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(54) **A heel-lasting machine for footwear manufacture**

(57) A heel-lasting machine for footwear manufacture comprises support means (1) on which to position a last (A) over which an upper (C) is stretched and with which an insole (B) covered with glue is associated, a plurality of tensioning clamps for engaging and pulling the edge of the upper (C), means for clamping the last (A) to the support means (1), and means for bending and pressing the edge of the upper (C) onto the insole (B) in the region of the rear portion (4) and of the sides (5) of the insole (B). The machine advantageously comprises two nozzles (7) for supplying hot air towards the portions of the insole (B) which are covered with glue and which are to come into contact with the folded and pressed edge of the upper (C). The nozzles are movable in order to follow the edge of the insole (B) along the rear portion and the sides thereof and are moved by actuating means which bring about their movement in a manner such that the air jet emerging from the nozzles (7) is directed along the edges of the insole (B).

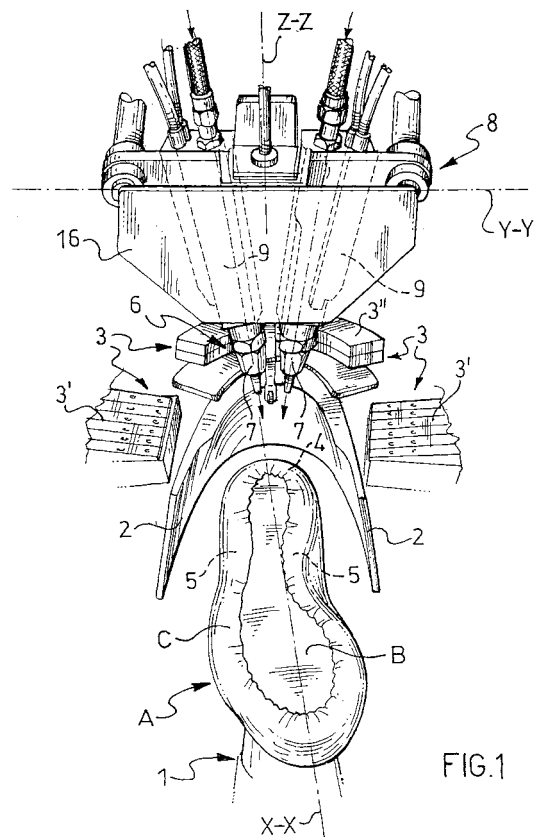


FIG.1

EP 0 970 631 A1

Description

[0001] The present invention relates to a heel-lasting machine for footwear manufacture, that is, to a machine for fitting the heel portion of an item of footwear, of the type comprising support means on which to position a last over which an upper is stretched and with which an insole covered with glue is associated, a plurality of tensioning clamps for engaging the edge of the upper and pulling the upper, causing it to fit tightly against the last, means for clamping the last to the support means, means for bending and pressing the edge of the upper onto the insole in the region of the rear portion and of the sides of the insole, and means for sending hot air towards the portions of the insole which are covered with glue and which are to come into contact with the folded and pressed edge of the upper.

[0002] The rear or heel portion and the sides of the upper are generally glued to the insole. This is done by bending the edges of the heel portion and of the sides onto the insole after applying a layer of glue between them.

[0003] In order to perform the gluing operation, heel-lasting machines currently in use have suitable devices for dispensing hot glue, which spread a layer of glue along the edges of the insole over which the edge of the heel portion and of the sides is bent.

[0004] However, as well as increasing the complexity of the structure of heel-lasting machines, the presence of the dispensing devices also requires more frequent maintenance operations. In fact, to prevent any residues of glue due to dribbling from causing jamming and reducing the efficiency of operation of the machines, their moving parts must always be kept perfectly clean.

[0005] It is clear from the foregoing that there is a great need to eliminate the presence of the above-mentioned glue-dispensing devices from heel-lasting machines. In other words, there is a need to eliminate the step of spreading glue during the fitting of the heel and of the sides of the upper on the insole.

[0006] For this purpose, insoles to which a layer of glue has previously been applied are used. More precisely, the layer of glue is applied to the sheet material from which the insoles are formed by punching.

[0007] The gluing of the upper to the insole is then performed simply by exerting pressure on the edge of the upper which is bent onto the insole.

[0008] In order for the gluing to be satisfactory, however, it is necessary to subject the layer of glue of the insole to a thermal softening treatment which is achieved by directing a jet of hot air onto the glue.

[0009] However, it should be pointed out that, whereas in pre-lasting machines, that is, machines for fixing the toe of the upper to the front portion of the insole, this can easily be achieved by a plate diffuser having a plurality of air-outlet jets, the same cannot be said for heel-lasting machines.

[0010] In fact, because of the greater dimensional var-

iation of the rear portions of insoles with variations in their size in comparison with the front portions, the use of a single diffuser for softening the glues of the rear portion is not satisfactory, necessitating the use of a specific type of air diffuser for each different type of insole.

[0011] In this connection, it should be borne in mind that the hot-air softening step must be very short in order not to prolong the working cycle of the machine excessively, since the machine must be as efficient as possible. On the other hand, the need to use a different diffuser for each type of insole constitutes a considerable disadvantage which reduces the advantages resulting from the elimination of the glue-spreading step during the fixing of the heel portion and the sides of the upper to the insole.

[0012] The problem upon which the present invention is based is that of devising a heel-lasting machine for footwear manufacture, that is, a machine for fitting the heel portion of an item of footwear, which has structural and functional characteristics such as to satisfy the above-mentioned need without having the disadvantages referred to above.

[0013] This problem is solved by a heel-lasting machine for footwear manufacture according to Claim 1.

[0014] Further characteristics and the advantages of the machine according to the present invention will become clear from the following description of an embodiment thereof, given by way of non-limiting example, with reference to the appended drawings, in which:

Figure 1 is a schematic, perspective view of some details of the machine according to the invention, Figure 2 is a partially-sectioned perspective view of a detail of Figure 1.

[0015] With reference to Figures 1 and 2, a heel-lasting machine according to the invention comprises:

- support means 1 on which to position a last A over which an upper C is stretched and with which an insole B covered with glue is associated,
- a plurality of tensioning clamps, not shown in the drawings, for engaging the edge of the upper C and pulling the upper C, causing it to fit tightly against the last A,
- means 2 for clamping the last A to the support means 1, and
- means 3 for bending and pressing the edge of the upper C onto the insole B in the region of the rear portion 4 and of the sides 5 of the insole B.

[0016] The support means 1 enable the last A to be supported in an inverted position, that is, with the sole facing upwards, as shown in Figure 1. The support means comprise a pad, partially visible in Figure 1, for supporting the toe of the last A, and a rear support which is adjustable in height.

[0017] The insole B is positioned on the sole of the

last A and the upper C is stretched over the remaining portion of the last.

[0018] A layer of glue is applied to the surface of the insole B which is to come into contact with the folded edge of the upper C, that is, the upward-facing surface visible in Figure 1, so that the upper C can be glued to the insole simply by exerting a pressure on the edge of the upper C once it has been bent onto the insole B.

[0019] As stated in the introduction, the insoles are preferably formed by punching from sheet material on which a layer of glue has been spread beforehand.

[0020] Once the last A has been positioned on the support means 1, the tensioning clamps grip and pull the edges of the upper C so as to apply sufficient tension to the upper C to cause it to fit tightly against the last A.

[0021] In the embodiment shown, the means 2 for clamping the last A to the support means 1 take the form of two jaws which can be clamped onto the last A below its sole. This enables the upper C to be kept stretched over the last A even after the edge of the upper C has been released by the tensioning clamps.

[0022] The bending and pressing means 3 take the form of a plurality of stretchers 3' and further closure plates 3" which enable the edge of the upper C to be bent onto the sides 5 and onto the rear portion 4 of the insole B.

[0023] The above-mentioned parts of the heel-lasting machine are of known type and their structure and operation will not be described further herein.

[0024] The heel-lasting machine further comprises means 6 for sending hot air towards the portions of the insole B which are covered with glue and which are to come into contact with the bent and pressed edge of the upper C. These means 6 are positioned above the support means 1 and hence above the last A and the insole B associated therewith.

[0025] The hot air softens the glue of the insole so as to bring about optimal gluing.

[0026] The means for sending hot air advantageously comprise one or more nozzles 7 and, in the embodiment shown, comprise two separate air-supply nozzles. The nozzles 7 are movable in order to follow the edge of the insole B along the rear portion 4 and the sides 5 thereof.

[0027] Moreover, actuating means 8 move the nozzles 7 in a manner such that the air jets emerging therefrom are directed along the edges of the insole B.

[0028] As shown best in Figure 2, each nozzle 7 is associated with an air-heating device 9 comprising a body 11 of thermally conductive material with which heating means 10 are associated and in which a substantially serpentine duct 12 puts an inlet 13 for the air to be heated into fluid communication with an outlet 14 for the heated air. The serpentine duct 12 increases the time spent by the air inside the body 11 so that the air can be heated to a greater extent.

[0029] More precisely, the nozzle 7 is fixed to the device 9 by means of a threaded connection in the region of the outlet 14 thereof, so as to be in fluid communi-

tion with this outlet.

[0030] The body 11 of the device 9 is preferably made of a metallic material such as brass or aluminium.

[0031] In the embodiment shown, the heating means 10 associated with each device 9 take the form of an electrical resistor, the heating of which is regulated by a thermostat (not shown in the drawings) in dependence on the temperature value detected by a heat probe 15 inserted in the body 11.

[0032] The inlet 13 for the air to be heated is connected to a compressed-air distribution network or, in wholly equivalent manner, may be connected to a compressed-air container or to an air blower.

[0033] The actuating means 8 comprise a plurality of linear actuators such as, for example, pneumatic cylinders of known type, not shown in the drawings, which enable the two air-heating devices 9, and hence the respective nozzles 7, to be moved in order to direct the air-flow emerging from each nozzle to the desired point.

[0034] In the specific embodiment, the two air-heating devices 9 are mounted on a movable framework 16 which is moved by the linear actuators away from and towards the last A along a vertical axis Z-Z and longitudinally relative to the last A along a longitudinal axis X-X.

[0035] The two devices 9 can also be moved relative to the movable framework 16, independently of one another, along an axis Y-Y transverse the axis X-X.

[0036] The heel-lasting machine further comprises an electronic control unit for controlling the operation of the actuating means 8.

[0037] When the heel-lasting machine is in operation, the last A, over which an upper C has been stretched beforehand and with which an insole B covered with glue is associated, is positioned on the support means 1 in the manner specified above.

[0038] As soon as the tensioning clamps have gripped and pulled the edges of the upper C so as to stretch it and fit it tightly against the last A, the jaws 2 are closed, clamping the last A in position.

[0039] The tensioning clamps then release the edges of the upper C and are brought to a retracted position. As explained above, the jaws 2 keep the upper stretched over the last A.

[0040] Before the means 3 for bending and pressing the sides and the rear portion of the upper C onto the insole B are operated, it is necessary to perform the thermal softening of the glue.

[0041] For this purpose, the actuator means 8 move the movable framework 16 towards the last A along the vertical axis Z-Z until the nozzles 7 are in the vicinity of the insole B.

[0042] The two nozzles 7 are then moved by coordinated movement of the framework 16 along the longitudinal axis X-X and of the devices 9 along the transverse axis Y-Y, so that each nozzle follows a portion of the edge of the insole B.

[0043] When there are two nozzles arranged symmetrically with respect to the longitudinal axis X-X of the in-

sole B as shown in Figure 1, the nozzles are moved in a manner such that each has to follow one side 5 and one half of the rear portion 5 of the insole B. The two nozzles 7 perform reflectively symmetrical movements relative to the longitudinal axis X-X.

[0044] During these movements, an air-flow emerges from the nozzles 7 and strikes the edge of the insole B. As stated, since the body 11 of the device 9 is heated by the electrical resistor 10 and the air has to travel through the entire serpentine duct 12, the air-jet emerging from the nozzles 7 is hot and can soften the glue of the insole B.

[0045] The movable framework 16 is then returned along the axis Z-Z to its initial position in which it is spaced from the last A so as to leave room for the means 3 for bending and pressing the edge of the upper C onto the insole B in the region of the rear portion 4 and of the sides 5 of the insole B.

[0046] It is clear from the foregoing that, by suitable control of the operation of the actuating means 8, it is possible to arrange for the two nozzles 7 to be moved in a manner such as to follow, point by point, the edge of the insole B associated with the last A. This control is achieved by the storage, in the electronic control unit of the machine, of a specific program for controlling the operation of the actuators.

[0047] The presence of the electronic control unit permits the storage of a different program for controlling the actuating means, that is the actuators, for each type of insole. As a result, when there is a change in the dimensions of the insole B associated with the last A, it suffices to select on the control unit the correct program for controlling the actuator means to achieve the correct movement of the nozzles 7, without the need to replace any part of the machine.

[0048] As can be appreciated from the foregoing, the heel-lasting machine according to the invention satisfies the need referred to in the introduction to the present description and at the same time overcomes the problems of the prior art.

[0049] In fact, with the heel-lasting machine according to the invention, it is possible to soften the glue of insoles of different shapes and sizes in an optimal manner, without the need to replace any parts.

[0050] A further advantage of the heel-lasting machine according to the invention lies in the fact that it is structurally and functionally simple.

[0051] Naturally, in order to satisfy contingent and specific requirements, an expert in the art may apply to the above-described heel-lasting machine many modifications and variations all of which, however, are included within the scope of protection of the invention as defined by the following claims.

Claims

1. A heel-lasting machine for footwear manufacture

comprising support means (1) on which to position a last (A) over which an upper (C) is stretched and with which an insole (B) covered with glue is associated, a plurality of tensioning clamps for engaging the edge of the upper (C) and pulling the upper (C), causing it to fit tightly against the last (A), means (2) for clamping the last (A) to the support means (1), means (3) for bending and pressing the edge of the upper (C) onto the insole (B) in the region of the rear portion (4) and of the sides (5) of the insole (B), and means (6) for sending hot air towards the portions of the insole (B) which are covered with glue and which are to come into contact with the folded and pressed edge of the upper (C), characterized in that the means (6) for sending hot air comprise an air-supply nozzle (7) which is movable in order to follow the edge of the insole (B) along the rear portion (4) and the sides (5) thereof, and in that the machine comprises actuating means for bringing about the movement of the nozzle (7) in a manner such that the nozzle (7) directs the air jet along the edges of the insole (B).

2. A machine according to Claim 1, comprising an air-heating device (9) comprising a body (11) of thermally conductive material with which heating means (10) are associated and in which a substantially serpentine duct (12) puts an inlet (13) for the air to be heated into fluid communication with an outlet (14), the nozzle (7) being associated with the outlet (14).
3. A machine according to Claim 2, in which a heat probe (15) is associated with the air-heating device (9) in order to detect the temperature.
4. A machine according to Claim 2, in which the heating means (11) comprise an electrical resistor.
5. A machine according to Claims 3 and 4, comprising a thermostat for controlling the heating of the electrical resistor in dependence on the temperature value detected by the heat probe (15).
6. A machine according to Claim 2, in which the body (11) of the air-heating device (9) is made of a thermally conductive material.
7. A machine according to Claim 2 or Claim 6, in which the body (11) of the air-heating device (9) is made of metal.
8. A machine according to Claim 2 or Claim 6, in which the body (11) of the air-heating device (9) is made of brass.
9. A machine according to Claim 2, in which the inlet of the air-heating device (9) is connected to a com-

pressed-air distribution network.

10. A machine according to Claim 1, comprising an electronic control unit for controlling the operation of the actuating means, a different program for controlling the actuating means of the nozzle (7) being stored in the control unit for each type of insole (B). 5
11. A machine according to Claim 1, in which the nozzle (7) faces towards the insole (B) and is supported by the actuating means. 10
12. A machine according to any one of the preceding claims, comprising a plurality of independent nozzles (8) each of which is intended to follow a different portion of the edge of the insole (B). 15

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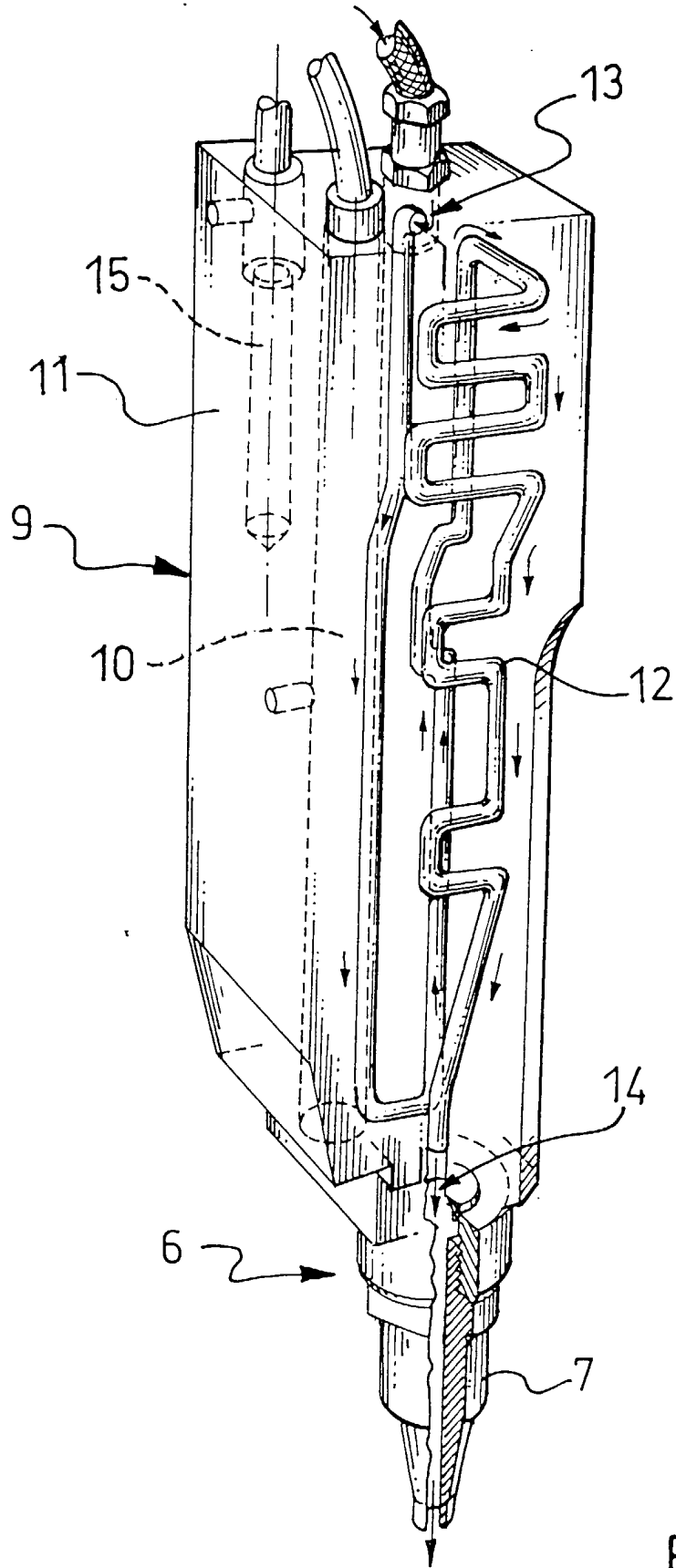


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2129

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	GB 793 774 A (C & J CLARK LTD) 23 April 1958 (1958-04-23) * the whole document *	1-7, 9, 11	A43D25/20 A43D119/00
A	US 2 474 307 A (UNITED SHOE MACHINERY CORP) 28 June 1949 (1949-06-28) * column 4, line 57 - column 5, line 14 * * figures 3,4 *	1, 4, 6, 7, 9, 11	
A	GB 2 172 190 A (MOLINA & BIANCHI SPA) 17 September 1986 (1986-09-17) * claim 3; figure 1 *	1, 10, 12	
A	US 2 669 735 A (UNITED SHOE MACHINERY CORP) 23 February 1954 (1954-02-23) * column 3, line 1 - line 15; figure 4 *	1, 8	
A	US 4 380 524 A (RUNIONS SINVILLE) 19 April 1983 (1983-04-19) * claim 1; figures 1, 24 *	1, 12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A43D B05B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		16 November 1999	van Elk, M
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EP 99 20 2129

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16-11-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 793774 A		NONE	
US 2474307 A	28-06-1949	NONE	
GB 2172190 A	17-09-1986	IT 1200390 B ES 552659 A FR 2577770 A US 4728378 A	18-01-1989 16-11-1986 29-08-1986 01-03-1988
US 2669735 A	23-02-1954	NONE	
US 4380524 A	19-04-1983	US 4313395 A	02-02-1982

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