

[54] **MACHINE FOR TURNING THE SHANK
EDGE ON AND SECURING IT TO THE
INSOLE OF A SHOE**

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12/10.3, 11.2

[56]

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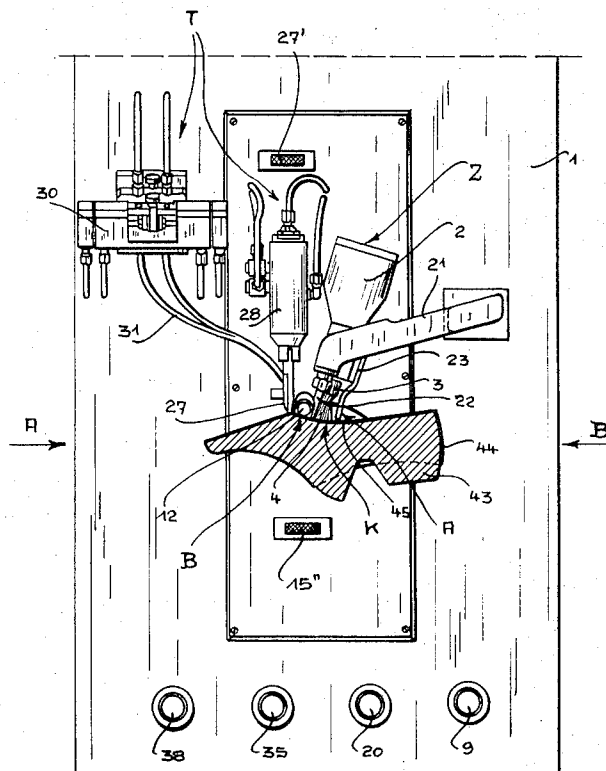
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ABSTRACT

In a shoemaking machine there is provided a draw roll mechanism, a pressing mechanism, an adhesive applicator mechanism and a nailing mechanism, all arranged in close juxtaposition and all having the same work range to operate in close succession on the same portion of a last advanced through the machine.

11 Claims, 5 Drawing Figures



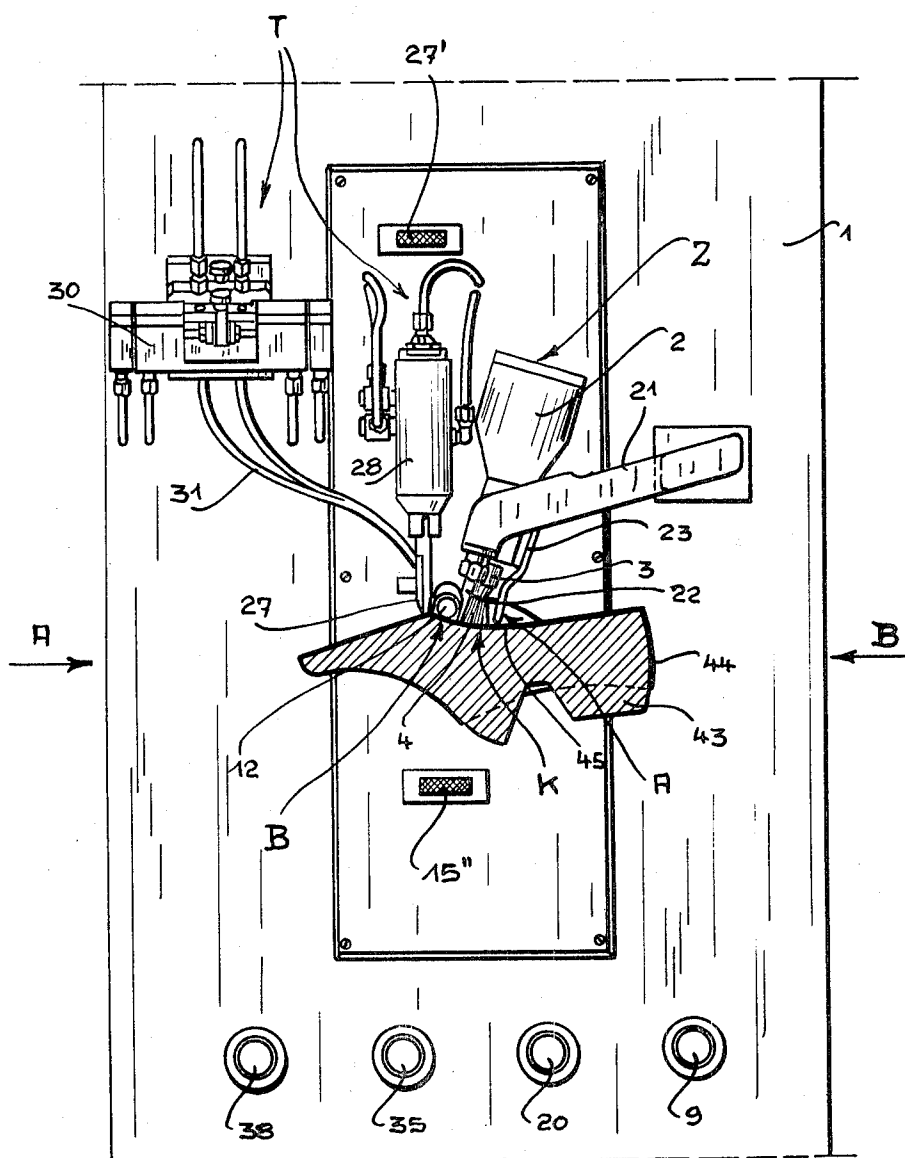


Fig. 1

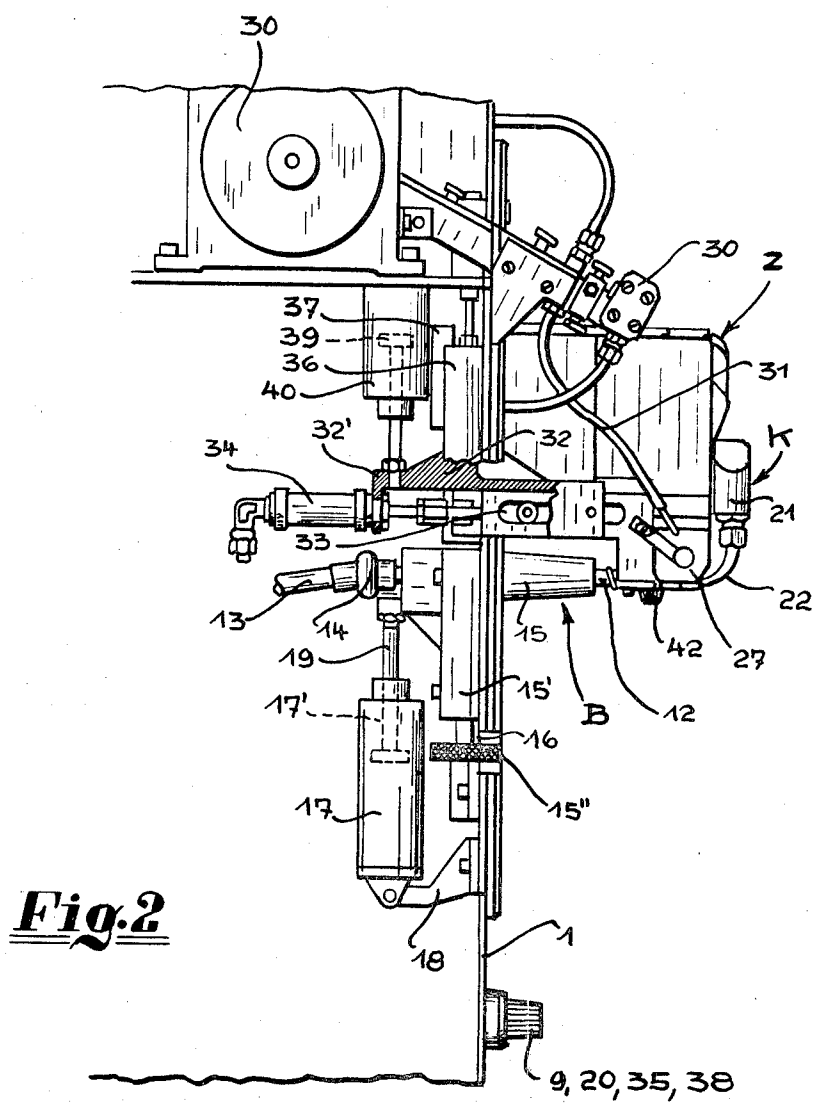


Fig. 3

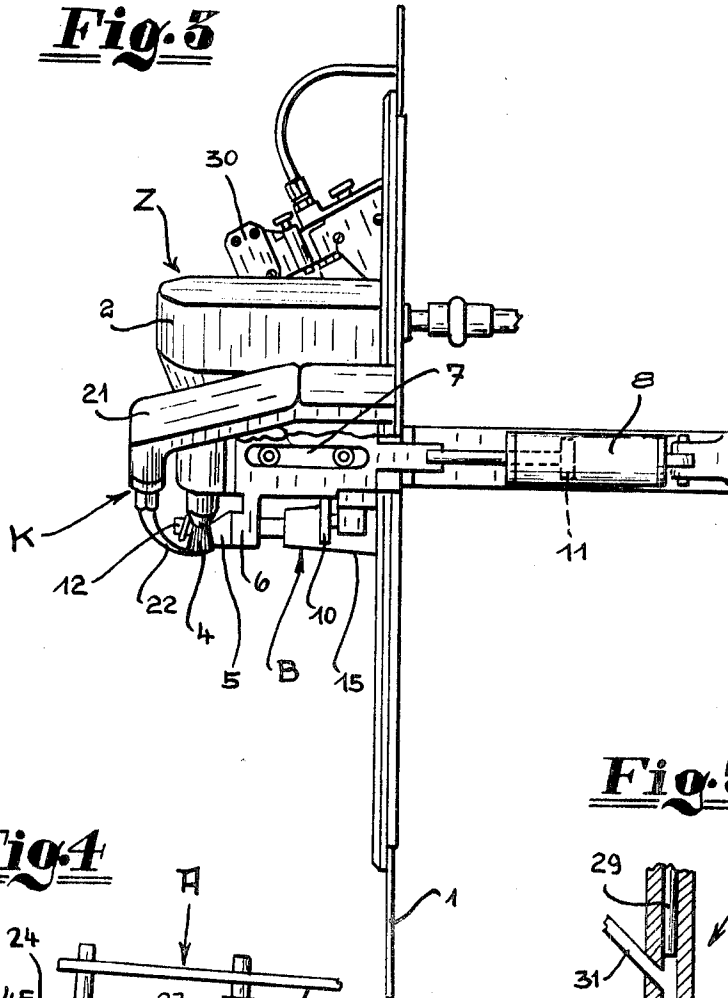


Fig. 4

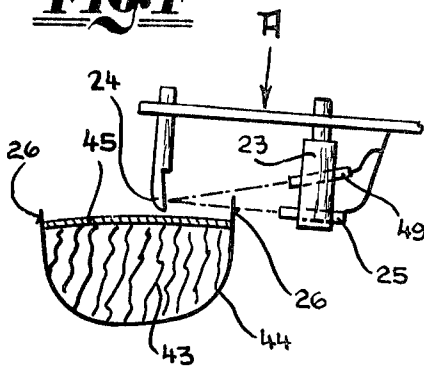
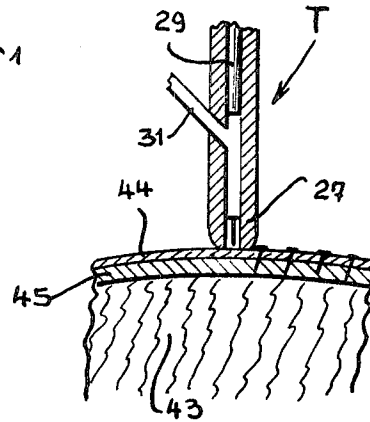


Fig. 5



MACHINE FOR TURNING THE SHANK EDGE ON AND SECURING IT TO THE INSOLE OF A SHOE

BACKGROUND OF THE INVENTION

This invention relates to a machine for turning the shank edge on and securing it to the insole of a shoe, the upper and insole of which are secured to a last, which is passed through manually. Machines of this type, generally referred to as lasting machines, are available in a great number of structures; some of them are provided with a drawing roll, a countersupport as well as a pressing roll. The edge of the upper which is secured to the last, is clamped between the drawing roll and the countersupport and is, by the drawing roll, continuously forwarded under the work device with the last whereby the shaft edge is drawn up and pressed upon the insole. An adhesive is injected between the shank and the insole from a dispenser nozzle. The pressing roll presses the shank edge onto the insole to thus secure a bond therebetween. Often, in a known manner, the insole is reinforced with cardboard. To securely prevent a separation of the uppermost layer of the insole, a lasting machine with a nailing device has to be used which, in the range of the joint — the part exposed to the maximum stresses during walking — drives in several nails to provide a firm connection between the shank edge, the cardboard reinforcement and the inner sole proper.

Heretofore, the abovenoted nailing operation has been performed as a separate work step by means of a separate nailing and lasting machine. Since such a procedure interrupts the continuity of the shoemaking process for a shorter or longer period, additional finishing work is necessitated and waste results.

OBJECT AND SUMMARY OF THE INVENTION

It is an object of the invention to provide an improved shoemaking machine in which the lasting, turning, pressing and nailing operations follow successively in such a manner that thereafter the shoe is, in an improved manner, ready for further processing.

Briefly stated, according to the invention, the shoemaking machine comprises a draw roll mechanism, a pressing mechanism and an adhesive applicator mechanism which are known per se, in combination with a nailing device which is also known by itself. All these mechanisms are disposed close to one another and have the same work range with respect to the last. The operation takes place in such a manner that in a close succession at the same location the upper is pulled over the edge of the insole, the latter is sprayed with an adhesive, the edge of the upper is turned and pressed on the insole and then nailed thereto. During all these operational steps the last and the upper are advanced by virtue of the drawing roll and the countersupport as the operator manually exerts a counterpressure urging the last against the tools.

The invention will be better understood as well as further objects and advantages of the invention will become more apparent from the ensuing detailed specification of a preferred although exemplary embodiment taken in conjunction with the drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic front elevational view of the preferred embodiment;

FIG. 2 is a side elevational view of the same embodiment in the direction of arrow A of FIG. 1;

FIG. 3 is a side elevational view of the same embodiment in the direction of arrow B of FIG. 1;

FIG. 4 is a schematic side elevational view of a sensor device associated with the preferred embodiment, wherein the last is shown in cross section and

FIG. 5 is an axial sectional schematic view of a nailing device forming part of the preferred embodiment, wherein the last is shown in longitudinal section.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to FIG. 1, on the stand 1 of the shoemaking machine there are arranged in close juxtaposition, a nailing device T, a pressing device B, a gluing device K and the draw roll conveying mechanism Z as well as a sensor device A, all simultaneously cooperating in the lasting of the shank 44 on the insole 45 which are secured to the last 43.

The drawing roll device Z includes a drive means 2 having an output shaft 3 which carries at its free end a knurled wheel 4. As seen in FIG. 3, opposite the knurled wheel 4, there is disposed at a predetermined distance a countersupport 5 affixed to a carriage 6 which, in turn, is guided in a slot 7. The clearance between the countersupport 5 and the knurled wheel 4 may be adjusted by actuating a power cylinder 8 which also supplies, through a piston rod 11, the pressure necessary for advancing the shank with the last. The pressure is regulated by a pressure control valve of which only the operating knob 9 is seen. A setting screw 10 is provided for adjusting the distance between the countersupport 5 and the knurled wheel 4. The setting screw 10 limits the motion of the countersupport 5 and thus the motion of the piston 11 in the cylinder 8. The knurled wheel 4 is so driven by a conventional motor (not shown) that it advances the last 43 in a direction from the right to the left when viewed in FIG. 1.

The aforementioned conventional motor also drives the pressing roller 12 of the pressing mechanism B, the driving components of which comprise the shaft 13 and the joint 14 (FIG. 2). The bearing support 15 of the pressing roll 12 is affixed to a carriage 15' which glides in the vertical carriage guide 16. The latter may be set by means of a manually engageable wheel 15'' to the appropriate working height. The operating pressure is generated by a power cylinder 17 which is supported by a bracket 18 and the piston rod 19 of which is affixed to the carriage 15'. The pressure in the upper cylinder chamber 17' of the cylinder 17 is set by means of pressure regulating means, such as a setting valve of which only the operating knob 20 is visible in the figures.

The adhesive applicator device K has a gluing mechanism 21 provided with an adhesive dispensing nozzle 22 which is situated between the knurled wheel 4 and the pressing roll 12. The gluing device 21 is heated in case a thermoplastic adhesive is used. The machine stand 1 also supports a conventional glue pump having a valve. The control of the adhesive supply is effected by the sensor device A, illustrated in detail in FIG. 4. It is disposed, when viewed in the direction of motion of the last 43, upstream of the knurled wheel 4 and includes an adjustable holder 23 which supports a reflector 24, a photocell 25 and a light source 49. As long as the shank edge 26 is in an upright position between the photocell 25 and the reflector 24, the light beam which

emanates from the light source 49 and is reflected by the reflector 24 toward the photocell 25, is interrupted by the edge of the upper. An absence of signal in the photocell 25 effects delivery of adhesive from the dispensing nozzle 22. At the end of the work path of the last, the edge of the upper is turned along the entire length of the joint. Consequently, the light beam reflected by the reflector 24 impinges upon the photocell 25 and produces a signal therein, whereupon delivery of adhesive from the nozzle 22 is stopped.

The nailing mechanism T is arranged downstream of the pressing roller 12 when viewed in the travelling direction of the last. Basically it comprises a nailing head 27 with a hammering cylinder 28 and a hammering pin 29. The nails are forwarded to the nailing head 27 by a nail feeder 30 through a conduit 31. This mechanism is known per se and therefore is not described in more detail. The nailing device operates in such a manner that in the proper moment a nail is admitted to the nailing head 27. The nailing operation may be triggered either by manipulating a switch or by means of the photocell 25. The timing of the successive nailing operations may be set by a time switch which emits a command signal through an electric control means for a pneumatic switch valve (not shown). The latter operates a piston which is disposed in the cylinder 28 and which, in turn, operates the hammering pin 29.

The nailing device should have a certain mobility, since it has to engage with sufficient pressure both the outer edge of the insole and the insole itself. Accordingly, it is horizontally guided in the slider 32 by means of an elongated slot 33, while the slider 32 may be adjusted vertically. The pressure in the horizontal direction is supplied by a power cylinder 34 and may be set by means of a pressure regulating valve having an operating knob 35. The adjustment of the slider 32 by means of the slider guide 36 for pressing the nailing head 27 against the insole is effected by a power cylinder 40 containing a piston 39 connected to a piston rod 41. The latter is secured to an eyelet 36'. For adjusting the working height of the nailing head 27 there is provided an adjusting device constituted by a manually engageable wheel 27'.

To the nailing head 27 there is secured a guiding roll 42. During operation, the edge of the last, together with the insole and the shank edge is passed along the guiding roll 42 to insure that the nails are driven into the shoe at a correct distance from the edge.

Prior to inserting the last into the machine, the insole 45 is tacked and the shank is partially — at the heel and toe portions — lasted over the last. In the joint portion the shank material extends vertically upward from the insole.

OPERATION OF THE PREFERRED EMBODIMENT

First, the distance between the knurled wheel 4 and the countersupport 5 is adjusted by means of the setting screw 10 to be somewhat less than the leather thickness of the shank 44. The last is introduced into the machine in such a manner that the edge of the shank 44 enters between the knurled wheel 4 and the countersupport 5. The knurled wheel 4 grasps the shank and thus also the last with the insole and forwards the entire assembly through the pressing roll 12. At the same time, the operator exerts a counterpressure with the last. The force of the pressing roll 12 may be set by operating the knob 20 associated with a pressure control valve. Upon in-

roduction into the machine, the shank edge enters between the reflector 24 and the photocell 25 and thus interrupts the light beam whereby the adhesive applicator device is actuated and the nozzle 22 dispenses an adhesive. The nailing head 27, disposed over the travelling path of the last, engages the turned edge of the shank 44 by its own weight and by means of additional pressure. The nailing device is actuated by a foot pedal, whereby nails are intermittently driven through the shank edge and the insole. The distance between nails may be varied at will by setting a timer switch, or, the sensor device A may be so designed that, simultaneously with the control of adhesive, it also controls the nailing operation. When the last arrives at the end of its travelling path in the machine and the edge of the upper has been turned, the light beam again impinges upon the photocell 25 and thus the delivery of the adhesive is interrupted. The lasting operation is terminated when the pressing roll too has travelled its full work path.

According to the invention, the abovedescribed machine may be provided with a switching device which permits to perform either a combined operation of the nailing device T and the adhesive applicator device K or which operates the two devices T and K in a selective manner.

The machine according to the invention may also be used for circular shoe lasting.

What is claimed is:

1. In a shoemaking machine for turning the shank edge on and securing it to the insole of a shoe, the upper and insole of which are secured to a last passed through manually, the improvement comprising in combination

- A. a draw roll mechanism,
- B. a pressing mechanism,
- C. an adhesive applicator mechanism,
- D. a nailing mechanism and

E. a machine stand supporting all said mechanisms in close juxtaposition; all said mechanisms having the same work range to operate on the same portion of said last advanced through said machine.

2. An improvement as defined in claim 1, including

- A. a nailing head forming part of said nailing mechanism,

- B. a roll secured to said nailing head to be guided along said shank edge positioned on said insole,

- C. a first and a second power cylinder means to displace said nailing mechanism vertically and horizontally and

- D. manually operable pressure regulating means to actuate said first and second power cylinder means.

3. An improvement as defined in claim 2, including an adjusting device for setting the height position of said nailing mechanism.

4. An improvement as defined in claim 1, wherein said pressing mechanism includes

- A. a bearing support,
- B. a pressing roll carried by said bearing support,
- C. vertically displaceable carriage means supporting said pressing roll and said bearing support,
- D. a power cylinder means connected to said carriage means to cause movement of the latter, and
- E. a pressure regulating means associated with said power cylinder means to adjust the force exerted thereby against a manual pressure applied to said last.

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5. An improvement as defined in claim 4, including a manually engageable means to adjust the height position of said pressing roll.

6. An improvement as defined in claim 1, wherein said draw roll mechanism includes

A. a drive means,

B. a knurled roll operatively connected to said drive means and

C. a countersupport adjacent said knurled roll; said shank edge being clamped between said knurled roll and said countersupport and forwarded by said knurled roll.

7. An improvement as defined in claim 6, including a pressure regulating valve for setting the force exerted by said knurled roll to said countersupport and said shank edge.

8. An improvement as defined in claim 6, wherein said nailing mechanism is disposed upstream of said knurled roll and said countersupport when viewed in a direction pointing from the toe towards the heel of the

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shoe processed by said machine.

9. An improvement as defined in claim 8, including a photoelectric sensor device supported on said machine stand for sensing said shank edge at a location downstream of said knurling roll when viewed in said direction.

10. An improvement as defined in claim 9, wherein said photoelectric sensor device is operatively connected to said nailing mechanism and said adhesive applicator mechanism to control the operation of the last-named two mechanisms by signals from said photoelectric sensor device.

11. An improvement as defined in claim 9, wherein said photoelectric sensor device includes

A. a light source,

B. a reflector spaced from said light source and

C. a photocell spaced from said reflector and receiving a light beam from said light source in the absence of a shank edge in the path of the light beam.

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