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(72) Inventors:
• **Molina, Guiseppe**
27029 Vigevano - Pavia (IT)
• **Bianchi, carlo**
27025 Gambolo' - Pavia (IT)

(71) Applicant:
OFFICINE MECCANICHE MOLINA & BIANCHI
S.p.A.
27029 Vigevano (Pavia) (IT)

(74) Representative:
Siniscalco, Fabio et al
c/o JACOBACCI & PERANI S.p.A.
Via Senato, 8
20121 Milano (IT)

(54) **Last support for preassembly machines**

(57) The present invention relates to a last support for preassembly machines used in the manufacture of footwear.

last support for preassembly machines comprising a last carrier plate (7) characterized in that it comprises means for cooling the said plate (7).

More specifically, the present invention relates to a

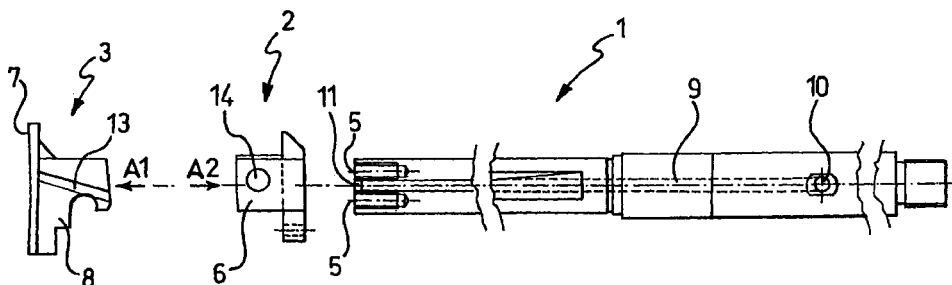


FIG.1

EP 0 993 785 A1

Description

[0001] The present invention relates to a last support for preassembly machines used in the manufacture of footwear.

[0002] In the footwear manufacturing industry, machines - known as preassembly machines - are commonly used consisting of a last on which the upper and the insole are placed, stretching clamps to hold the upper taut over the last, means for applying adhesive on to the insole and a device for pressing the upper against the insole, which is activated once the glue has been applied.

[0003] The means for applying the adhesive on to the insole essentially consist of a dispensing plate whose shape replicates that of the edge of the insole. This plate is connected to an adhesive dispenser and comprises a plurality of holes through which the adhesive is applied along the edge of the insole. The dispensing plate also comprises heating means (a heating element for example) whose function it is to keep the adhesive fluid as it is applied on to the insole.

[0004] Also mounted inside the dispensing plate is a last support which is connected by means of a shaft to a pneumatic actuator that enables it to move along the axis perpendicular to the dispensing plate. The function of the last support is to support the last carrying the upper and the insole during some of the manufacturing stages of the shoe, especially while the glue is applied to the insole.

[0005] Furthermore, a recent innovation in this field involves the use of insoles that have already had glue applied to them. Indeed, such pre-glued insoles are readily obtainable by punching them out of pre-glued sheets.

[0006] Given that in such cases the adhesive needs to be heated to soften it and make it more fluid so that the insole can make contact with and stick to the upper, the dispensing plate is replaced by a heating plate that heats the edge of the insole to the right temperature to soften the glue. It is worth noting, incidentally, that this temperature is usually higher than that required to keep the glue in the dispensing plate fluid.

[0007] We have observed that, especially when working with pre-glued insoles, unsightly stains form inside the shoe, in the middle of the insole.

[0008] From a careful examination of this stage of the process we have noted that these stains are caused by undesired heating of the central area of the insole by the last support.

[0009] This is because, in order to fulfil its support function, the last support exerts pressure on the central part of the insole. Given that, as has been said, the adhesive-dispensing plate also comprises heating means to keep the glue fluid, this means that the last support is also overheated, thereby transmitting its heat to the central area of the insole with which it is in contact.

[0010] In addition, the fact that in the case of pre-glued insoles the adhesive is present over the entire surface area of the insole and not just around its edges, exacerbates the problem described above in relation to heating the central area of the insole. The softened glue tends to seep through, forming a very large stain on the upper surface of the insole, on the inside of the shoe. Softening of the glue on the central area of the insole during this stage can also create problems during manufacture.

[0011] The problem forming the basis of the present invention is therefore one of preventing the formation of stains inside the shoe.

[0012] This problem has been solved by providing a last support for preassembly machines comprising a last carrier plate, characterized in that it comprises means for cooling the said plate.

[0013] More specifically, the present invention relates to a last support for preassembly machines comprising a last carrier plate characterized in that it comprises a coolant feed duct designed to convey the said coolant into contact with the said plate.

[0014] The features and advantages of the last support for preassembly machines that forms the subject of the present invention will become apparent from the description of some preferred embodiments, given below by way of non-limiting example. Referring to the appended figures:

Figure 1 shows an exploded sectional view of a preferred embodiment of the last support that forms the subject of the present invention,

Figure 2 shows a sectional view in the direction A1 of Figure 1 of the detail of the last carrier plate,

Figure 3 shows a view in partial section in the direction A2 of Figure 1 of the detail of the base of the last carrier plate.

[0015] With reference to Figures 1, 2 and 3, a preferred embodiment of the last support that forms the subject of the present invention comprises a shaft 1, one end of which is fixed to a base 2 and the other end of which is connected to a pneumatic actuator (not shown), and a last carrier element 3 which is removably fixed to the said base 2.

[0016] Two through holes 4 are formed in the base 2 and, together with the corresponding seats 5 in the shaft 1, are designed to house suitable fixing means, such as for example screws, for fixing the base 2 to the shaft 1.

[0017] The base 2 has an elongate shape and also comprises, along the edges of its longer sides, a pair of side panels 6 which extend perpendicularly to the surface of the base 2 and parallel with each other. These panels 6 comprise suitable attachment means, for example a pin 14 of essentially cylindrical shape, that joins the panels 6 together enabling the carrier element 3 to be removably fixed to the said base 2.

[0018] The carrier element 3 comprises a carrier plate 7 from which and perpendicular to which extends an attachment element 8 designed to be removably fixed to the said attachment means on the base 2.

[0019] The carrier plate 7 can be of many different shapes depending on the type of footwear to be made but is generally of elongate shape, with two essentially convergent sides, as shown in Figure 2.

[0020] The shaft 1 comprises a duct 9 for the coolant. This duct 9 can be formed inside the shaft 1, the coolant communicating with the external environment via the inlet aperture 10. This aperture 10 comprises a union or more generally any means for connecting it to a device for dispensing the coolant, for example compressed air.

[0021] The duct 9 terminates, at that end of the shaft 1 designed to be fixed to the said base 2, in an outlet aperture 11, which in turn links up with two through holes 12 formed in the said base 2 to enable the coolant to flow from the duct 9 to the carrier element 3.

[0022] Two semicylindrical grooves 13, positioned facing the through holes 12 in the base 2, are formed on either side of the attachment element 8. The purpose of these grooves 13 is to convey the coolant directly on to the carrier plate 7.

[0023] The way in which the last support that forms the subject of the present invention operates will now be described, again with reference to Figures 1, 2 and 3.

[0024] The base 2 is fixed to the shaft 1 and the carrier element 3 is then attached to the said base 2.

[0025] The aperture 10 is connected to a source of the coolant used. Gases which are inert under the operating conditions are preferred as coolants. A gas that is particularly preferred is air. The aperture 10 will then be connected to a source of compressed air. The air can be used at ambient temperature or, if desired, can be pre-cooled so as to increase the cooling effect of the plate 7.

[0026] It is nevertheless also possible to use liquids as coolants, for example water at the mains temperature or pre-cooled.

[0027] As has already been said, the plate 7 tends to overheat during operation of the machine. The coolant (for example compressed air) is thus conveyed through the duct 9, from which it then flows through the holes 12 in the base 2 and through the grooves 13 in the fixing element 8, until it comes into contact with the surface of the last carrier plate 7, thereby lowering its temperature. The temperature to which the plate 7 is cooled depends on the temperature of the coolant and its flow rate, both of which parameters can be adjusted as desired.

[0028] In this way it is possible to prevent overheating of the central area of the insole, thereby eliminating the problem of unsightly stains forming inside the shoe.

[0029] Another embodiment of the present invention involves dispensing with the grooves 13 and forming a gap between the walls of the attachment element 8 and the two panels 6 on the base 2. In this way the

coolant can flow through this gap until it comes into contact with the surface of the last carrier plate 7.

[0030] Clearly, the embodiment described is only one particular type of embodiment of the last support for preassembly machines that forms the subject of the present invention, and a person skilled in the art will be able to make any modifications that may be necessary in order to adapt it to specific applications, without thereby departing from the scope of protection of the present invention.

[0031] For example, the duct 9 for the coolant could be formed on the outside of the shaft 1, for example by running the compressed air pipe close up to the surface of the plate 7. This embodiment is preferred when adapting existing machines to the new techniques required when using pre-glued insoles.

[0032] In another embodiment, the duct 9 for the coolant passes inside the body of the plate 7, thereby recirculating the coolant and subsequently discharging it to the outside. In this case, the plate 7 should be thick enough to accommodate this duct. This embodiment would be particularly advantageous in cases where a liquid is used as coolant.

Claims

1. Last support for preassembly machines comprising a last carrier plate (7), characterized in that it comprises means for cooling the said plate (7).
2. Last support according to Claim 1, in which the said cooling means comprise a coolant feed duct (9) designed to convey the said coolant into contact with the said plate (7).
3. Last support according to Claim 1 or 2, comprising:
 - a shaft (1) comprising the said duct (9) for the coolant,
 - a base (2) fixed to one end of the said shaft (1),
 - a last carrier element (3) which is removably fixed to the said base (2) and comprises the said last carrier plate (7), in which the said duct (9) conveys the coolant on to the surface of the said plate (7).
4. Last support according to Claim 3, in which the said duct (9) is formed inside the said shaft (1), between an inlet aperture (10) and an outlet aperture (11) for the coolant and in which the said base (2) comprises a pair of mutually parallel side panels (6) and a pair of through holes (12) facing the said outlet aperture (11) and in which the said last carrier element (3) comprises an element (8) for attaching it to the said base (2) on which a pair of grooves (13) are formed so as to enable the coolant to flow from the said duct (9) to the said plate (7).

5. Last support according to Claim 4, in which, instead of the said grooves (13) on the said attachment element (8), a gap is formed between the said attachment element (8) and the said pair of panels (6) on the said base (2). 5
6. Last support according to Claim 3, in which the said duct (9) is formed on the outside of the said shaft (1). 10
7. Footwear preassembly machine characterized in that it comprises a last support as claimed in Claims 1 to 6.
8. Method of gluing the upper to the insole, comprising a stage in which the said last carrier plate (7) is cooled during the time the said plate (7) is in contact with the insole. 15
9. Method according to Claim 8, in which the said cooling stage is achieved by causing a coolant to flow in contact with the said plate (7). 20
10. Method according to Claim 9, in which the said coolant is air. 25
11. Method according to Claim 9, in which the said coolant is water.

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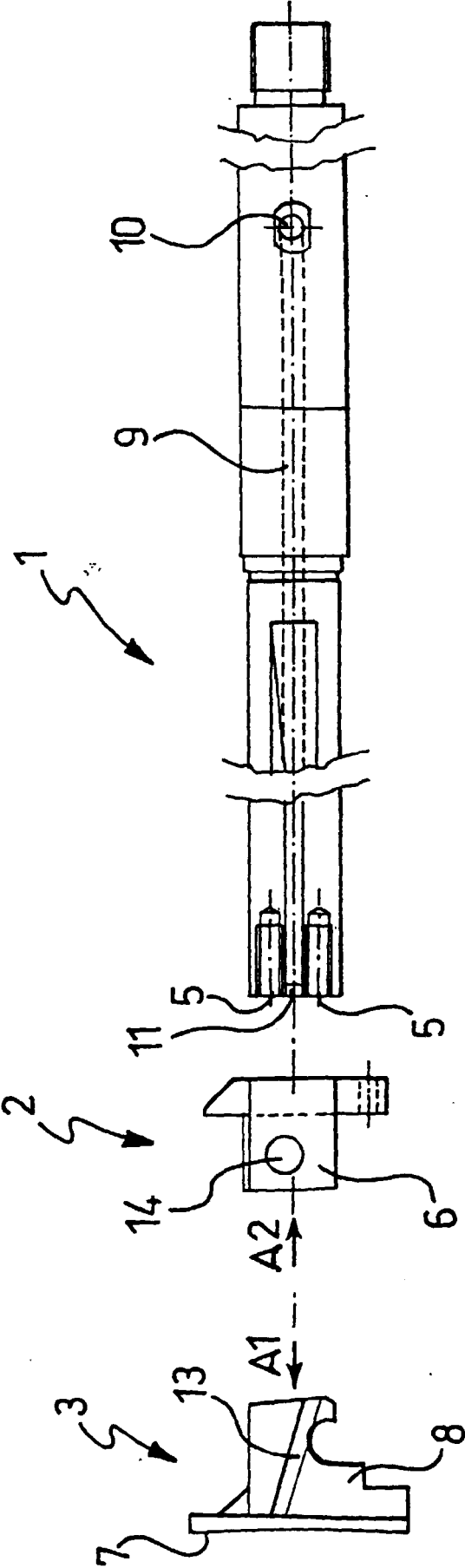


FIG.1

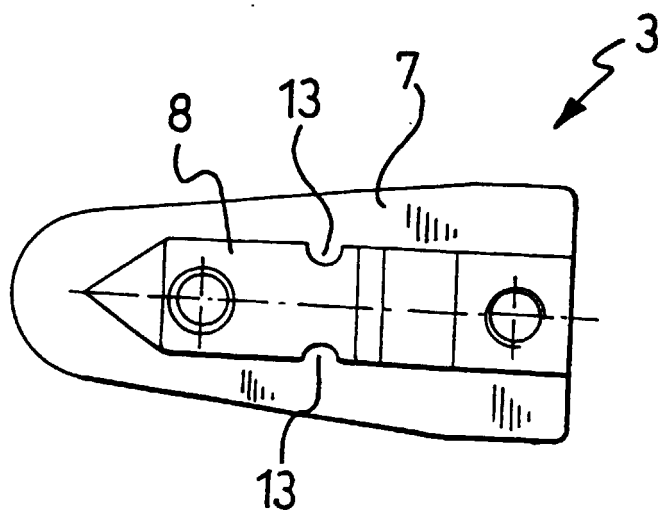


FIG. 2

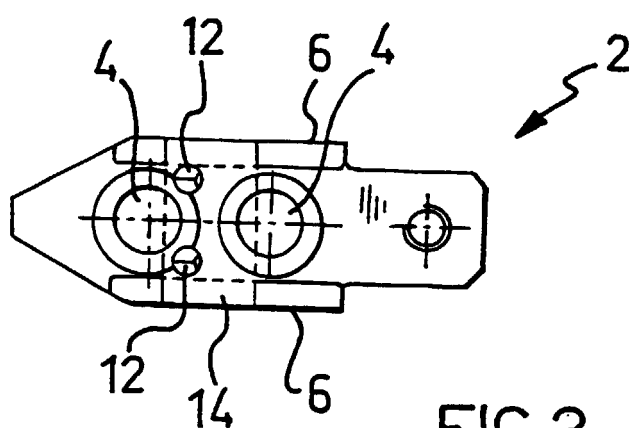


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0548

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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A	US 2 694 131 A (CARSON) 9 November 1954 * column 2, line 46 - line 60; figures *	1	
A	US 1 951 374 A (PYM) 20 March 1934 * page 1, line 26 - line 28; figures *	1	
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A	WO 92 08385 A (CARTER FOOTWEAR INC) 29 May 1992 * page 11, line 20 - page 13, line 10; figures *	1	
A	US 5 714 098 A (POTTER DANIEL R) 3 February 1998 * column 7, line 50 - column 8, line 42; figures 9,10 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) A43D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 March 1999	Examiner Scholvinck, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 98 83 0548

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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