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⑤④ **Machine for lasting side portions of shoe uppers.**

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GB-A-1 339 835
GB-A-1 559 171
US-A-1 722 499
US-A-1 843 232
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Description

This invention is concerned with a machine for use in lasting side portions of shoe uppers. The term "shoe" where used herein is used generically as indicating articles of outer footwear generally, including such articles in the course of manufacture.

Machines for lasting side portions of shoe uppers are known comprising a support for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned, and two side lasting assemblies arranged to act on opposite side portions of an upper positioned on a last supported by said support, wherein each side lasting assembly comprises clamping means, comprising at least one clamp member, movable towards the support to clamp a side portion of the upper against its last at a locality spaced from the feather line thereof, lasting element means comprising a plurality of lasting elements arranged side-by-side and movable inwardly towards the support so as to cause lasting marginal portions of the side portion of the upper to be wiped over corresponding marginal portions of the insole and be pressed thereagainst, and lasting band means comprising at least one band portion of flexible sheet material arranged to be interposed between the shoe upper on the one hand and the lasting elements and the clamp member(s) on the other, whereby the side portions of the upper are clamped as aforesaid by the clamp members acting through the band portions.

In GB—A—1559171 is described a side lasting machine in which each side lasting assembly comprises a single lasting band which is supported at its upper and lower edges, the arrangement being such that, as the lasting band is moved inwardly towards the last support, a portion thereof intermediate its upper and lower edges first engages the upper in the waist region, continued movement thereafter causing the upper to be deformed in the direction of both the top line and the feather line. The inward movement of each assembly, furthermore, is limited by a presser pad between which and the upper the lasting band is interposed, which pad also assists in holding the upper in position against the last during the lasting operation. When the inward movement of each lasting band is arrested, the lasting marginal portions of the upper, which are already partially folded over the feather line by the action of the inward movement of the lasting band, is merely rolled over and pressed against corresponding marginal portions of the insole by presser feet, which serve also to support one edge of the lasting band.

It will thus be appreciated that, in the operation of this machine, no significant drafting of the upper, in the waist portion thereof, takes place but rather the upper is deformed to the shape of the last by the progressive application of pressure thereto from an intermediate point outwardly towards the top line and feather line. Further-

more, the action of the presser feet is merely to roll the lasting marginal portion of the upper over the insole edge without any inward wiping action being applied thereto.

In US—A—1722499 is described a machine having side lasting assemblies, each of which comprises a plurality of lasting devices, each device in turn comprising a lasting element in the form of a wiping finger, a strap of flexible material one end of which is secured to the wiping finger, and the other end also being secured to a portion of the assembly, and a clamp pad between which and the upper the strap is interposed. In the operation of this machine, each device operates independently of the others, the arrangement being such that each assembly is moved bodily towards the shoe and the presser pads are brought into pressing engagement with the band against the upper, thus to clamp the upper against the last at a locality closely adjacent the feather line. Thereafter, the pressure applied by the pads is increased as the wipers move inwardly to wipe lasting marginal portions of the upper against corresponding marginal portions of the insole and press them thereagainst. Thereafter, the wiping fingers are cammed down from an out-of-the-way position to lay the lasting marginal portions of the upper over corresponding marginal portions of the insole and press them thereagainst.

A further modification of this machine is described in US—A—1843232. In this machine, the straps are secured to the clamp members at one end and are resiliently connected at the other to the wiping fingers, the arrangement being such that the wiping fingers effect an in-wiping action effectively on the strap rather than on the upper, the resilient connection yielding during such in-wiping movement so that the wiping fingers move relative to their associated straps. The overall effect of this arrangement is that the lasting marginal portions of the upper are again merely laid over corresponding marginal portions of the insole and pressed thereagainst.

In GB—A—1079611 are described two lasting machines, in a first of which two side lasting assemblies are provided, each comprising a plurality of lasting bands which are pressed against the upper by clamp members in the form of fingers, the bands being capable of limited movement heightwise of the last thus to provide an updraft on the upper prior to lasting marginal portions thereof being folded over the insole edge and pressed against corresponding marginal portions of the insole. In this machine, however, no separate lasting elements are provided, the bands serving the function of both updrafting and overlying members. Again, in GB—A—1339835, a machine is described having two side lasting assemblies, each comprising a plurality of lasting elements and a plurality of bands, but in this case no clamping pads are provided, the upper merely being engaged by the bands which are drawn over the insole edge, together with lasting marginal portions of the upper, during the in-wiping

movement of the lasting elements.

In the side lasting of shoes, problems arise where the inside of the last, at the waist region, is significantly inclined or rounded, so that it is difficult to ensure that the material of the upper, which is relatively bulky, is properly bedded down to the last before the lasting marginal portions of the upper are secured to corresponding marginal portions of the insole. Thus, it is not always sufficient merely to rely on the in-wiping action of wiping fingers to ensure that the upper is properly bedded to the last, nor it is necessarily sufficient merely to press the upper against the last without any drafting force being first applied. On the other hand, the use of wiping fingers or similar lasting elements is advantageous in ensuring a sharp feather edge on the finished shoe and also an adequate bedding down of the lasting marginal portions on to corresponding marginal portions of the insole, so that the mere application of an updrafting force does not in itself necessarily provide a good result in the finished shoe. Furthermore, it is desirable that clamp pads be provided so that a controlled drafting force can be applied to the upper, thus ensuring that any displacement of the upper does not lead to its being badly positioned on the last prior to the waist lasting operation.

It is thus the object of the present invention to provide a machine for lasting side portions of shoes, wherein the upper is properly conformed to the last, regardless of the shape of the latter in the waist region, by the application of a controlled drafting force, and also in the operation of which lasting marginal portions of the upper are wiped over corresponding marginal portions of the insole and pressed thereagainst using conventional lasting elements.

This object is resolved in accordance with the invention, in a shoe upper conforming machine as set out in the second paragraph of this specification, in that the or each band portion is pressed by the clamp member(s) against the side portion of the upper as aforesaid under a pressure which does not prevent movement of the band portion(s) relative to the clamp member(s) heightwise of the shoe in a direction from the top line to the feather line thereof, and which during such heightwise movement causes the portion of the upper engaged thereby to be drafted on its last in said direction and in that the or each band portion of each side lasting assembly is connected at one end to the lasting elements of said assembly, inward movement of the lasting elements towards the support as aforesaid thus being effective to cause movement of said band portion(s) to take place relative to the clamp member(s) and thus to cause a drafting force to be applied to the upper as aforesaid.

It will thus be appreciated that, using a machine in accordance with the invention, the lasting elements are utilised to apply a controlled drafting force to the upper through the band portion(s), the control being specifically achieved by

the action of the clamp member(s) acting on the band portion(s).

Desirably, the upper-engaging surface of the or each band portion is such as to cause the upper to be frictionally engaged thereby, thus to apply a drafting force to the upper as aforesaid and at least one of the opposite surface of the or each band portion and the surface of the or each clamp member engaging such opposite surface is a low-friction surface. Thus, for example, the aforementioned surface of the or each clamp member may be of polytetrafluoroethylene. Conveniently, furthermore, the or each band portion may be made of a laminated sheet material having a first layer which comprises the upper-engaging surface and which provides sufficient friction to apply a drafting force to the upper engaged thereby, and a second layer which comprises a low-friction surface which is engaged by the clamping member(s).

In order further to ensure that the drafting force applied by the band portion(s) is controlled, desirably the sheet material from which the or each portion is made has a modulus not less than 586.24 N/cm^2 (850 p.s.i.) at 100% elongation (as per the ASTM test procedure).

The holding pressure applied by the clamp member(s) to the upper-engaging band portion(s) is preferably of the order of 13.79 N/cm^2 (20 lbs/sq. in.). Furthermore, preferably the or each clamp member is mounted for pivotal movement about an axis extending heightwise of the last. Where the clamping means comprises a plurality of clamp members, desirably the position of each such axis in relation to its clamp member, and also the cross-sectional shape, viewed along said axis, of each clamp member, are such as to enable the clamp members to pivot without adjacent members binding on one another.

For effecting movement of the clamp member(s) towards the last support as aforesaid, preferably fluid pressure operated means is provided. In addition, preferably locking means, e.g. a bar lock arrangement associated with the or each clamp member, is also provided for locking the clamp member(s) in position after having been moved towards the last support to hold the band portion(s) as aforesaid.

The machine in accordance with the invention is preferably constructed and arranged in such a manner that operation of the fluid pressure operated means is also effective to cause inward movement of the lasting elements to take place, further fluid pressure operated means also being provided for effecting further inward movement of the lasting elements, when the or each clamp member is holding the band portion(s) against the upper as aforesaid. Conveniently, such further inward movement of the lasting elements is through a predetermined distance. Furthermore, conveniently in the operation of the machine, after lasting marginal portions of the upper have been wiped over corresponding marginal portions of the insole as aforesaid under the action of

the lasting element means, said locking means is operated to cause the clamp member(s) of each side lasting assembly to be released, viz. when bedding pressure is applied through the lasting elements to such marginal portions.

In conventional machines which utilise lasting elements in the form of wiping fingers, it is usual to set each lasting element heightwise of the last support, so that, in effecting an in-wiping action on the shoe bottom, each such element engages the shoe just below the feather line and rides up over said line, in this way achieving a desired in-wiping drafting force. This feature can be dispensed with in the machine in accordance with the invention, and to this end preferably each lasting element is movable not only inwardly towards the last support as aforesaid, but also heightwise thereof between a first condition, in which a pressure-applying surface thereof is spaced from the shoe bottom, and a second condition, in which, in the operation of the machine, said element is in pressing engagement with the shoe bottom, the arrangement being such that, as each element is moved inwardly towards the last support as aforesaid, it is also moved from its first to its second condition, whereby the or each band portion is caused to be drawn around the feather edge of the shoe bottom, thus effecting a drafting force on the upper prior to the lasting marginal portion of the upper engaged thereby being pressed against corresponding marginal portions of the insole.

In accordance with the invention various arrangements of band portions and lasting elements may be contemplated. Thus, a single band portion may be used in combination with a plurality of lasting elements. Alternatively, the lasting band means of each side lasting assembly may comprise a plurality of band portions, one associated with each lasting element, and in such case, furthermore, the lasting elements may be mounted in pairs and each pair have one clamp member associated therewith, each clamp member thus being arranged to hold two band portions in pressing engagement with the upper as aforesaid. Again with such an arrangement of lasting elements and clamp members, each pair of lasting elements may have one band portion associated therewith.

There now follows a detailed description, to be read with reference to the accompanying drawings, of one machine in accordance with the invention, this machine having been selected for description merely by way of exemplification of the invention and not by way of limitation thereof.

In the accompanying drawings:—

Figure 1 is a front perspective view of the machine in accordance with the invention; and

Figure 2 is a view in front elevation, showing details of a left-hand side lasting assembly of said machine.

The machine in accordance with the invention now to be described is a combined heel seat and side lasting machine comprising a last support 10 on which a last can be supported, bottom upper-

most, with an insole I located on the bottom thereof and a shoe upper U positioned thereon. The machine further comprises heel seat wiping instrumentalities 12 and a heel band 14, and also two side lasting assemblies generally designated 16, arranged forwardly of the heel seat lasting instrumentalities, one at either side of the last support 10. The side lasting assemblies are mirror-opposites of one another and the left hand assembly will now be described with reference to Figure 2.

The side lasting assembly 16 comprises a sub-frame 18 carried on a forwardly extending plate 20 mounted on a main machine frame 22 by pin-and-slot connections whereby the side lasting assembly 16 can pivot bodily about an axis extending transversely of the machine through a leading edge of the heel seat wipers 12 when in their advanced condition. For pivoting the sub-frame, a handle 30 is provided on the front thereof.

Forming part of the sub-frame 18 is a block 32 which accommodates four push-rods 34 for sliding movement in a direction transversely of the bottom of a last carried by the last support 10, said rods being arranged side-by-side in the block 32. Fixedly supported at the end, near the last support 10, of each push-rod 34 is a block 36 carrying a pivot pin 38 which extends fore-and-aft of the machine and on which two levers 40 are supported for pivotal movement. Each lever 40 supports a further pivot pin 42, extending transversely of the machine, and carrying an arm 44 on which a lasting element 46 is supported by a pivot pin 48, the axis of which extends fore-and-aft of the machine. Each side lasting assembly 16 thus comprises eight such lasting elements. A spring 50 urges the lasting element downwardly about the pin 48 (anti-clockwise, viewing Figure 2). The lasting element 46 has a flat pressure-applying surface 52, while the end of said element facing the last support 10 is rounded at its top and bottom.

It will be appreciated that each block 36 carries a pair of lasting elements 46, each element being independently pivotable therein about its own pin 42. Furthermore, it is to be noted that, when the pressure-applying surface 52 is horizontal, the axis of the pin 42 lies in the plane of said surface.

For urging each lever 40 about its pin 38, furthermore, four piston-and-cylinder arrangements 66 are provided, each acting on two associated levers 40 and each being carried by a bracket 68 carried on a mounting 70 secured to a rearward end of its associated push-rod 34. In each pair of levers 40 one is shorter than the other and there is provided, pivotally connected to the shorter lever and connected by a pin-and-slot connection to the longer lever, a link 92 itself connected by a pin-and-slot connection to a piston rod 90 of its associated piston-and-cylinder arrangement 66. In this manner, the levers 40 can be pivoted about the pin 38 independently of one another using a single piston-and-cylinder arrangement. The amount of movement in a

clockwise direction of each lever is determined by a stop pin 94 carried by the bracket 68.

Mounted in the block 32, one beneath each of the push-rods 34, are four further push-rods 80. At the end, nearer the last support 10, of each push-rod 80 is secured a plate 78 to which is in turn secured a C-shaped bracket 74 between the arms of which is secured a pivot pin 136, on which is freely pivotable a clamp pad 72, each pad thus being associated with a pair of lasting elements 46. The clamp pad 72 is of a polyurethane material having a Shore A hardness of 70. The position of the pin 136 and the cross-sectional shape, viewed in plan, of each pad 72 is such that pivoting movement of each pad can take place, independently of the other pads, without adjacent pads binding on one another.

Also mounted adjacent said end of each push-rod 80 is a block 96 which is connected to a piston rod 82 of a piston-and-cylinder arrangement 84, there being four such arrangements 84 each pivotally mounted on the sub-frame 18. Furthermore, each block 96 is arranged to be in engagement, in the rest condition of the machine, with a face of a depending portion of its associated block 36. Thus, when each piston-and-cylinder arrangement 84 is operated, the push-rod 80 associated therewith is moved inwardly to move the clamp pad 72 inwardly towards the last support and, by engagement of the block 96 with the block 36, the pair of wiping elements 46 associated with said pad is moved inwardly also.

At the end of the inward movement of each clamp pad 72, locking means is actuated to lock the push-rod 80 in position, said locking means comprising an apertured plate 98 through a restricted aperture 100 of which passes the push-rod 80 (and through a larger aperture 102 of which passes the push-rod 34). Each plate 98 is pivoted at 104 on a lug of the block 32 and is urged by a spring 106 into a locking position in which the aperture 100 binds on the push-rod 80 in the manner of a bar lock. For releasing the lock, a bar 108 is mounted for pivotal movement on lugs of the block 32, said bar carrying four adjustable stop screws 110 each of which can engage with one of the plates 98. For pivoting the bar 108 a piston-and-cylinder arrangement 112 is mounted on the block 32 and acts through a link 114 connecting the piston rod 116 thereof with said bar.

Carried on a depending portion of each block 96 is a bracket 118 supporting a piston-and-cylinder arrangement 56 a piston rod 58 of which is pivotally connected to a lever 60 pivoted, intermediate its length, on a rearward end of its associated push-rod 80, and connected by a pin-and-slot connection at its other end to the mounting 70 on the rearward end of the associated push-rod 34, for purposes to be hereinafter described.

The machine in accordance with the invention also comprises lasting band means comprising a plurality of bands 128, one associated with each lasting element 46. The bands are connected by clamp plates 130 to upper surfaces of the arms 44

by which the lasting elements 46 associated with the bands are carried, and each band extends over the inwardly facing end face of its associated lasting element 46. The bands also extend, in pairs, side-by-side over the inwardly facing face of the clamp pad 72 associated therewith. The lower end of each band is connected by springs 132 to a bracket 134 mounted on the lower end of the plate 78. The springs 132 merely serve to control the lower end of the bands but do not affect the function of the bands, to be hereinafter described.

In the operation of the machine, when in a rest condition the lasting elements, under the action of their associated cylinders 66, are in a first, raised, condition in which they are spaced above the plane of the last bottom; in addition, the lasting elements and the clamp pads 72, are in a retracted position (see Figure 2). When a shoe to be operated upon has been placed on the last support 10, piston-and-cylinder arrangements 84 are actuated to cause the clamp pads, and thus the lasting elements 46 therewith, to be moved inwardly towards the last support until the clamp pads, independently of one another, are pressing their associated bands 128 into contact with the shoe upper. As the clamp pads are moved into pressing engagement with the bands as aforesaid, they are free to pivot, independently of one another, each about the axis of its pin 136, so that the surface of each pad, through which surface pressure is applied as aforesaid, engages, over substantially the whole of its width, its associated bands. The pressure applied by the pads is in the order of 1.4 kgf/sq. cm. (20 lbs./sq. in.). In this position, piston-and-cylinder arrangement 112 is de-actuated and the bar lock is applied, the clamp pads now being locked in said position. At this stage, the lasting elements 46 are still in their first, raised, condition. Thereafter, piston-and-cylinder arrangements 56 are actuated whereupon, through their associated levers 60, the pivots of which on the push-rods 80 are now stationary, the push-rods 34, and thus the lasting elements 46, are moved inwardly relative to the clamp pads, and at the same time piston-and-cylinder arrangements 66 are actuated to cause the lasting elements 46 to be moved downwardly to a second, operative, condition in which the pressure-applying surface 52 of each element 46 can engage the shoe through its associated band 128. The inward movement of the elements 46 under the action of the cylinder 56 is limited by engagement of the forward face of the block 36 with the plate 78; the distance through which the elements 46 can move inwardly relative to the pads 72, is of the order of 50 mm.

The effect of the inward and downward movement of the lasting elements 46 is to cause the bands 128 associated therewith to be drawn relative to the pads 72 heightwise of the last and about the feather line region thereof. To this end, the pressure applied by the pads is sufficient to hold the bands in pressing engagement with the upper while allowing such slippage to take place,

and further the surface of each band engaging the upper is such that it can apply a frictional drafting force to the upper while the surface of the pad 72 is coated with a low-friction coating, e.g. polytetrafluoroethylene, so that the band can readily slip relative thereto.

Also during the inward and downward movement of the lasting elements 46, because of the action of the springs 50 in urging the elements anti-clockwise (viewing Figure 2) about the pins 48, the pressure-applying surface 52 of each element is brought into early engagement, along its length, with the feather edge of the shoe bottom, through its associated lasting band, and after such engagement is progressively caused to pivot in a clockwise direction (viewing Figure 2) about its pin 48 until it reaches its second condition in which it overlays the lasting marginal portion of the upper and serves to press them against corresponding marginal portions of the insole. This progressive action of each lasting element 46 has an "ironing" effect on the marginal portions of the upper.

It will be appreciated that the material of the lasting bands 128 should not be significantly stretchy for this function, while being relatively flexible so as to conform to the shape of the shoe being operated upon. It has been found that a suitable material is a polyurethane having a Shore A hardness in the range 70 to 90 and a modulus not less than 586.24 N/cm² (850 p.s.i.) at 100% elongation (as per the ASTM test procedure). Furthermore, each band has a thickness in the range 1.5 to 3.0 mm. (1/16 to 1/8 ins.).

When all the lasting elements 46 have reached their second condition, and are in pressing engagement with the shoe bottom, a bedding pressure can be applied thereby to the wiped-over lasting marginal portions of the upper, and to this end the fluid pressure control circuit of the machine is arranged so that the piston-and-cylinder arrangements 66 can be supplied with pressure fluid at two different pressures. Furthermore, when bedding pressure is applied, the piston-and-cylinder arrangement 112 of each assembly is again actuated, thereby releasing the bar lock arrangement against the action of the springs 106, whereupon the action of the piston-and-cylinder arrangements 56 is effective to cause the levers 60 to pivot about their pin-and-slot connection with the mountings 70 to cause a small withdrawal movement of the push-rods 80 away from the last support, and thus of the clamp members 72, thereby discontinuing their pressing of the bands against the upper. In this way, the bands 128 and clamp members 72 do not interfere with the application of bedding pressure to the shoe bottom.

The machine in accordance with the invention may also comprise selector means (not shown) whereby any one pair of lasting elements 46 can be rendered inoperative.

Claims

1. Machine for lasting side portions of shoe uppers comprising a support (10) for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned, and two side lasting assemblies (16) arranged to act on opposite side portions of an upper positioned on a last supported by said support (10), wherein each side lasting assembly (16) comprises clamping means (72), comprising at least one clamp member (72), movable towards the support (10) to clamp a side portion of the upper against its last at a locality spaced from the feather line thereof, lasting element means (46), comprising a plurality of lasting elements (46) arranged side-by-side and movable inwardly towards the support (10) so as to cause lasting marginal portions of the side portion of the upper to be wiped over corresponding marginal portions of the insole and to be pressed thereagainst, and lasting band means (128) comprising at least one band portion (128) of flexible sheet material arranged to be interposed between the shoe upper on the one hand and the lasting elements (46) and the clamp member(s) (72) on the other, whereby the side portions of the upper are clamped as aforesaid by the clamp members (72) acting through the band portions (128), characterised in that the or each band portion (128) is pressed by the clamp member(s) (72) against the side portion of the upper as aforesaid under a pressure which does not prevent movement of the band portion(s) (128) relative to the clamp member(s) (72) heightwise of the shoe in a direction from the top line to the feather line thereof, and which during such heightwise movement causes the portion of the upper engaged thereby to be drafted on its last in said direction, and in that the or each band portion (128) of each side lasting assembly (16) is connected at one end to the lasting elements (46) of said assembly (16), inward movement of the lasting elements (46) towards the support (10) as aforesaid thus being effective to cause movement of said band portion(s) (128) to take place relative to the clamp member(s) (72) and thus to cause a drafting force to be applied to the upper as aforesaid.

2. Machine according to Claim 1 characterised in that the upper-engaging surface of the or each upper-engaging band portion (128) is such as to cause the upper to be frictionally engaged thereby, thus to apply a drafting force to the upper as aforesaid, and further in that at least one of the opposite surface of the or each band portion (128) and the surface of the or each clamp member (72) engaging such opposite surface is a low-friction surface.

3. Machine according to Claim 2 characterised in that the or each upper-engaging band portion (128) is made of laminated sheet material having a first layer which comprises the upper-engaging

surface and which provides sufficient friction to apply a drafting force to the upper engaged thereby, and a second layer which comprises a low-friction surface which is engaged by the clamp member(s) (72).

4. Machine according to any one of the preceding Claims characterised in that the holding pressure applied by the clamp member(s) (72) to the upper-engaging band portion(s) (128) is of the order of 13.79 N/cm² (20 lbs./sq. in.).

5. Machine according to any one of the preceding Claims characterised in that the or each clamp member (72) is mounted for pivotal movement about an axis (136) extending heightwise of the last.

6. Machine according to Claim 5 characterised in that the clamping means comprises a plurality of clamp members and in that the position of each said axis (136) in relation to its clamp member (72), and also the cross-sectional shape, viewed along said axis (136), of each clamp member (72), are such as to enable the clamp members (72) to pivot without adjacent members (72) binding on one another.

7. Machine according to any one of the preceding Claims wherein fluid pressure operated means is provided for effecting movement of the clamp member(s) (72) inwardly towards the last support (10) as aforesaid, operation of said means also being effective to cause inward movement of the lasting elements (76) therewith, and wherein locking means (98, 100, 104, 106) is provided for locking the clamp member(s) (72) in such position, after having been moved to hold the band portion(s) (128) as aforesaid, further fluid pressure operated means then being effective to cause further inward movement of the lasting elements (76) whereby to cause lasting marginal portions of the upper to be wiped over and pressed against corresponding marginal portions of the insole, characterised in that said locking means (98, 100, 104, 106) is operated to cause the clamp member(s) (72) to be released, when bedding pressure is applied through the lasting elements (46) to the wiped-over lasting marginal portions of the upper.

8. Machine according to any one of the preceding Claims wherein each lasting element (76) is also movable heightwise of the last support between a first condition, in which a pressure-applying surface thereof is spaced from the shoe bottom, and a second condition, in which, in the operation of the machine, said element is in pressing engagement with the shoe bottom, characterised in that, as each element (46) is moved towards the last support (10) as aforesaid, it is also moved from its first to its second condition, whereby the or each band portion (168) is caused to be drawn around the feather edge of the shoe bottom, thus effecting a drafting force on the upper prior to the lasting marginal portions of the upper engaged thereby being pressed against corresponding marginal portions of the insole.

9. Machine according to any one of the preceding Claims characterised in that the lasting band

means (128) of each side lasting assembly (16) comprises a plurality of band portions (128), one associated with each lasting element (46).

10. Machine according to any one of Claims 1 to 8 characterised in that the lasting elements (46) of the lasting element means are arranged in pairs, each pair having associated therewith a clamp member (72), and one band portion of the lasting band means being associated with each pair of lasting elements (46).

Revendications

1. Machine à monter des côtés d'empignes de chaussures, comprenant un support (10) pour une forme de chaussure sur laquelle une empeigne, dont les côtés doivent être montés, et une première sont positionnées, et deux ensembles de montage de côté (16) agencés pour agir sur les côtés opposés d'une empeigne positionnée sur une forme supportée par ledit support (10), dans laquelle chaque ensemble de montage de côté (16) comporte un dispositif de serrage (72) comprenant au moins une pièce de serrage (72) mobile vers le support (10) pour serrer un côté de l'empeigne contre sa forme dans une position espacée de sa marge de montage, un dispositif à éléments de montage (46) comprenant plusieurs éléments de montage (46) disposés côté à côté et mobiles vers l'intérieur, vers le support (10) de manière à entraîner que des parties marginales de montage du côté de l'empeigne soient rabattues sur des parties marginales correspondantes de la première et soient serrées contre elles, et un dispositif à bandes de montage (128) comprenant au moins une partie de bande (128) d'une matière en feuille flexible agencée pour être intercalée entre l'empeigne de chaussure d'une part et les éléments de montage (46) et la pièce ou les pièces de serrage (72) d'autre part, de manière que les côtés de l'empeigne soient serrés de la manière précitée par les pièces de serrage (72) agissant par les parties de bandes (128), caractérisée en ce que la partie ou chaque partie de bande (128) est serrée par la pièce ou les pièces de serrage (72) contre le côté de l'empeigne de la manière précitée sous une pression qui n'empêche pas un mouvement de la partie ou des parties de bande (128) par rapport à la pièce ou les pièces de serrage (72) dans le sens de la hauteur de la chaussure, dans une direction à partir de son haut de quartier vers sa marge de montage, et qui, pendant ce mouvement dans le sens de la hauteur, entraîne que la partie de l'empeigne ainsi engagée soit tirée sur sa forme dans ladite direction et que la partie ou chaque partie de bande (128) de chaque ensemble de montage de côté (16) est reliée par une extrémité aux éléments de montage (46) dudit ensemble (16), un mouvement vers l'intérieur des éléments de montage (46) vers le support (10) de la manière précitée ayant pour effet de produire un mouvement de ladite partie ou desdites parties de bande (128) par rapport à la pièce ou les pièces de serrage (72), entraînant ainsi qu'une force de traction soit

appliquée à l'empeigne de la manière précitée.

2. Machine selon la revendication 1, caractérisée en ce que la surface d'engagement d'empeigne de la partie ou de chaque partie de bande (128) d'engagement d'empeigne est telle qu'elle entraîne qu l'empeigne soit engagée par frottement, en appliquant ainsi une force de traction sur l'empeigne, de la manière précitée, et en ce que l'une au moins de la surface opposée de la partie ou de chaque partie de bande (128) et la surface de la pièce ou de chaque pièce de serrage (72) engageant cette surface opposée est une surface à faible frottement.

3. Machine selon la revendication 2, caractérisée en ce que la partie ou chaque partie de bande (128) d'engagement d'empeigne est faite d'une matière en feuille contre-collée dont une première couche constitue la surface d'engagement d'empeigne et qui produit un frottement suffisant pour appliquer une force de traction sur l'empeigne ainsi engagée, et dont une seconde couche constitue la surface à faible frottement qui est engagée par la pièce ou les pièces de serrage (72).

4. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce que la pression de maintien appliquée par la pièce ou les pièces de serrage (72) sur la partie ou les parties de bandes (128) d'engagement d'empeigne est de l'ordre de 13,79 N/cm².

5. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce que la pièce ou chaque pièce de serrage (72) est montée pour un mouvement pivotant autour d'une axe (136) dirigé dans le sens de la hauteur de la forme.

6. Machine selon la revendication 5, caractérisée en ce que le dispositif de serrage comporte plusieurs pièces de serrage et en ce que la position de chacun desdits axes (136) par rapport à sa pièce de serrage (72) et également la forme en coupe vue suivant ledit axe (136) de chaque pièce de serrage (72) sont telles qu'elles permettant que les pièces de serrage (72) pivotent sans que des pièces voisines (72) s'entraînent entre elles.

7. Machine selon l'une quelconque des revendications précédentes, dans laquelle un dispositif actionné par une pression de fluide est prévu pour produire un mouvement de la pièce ou des pièces de serrage (72) vers l'intérieur, vers le support de forme (10) de la manière précitée, le fonctionnement dudit dispositif ayant pour également pour effet de produire un mouvement vers l'intérieur des éléments de montage (46) associés, et dans laquelle un dispositif de blocage (98, 100, 104, 106) est prévu pour bloquer la pièce ou les pièces de serrage (72) dans cette position après avoir été déplacées pour maintenir la partie ou les parties de bandes (128) de la manière précitée, un autre dispositif actionné par une pression de fluide ayant ensuite pour effet de provoquer un autre mouvement vers l'intérieur des éléments de montage (46) afin que des parties marginales de l'empeigne soient rabattues et serrées contre des parties marginales correspondantes de la pre-

mière, caractérisée en ce que ledit dispositif de blocage (98, 100, 104, 106) est actionné pour que la pièce ou les pièces de serrage (72) soient libérées, lorsqu'une pression de tassement est appliquée par les éléments de montage (46) sur les parties marginales de montage rabattues de l'empeigne.

8. Machine selon l'une quelconque des revendications précédentes, dans laquelle chaque élément de montage (46) est également mobile dans le sens de la hauteur du support de forme entre une première position dans laquelle une surface d'application de pression qui en fait partie est espacée du dessous de chaussure et une seconde position dans laquelle, pendant le fonctionnement de la machine, ledit élément est en contact sous pression avec le dessous de chaussure, caractérisée en ce que, quand chaque élément (46) est déplacé vers le support de forme (10) de la manière précitée, il est également déplacé de sa première à sa seconde positions de manière que la partie ou chaque partie de bande (168) soit tirée autour du quart de forme du dessous de chaussure, produisant ainsi une force de traction sur l'empeigne avant que les parties marginales de montage de l'empeigne ainsi engagées, soient serrées contre les parties marginales correspondantes de la première.

9. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce que chaque dispositif à bandes de montage (128) de chaque ensemble de montage de côté (16) comporte plusieurs parties de bande (128) associées chacune avec un élément de montage (46).

10. Machine selon l'une quelconque des revendications 1 à 8, caractérisée en ce que les éléments de montage (46) du dispositif à éléments de montage sont disposés par paires, chaque paire étant associée avec une pièce de serrage (72) et une partie de bande du dispositif à bandes de montage étant associée avec chaque paire d'éléments de montage (46).

Patentansprüche

1. Maschine zum Zwicken der Seitenbereiche von Schuhschäften, mit einem Träger (10) für einen Schuhleisten, an welchem ein Schaft, dessen Seitenbereiche zu zwicken sind und eine Innensohle angeordnet sind, wobei zwei Seiten-Zwickanordnungen (16) vorgesehen sind, um auf gegenüberliegende Seitenbereiche eines an dem von dem Träger (10) getragenen Leisten angeordneten Schaftes wirken, wobei jede Seiten-zwickanordnung (16) eine Klemmeinrichtung (72) umfaßt, welche wenigstens ein Klemmglied (72) einschließt, das zu dem Träger (10) bewegbar ist, um einen Seitenbereich des Schaftes gegen seinen Leisten an einer Stelle im Abstand von seiner Nahtlinie zu klemmen, wobei eine Zwick- bzw. Formelementeinrichtung (46) vorgesehen ist, welche eine Vielzahl von Zwickelementen (46) umfaßt, die Seite an Seite angeordnet und einwärts zu dem Träger (10) bewegbar sind, um so zu verursachen, daß Randabschnitte des Seiten-

bereiches des Schaftes über entsprechende Randabschnitte der Innensohle gestreift und dagegen gedrückt werden, wobei eine Zwickbandeinrichtung (128) wenigstens einen Bandabschnitt (128) aus flexiblem Streifenmaterial umfaßt, der so angeordnet ist, daß er zwischen dem Schuhschaft einerseits und den Zwickelementen (46) und den Klemmgliedern (72) andererseits angeordnet werden kann, so daß die Seitenbereiche des Schaftes mit Hilfe der Klemmglieder (72) festgeklemmt werden, welche über die Bandabschnitte (128) wirken, dadurch gekennzeichnet, daß der oder jeder Bandabschnitt (128) von dem Klemmglied bzw. den Klemmgliedern (72) gegen den Seitenbereich des Schaftes unter einem Druck gepreßt werden, der eine Bewegung des Bandabschnittes bzw. der Bandabschnitte (128) in Bezug auf das Klemmglied bzw. die Klemmglieder (72) in Bezug auf die Schuhhöhe in einer Richtung von der oberen Linie zur Nahtlinie nicht verhindert und welche während einer solchen Hochbewegung verursacht, daß der ergriffene Abschnitt des Schaftes auf seinem Leisten in diese Richtung gezogen wird, daß der oder jeder Bandabschnitt (128) einer jeden Seitenzwickanordnung (16) an einem Ende mit den Zwickelementen (46) der Anordnung (16) verbunden ist, so daß eine Einwärtsbewegung der Elemente (46) zu dem Träger (10) wirksam ist, um zu verursachen, daß eine Bewegung des Bandabschnittes bzw. der Bandabschnitte (128) in Bezug auf das Klemmglied bzw. die Klemmglieder (72) erfolgt, so daß eine an dem Schaft angelegte Zugkraft verursacht wird.

2. Maschine nach Anspruch 1, dadurch gekennzeichnet, daß die den Schaft ergreifende Oberfläche eines jeden Bandabschnittes (128) derart ist, daß der Schaft damit in Reibeingriff bringbar ist, um so eine Zugkraft auf den Schaft aufzubringen und daß wenigstens eine entgegengesetzte Fläche des oder eines jeden Bandabschnitts (128) und die Oberfläche des oder eines jeden Klemmgliedes (72), welches diese entgegengesetzte Fläche ergreift, eine Oberfläche geringer Reibung ist.

3. Maschine nach Anspruch 2, dadurch gekennzeichnet, daß der oder jeder Bandabschnitt (128) aus einem laminierten Streifenmaterial mit einer ersten Schicht, welche die den Schaft ergreifende Fläche umfaßt und ausreichend Reibung schafft, um eine Zugkraft auf den davon ergriffenen Schaft aufzubringen, und einer zweiten Schicht besteht, welche eine Oberfläche mit niedriger Reibung umfaßt, welche von dem Klemmglied bzw. den Klemmgliedern (72) ergriffen ist.

4. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der von dem Klemmglied bzw. den Klemmgliedern (72) auf den Bandabschnitt bzw. die Bandabschnitte (128) ausgeübte Haltedruck in der Größenordnung von $13,79 \text{ N/cm}^2$ liegt.

5. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß jedes Klemmglied (72) um eine Achse (136) schwenkbar angeordnet ist, welche sich in Bezug auf die Höhe des Leistens erstreckt.

6. Maschine nach Anspruch 5, dadurch gekennzeichnet, daß die Klemmeinrichtung eine Vielzahl von Klemmgliedern umfaßt und daß die Position einer jeden Achse (136) in Bezug auf sein Klemmglied (72) und auch die Querschnittsausgestaltung eines jeden Klemmgliedes (72) längs der Achse (136) derart sind, daß die Klemmglieder (72) schwenkbar sind, ohne daß benachbarte Glieder (72) in Eingriff kommen.

7. Maschine nach einem der vorhergehenden Ansprüche, wobei eine mit Fluiddruck betätigbare Einrichtung vorgesehen ist, um eine Bewegung des Klemmgliedes bzw. der Klemmglieder (72) einwärts zu dem Leistenträger (10) zu bewirken, wobei im Betrieb dieser Einrichtung damit ebenfalls eine Einwärtsbewegung der Zwickelemente (46) verursacht ist, wobei eine Verriegelungseinrichtung (98, 100, 104, 106) vorgesehen ist, um die Klemmglieder (72) in einer solchen Position zu verriegeln, nachdem sie bewegt sind, um den Bandabschnitt bzw. die Bandabschnitte (128) wie erwähnt zu halten, wobei eine weitere mit Fluiddruck betätigbare Einrichtung dann wirksam ist, um eine weitere Einwärtsbewegung der Zwickelemente (46) zu verursachen, so daß Randabschnitte des Schaftes über entsprechende Randabschnitte der Innensohle gelegt und dagegengepreßt sind, dadurch gekennzeichnet, daß die Verriegelungseinrichtung (98, 100, 104, 106) betätigbar ist, um zu verursachen, daß das Klemmglied bzw. die Klemmglieder gelöst werden, wenn über die Zwickelemente (46) auf die übergelegten Randabschnitte des Schaftes ein Einbettungsdruck aufgebracht ist.

8. Maschine nach einem der vorhergehenden Ansprüche, wobei jedes Zwickelement (46) ebenfalls in Bezug auf den Leistenträger zwischen einer ersten Lage, in welcher eine Druckaufbringfläche im Abstand vom Schuhboden angeordnet ist und einer zweiten Lage bewegbar ist, wobei im Betrieb der Maschine dieses Element mit dem Schuhboden in Preßeingriff steht, dadurch gekennzeichnet, daß wenn jedes Element (46) zu dem Leistenträger (10) bewegt ist, es ebenfalls von seiner ersten in seine zweite Lage bewegt ist, so daß der oder jeder Bandabschnitt (128) um den Nahtrand des Schuhbodens gezogen ist, so daß auf den Schaft vor Eingriff der Randabschnitte des Schaftes eine Zugkraft bewirkt ist, so daß sie gegen entsprechende Randabschnitte der Innensohle gedrückt werden.

9. Maschine nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Zwickbandeinrichtung (128) einer jeden Seitenzwickanordnung (16) eine Vielzahl von Bandabschnitten (128) umfaßt, von denen einer jedem Zwickelement (46) zugeordnet ist.

10. Maschine nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß die Zwickelemente (46) der Zwickelementeneinrichtung paarweise angeordnet sind, daß jedem Paar ein Klemmglied (72) zugeordnet ist und daß ein Bandabschnitt der Zwickbandeinrichtung einem jeden Paar der Zwickelemente (46) zugeordnet ist.

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