheel engageable with the shoe attaching surface of the outsole and a work support engageable with the flat lower surface of the pallet, a second power driven feed wheel engageable with the flat lower surface of the pallet opposite to said first feed wheel, and edge gaging means mounted above the work support and engageable with the edge of the outsole above the pallet.

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6. In a machine for roughing the shoe attaching surface of a rubber composition outsole having an integral heel portion of greater thickness than the remainder of the sole, an end mill roughing tool rotatable about a substantially vertical axis, first and second power driven feed wheels rotatable about spaced substantially horizontal axes and adapted to operate above and below the outsole respectively, and a temporary supplemental sole portion engageable with the tread surface of the outsole to present a combined work piece of uniform vertical thickness to the first and second feed wheels and to the tool.

7. In a machine for roughing the shoe attaching surface of a rubber composition outsole having an integral heel portion of a greater thickness than the remainder of the outsole, a support for the outsole, an end mill roughing tool, feed wheels for moving the outsole over the support and past the roughing tool, a temporary supplemental sole portion engageable with the tread surface of the outsole to present a combined work piece of uniform thickness to the roughing tool, and edge gaging means above the support and engageable with the edge of the outsole above the temporary supplemental sole portion.

References Cited in the file of this patent

UNITED STATES PATENTS

2,832,974 Tusa et al. ----- May 6, 1958