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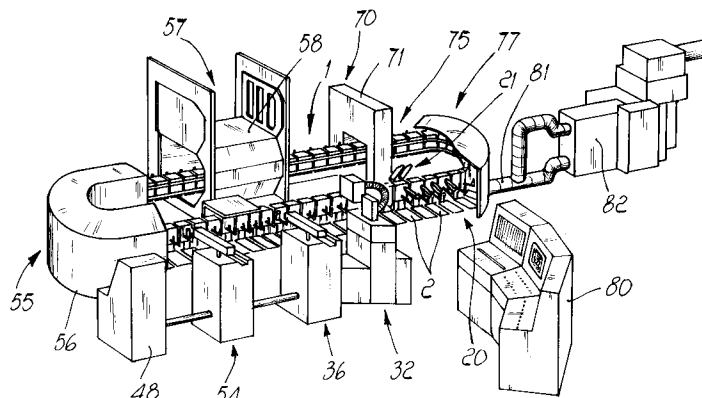
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16
I-20123 Milano(IT)(54) **Tooled, integrated and automated production line for glueing operations in shoe production lines.**

(57) Toolled, integrated and automated production line, comprising a conveyor (1) provided with trucks (2) slideable on guides (3,4) for conveying the uppers (15), which are already mounted on the lasts (14), are possibly already carded and are paired with respective soles (19), which are possibly already prepared for receiving the adhesive, between a succession of working areas. A first area (20) for loading, has means for reading identification codes provided on the soles and/or on the uppers. A second area (36) has means for treating the carded part of the uppers (15) with a priming product or for spraying a first layer of adhesive on the uppers (15) and means for spraying adhesive on the soles (19), and

is followed by a third area (52) in which there is a chamber (53) for drying the priming product and the first layer of adhesive. A fourth area (54) has means for spraying adhesives on the uppers on the treated parts. A fifth area (55) has a tunnel (56) for drying the adhesive and for removing creases from the uppers (15). A sixth area (57) has a vacuum heating chamber (58). A seventh area (70) has an adhesive reactivation oven (71), and an eighth area (75) has means for pressing the uppers (15) against the respective soles (19). A ninth and last area (77) has means for cooling the shoes prior to finishing. The entire system is connected to an electronic computer for management and control.

*Fig. 1***EP 0 512 526 A1**

The present invention relates to a tooled, integrated and automated production line for glueing operations in shoe production lines.

The production line is to be used in particular for manufacturing shoes with the method commonly known as assembly.

Shoes are currently manufactured with handi-craft methods which entail a very intensive use of labor.

This has caused a large part of production to be performed in third-world countries, where labor costs are extremely low, in order to save on work cost.

The manual nature of many steps of the production process furthermore entails consequences from the point of view of the quality of the final product, which is linked to the specific experience and skill of the operators.

Current production systems also have problems from the point of view of the healthiness of the working environment, again due to the fact of intensive use of labor, since chemical adhesive products with solvents which produce noxious fumes are used.

Other problems arise from the need to use extensive factory areas for the production process.

A last aspect is due to the excessive presence of idle times in current production processes which limit the maximum quantity of finished product which can be produced per day.

The aim of the present invention is to provide an apparatus for glueing operations in shoe production lines which eliminates or at least reduces the disadvantages described above in the prior art.

A consequent primary object is to provide an apparatus which allows to reduce the labor to be used for shoe production.

Another important object is to provide an apparatus which is particularly flexible in operation.

Another important object is to provide an apparatus which allows to improve the healthiness of the working environment.

Another important object is to provide an apparatus which allows productions of constant quality and accuracy.

Another important object is to provide an apparatus which allows considerable savings from the point of view of costs for business concerns which will use it.

Not least object is to provide an apparatus which allows a considerable saving of space in the departments where facilities suitable for the manufacture of shoes are located.

This aim, these objects and others which will become apparent hereinafter are achieved by a tooled, integrated and automated production line, characterized in that it comprises a conveyor provided with supporting means which are slideable

on guides for carrying the uppers, which are already mounted on the lasts, are possibly already carded and are paired with the respective soles, which are possibly already prepared for receiving the adhesive, between a succession of working areas: a first area for loading being provided with means for reading identification codes provided on the soles and/or on the uppers; a second area being provided with means for treating the carded part of the uppers with a priming product or for spraying adhesive on the uppers and means for spraying adhesive on the soles; a third area being provided with a chamber for drying the priming product and the first layer of adhesive; a fourth area being provided with means suitable for spraying the uppers with adhesives on the treated parts; a fifth area being provided with a tunnel for drying the adhesive and removing creases from the uppers; a sixth area being provided with a vacuum heating chamber; a seventh area being provided with an adhesive reactivation oven; an eighth area being provided with means for pressing the uppers against the respective soles; and a ninth area being provided with means for cooling the shoes prior to the finishing operations, the entire system being connected to an electronic computer for management and control.

Advantageously, means suitable for correctly positioning the uppers and the soles on the supporting means are arranged downstream of the loading area.

Further characteristics and advantages of the invention will become apparent from the detailed description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is an overall perspective view of the tooled production line according to the invention; figure 2 is a top view of the tooled production line of figure 1;

figure 3 is a view of a sole and of an upper with the respective regions where an identification bar code is provided;

figure 4 is a perspective view of an automated conveyor which connects the various working areas, taken in the area where means for adjusting the position of the uppers are provided;

figure 5 is a side view of the conveyor of figure 4;

figure 6 is a top view of the means for adjusting the position of the uppers;

figure 7 is a perspective view of means suitable for treating the carded uppers with a priming product or with a first layer of adhesive;

figure 8 is an enlarged view of a detail of means of figure 7;

figure 9 is a perspective view of a vacuum heating chamber;

figure 10 is a side view of the chamber of figure 9;

figure 11 is a front view of the chamber of figure 9;

figure 12 is a detail view of means suitable for feeding the chamber of figure 9;

figure 13 is a detail view of means suitable for feeding an adhesive reactivation oven;

figure 14 is a schematic view of the final cooling means.

With reference to the above figures, the tooled, integrated and automated production line according to the present invention comprises an automated conveyor 1 which is composed of a plurality of trucks 2 slideable on a pair of rails, respectively designated by 3 and 4, which have a substantially annular extension.

In particular, each truck 2 comprises a first plate 5 which is conveniently vertical and is arranged to the side of the rails 3 and 4, which are arranged one above the other.

A second horizontal plate 6 is bolted to the first plate 5 in an upward position and supports, in a downward position, two longitudinal rows of bearings 7 which rest on the upper rail 3, which conveniently has a circular cross-section.

A bearing 8 rests in a downward position on the rail 3 and is directly coupled to the first plate 5.

The lower rail 4 is conveniently constituted by a flat strip which is arranged vertically edgewise, and bearings 9, which are supported by a third plate 10 which is bolted laterally to the first plate 5, rest on said rail on both sides.

A horizontal rod 12 having a circular cross-section is fixed laterally, on the side opposite to the rails 3 and 4, to each first plate 5; a support 13, which bears a last 14 suitable for the fitting of an upper 15, and a support 16 for the tip of the last 14, are adjustably positioned and fixed by means of bolts on said rod.

A fourth plate 17 is arranged horizontally below the rod 12 and is fixed to the first plate 5 by means of shaped strips 18 and bolts.

Each fourth plate 17 is suitable for the resting of a corresponding sole 19 at the position of the upper 15.

The tooled production line has a first area for loading, which is designated by the arrow 20 and in which an operator mounts the lasts 14, on which the uppers 15 are fitted, on the supports 13, and rests the corresponding soles 19 on the plates 17.

Optical readers, not shown, are positioned at the loading area and are suitable for identifying, by reading bar codes 15a and 19a provided respectively on the uppers 15 and on the soles 19, the type of shoe to be manufactured, the type of treatment to be performed and other data required for treatment.

A pair of devices, generally designated by the reference numeral 21, suitable for adjusting the position of the lasts 14 and of the soles 19 is arranged on the conveyor 1 downstream of the loading area 20.

Each one of said devices 21 comprises a pair of opposite shaped plate-like elements 22 between which the last 14 or the sole 19 is positioned.

Each element 22 is articulated to a substantially vertical pivot 23 which is in turn fixed radially to a horizontal pivot 24 which is coupled, so as to be able to rotate, between two wings 25 which extend from a supporting plate 26 arranged above the rail 3.

The plate-like elements 22 can be spaced or moved closer with respect to one another, since they are associated by a piston 27 which acts in contrast with helical springs 28 arranged between them.

The rotation of the horizontal pivot 24 is obtained by means of a piston 29 which is rigidly coupled between radial wings 30 which extend from it and wings 31 which are fixed to the plate 26.

When the last 14 or the sole 19 arrives, the plate-like elements 22 are in a raised and open position.

They are then lowered so that the last 14 or the sole 19 is arranged between them and are closed by means of the piston 27 in order to position said last or sole correctly.

The tooled production line according to the invention furthermore comprises other working areas in which the various operations are performed on the upper 14 and on the sole 19.

An area which may be present if the uppers 14 have not been carded beforehand is designated by the arrow 32 and is provided with automated means suitable for carding the lower part of the uppers.

In particular, said means suitable for carding are constituted by a per se known carding unit 33 with a movable arm 34 which supports, at its end, a carding head with an abrasive grinding wheel which is not shown in the figures.

The carding unit 33 makes the tool follow a stored path which corresponds to the type and size of the shoe.

A second working area 36, subsequent to the first loading area 20 and to the possible carding area 32, is occupied by automated means, suitable for treating the carded part of the upper 15 with a primer or for spraying thereon a first layer of adhesive, and by automated means suitable for spraying adhesive onto the soles 19.

In particular, each one of said spraying means 36 has, on a supporting structure 37, a horizontal arm 38 which is transverse with respect to the rails

3 and 4 and can slide on guides 39 in a direction which is parallel to its axis.

Actuation is obtained by means of a rear motor 40 and a screw-based kinematic system which is not shown in the figures.

Said guides 39 are supported by a support 41 which is in turn mounted and able to slide on guides 42 which are arranged horizontally and transversely to the preceding guides 39.

Movement of the support 41 is obtained by means of a motor 43 and of a screw-based kinematic system similar to the preceding one.

In turn, the guides 42 are mounted on a support 44 which can move vertically.

Said support is in fact mounted on rods 45 which are slidingly coupled to the structure 37 and is actuated by a piston which is not visible in the figures.

Said arm 38 is provided, at the front, with a vertical head 46 with a spraying nozzle which is connected by means of ducts 47 to a tank 48.

A brush 49 is articulated below the head 46 so as to be able to rotate on a horizontal plane and is actuated by a motor 50 which is connected thereto.

Said brush and said motor are fixed to a rotating arm 51 which is rigidly coupled to the support 44.

The spraying means are conveniently arranged in pairs suitable for simultaneously treating the left and right uppers and soles.

A third working area 52 is occupied by a drying chamber 53 with ceramic walls which is internally provided with electric resistors.

The chamber 53 is suitable for drying the primer or the first layer of adhesive on the upper 15 and the layer of adhesive on the sole.

According to the invention, automatic means suitable for spraying the uppers with adhesives on the treated parts are provided in a fourth working area 54.

Said means are constituted by two arms, one for right shoes and one for left shoes, such as the one designated by 38 in the second working area and with the same possibilities of movement along three axes, two mutually perpendicular horizontal ones and a vertical one.

The supply is drawn from the tank 48.

The fifth working area, designated by 55, is provided with a tunnel 56 with ceramic walls which is internally provided with electric resistors.

The drying of the adhesive and the removal of the creases which form on the upper during the assembly steps occur inside the tunnel 56.

The sixth working area 57 is arranged at the outlet of the tunnel 56; a chamber 58 is provided in said area and is suitable for simultaneously accommodating a plurality of trucks 2 (preferably four).

Said heated chamber 58 has a sealed closure

and vacuum is conveniently produced inside it so as to cause the complete evaporation of the solvents contained in the adhesives.

In particular, said chamber 58, which can slide on guides 59 which are transverse to the rails 3 and 4 and is moved by a piston 60, is internally provided with portions 3a and 4a of the rails 3 and 4 which are conveniently separated from the rest, and with two sliding doors, respectively 61 and 62, which are arranged mutually opposite and are provided with sealing gaskets 63 and 64.

The two doors 61 and 62 are slidingly coupled, for this reason, to rod-like guides 65 which are supported by a framework 66, which is external to the chamber 58 and is rigidly associated therewith, and are actuated by a piston 66a.

Microswitch probes 67 are arranged inside said chamber 58; their number is equal to the number of trucks 2 which said chamber must contain, and they are suitable for providing the enable signal for closing the doors 61 and 62 after complete filling.

Filling is performed by means of a piston 67a which is parallel to the rails 3 and 4 and the stem of which is provided, at the end, with a block 68 with an arm 69 which is articulated thereto.

When it is in raised position, said arm 69 does not interfere with the movement of the trucks 2, whereas in its lowered position it interferes by pushing with the third plate 10 of each of said trucks.

Thus, by actuating the piston 67, its stem is passed through the chamber 58 until it arranges itself so as to push the last truck 2 to be inserted therein.

The last truck naturally pushes the preceding ones and they all enter the chamber 58.

After treatment in the chamber 58, the trucks 2 are individually conveyed into a seventh working area, designated by 70, inside a reactivation oven 71.

A ballscrew device 72 is provided for this transfer and has an engagement means 73 which is suitable for acting again on the third plate 10 of each truck 2.

The ballscrew 72 starts to operate after the piston 67 has extracted all the trucks 2 from the chamber 58, leaving them in a region located downstream of said chamber, where conveniently arranged microswitch probes 74 are suitable for detecting the presence of the outgoing trucks.

An eighth working area 75 is arranged at the outlet of the oven 71, and a per se known pressing unit 76, suitable for pressing the uppers against the respective soles, is present in said working area.

A ninth and final working area of the tooled production line 1 is designated by 77 and provides for the presence of means suitable for cooling the shoes prior to finishing.

Said means are constituted by metallic blades 78 which are shaped so as to embrace the rear parts of the uppers 15 which are glued to the soles 19 which, after the pressing operation, are placed back onto the trucks 2.

The blades 78 have holes 79 which are connected to a cold air distribution system and are thus suitable for spraying the air against the rear part of the shoe, on which actions are subsequently performed in order to remove it from the last.

At this point, an operator separates the finished shoe from the last, unloading it from the tooled production line according to the invention and sending it to the finishing units.

An electronic computer 80 supervises and controls all the movements of the various units which compose the production line according to the invention.

At this point it should be stressed that intake ports are provided at each working area and lead into a central tube 81 which ends with a treatment unit 82 which is suitable for eliminating the organic solvents contained in the adhesives by means of a catalytic process.

As regards operation, the lasts 14, with the uppers 15 and the soles 19, are fitted by an operator onto the trucks 2 in the first area 20 after all the data related to the dimensions, quantity, working times etc. have been stored in the computer 77.

The information related to the type of shoe, to the last etc. is stored by reading the bar codes 15a and 19a.

The trucks 2 then pass in the area of the device 21 where the lasts 14 and the soles 19 are centered on the trucks 2.

The possible carding of the lower rim of the fitted upper 15 is then performed and then, in succession, in the second area 36, the primer or first layer of adhesive is sprayed onto the uppers 15, following the same path as the carding operation, and a layer of adhesive is sprayed onto the soles 19.

The spraying path for the soles 19 is the same as the one for the uppers 15, which is stored in the central unit 80.

The trucks 2 thus prepared pass for a time of preferably approximately 60 seconds inside the chamber 53 of the third working area 52 in which the pre-glued uppers and soles are raised to a temperature of preferably 50 degrees Celsius.

At the exit from the chamber 53, the trucks arrive in the fourth working area 54, in which the uppers 15 have a residual temperature of approximately 70 degrees Celsius.

At this point the uppers 15, and possibly the soles 19, if they are not already provided with an applied layer of adhesive, are treated with adhesive

in the same areas affected by carding and primer spraying.

After the fourth working area 54, the trucks enter the fifth area 55, which is constituted by the crease removal tunnel 56, in which they are kept for a total of approximately 3 minutes at a temperature of preferably approximately 100 degrees Celsius.

After this, the trucks 2 are transferred in groups, for example of four units, into the sixth working area 57, which is constituted by the vacuum chamber 58 which is constantly heated at approximately 60 degrees Celsius.

The permanence time is conveniently approximately 60 seconds, until all the solvents contained in the adhesives have evaporated.

Then, one by one, the trucks 2 are transferred into the oven 71 of the seventh area 70, in which the uppers 15 are heated up to 80 degrees Celsius so as to reactivate the film of adhesive.

The trucks 2 are then transferred to the eighth working area 75, where pressing between the uppers 15 and the soles 19 occurs.

The final operation occurs in the ninth working area 77, with cooling to a very low temperature in order to avoid separation of the sole 19 and the upper 15 during removal from the last.

Another operator then removes the shoes from the lasts and sends them to the finishing department.

The use of the tooled production line according to the invention allows a considerable saving in labor, estimated as approximately 40%.

This fact is extremely interesting both from the point of view of reducing production costs and from the point of view of the marketing of the production line itself, since its amortization is facilitated and accelerated.

The operators are not in direct contact with the chemical products, so that there is a considerable improvement in the working environment and health is protected.

It should furthermore be stressed that the use of the tooled production line according to the invention allows to perform the most demanding and delicate tasks with a constancy and accuracy which cannot be compared to the manual skill of the most expert operators.

This leads to undisputed advantages from the point of view of the quality of the finished product.

Finally, the tooled production line is compact, and its use provides for a considerable reduction in the space required in the company premises for the assembly equipment.

In practice it has thus been observed that the above described tooled production line has achieved the intended aim and objects of the present invention.

The production line according to the invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Tooled, integrated and automated production line for glueing operations in shoe production lines, characterized in that it comprises a conveyor (1) provided with supporting means (2) slideable on guides (3,4) for carrying the uppers (15), which are already mounted on the lasts (14) which are possibly already carded and are paired with the respective soles (19) and which are possibly already prepared for receiving the adhesive, between a succession of working areas comprising: a first area (20) for loading, provided with means for reading identification codes provided on the soles (19) and/or on the uppers (15); a second area (36) provided with means for treating the carded part of the uppers (15) with a priming product or for spraying adhesive on the uppers (15) and means (36,37,38,39) for spraying adhesive on the soles (19); a third area (52) provided with a chamber (53) for drying the priming product and the first layer of adhesive; a fourth area (54) provided with means for spraying the uppers with adhesives on the treated parts; a fifth area (55) provided with a tunnel (56) for drying the adhesive and removing creases from the uppers; a sixth area (57) provided with a vacuum heating chamber (58); a seventh area (70) provided with an adhesive reactivation oven (71); an eighth area (75) provided with means (76) for pressing the uppers (15) against the respective soles (19); and a ninth area (77) provided with means (78,79) for cooling the shoes prior to the finishing operations, the entire system being connected to an electronic computer for management and control.

2. Tooled production line according to claim 1,

characterized in that means (21) for adjusting the position of the uppers (15) and of the soles (19) on said sliding supporting means (3,4) are provided downstream of said loading area (20).

3. Tooled production line according to claim 1, characterized in that it comprises, upstream of the second working area (36), a carding area (32) which is provided with means (33,34) for carding the lower part of the uppers (15).

4. Tooled production line according to one or more of the preceding claims, characterized in that said conveyor (1) is constituted by a pair of parallel rails (3,4) which are arranged one above the other.

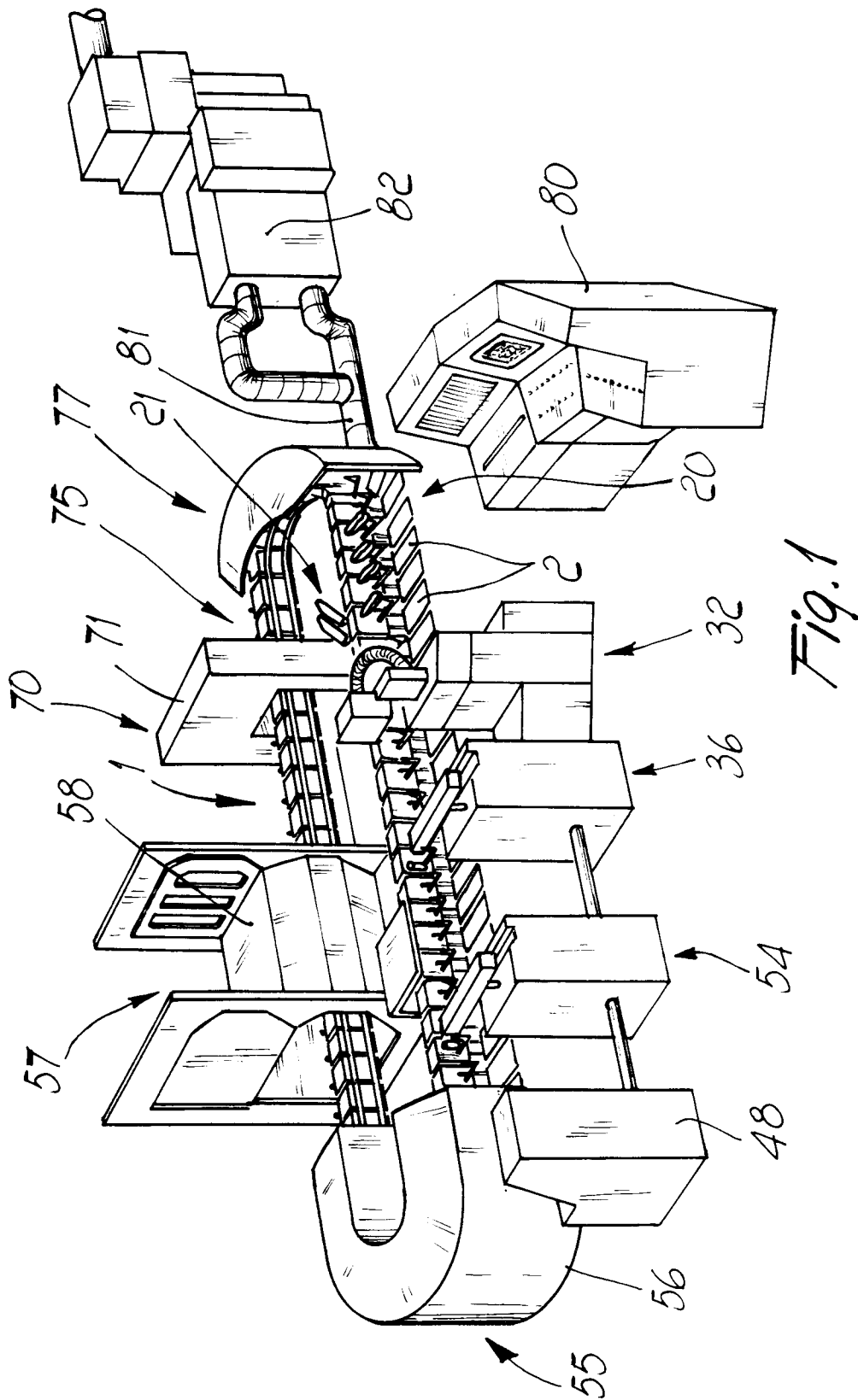
5. Tooled production line according to one or more of the preceding claims, characterized in that said supporting means (2) slideable on guides (3,4) are constituted by trucks (2) which can slide on said rails (3,4), each truck (2) being provided, in an upward position, with a support (13) for the fixing of a last (14) and, in a downward position, with a plate (17) for the resting of a corresponding sole (19).

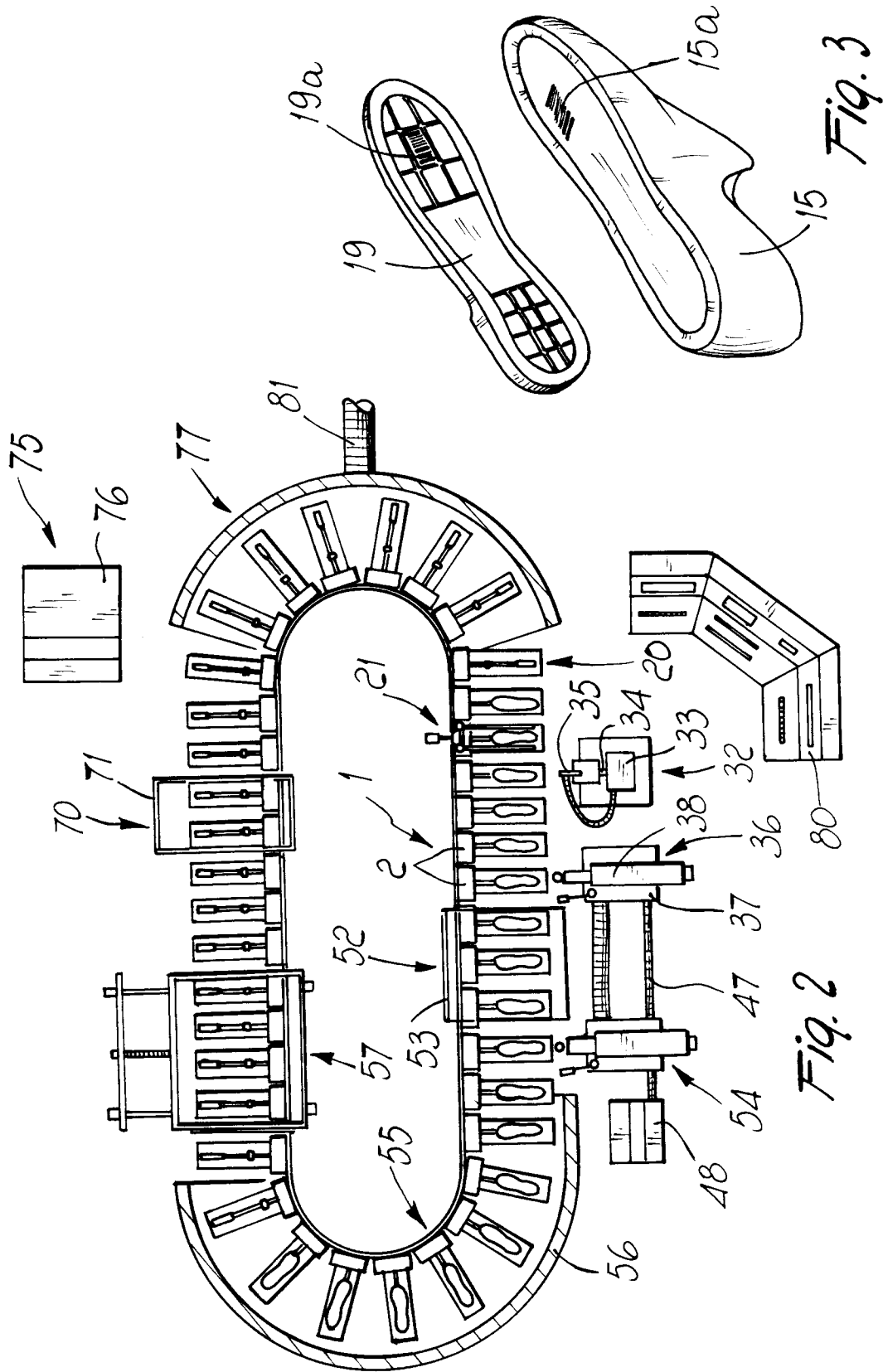
6. Tooled production line according to one or more of the preceding claims, characterized in that said means (21) for adjusting the position of the uppers (15) and of the soles (19) comprise a pair of shaped plate-like elements (22) which are arranged transversely to said rails (3,4), said shaped elements (22) being articulated about respective pivots (23) which are mutually parallel and fixed radially to a further horizontal articulation pivot (24), said shaped elements (22) being mutually associated by a piston (27) which acts in contrast with spring-loaded elastic means (28) for actuating the mutual opening and closure articulations, and a further piston (29) for actuating the articulations around said horizontal pivot (24).

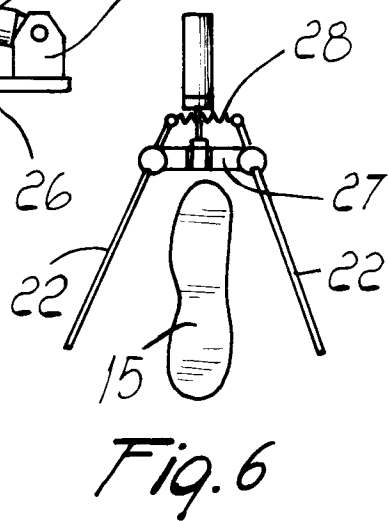
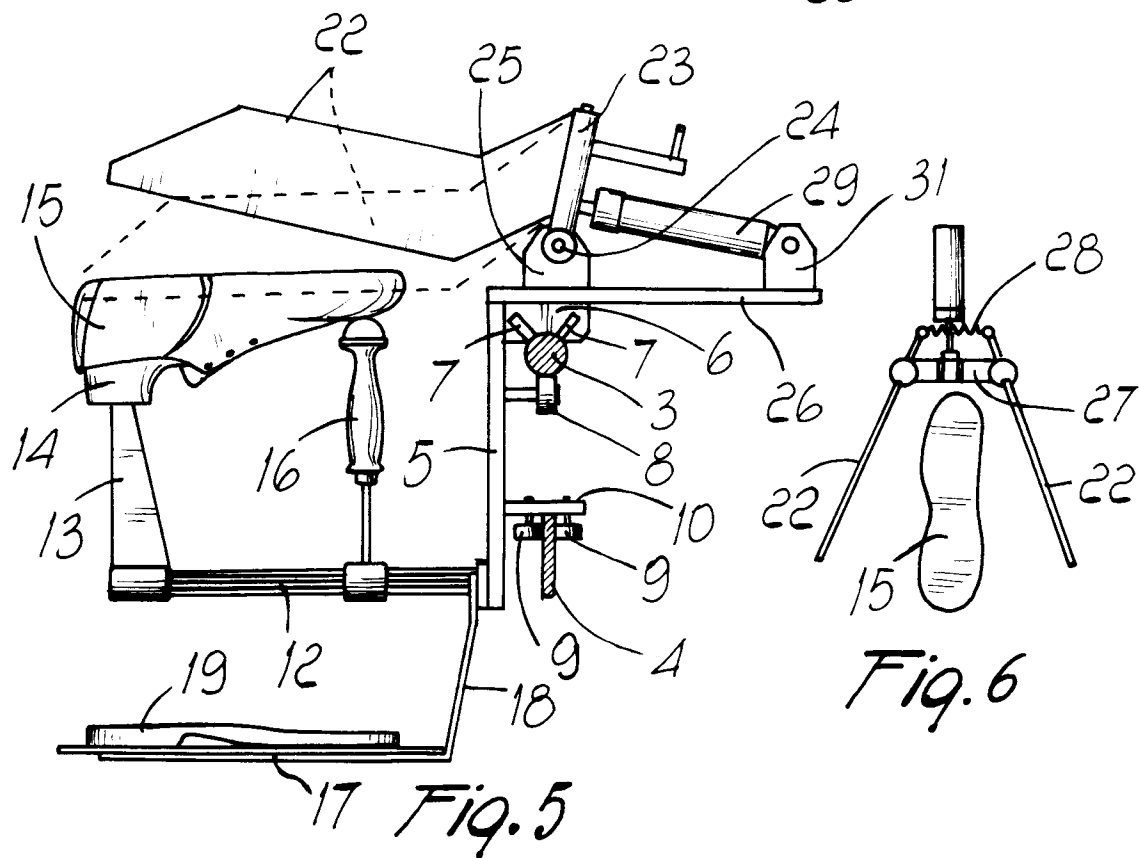
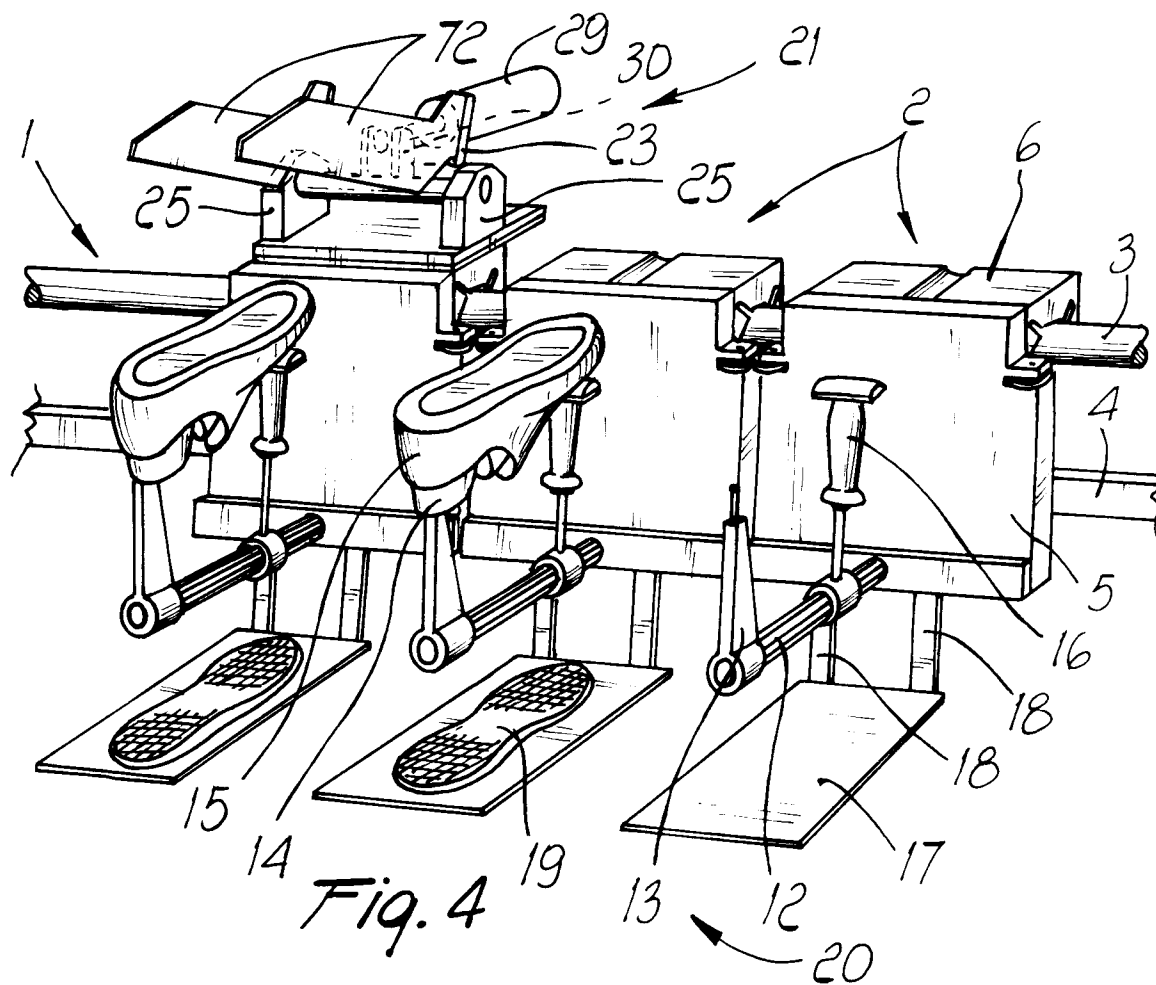
7. Tooled production line according to one or more of the preceding claims, characterized in that said means for reading identification codes provided on the soles and/or on the uppers are constituted by at least one bar code reader.

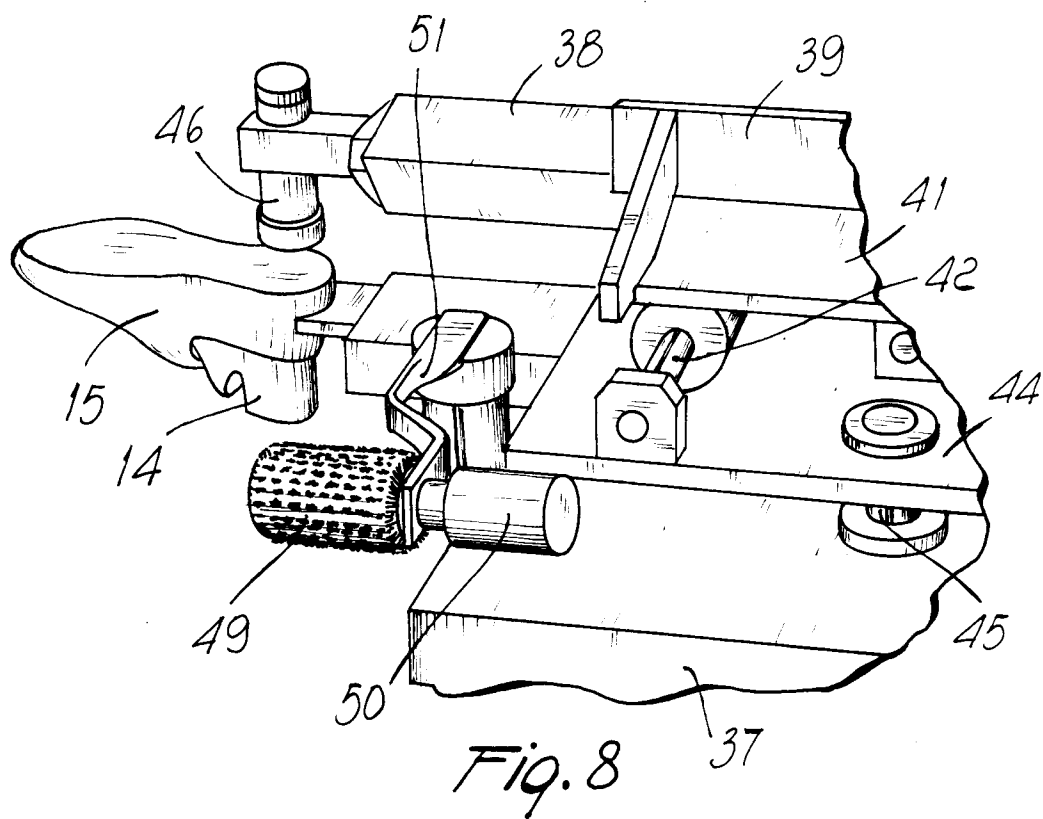
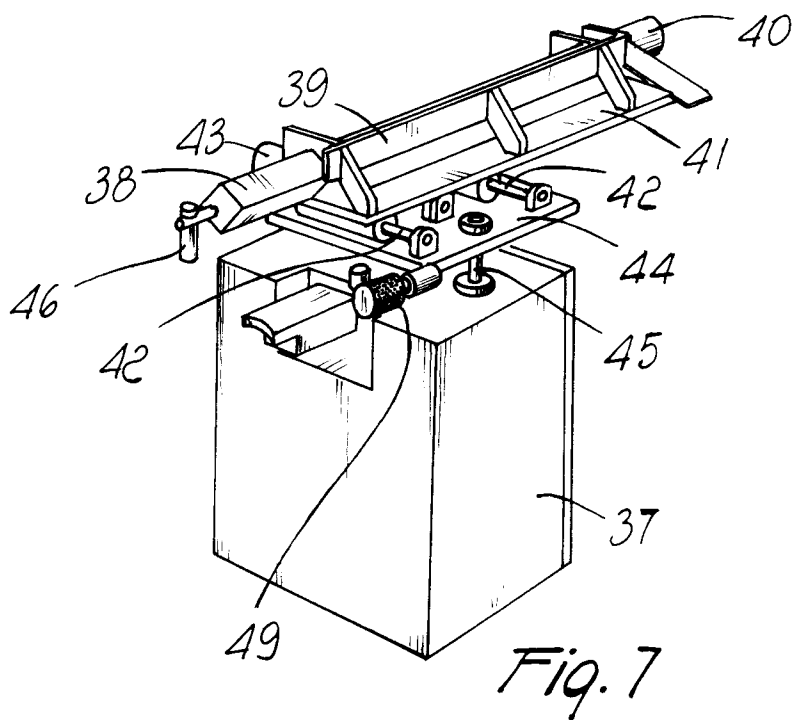
8. Tooled production line according to one or more of the preceding claims, characterized in that said means (33,34) for carding the lower part of the uppers (15) are constituted by at least one unit with an arm (34) moveable along three mutually perpendicular axes and supporting a carding tool.

9. Toolled production line according to one or more of the preceding claims, characterized in that said means for treating the carded part with a priming product or for spraying a first layer of adhesive on the uppers (15) are constituted by at least one arm (38) moveable along three mutually perpendicular axes and supporting a head (46) equipped with a spraying nozzle. 5
10. Toolled production line according to one or more of the preceding claims, characterized in that said means for spraying adhesive on the soles (19) are constituted by at least one arm (38) moveable along three mutually perpendicular axes and supporting a head equipped with a spraying nozzle (46). 10
11. Toolled production line according to one or more of the preceding claims, characterized in that said chamber (53) for drying the priming product or the first layer of adhesive has ceramic walls and internal heating resistors. 15
12. Toolled production line according to one or more of the preceding claims, characterized in that said automated means for spraying the uppers with adhesives on the treated parts are constituted by at least one arm (38) moveable along three mutually perpendicular axes and supporting a head (46) equipped with a spraying nozzle. 20
13. Toolled production line according to one or more of the preceding claims, characterized in that said tunnel (56) for drying the adhesive and removing creases from the uppers has ceramic walls and internal resistors. 25
14. Toolled production line according to one or more of the preceding claims, characterized in that said vacuum heating chamber (58) is internally provided with a portion of said rails (3a,4a), which is thus divided from the remainder, and is slideable on guides (59) which are transverse to said rails (3,4), said chamber being provided with sliding doors (61,62) which form a sealed closure and are arranged in opposite positions. 30
15. Toolled production line according to one or more of the preceding claims, characterized in that it comprises, downstream of said vacuum heating chamber (58), a piston (67a) which is parallel to said rails (3,4) the stem whereof has engagement means (68,69) for removing sets of said trucks from said tunnel for drying the adhesive and removing creases from the uppers, transferring said trucks inside said chamber, said engagement means pushing the last one of said trucks (2) and consequently the trucks (2) which precede said last truck. 35
16. Toolled production line according to one or more of the preceding claims, characterized in that said vacuum heating chamber (58) is internally provided with microswitch probes (74) suitable for enabling its movement which allows to close said doors (61,62). 40
17. Toolled production line according to one or more of the preceding claims, characterized in that a ballscrew device (72) is arranged downstream of said vacuum heating chamber (58), is parallel to said rails and is provided with means (73) for individually engaging said trucks (2) and transferring them into said oven (71) for reactivating the adhesive film. 45
18. Toolled production line according to one or more of the preceding claims, characterized in that said reactivation oven (71) is constituted by a per se known thermal-shock oven. 50
19. Toolled production line according to one or more of the preceding claims, characterized in that said means for pressing the uppers against the respective soles are constituted by a per se known pressing unit (76). 55
20. Toolled production line according to one or more of the preceding claims, characterized in that said means for cooling the shoes prior to finishing are constituted by metallic blades (78) which are shaped so as to embrace the rear parts of the uppers (15) which are glued to the soles (19), said blades (78) being provided with holes (79) which are connected to a cold air distribution system.
21. Toolled production line according to one or more of the preceding claims, characterized in that it comprises a purifying system with intake ports which are arranged in the various working areas and lead into a central tube (81) which ends with a catalytic treatment unit (82).
22. Toolled production line according to one or more of the preceding claims, characterized in that said arms (38) moveable along three perpendicular axes are actuated by actuators which are connected to said management and control computer.









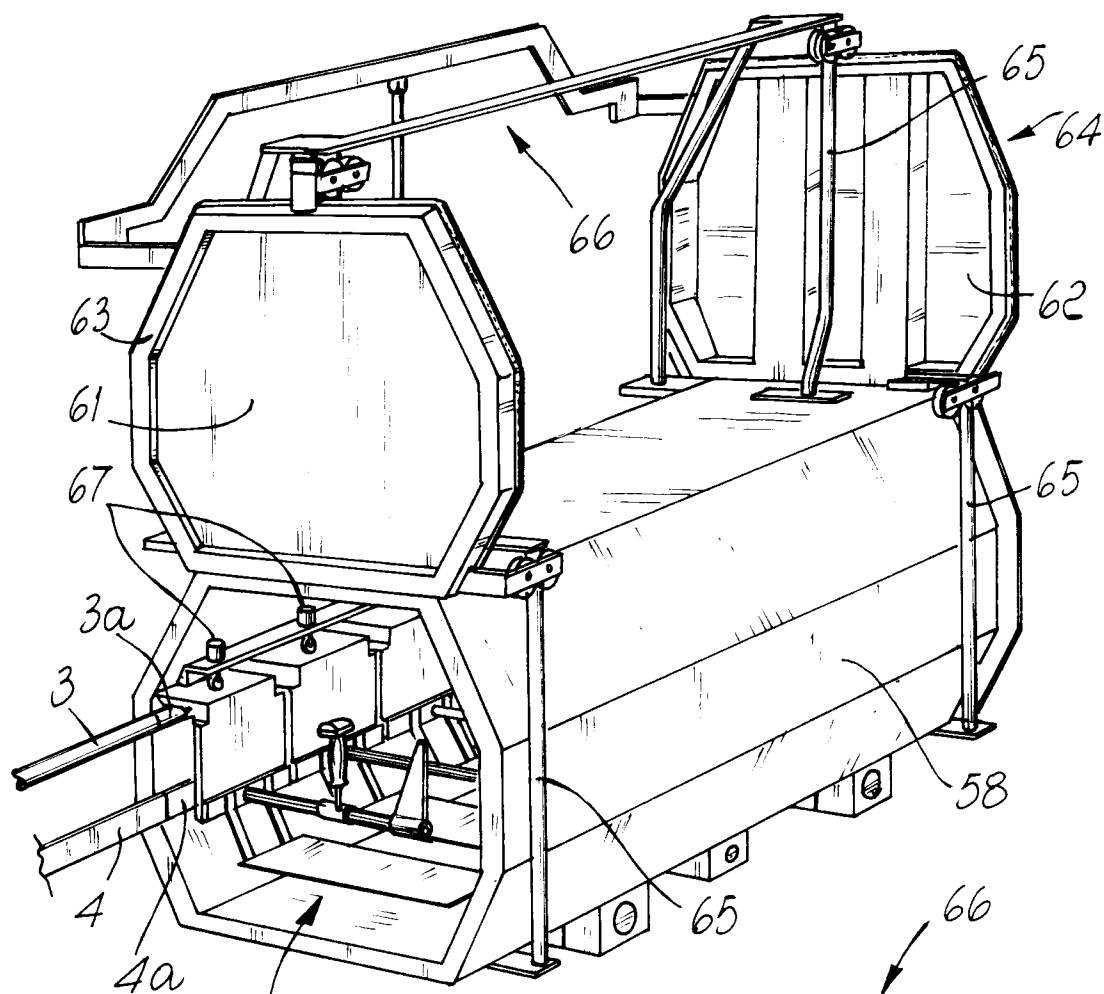
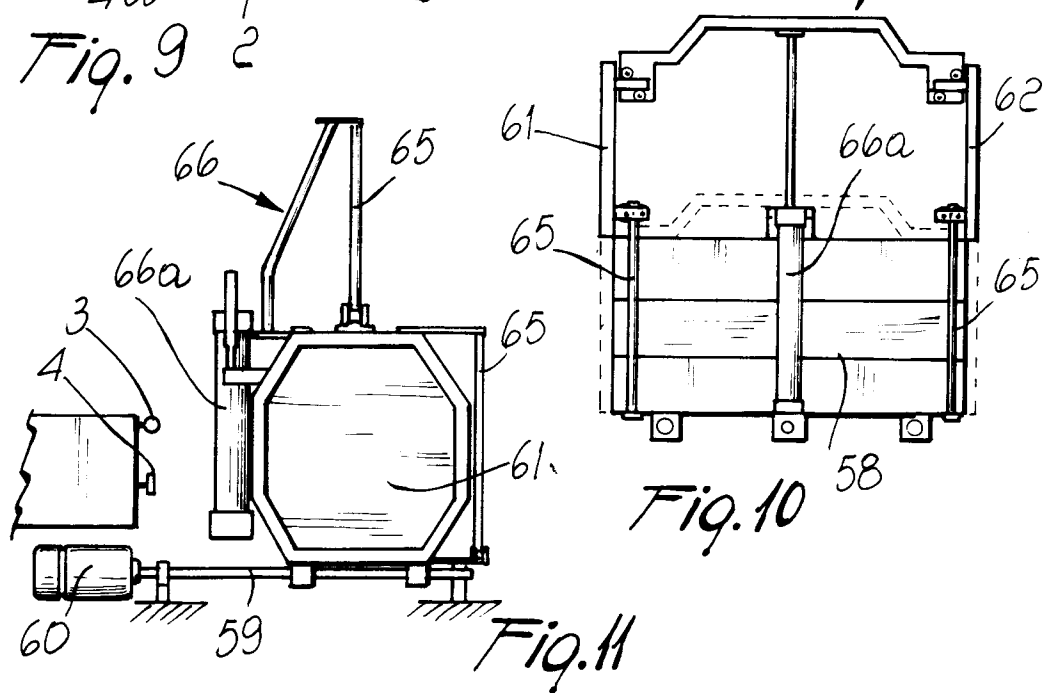
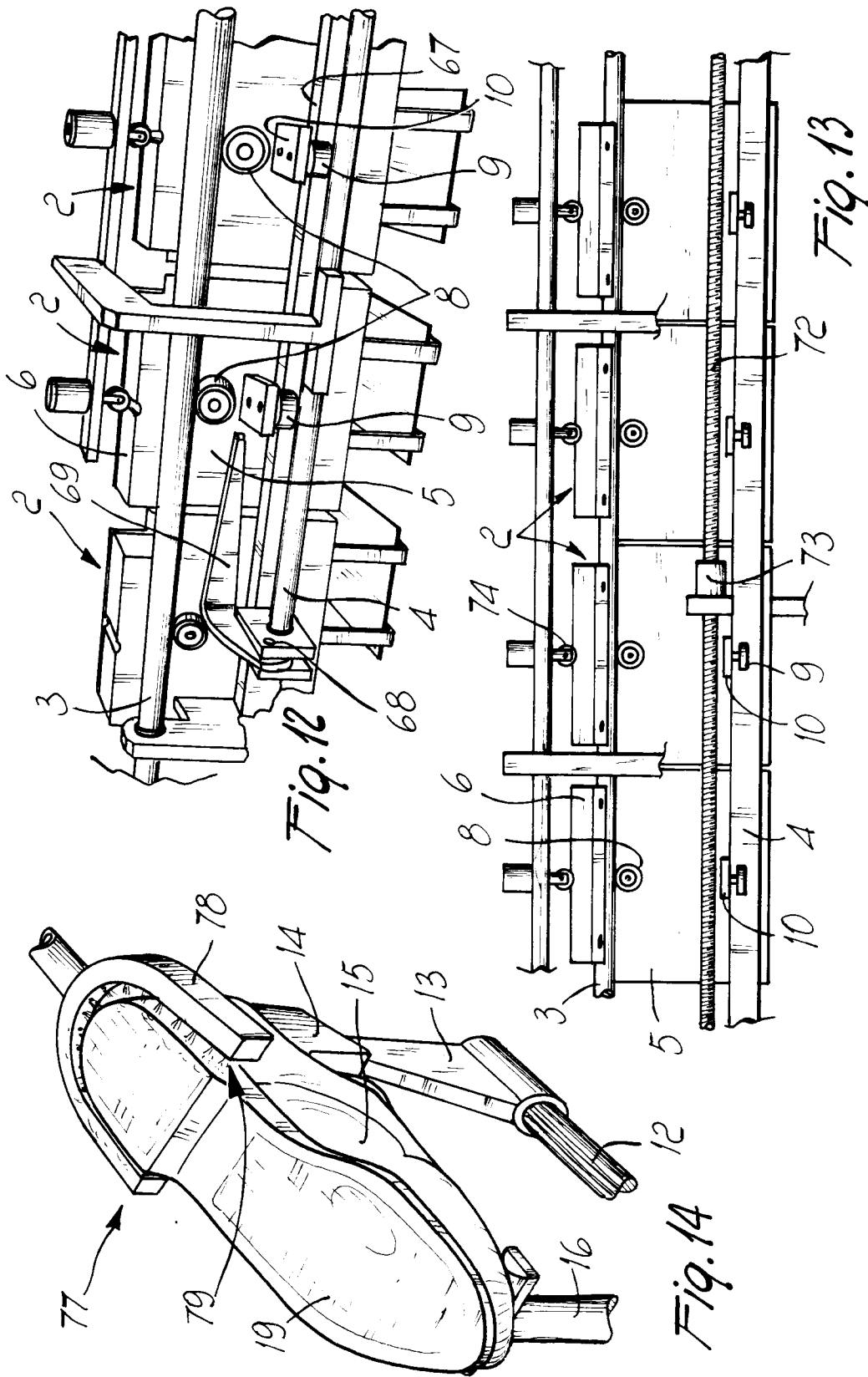


Fig. 9 2







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 7682

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.5)
X	EP-A-0 009 422 (P. BONNET ET AL.) * page 3, line 4 - line 30; claims; figure 1 * ---	1-22	A43D111/00 A43D95/12
A	EP-A-0 329 007 (PSB GMBH FÖRDERANLAGEN UND LAGERTECHNIK) * abstract; claims; figures 4,5 * ---	1-22	
A	FR-A-2 610 800 (ETS MAILLE SA) * abstract; claims; figure * ---	1,9,10, 12,13	
A	FR-A-2 100 190 (A. FREEMAN) ---		
A	FR-A-2 612 052 (ETABLISSEMENT ACTIS) ---		
A	FR-A-2 309 172 (VIGES SPA) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A43D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 AUGUST 1992	Examiner SOEDERBERG J. E.
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			