July 2, 1968 E. O. PETERSON 3,390,663

APPARATUS FOR APPLYING ADHESIVE TO THE MARGINAL EDGE OF PREFORMED BOTTOM MEMBERS

Filed June 7, 1966 2 Sheets-Sheet 1

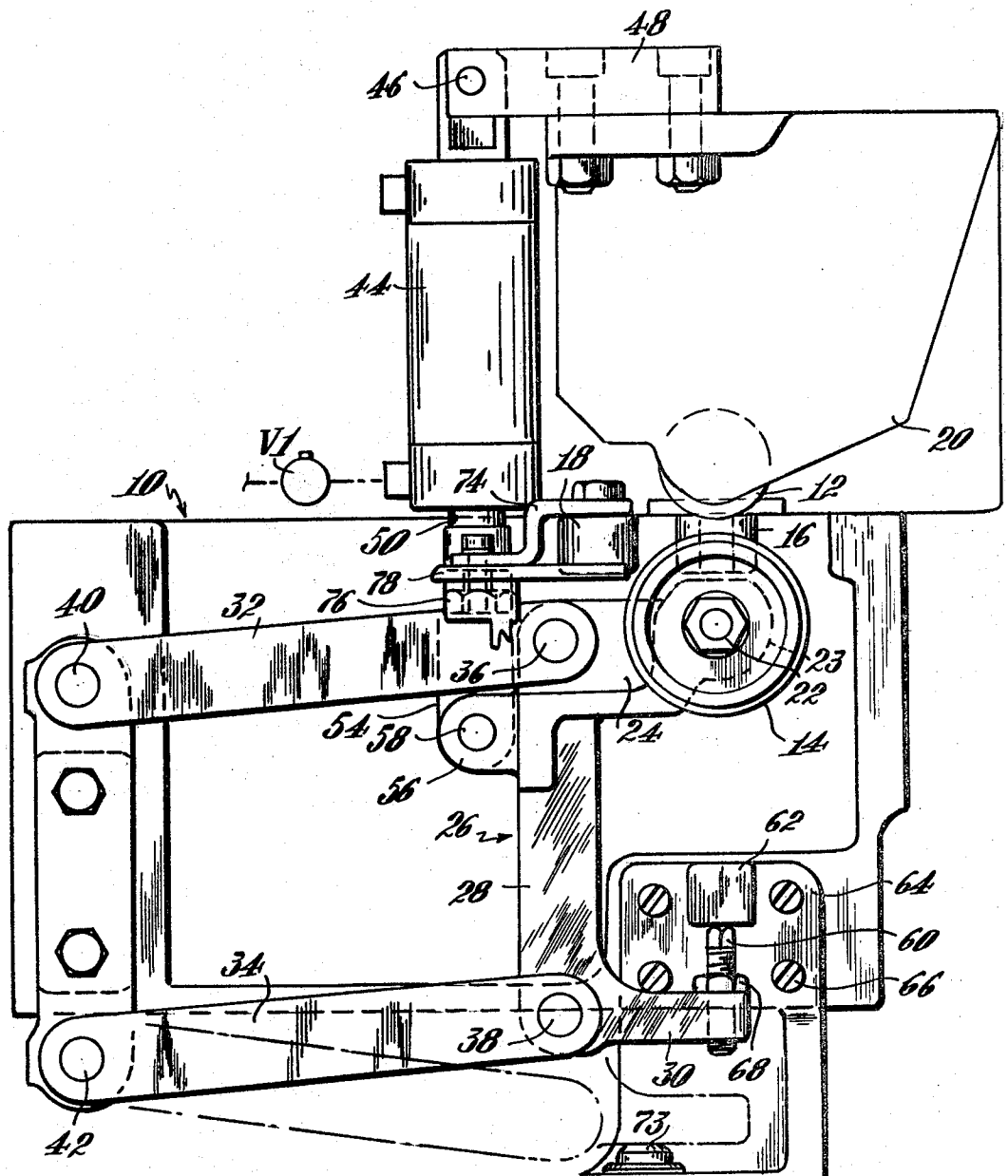

Fig. 1

Fig. 3

Fig. 4

Fig. 5

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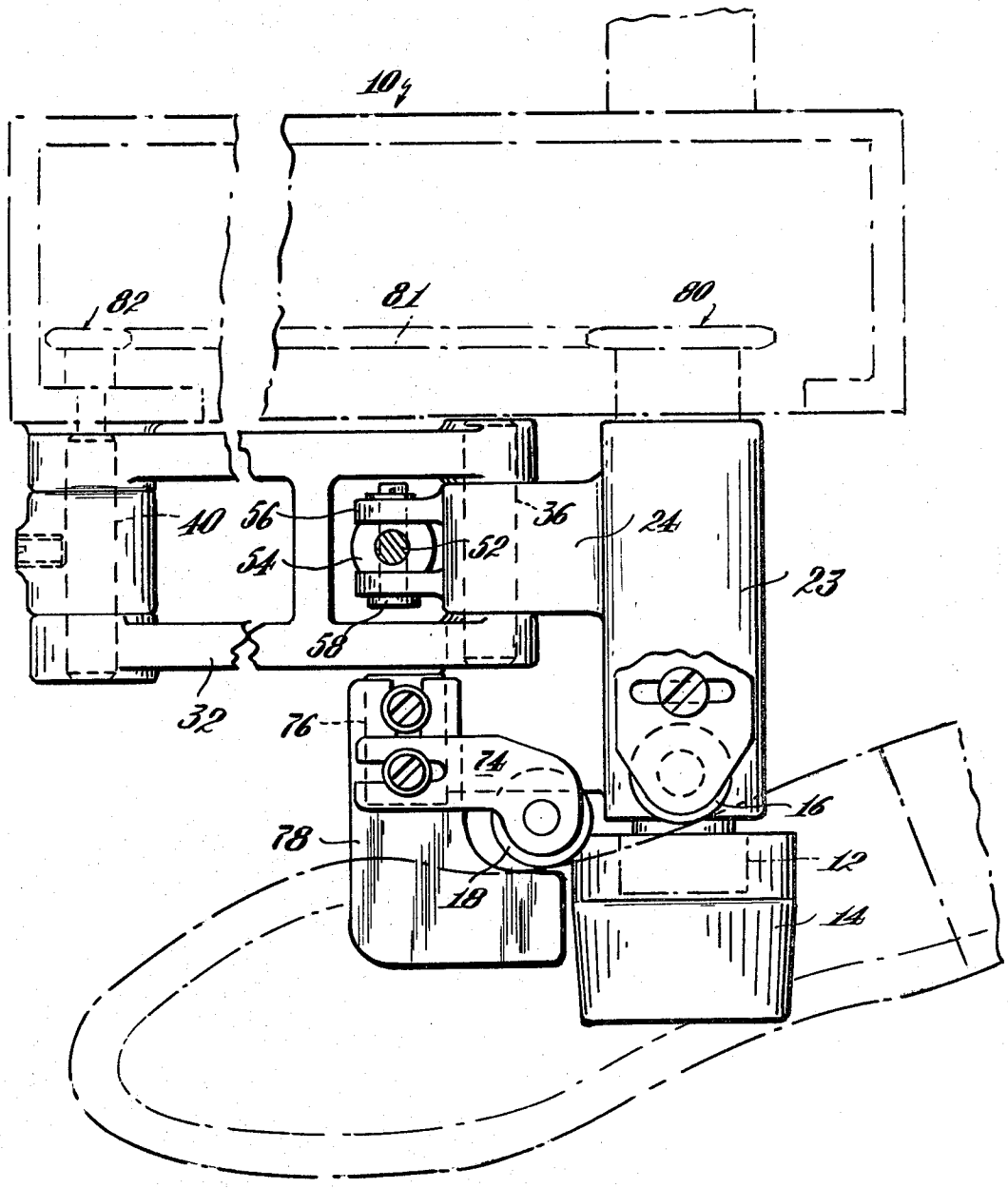

Fig. 2

United States Patent Office 3,390,663 Patented July 2, 1968

3,390,663

APPARATUS FOR APPLYING ADHESIVE TO THE MARGINAL EDGE OF PREFORMED BOTTOM MEMBERS

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Filed June 7, 1966, Ser. No. 555,764
9 Claims. (Cl. 118—249)

ABSTRACT OF THE DISCLOSURE

Apparatus for applying adhesive to the marginal edge of an insole by progressively advancing its marginal edge between a pair of feed rolls, one of which is an applicator roll, against edge guides disposed at an angle to the direction of feed which turns the insole automatically so as to present the entire edge to the applicator roll.

Machines of this type are not new; however the feed rolls are mounted on parallel axes and usually with the lower feed roll supported for movement downwardly relative to the upper feed roll about a center located on the axis of the lower feed roll rearwardly of the rolls. Such pivotal movement of the lower feed roll relative to the upper feed roll decreases the contact of the rolls with the margin and hence lessens the feeding force necessary to rotate the bottom member efficiently. This non-parallel relation of the feed rolls is greatly increased when the bottom member is quite thick, wedge-shaped and/or has an attached or integral heel of increased thickness with the result that the bottom member is apt to be flipped out of the machine especially at the toe end.

The principal object of this invention is to provide a machine of the foregoing kind wherein a substantially constant feeding force may be maintained independently of the proximity of the feed rolls and hence the thickness of the bottom member, or variations in thickness thereof. This is accomplished herein by mounting the lower feed roll for movement rectilinearly with respect to the upper feed roll so that the surfaces of the rolls remain substantially parallel throughout their relative movement, and of yieldably opposing relative movement of the feed rolls by a constantly applied pressure. A pressure fluid operable motor is employed to apply yieldable pressure to resist separation, and an adjustable regulator valve is employed to maintain a uniform pressure. The forward one of the guides and the work-supporting table are supported for movement with the lower feed roll. The mounting for the lower feed roll is supported on the machine frame by spaced paralliel arms pivotally connected at one end to the mounting at at their other ends to the machine frame, and there is means for limiting the upward and downward movement of the mounting. The limiting means are adjustable. The mounting for the lower feed roll comprises a C-shaped frame having a back and spaced parallel limbs, the forward ends of the arms are pivotally connected to the back of the frame, the lower roll is mounted on the upper limb and the lower limb is movable between limiting means to limit movement thereof.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is an elevation of the machine showing, in particular, the mounting for the lower feed roll which permits movement relative to the upper feed roll;

FIGS. 2, 3 and 4 show bottom members which the machine is especially designed to handle; and

FIG. 5 is a plan view of FIG. 1, showing the relation of the bottom member relative to the feed rolls and the guides.

Referring to the drawings, the machine has a supporting frame **10**, only the upper portion of which is shown herein, on which are mounted the operating instrumentalities, to wit, a pair of feed rolls **12** and **14**, a pair of gauges **16** and **18** against which the edge of a bottom element is held and traversed by the feed rolls, and a receptacle **20** within which the upper portion of the feed roll **12** is recessed for supplying its upper portion with adhesive.

The upper feed roll **12**, which is also the applicator roll, is secured to a horizontally supported shaft (not shown), by means of which it is rotated. The guides **16** and **18** are rollers mounted for free rotation on spaced parallel stub shafts which are perpendicular and at right angles to the shaft to which the upper roll **12** is attached. A suitable drive is provided for effecting rotation of the feed roll **12**.

In accordance with this invention, it is desirable to mount the lower feed roll **14** so that it can be displaced relative to the upper feed roll **12**, that is moved downwardly therefrom without changing the parallel relation of the surfaces of the rolls relative to each other, that is to maintain their parallelism so that tangential contact throughout the entire width of each roll is maintained regardless of the displacement of the feed roll **14** relative to the feed roll **12**, as, for example, takes place when the bottom part varies in thickness and/or has a heel end of greater thickness than the forepart. This is achieved herein by mounting the lower feed roll **14** for rectilinear movement relative to the feed roll **12** for rotation on an axis parallel to that of the axis of rotation of the feed roll **12**. To this end the lower feed roll **14** is rotatably mounted on a shaft **22** journaled in a bearing **23** secured to the upper limb **24** of a C-shaped frame member **26** having a back **28** and upper and lower limbs **24** and **30**. The C-shaped frame **26** is supported on the machine frame **10** by pairs of arms **32** and **34**, the forward ends of which are pivotally connected to the upper and lower ends of the back **28** by pins **36** and **38**, and the rear ends of which are connected to the frame **10** by pins **40** and **42**. The four bar linkage thus provided will, of course, maintain the movement of the frame **26** in a perpendicular position as it is moved up and down and correspondingly will effect movement of the shaft **22** on which the lower roll **14** is mounted rectilinearly, so that the surface of the lower feed roll **14** will remain parallel to the upper surface of the feed roll **12** throughout movement of the rolls relative to each other.

The lower feed roll **14** is constantly urged toward the feed roll **12** by a pressure fluid operable motor **44** (FIG. 1), the upper end of which is pivotally connected by a pin **46** to a bracket **48** bolted to the receptacle **20** which in turn is fastened to the frame of the machine. A piston rod **50** projects from the lower end of the motor cylinder and is provided with a screw-threaded portion **52** which is screwed into a link **54**, the lower end of which is pivotally connected between a pair of spaced ears **56** by means of a pin **58**. The ears **56** are formed integral with the back **28** of the frame **26** so that the movement of the bracket and hence of the lower feed roll is controlled by the motor cylinder **44**. A regulator valve V1 is provided to supply pressure fluid at a predetermined pressure to the motor cylinder and in order to maintain a uniform pressure regardless of the thickness of the bottom part which is being operated upon the regulator valve is adjustable to vent an increase in pressure due to downward displacement of the feed roll **14**. Thus it is possible to maintain a constant and uniform feeding force on the bottom member regardless of variations in thickness and this makes the apparatus particularly suitable for applying adhesive to preformed bottom members of varying thickness or having a heel end of increased thickness;

for example for application of adhesive to the marginal edges of outsoles with heel taps secured thereto, or to outsoles preformed of elastomer and equivalent moldable composition, such as shown in FIGS. 3, 4 and 5.

The motor cylinder **44**, as related above, exerts a constant upward pull on the frame **26** and in order to maintain the feed rolls at an initial spacing such that the lower feed roll **14** will be held away from the upper feed roll **12**, so that no adhesive will be transferred to the surface of the lower feed roll in the absence of a bottom member between the rolls, an abutment member **60** is screwed into the limb **30** so that its upper end is vertically subjacent a boss **62**. As illustrated, the boss **62** projects forwardly from a plate **64** fastened by screw bolts **66** to the machine frame **10**. A locking nut **68** provides for fixing the abutment member **60** in a selected heightwise position on the limb **30**. Downward displacement of the lower feed roll **14** is limited by an abutment member **70** screwed into an arm **72** at the lower edge of the plate **64** in a position vertically subjacent the lower limb **30**. To prevent impact with the abutment member **70** which might be damaging, a rubber tip **73** is secured to its upper end so as to cushion contact of the limb **30** with the abutment member **70**.

Desirably the forward one of the guides **18** is mounted for movement with the lower feed roll **14** and to this end is supported on a bracket member **74**, the latter being bolted to a flange **76** extending from the bearings **23**. A work-supporting table **78** is also provided and is mounted on the flange so as to be movable in elevation with the lower feed roll.

The shaft **22** on which the lower feed roll is rotated extends rearwardly through its bearing sleeve **23** into the frame of the machine and has on it a sprocket **80** by means of which it is rotated. Rotation is effected by means of a chain **81**, one end of which is entrained about the sprocket **80**, and the other end of which is entrained about a sprocket **82** supported in the machine frame **10** on a shaft, the axis of which is spaced from and parallel thereto and located sufficiently distant therefrom so that the downward displacement of the lower feed roll does not appreciably change the distance between the centers of the sprockets and hence does not interfere with the drive.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Apparatus for applying adhesive to the marginal edge of a preformed bottom element of the kind wherein the bottom element is supported for rotation between a pair of feed rolls, with an edge engaged with a pair of spaced guides so arranged as to traverse the bottom element peripherally, and wherein the upper feed roll is an applicator roll and the lower feed roll is a support; characterized in that a parallel bar linkage supports the lower feed roll for substantially rectilinear movement away from the upper roll while maintaining the axis of the lower feed roll parallel to the axis of the upper feed roll, and there is means applying to a constant pressure to the linkage in a direction opposing displacement of the lower roll from the upper roll.

2. Apparatus according to claim **1**, comprising a pressure fluid operable motor connected to the linkage and urging the linkage in a direction opposing displacement of the lower roll away from the upper roll, and a regulator valve associated with the motor operable, in response to displacement of the linkage, to maintain a constant pressure by venting the motor cylinder in proportion to the amount of its displacement.

3. Apparatus according to claim **1**, comprising, adjustable means operable to determine the upper limit of movement of the linkage and hence the spacing between the upper and lower rolls, and adjustable means operable to determine the lower limit of movement of the linkage.

4. Apparatus according to claim **3**, comprising yieldable means associated with the means for determining the lower limit of movement to cushion movement of said lower roll to said lower limit.

5. Apparatus according to claim **1**, comprising mounting one of the guides, the forward one in the direction of movement on said linkage for movement with the lower roll.

6. Apparatus according to claim **1**, comprising mounting a work support on the linkage for movement therewith.

7. In a machine for applying adhesive, a pair of rolls, one of which is an applicator roll and the other of which holds a workpiece in engagement with the applicator roll, and means supporting said other roll for rectilinear movement perpendicular to the plane of tangency of the roll, comprising a bearing member on which said other roll is rotatably mounted for rotation about an axis parallel to the axis of the applicator roll, spaced parallel bars, means pivotally supporting the bars at one end for pivotal movement about axes spaced from and parallel to the axes of the rolls, and means pivotally connecting the opposite ends of the bars to said bearing member such that the centers of said pivots lie on a line perpendicular to said plane of tangency.

8. Apparatus for applying adhesive to the marginal edge of a preformed bottom element of the kind wherein the bottom element is supported between a pair of feed rolls with an edge engaged with a pair of spaced guides so arranged as to turn the bottom element peripherally in a plane perpendicular to its surface, and wherein the upper feed roll is an applicator roll and the lower feed roll is a support, characterized in that there is means supporting the lower feed roll for movement substantially perpendicularly relative to the upper feed roll while maintaining its axis parallel to the axis of the upper feed roll, a bearing member on which the lower feed roll is mounted for rotation about an axis parallel to the axis of the upper feed roll, a pair of spaced parallel bars, means pivotally supporting the bars at one end for pivotal movement about axes spaced from and parallel to the axes of the rolls, and means pivotally connecting the opposite ends of the bars to the bearing member.

9. Apparatus according to claim **8**, wherein the spaced parallel bars and bearing member constitute a parallel bar linkage, and there is adjustable means for limiting displacement of the linkage in either direction relative to the upper roll.

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