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(54) **Side and heel seat lasting machine.**

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Description

This invention is concerned with improvements in or relating to side and heel seat lasting machines.

There is described e.g. in EP-A-0 123 471 a side and heel seat lasting machine comprising a shoe support for supporting, bottom uppermost, a shoe comprising a shoe upper a forepart of which has been lasted to an insole, a holddown member disposed above the shoe support and co-operable therewith to determine the heightwise position of the heel seat region of the shoe and to hold the heel end of the shoe in such heightwise position, heel seat lasting instrumentalities comprising a wiper assembly by which lasting marginal portions of the upper of a shoe held by the shoe support and holddown member can be wiped over and secured to corresponding marginal portions of the insole of such shoe in the heel seat region thereof, and side lasting instrumentalities comprising two side lasting assemblies arranged one at each side of the shoe support and each comprising a wiper arrangement by which lasting marginal portions of the shoe upper can be wiped over and pressed against corresponding marginal portions of the insole, and a fastener-inserting tool by which such over-wiped lasting marginal portions of the upper can thus be secured to the corresponding marginal portions of the insole, the machine further comprising means operable prior to initiation of the operation of the heel seat lasting instrumentalities for moving each side lasting assembly bodily from an out-of-the-way position to an operative position in which the fastener-inserting tool overlies the shoe bottom in the heel breast line region thereof, and means for thereafter effecting relative movement, lengthwise of the shoe, between the shoe support and side lasting assemblies, during which movement the lasting marginal portions of the shoe upper in the side regions thereof are progressively wiped over and pressed against the corresponding marginal portions of the insole.

There is furthermore described in e.g. DE-C-3 448 119 a machine which is generally similar to the machine referred to in the preceding paragraph except that the wiper arrangement in this case comprises a sleeking roll extending transversely of the shoe bottom and having a helical wiping element by which, as the roll rotates, lasting marginal portions of the shoe upper can be wiped over and pressed against corresponding marginal portions of the insole, and in addition each side lasting assembly comprises a finger by which lasting marginal portions of the shoe upper can be engaged in advance of the sleeking roller and be preliminarily folded over the insole edge.

In using either of these machines, in general a satisfactory lasting operation is achieved, the wiper arrangement/sleeking rolls in each case providing a sufficient drafting of the shoe upper to the last, as the lasting marginal portions are wiped over the insole edge, to ensure that the upper is correctly positioned on the shoe last and conformed to it. In some cases, however, and more particularly in cases where the shoe upper has not been correctly cut to the shape of the last, it has been found insufficient merely to rely upon the wipers to ensure that the upper is correctly conformed to the last. In this regard, moreover, one problem which is sometimes met is concerned with the positioning of the stiffener (counter) which is accommodated in the heel end of the shoe upper, it being of importance that this stiffener be correctly located on the last prior to the initiation of the heel seat lasting and/or side lasting operation. In order to ensure that the heel end of the shoe is thus properly accommodated to the shape of the last, in many machines there are provided shoe upper tensioning means in the form of so-called breast line pincers (i.e. pincers which are arranged to operate in the shoe bottom region with which, in the finished shoe, the heel breast is aligned, this region generally being also that by which leading edges of the heel seat wiper assembly are traversed when said assembly closes over the shoe bottom in a heel seat lasting operation), which are operable prior to initiation of the operation of the heel seat lasting instrumentalities, for tensioning the shoe upper about its last by gripping the upstanding lasting marginal portions of the upper in the heel breast line region thereof, together with the ends (or corners) of the standard-sized stiffener, and drawing them upwardly and over the insole edge in said heel breast line region.

One problem encountered in providing pincers, whether at the breast line region or elsewhere, arises because of the amount of space required for accommodating such pincers in conventional side and seat lasting machines. Furthermore, because these pincers comprise two jaws which are necessarily relatively small so that the "mouth" of the open jaws is also restricted, the operator frequently finds difficulty in feeding the marginal portion of the upper into the mouth with the result that the correct feeding is time-consuming, while in the absence of sufficient care and time spent there is always the risk that the marginal portion is incorrectly fed into the jaws or indeed misses the jaws completely. When, furthermore, it is a question of automatically loading the shoe into such a machine, these problems of feeding the marginal portion into the jaws are significantly greater. Quite apart from the problems associated with the feeding of the upper, furthermore, it should be realised that the use of

the breast line pincers as aforesaid is a distinct operation in the machine cycle and serves thus to extend the overall cycle time in that the initiation of operation of the lasting instrumentalities is necessarily delayed thereby for a significant time.

Moreover, in some shoes so-called "long" counters (or stiffeners) are used which extend well into the waist region of the shoe, and when using such counters it may be inappropriate to apply an upward pull at the heel breast line region, since in this way it may be that the counter becomes improperly positioned as a result. Nevertheless, even when using long counters it may sometimes be necessary for an up-drawing operation to take place on the shoe, independently of the wiping operations.

Reference is also made to French Patent Publication No. 2 440 702 in which is disclosed a side and heel seat lasting machine in which a reciprocating wiper arrangement is provided and furthermore said wiper cooperates with a lever whereby, each time the wiper is advanced over the edge of the insole the lasting marginal portion of the upper is trapped, with a slipping grip, between the wiper and the lever so that in each wiping stroke the upper is drawn tightly to the last. Whereas using such an arrangement a "snug" accommodation of the upper to the shape of the last can readily be achieved, it would not be practicable in this machine to utilise this up-drafing arrangement for initially ensuring that the upper, including the heel stiffener, is correctly positioned on its last, since in the machine the heel seat lasting operation takes place prior to initiation of the side lasting operations, and, as will be appreciated, once the heel seat lasting operation has been effected, the position of the heel end of the shoe, including the counter, is firmly fixed and is unaffected by any subsequent side lasting operation.

It is thus the object of the present invention to provide an improved side and heel seat lasting machine of the progressive type wherein the gripping of the marginal portion of each side portion of the upper in the heel breast line region thereof and the tensioning of the upper in said region is facilitated, while the means afforded for such gripping and tensioning on the one hand does not impede the passage of the side lasting instrumentalities during the subsequent side lasting operations, and on the other hand does not require a significant amount of extra time within which the tensioning is to be effected.

With a view to resolving this object, the invention provides a machine as set out hereinafter in Claim 1.

It will thus be appreciated that, by using a counter-abutment to cooperate with the abutment in the manner set out above, the upper is gripped and up-drafted in the same manner as using a breast line pincer, but without any significant time being additionally required, since this operation takes place during the period in which the fastener-inserting tool is moved into its operative position. Furthermore, by the time the tool has reached said position, the side lasting operation can be initiated forthwith, that is to say without any need to return any part of the side lasting instrumentalities to a start position.

Other advantages of the present invention are also to be found in that by the provision of abutments cooperating with counter-abutments as aforesaid, a more reliable gripping and tensioning operation can be performed than is the case with pincers, e.g. breast line pincers of the conventional type, and such greater reliability lends itself to the automatic loading of shoes into the machine.

Also, by the provision of the abutments and counter-abutments at one pre-set locality only (as opposed to along the length of the side portions of the shoe) and further by said abutments having an out-of-the-way position, to which they can be moved after they have effected the gripping and tensioning operation, no problem of impeding the passage of the side lasting assemblies by the abutment means can arise.

Furthermore, by this arrangement a relatively simple construction can be afforded, which is inexpensive to produce and has relatively low space requirements.

In one embodiment of the invention, in which the support is mounted on a support for the hold-down and fixed thereon against movement in the lengthwise direction of the shoe, each counter-abutment is provided by a face of one of the fastener-inserting tools. Alternatively, where each side lasting assembly comprises a sleeking roller extending transversely of the shoe bottom and having a helical wiping element by which, as the roll rotates, lasting marginal portions of the shoe upper can be wiped over and pressed against corresponding marginal portions of the insole, and a finger by which lasting marginal portions of the shoe upper can be engaged in advance of the sleeking roller and be preliminarily folded over the insole edge, each counterabutment is provided by an end face of one of the fingers.

Moreover in this latter embodiment, for enhancing its versatility the support for the abutments may be mounted for movement in the lengthwise direction of the shoe, between two fixed positions, there being provided, in addition to the counter-abutments provided by faces of the fingers, two further counter-abutments provided each by a face of one of the fastener-inserting tools, the arrangement being such that in a first of said fixed operative positions the abutments cooperate with the

counter-abutments and in the second position they cooperate with the further counter-abutments, means being provided for moving the support into a selected one of its fixed positions.

Conveniently the abutments are supported adjacent the holddown in such a manner that they are held out of engagement with the insole. More particularly, preferably the abutments are mounted on a carrier which is mounted on the holddown for sliding movement heightwise of the shoe bottom. In this way the facility is provided of ensuring that the abutments are moved not only inwardly, but also heightwise of the shoe bottom in moving to their out-of-the-way position, so that they can completely clear the path of the side lasting instrumentalities. Furthermore, by holding the abutments out of engagement with the insole even when in their lowered position, it is ensured that, as the abutments yield inwardly, they do not disturb the insole on the last bottom. In this regard, it will of course be appreciated that in the case of flimsy insoles the risk of bowing or crumpling by contact with such abutments would be significant.

Conveniently in the machine in accordance with the invention at the start of a cycle of operation the abutments are moved downwardly towards the shoe bottom while being urged inwardly towards one another, sequence control means being provided for initiating outward transverse movement of the abutments as aforesaid and also for initiating movement of the side lasting assemblies to their operative position in response to such downward movement of the abutments. By the provision of such sequence control means the movement of the abutments and of the fastener-inserting tools are readily coordinated, thereby avoiding any significant time loss in the machine cycle.

In the machine in accordance with the invention, preferably the means for urging the abutments outwardly as aforesaid comprises a single fluid pressure operated cylinder the piston of which is operatively connected to the abutments, means also being provided for adjusting the pressure of the fluid supplied to the cylinder thus to vary the gripping force applied by each abutment and counter-abutment to the upper. Conveniently the connection between the piston and the abutments is by Bowden cable, thereby allowing the operating cylinder to be positioned in a convenient location in the machine frame, leaving only the abutments and their mountings in the operating locality of the machine where space is restricted. Furthermore using a single cylinder enables also a single setting stop to be used, also disposed away from the operating locality of the machine, whereby the limit of outward movement of the abutments can be controlled. In addition, the piston rod of the cylinder may conveniently also carry an actuator for the sequence control means, again disposed away from the restricting area of the operating locality of the machine.

For controlling the sequence of operation of the machine, furthermore, conveniently a sensing finger is mounted on the fastener-inserting tool for engagement with the edge of the shoe, upon which engagement the finger causes a signal to be generated whereby the inward movement of the fastener-inserting tool is caused to be arrested, the tool is caused to be actuated, and the abutment is caused to be moved to its out-of-the-way position.

There now follows a detailed description, to be read with reference to the accompanying drawings, of two embodiments of the invention. It will be appreciated that these embodiments have been selected for description merely by way of non-limiting example of the invention.

In the accompanying drawings:-

Fig. 1 is a front perspective view of a machine in accordance with the invention;

Fig. 2 and Fig. 3 show details of one side lasting assembly of a first embodiment of the machine;

Fig. 4 is a side view of abutment means by which a shoe upper can be tensioned in the heel breast line region, in the operation of the machine;

Fig. 5 is a fragmentary view showing details of a mechanism for operating the abutment means;

Fig. 6 is a fragmentary view of a mechanism by which the abutment means is moved heightwise of the operating locality of the machine;

Fig. 7 is a schematic diagram showing the arrangement of lasting assemblies of a second embodiment of the machine; and

Fig. 8 is a view generally similar to Fig. 4, but showing the facility in the second embodiment for varying the position of the abutments between pre-set locations.

In the first embodiment, the machine for lasting side and heel seat portions of shoes is generally similar, except as hereinafter described, so far as concerns the lasting of heel seat portions, to the machine described in GB-A 2052950, together with the addition of side lasting instrumentalities generally as set out in EP-A-123471, with particular reference to Figs. 5 to 9. Thus, the machine comprises a shoe support 10 mounted for movement about a horizontal axis 12 between a shoe loading position and the operating locality of the machine in which the heel end portion of the shoe is embraced by a heel band 14 forming part of heel seat lasting instrumentalities of the machine, said band determining the lengthwise disposition of the shoe in the machine. The shoe support comprises a heel pin 16 and a toe rest 18 whereby the shoe can be supported bottom up. For determining the heigh-

twise disposition of the shoe in relation to the heel seat lasting instrumentalities, a holddown 20 is provided which is carried on a support 22 (Fig. 4) itself supported on a frame portion 24 of the machine.

The heel seat lasting instrumentalities of the machine comprise a wiper assembly 26, comprising a pair of wiper plates by which marginal portions of a shoe upper can be wiped over and secured to corresponding marginal portions of the insole of the shoe, said assembly and its operation being fully described in the aforementioned GB-A-2052950. In addition, the heel seat lasting instrumentalities comprise fastener-inserting tools generally designated 28 associated with the wiper assembly in such a manner that, after the over-wiping of lasting marginal portions of the upper, said portions are secured to the insole by fasteners driven thereinto.

The machine also comprises side lasting instrumentalities by which opposite side portions of the shoe upper can be wiped over and secured to corresponding marginal portions of the insole, said side lasting instrumentalities comprising two side lasting assemblies generally designated 30, arranged one at each side of the shoe support 10. The two side lasting assemblies are generally the same, save that one is a left-hand and the other a right-hand, and consequently only one of the assemblies 30 will now be described with reference to Figs. 2 and 3; it will be appreciated that these two Figures have been separated in order better to indicate features of the construction of the assembly.

Each side lasting assembly 30 comprises a casting 32 which includes a pivotal mounting 34 by which the assembly 30 is supported on a frame portion 36 of the machine for pivotal movement about a vertical axis whereby the operating elements of the assembly can be caused to move progressively in a direction lengthwise of the shoe bottom whereby, starting from the heel breast line region, a succession of side lasting operations can be effected along the sides of the shoe. For so moving the assembly 30, furthermore, a piston-and-cylinder arrangement 38 is provided, also mounted on a frame portion of the machine, and having associated therewith a so-called "Hydrocheck" control unit 40 by which the speed at which the operating elements are caused to move progressively along the shoe bottom can be controlled.

The casting 32 is provided with a pivot pin 42, extending horizontally and normally to the direction of the axis of the mounting 34 for supporting a main support block 44 of the assembly 30, the arrangement being such that the operating elements of said assembly can thus move heightwise of the bottom of a shoe supported by the shoe support. For effecting such heightwise movement, a piston-and-cylinder arrangement 46 is provided, mounted on the casting 32 and acting upon a rearward end portion of an extension rod 48 projecting from the block 44.

The block 44 supports at its opposite end a piston-and-cylinder arrangement 50 having a piston rod 52 projecting forwardly therefrom (to the left viewing Fig. 2), said rod in turn supporting a block 54 at its forward end. Secured to one side of the block 54 is a support plate 56, while a pivotal mounting 58 is provided therein at the remote side, the axis of said mounting extending in a plane generally parallel to that of the piston rod 52, but being inclined thereto. The pivotal mounting 58 provides support for a carrier 60, which is thus mounted for pivotal movement about said axis, a piston-and-cylinder arrangement 62 being supported by the support plate 56 for effecting such pivotal movement.

The carrier 60 (which is shown on both Fig. 2 and Fig. 3) firstly supports a fastener-inserting tool generally designated 64 (being of the same construction as the tack insertion device 5 described in EP-A-123471), said tool comprising a block 66 in which a fastener (tack) can be received for driving into the shoe, and also in which the leading end of a driver rod 68 is accommodated for driving such fastener. The block 66 also provides a surface 70 which engages the over-wiped lasting marginal portion of the shoe upper to be secured by the fastener. It will be appreciated that the because the fastener-inserting tool 64 can pivot about the axis of the pivotal mounting 58 the block 66 can be oriented according to the contour of the shoe bottom, especially in the case of ladies high heeled shoes, it being of course desirable that the tacks are driven perpendicularly, or substantially so, into the shoe bottom.

Also supported by the carrier 60 is a bracket member 72 (Fig. 3) supporting a pivot pin 74 on which a wiper arrangement generally designated 76 is supported, a damping cylinder 78 being mounted on the bracket member 72 and acting on a block 80 forming part of the wiper arrangement. The wiper arrangement is generally the same as that described in EP-A-123471 (the pivot pin 74 corresponding to the pin 15 in the earlier case).

The wiper arrangement 76 thus comprises a wiper element 82 which is movable in a direction transversely of the bottom of a shoe supported by the shoe support 10 under the action of a piston-and-cylinder arrangement 84 supported on a block pivotal on the pin 74. Attached to the wiper element 82 is one end of a lasting band 88 which passes over a roll 90 and the opposite end of which is connected to the piston rod 92 of a piston-

and-cylinder arrangement 94, which thus acts as an air spring to maintain the tension in the lasting band 88. The roll 90 is carried by a lever 96 pivoted on a pin 98 carried by the block 86, and operatively connected to an intermediate portion of the lever 96 is the piston rod 100 of a piston-and-cylinder arrangement 102 whereby the roll 90 can be caused to move, about the pin 98, towards and away from a shoe being operated upon. In this way, it is ensured that the lasting band "wraps around" the whole of the side portion of the shoe engaged thereby.

It will be appreciated that the side lasting instrumentalities as so far described differ essentially from those described in EP-A-123471 only in that the operating elements 64, 76 are generally movable in a direction transversely of the bottom of a shoe supported by the shoe support 10, such movement enabling the elements to be moved from an initial, out-of-the-way position into an operative position in which the fastener-inserting tool 64 overlies the marginal portions of the shoe bottom.

For determining such operative position, the machine in accordance with the present invention comprises a sensing finger 104 which is pivotally mounted on an extension of the block 66. The finger has a camming surface 106 by which a side portion of the shoe can be engaged, the arrangement being such that because of the inclination of said surface the finger is cammed sideways about its pivot upon such engagement. The opposite end of the finger 104 constitutes an actuator for a microswitch 108 which, when actuated, generates a signal to terminate inward movement of the operating elements 64, 76 under the action of the piston-and-cylinder arrangement 50. It will thus be appreciated that, by the provision of the sensing finger 104, the operative position of the fastener-inserting tool 64 is now accurately determined in relation to the edge of the shoe bottom.

The machine in accordance with the present invention also comprises means for tensioning the upper about its last when the side lasting assemblies are first moved to their operative position as aforesaid, that is to say the tensioning takes place in the heel breast line region, such tensioning being effected prior to the side lasting operations being initiated. To this end, said means comprises abutment means generally designated 110 which co-operate with the block 66 of the fastener-inserting tool 64 to trap the marginal portion of the shoe upper, in the heel breast line region thereof, with a slipping grip and draw it over the insole edge during the movement of said tool inwardly to its operative position. The abutment means 110 comprises two abutments 112, one associated with each side lasting assembly 30. Each abutment 112 which is constituted by a lower end portion of a lever 114 pivotal about a pivot pin 116 extending generally lengthwise of the bottom of a shoe supported by the shoe support 10, so that the abutments 112 are movable transversely of the shoe bottom. The pivot pins 116 are mounted in a block 118 which will be referred to hereinafter. For pivoting each abutment 112 about its pin 116, an upper end of each lever 114 carries a block 120 to which is connected one end of a Bowden cable 122, the sheath 124 of which is secured by a bracket 126 to the block 118. The other end of each Bowden cable 122 is connected to a cross-member 128 (Fig. 5), one at each end thereto, said cross-member being supported on a piston rod 130 of a piston-and-cylinder arrangement 132. This arrangement 132 is mounted on a machine frame portion remote from the operating locality of the machine. For limiting the stroke of the piston rod 130, and thus the outward movement of each abutment 112, an adjustable stop screw 134 is mounted on a block 136 carried by the piston rod 130, said screw being engagable with a mounting plate 138 on which the piston-and-cylinder arrangement 132 and the cross-member 128 are mounted. It will thus be appreciated that, under the control of piston-and-cylinder arrangement 132, each abutment 112 is movable transversely of the shoe bottom outwardly into an advanced, operative position for trapping the marginal portion of the shoe upper as aforesaid against the block 66, a leading surface portion 66a of which thus constitutes a counter-abutment, and is also retractable to an inward position.

The abutments 112 are also mounted for heightwise movement relative to the shoe bottom between such inward position and a retracted, out-of-the-way position, in which they will in no way interfere with the operation of the side lasting instrumentalities. To this end, the block 118 is mounted for sliding movement on a front face of a block 140 forming part of the support for the holddown 20. For moving the block 118, furthermore, one end of a Bowden cable 142 is secured thereto, the sheath 144 of which is secured to the holddown support. The opposite end of the Bowden cable 142 is secured to a piston rod 146 (Fig. 6) of a piston-and-cylinder arrangement 148, the sheath 144 being connected to a bracket 150 secured to a frame portion of the machine. Thus, operation of the piston-and-cylinder arrangement 148 is effective to move the block 118 and thus the abutments 112 heightwise of the shoe bottom. It will of course be appreciated that such heightwise movement does not interfere with the mechanism for effecting transverse movement of each abutment. The piston-and-cylinder arrangement 148 is also mounted on said frame portion, and because of the use of the Bowden cable 142, such mounting is again remote from the operating locality of the machine.

Furthermore, by mounting the abutments on the holddown support, it can be ensured that they can be positioned spaced from the insole by a small distance when in their inward and operative positions and when moving therebetween (see Fig. 4).

In the operation of the machine in accordance with the invention, after a shoe has been placed upon the shoe support 10 while the latter is in its loading position, in sequence the shoe support 10 is swung into its operative position, determined by engagement of the heel end of the shoe with the heel band 14 and further is moved heightwise to bring the heel seat region thereof into engagement with the holddown 20. Thereupon, piston-and-cylinder arrangement 148 is actuated to move the abutments 112 downwardly from their out-of-the-way position towards their inward position. This position is achieved at the end of a full stroke of the piston-and-cylinder arrangement 148. The piston rod 146 of said arrangement 148 carries an actuator 152 for a valve 154 forming part of sequence control means of the machine in accordance with the invention. The valve 154 is actuated before the stroke of the arrangement 148 is completed and is effective to initiate outward transverse movement of the abutments 112. In addition, the valve 154 signals the piston-and-cylinder arrangements 50 whereby the side lasting assemblies are moved to their operative position. It will be recalled that this operative position is determined by engagement of the sensing fingers 104 with edges of the shoe bottom. As the side lasting assembly 30 is moved to its operative position, firstly the leading surface 66a of the block 66 of the fastener-inserting tool 64 engages the lasting marginal portion of the shoe upper in the heel breast line region thereof and at the same time the abutment 112 is moved outwardly to engage the opposite side of such lasting marginal portion whereby said portion is trapped between the abutment 112 and the counter-abutment provided by said surface 66a. As the fastener-inserting tool 64 continues its inward movement, the abutment 112 yields inwardly, the pressure applied to the trapped marginal portion being such that it is drawn tightly over the insole edge, especially in the heel breast line region. By adjusting the pressure of the fluid (air) supplied to the piston-and-cylinder arrangement 132, it is possible to vary the force of the slipping grip on the lasting marginal portion, and thus to control the degree to which the upper is tensioned; in general a relatively heavy pressure may be applied to heavy shoes, e.g. men's shoes, while a relatively light pressure will usually be applied to shoes of lighter material, e.g. a ladies' fashion shoe.

As the side lasting assemblies 30 are moved inwardly as aforesaid, fluid (air) under pressure is also supplied to piston-and-cylinder arrangements 84, 102 whereby the lasting bands 88 are caused to be moved inwardly relative to the tools 64 thus to engage side portions of the shoe adjacent the heel breast line region thereof and also to wipe the lasting marginal portion, in the region toewardly of the tools 64, thus to clamp the lasting marginal portions as they are drawn over the insole edge between the abutments 112 and the counter-abutments 66a, until the fastener-inserting operation has been completed.

As above mentioned, upon engagement of each of the sensing fingers 104 with the edge of the shoe, the inward movement of its associated side lasting assembly 30 is arrested. Furthermore, upon engagement of both sensing fingers 104 as aforesaid, i.e. when both assemblies 30 have reached their operative position, a signal is generated from the microswitches 108 in response to which each fastener-inserting tool 64 is actuated and at the same time fluid (air) under pressure is supplied to piston-and-cylinder 148 to cause the abutments (112), now moved by engagement by the tools back into their inward position or substantially so, to be retracted to their out-of-the-way position heightwise of the shoe bottom, the piston-and-cylinder 132 at the same time being exhausted.

The side lasting operations are then continued along the side portions of the shoe as described in EP-A-123471.

Whereas in the machine described above, the counter-abutments co-operating with the abutments 112 are constituted by surfaces on the blocks 66 of the fastener-inserting tool 64, if desired the abutments may be elongated so as to extend forwardly of the counter-abutments 66a provided by said blocks 66 so as to co-operate also with the portions of the lasting bands 88 adjacent the wiper elements 82, thereby affording an extending area over which the gripping of the lasting marginal portion is effected.

In the second embodiment the machine is generally similar to that of the first embodiment, except that the wiper arrangement 76 of each side lasting assembly of the latter is replaced by a so-called sleeking roll 176 (Fig. 7) which extends transversely of the shoe bottom. Each roll 176, which may be cylindrical or frusto-conical, has a helical wiping element 176a on its surface such that, as the roll rotates, the element effects an inwiping action on the marginal portion of the upper engaged thereby. The operation of such rolls is well known and conventional: see e.g. DE-C-1817915 and US-A-3908216.

In addition there is associated with each roll a non-rotary finger 178 which extends inwardly over the shoe bottom and engages the lasting margin of the upper in advance of the roll 176 to afford a

preliminary folding of said margin over the insole edge. The position of each finger 178 is adjustable as to its inclination both heightwise and widthwise of the shoe bottom.

Each finger 178 has a surface portion 178a providing a further counter-abutment which can co-operate with the abutment 112 associated therewith. In the second embodiment the abutments 112 have a plurality of (in this case two) pre-set locations, in a first of which they co-operate with the counter-abutments provided by the surface portions 66a of the blocks 66, and in a second of which they co-operate with the further counter-abutments provided by the fingers 178. To this end, in the second embodiment a block 118′ (Fig. 8) is slidably mounted on the front face of the block 140 and is bifurcated to receive between its "arms" a further block 118a which is mounted for sliding movement by means of pin-and-slot connections 180,181, said further block supporting the levers 114 by the pivot pins 116. In addition, power means (not shown but comprising a remote piston-and-cylinder unit acting through a Bowden cable 182) is provided for effecting such movement of the further block 118a thus to move the abutments 112 between their pre-set locations, such movement being in a direction extending lengthwise of the shoe bottom. By provision of suitable stop means, the two pre-set locations for the abutments 112 can be determined.

It will be appreciated that the operation of the second embodiment is generally similar to that of the first described above, save that the operator must first make a selection of the position of the abutments 112, in accordance with the particular construction of shoe being operated upon.

Claims

1. Side and heel seat lasting machine comprising

a shoe support (10) for supporting, bottom uppermost, a shoe comprising a shoe upper a forepart of which has been lasted to an insole,

a holddown member (20) disposed above the shoe support (10) and co-operable therewith to determine the heightwise position of the heel seat region of the shoe and to hold the heel end of the shoe in such heightwise position,

heel seat lasting instrumentalities (14,26) comprising a wiper assembly (26) by which lasting marginal portions of the upper of a shoe held by the shoe support (10) and holddown member (20) can be wiped over and secured to corresponding marginal portions of the insole of such shoe in the heel seat region thereof, and

side lasting instrumentalities (30;30') comprising two side lasting assemblies (30;30') arranged one at each side of the shoe support (10) and each comprising

a wiper arrangement (76; 176,178) by which lasting marginal portions of the shoe upper can be wiped over and pressed against corresponding marginal portions of the insole, and

a fastener-inserting tool (64) by which such over-wiped lasting marginal portions of the upper can then be secured to the corresponding marginal portions of the insole,

the machine further comprising

shoe upper tensioning means (112 to 136), operable prior to initiation of the operation of the heel seat lasting instrumentalities, for tensioning the shoe upper about its last by gripping and drawing the upper over the insole edge in the heel breast line region thereof, and

drive means (50) also operable prior to initiation of the operation of the heel seat lasting instrumentalities for moving each side lasting assembly bodily from an out-of-the-way position to an operative position in which the fastener-inserting tool (64) overlies the shoe bottom in the heel breast line region thereof, and

means (38,40) for thereafter effecting relative movement, lengthwise of the shoe, between the shoe support (10) and side lasting assemblies (30;30'), during which movement the lasting marginal portions of the shoe upper in the side regions thereof are progressively wiped over and pressed against the corresponding marginal portions of the insole,

characterised in that the shoe upper tensioning means (112 to 136) comprises

two abutments (112), one co-operable with each side lasting assembly (30;30') and each mounted on a support (118;118a) which is mounted for movement heightwise of the shoe into an operative position which is fixed in the lengthwise direction of the shoe, each abutment (112) being disposed above the shoe support (10), and

actuator means (120 to 132), operable when the drive means (50) is actuated to move the side lasting assemblies (30;30') to their operative positions, for resiliently urging each abutment (112) transversely of the shoe bottom from an inward, retracted, position outwardly to enable a lasting marginal portion of the shoe upper to be trapped thereby against a counter-abutment (66a;178a) provided by the inwardly moving side lasting assembly (30;30'), the arrangement being such that, following engagement with said counter-abutment, the abutment (112) is also moved in-

wardly, against the action of the actuator means (120 to 132), thus applying a slipping grip to the trapped upper,

and in that means (142 to 150) is provided, operable when the side lasting assemblies (30;30') have reached their operative positions, for moving the abutments (112) out of their fixed operative position to an out-of-the-way position and for retaining them out of the way for the remainder of the operating cycle of the machine.

2. Machine according to Claim 1 characterised in that the support (118) is mounted on a support (140) for the holddown (20) and fixed thereon against movement in the lengthwise direction of the shoe, and in that each counter-abutment (66a) is provided by a face of one of the fastener-inserting tools (64).

3. Machine according to Claim 1 wherein each side lasting assembly (30') comprises

a sleeking roller (176) extending transversely of the shoe bottom and having a helical wiping element (176a) by which, as the roll rotates, lasting marginal portions of the shoe upper can be wiped over and pressed against corresponding marginal portions of the insole, and

a finger (178) by which lasting marginal portions of the shoe upper can be engaged in advance of the sleeking roller (176) and be preliminarily folded over the insole edge,
characterised in that each counter-abutment (178a) is provided by an end face of one of the fingers (178).

4. Machine according to Claim 3 characterised in that the support (118a) for the abutments (112) is mounted for movement, in the lengthwise direction of the shoe, between two fixed operative positions,
in that in addition to the counter-abutments (178a) provided by faces of the fingers (178) two further counter-abutments (66a) are provided, each by a face of one of the fastener-inserting tools (64),
and in that in a first of said fixed operative positions the abutments (112) cooperate with the counter-abutments (178a) and in the second position they cooperate with the further counter-abutments (66a),

means being (180,181,182) being provided for moving the support (118a) into a selected one of its fixed positions.

5. Machine according to any one of the preceding Claims characterised in that at the start of a cycle of operation the abutments (112) are moved downwardly towards the shoe bottom while being urged inwardly towards one another, sequence control means (154) being provided for initiating outward transverse movement of the abutments (112) as aforesaid and also for initiating movement of the side lasting assemblies (30;30') to their operative positions in response to such downward movement of the abutments (112).

6. Machine according to any one of the preceding Claims characterised in that a sensing finger (104) is mounted on each fastener-inserting tool (64) for engagement with the edge of the shoe, upon which engagement the finger causes a signal to be generated whereby the inward movement of the fastener-inserting tool (64) is caused to be arrested, the tool is caused to be actuated, and the abutment (112) is caused to be moved to its out-of-the-way position.

Patentansprüche

1. Seiten- und Fersensitz-Zwickmaschine, die folgendes umfaßt:

eine Schuhstütze (10) zum Stützen eines Schuhs mit nach oben gekehrter Unterseite, der einen Schuhschaft umfaßt, von dem ein Vorderteil an eine Brandsohle gezwickt worden ist,

eine Niederhalteglied (20), das über der Schuhstütze (10) angeordnet ist und damit zusammenwirken kann, um die höhenmäßige Position des Fersensitzbereiches des Schuhs festzulegen und um das Fersenende des Schuhs in einer solchen höhenmäßigen Position zu halten,

Fersensitz-Zwickinstrumente (14, 26), die einen Wischvorrichtungs-Aufbau (26) umfassen, mittels dessen Zwick-Randabschnitte des Schaftes eines Schuhs, der von der Schuhstütze (10) und vom Niederhalteglied (20) gehalten wird, im Bereich seines Fersensitzes über entsprechende Randabschnitte der Brandsohle eines solchen Schuhs wischend bewegt und daran befestigt werden können, und

Seiten-Zwickinstrumente (30; 30'), die zwei Seiten-Zwickaufbauten (30; 30') umfassen, die so angeordnet sind, daß sich an jeder Seite der Schuhstütze (10) eine befindet, und die jeweils folgendes umfassen:

eine Wischvorrichtungs-Anordnung (76; 176, 178), mittels derer Zwick-Randabschnitte des Schuhschaftes über entsprechende Randabschnitte der Brandsohle wischend bewegt und dagegen gepreßt werden können, und

ein Verbindeelemente-Einsetzwerkzeug (64), mittels dessen solche wischend herüberbewegten Zwick-Randabschnitte des Schaftes dann an den entsprechenden Randabschnitten der Brandsohle befestigt werden können,
wobei die Maschine ferner folgendes umfaßt:

Schuhschaft-Spannvorrichtungen (112 bis 136), die vor dem In-Gang-Setzen des Betriebs der Fersensitz-Zwickinstrumente betrieben werden können, zum Spannen des Schuhschaftes um seinen Leisten, indem der Schaft gegriffen und über die Brandsohlenkante in dessen Absatz-Brustlinienbereich gezogen wird, und

eine Antriebsvorrichtung (50), die ebenfalls vor dem In-Gang-Setzen des Betriebs der Fersensitz-Zwickinstrumente betrieben werden kann, zum physischen Bewegen eines jeden Seiten-Zwickaufbaus aus einer aus-dem-Weg-Position in eine Betriebsposition, in der das Verbindeelemente-Einsetzwerkzeug (64) die Schuhunterseite in dessen Absatz-Brustlinienbereich überlagert, und

Vorrichtungen (38, 40) zum nachfolgenden Ausführen einer Relativbewegung längs des Schuhs zwischen der Schuhstütze (10) und den Seiten-Zwickaufbauten (30; 30'), währenddessen die Zwick-Randabschnitte des Schuhschaftes in dessen Seitenbereichen fortschreitend über die entsprechenden Randabschnitte der Brandsohle wischend bewegt und dagegen gepreßt werden,
dadurch gekennzeichnet, daß die Schuhschaft-Spannvorrichtungen (112 bis 136) folgendes umfassen:

zwei Anstoßeinrichtungen (112), von denen jeweils eine mit einem Seiten-Zwickaufbau (30; 30') zusammenwirken kann und jede an einer Stütze (118; 118a) gehaltert ist, die für eine Bewegung höhenmäßig relativ zum Schuh in eine Betriebsposition gehaltert ist, die in der Längsrichtung des Schuhs fest ist, wobei eine jede der Anstoßeinrichtungen (112) über der Schuhstütze (10) angeordnet ist, und

Betätigungsvorrichtungen (120 bis 132), die betrieben werden können, wenn die Antriebsvorrichtung (50) betätigt wird, um die Seiten-Zwickaufbauten (30; 30') in ihre Betriebspositionen zu bewegen, zum elastischen Drängen einer jeden Anstoßeinrichtung (112) quer zur Schuhunterseite aus einer innengerichteten, eingezogenen Position nach außen, um es zu ermöglichen, daß ein Zwick-Randabschnitt des Schuhschaftes dadurch gegen eine Gegen-Anstoßeinrichtung(66a; 178a) festgehalten wird, die von dem sich nach innen bewegenden Seiten-Zwickaufbau (30; 30') bereitgestellt wird, wobei die Anordnung eine solche ist, daß die Anstoßeinrichtung (112) nach dem In-Eingriff-Kommen mit der Gegen-Anstoßeinrichtung ebenfalls, gegen die Wirkung der Betätigungsvorrichtungen (120 bis 132), nach innen bewegt wird und so einen rutschenden Griff auf den festgehaltenen Schaft ausübt,

und daß Vorrichtungen (142 bis 150), die betrieben werden können, wenn die Seiten-Zwickaufbauten (30; 30') ihre Betriebspositionen erreicht haben, dafür vorgesehen sind, die Anstoßeinrichtungen (112) aus ihrer festen Betriebsposition in eine aus-dem-Weg-Position zu bewegen, und dafür, sie für den Rest des Betriebszyklus der Maschine aus dem Weg zu halten.

2. Maschine gemäß Anspruch 1, dadurch gekennzeichnet, daß die Stütze (118) an einer Stütze (140) für das Niederhalteglied (20) gehaltert und daran gegen Bewegung in der Längsrichtung des Schuhs befestigt ist,
und daß eine jede Gegen-Anstoßeinrichtung (66a) in Gestalt einer Fläche eines der Verbindeelemente-Einsetzwerkzeuge (64) vorgesehen ist.

3. Maschine gemäß Anspruch 1, bei der jeder Seiten-Zwickaufbau (30') folgendes umfaßt:

eine Glättrolle (176), die sich quer zur Schuhunterseite erstreckt und ein schraubenförmiges Wischelement (176a) aufweist, mittels dessen, während sich die Rolle dreht, Zwick-Randabschnitte des Schuhschaftes über entsprechende Randabschnitte der Brandsohle wischend bewegt und dagegen gepreßt werden können, und

einen Finger (178), mittels dessen Zwick-Randabschnitte des Schuhschaftes vor der Glättrolle (176) in Eingriff genommen werden können und vorbereitend über die Brandsohlenkante gefaltet werden können,
dadurch gekennzeichnet, daß jede Gegen-Anstoßeinrichtung (178a) in Gestalt einer Stirnfläche eines der Finger (178) vorgesehen ist.

4. Maschine gemäß Anspruch 3, dadurch gekennzeichnet, daß die Stütze (118a) für die Anstoßeinrichtungen (112) für Bewegung in der Längsrichtung des Schuhs zwischen zwei festen Betriebspositionen gehaltert ist,
daß zusätzlich zu den Gegen-Anstoßeinrichtungen (178a), die in Gestalt von Flächen der Finger (178) vorgesehen werden, zwei weitere Gegen-Anstoßeinrichtungen (66a) jeweils in Gestalt einer Fläche einer der Verbindeelemente-Einsetzwerkzeuge (64) vorgesehen sind,
und daß die Anstoßeinrichtungen (112) in einer

ersten der festen Betriebspositionen mit den Gegen-Anstoßeinrichtungen (178a) zusammenwirken und sie in der zweiten Position mit den weiteren Gegen-Anstoßeinrichtungen (66a) zusammenwirken,

wobei Vorrichtungen (180, 181, 182) zum Bewegen der Stütze (118a) in eine ausgewählte seiner festen Positionen vorgesehen sind.

5. Maschine gemäß einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß zu Beginn eines Betriebszyklus die Anstoßeinrichtungen (112) nach unten auf die Schuhunterseite zu bewegt werden, während sie nach innen aufeinander zu gedrängt werden, wobei Abfolgesteuereinrichtungen (154) zum In-Gang-Setzen einer Querbewegung nach außen der Anstoßeinrichtungen (112) wie oben gesagt und auch zum auf eine solche Bewegung nach unten der Anstoßeinrichtungen (112) ansprechenden In-Gang-Setzen einer Bewegung der Seiten-Zwickaufbauten (30; 30') in ihre Betriebspositionen vorgesehen sind.

6. Maschine gemäß einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß ein Tastfinger (104) dafür an einem jeden Verbindeelemente-Einsetzwerkzeug (64) gehaltert ist, daß er die Kante des Schuhs in Eingriff nimmt, woraufhin der Finger die Erzeugung eines Signals veranlaßt, wodurch das Anhalten der Bewegung nach innen des Verbindeelemente-Einsetzwerkzeugs (64) veranlaßt wird, die Betätigung des Werkzeugs veranlaßt wird und die Bewegung der Anstoßeinrichtung (112) in ihre aus-dem-Weg-Position veranlaßt wird.

Revendications

1. Machine à monter les flancs et la partie talon, comprenant

un support (10) de chaussure destiné à supporter, en position retournée, une chaussure comprenant une tige de chaussure dont une partie antérieure a été montée sur une première,

un membre de maintien (20) disposé au-dessus du support (10) de chaussure et capable de coopération avec celui-ci afin de déterminer la position en hauteur de la région de la partie talon de la chaussure et de maintenir l'extrémité à talon de la chaussure dans une telle position en hauteur,

des instruments à monter (14, 26) la partie talon comprenant un ensemble à balayeur (26) grâce auquel les portions marginales à monter de la tige d'une chaussure maintenue par le support (10) de chaussure et le membre de maintien (20) peuvent être entraînées par balayage sur et fixées à des portions marginales correspondantes de la première de cette chaussure dans la région de la partie talon de celle-ci, et

des instruments à monter les flancs (30 ; 30') comprenant deux ensembles à monter les flancs (30 ; 30') agencés un de chaque côté du support (10) de chaussure et chacun comprenant

un agencement à balayeur (76; 176, 178) grâce auquel les portions marginales à monter de la tige de chaussure peuvent être entraînées par balayage sur et pressées contre des portions marginales correspondantes de la première, et

un outil (64) d'insertion de fixation grâce auquel ces portions marginales à monter entraînées par balayage de la tige peuvent être alors fixées aux portions marginales correspondantes de la première,

la machine comprenant en outre

un moyen de mise en tension de la tige (112 à 136), actionnable avant l'amorce du fonctionnement des instruments à monter la partie talon, destiné à tendre la tige de chaussure autour de sa forme métallique en serrant et tirant la tige sur le bord de la première dans la région de ligne de séparation du talon de celle-ci, et

un moyen d'entraînement (50) également actionnable avant l'amorce du fonctionnement des instruments à monter la partie talon destiné à déplacer chaque ensemble à monter les flancs physiquement depuis une position écartée à une position de travail dans laquelle l'outil (64) d'insertion de fixation surplombe le fond de la chaussure dans la région de ligne de séparation du talon de celle-ci, et

un moyen (38, 40) destiné à effectuer par la suite un mouvement relatif, dans le sens de la longueur de la chaussure, entre le support (10) de chaussure et les ensembles à monter les flancs (30 ; 30'), mouvement pendant lequel les portions marginales à monter de la tige de chaussure dans les régions de flanc de celle-ci sont progressivement entraînées par balayage sur et pressées contre les portions marginales correspondantes de la première,

caractérisée en ce que le moyen de mise en tension de la tige de chaussure (112 à 136) comprend

deux épaulements (112), l'un capable de coopération avec chaque ensemble à monter les flancs (30 ; 30') et chacun monté sur un support (118 ; 118a) qui est monté pour effectuer un mouvement dans le sens de la hauteur

de la chaussure en une position de travail qui est fixe dans le sens de la longueur de la chaussure, chaque épaulement (112) étant disposé au-dessus du support (10) de chaussure, et

un moyen actuateur (120 à 132), actionnable lorsque le moyen d'entraînement (50) est actionné afin de déplacer les ensembles à monter les flancs (30 ; 30') en leur position de travail, destiné à solliciter de manière élastique chaque épaulement (112) transversalement par rapport au fond de la chaussure depuis une position vers l'intérieur, rétractée, en direction de l'extérieur afin de permettre à une portion marginale à monter de la tige de chaussure d'être retenue de cette façon contre un contre-épaulement 66a ; 178a) prévu par l'ensemble à monter les flancs mobile (30 ; 30') en direction de l'intérieur, l'agencement étant tel que, après l'engagement avec ledit contreépaulement, l'épaulement (112) est également déplacé en direction de l'intérieur, contre l'action du moyen actuateur (120 à 132), appliquant ainsi une prise à glissement sur la tige retenue,

et en ce qu'un moyen (142 à 150) est prévu, actionnable lorsque les ensembles à monter les flancs (30 ; 30') ont atteint leur position de travail, destiné à déplacer les épaulements (112) hors de leur position de travail fixe en une position écartée et destiné à les maintenir à l'écart pendant le reste du cycle de fonctionnement de la machine.

2. Machine selon la revendication 1, caractérisée en ce que le support (118) est monté sur un support (140) pour le membre de maintien (20) et fixé sur celui-ci pour ne pas se déplacer dans le sens de la longueur de la chaussure,
et en ce que chaque contre-épaulement (66a) est prévu par une face de l'un des outils (64) d'insertion de fixation.

3. Machine selon la revendication 1, dans laquelle chaque ensemble à monter les flancs (30') comprend

un rouleau de lissage (176) s'étendant transversalement par rapport au fond de la chaussure et présentant un élément hélicoïdal (176a) d'entraînement par balayage grâce auquel, lorsque le rouleau tourne, les portions marginales à monter de la tige de chaussure peuvent être entraînées par balayage sur et pressées contre des portions marginales correspondantes de la première, et

un doigt (178) grâce auquel les portions marginales à monter de la tige de chaussure peuvent être engagées en avant du rouleau de lissage (176) et être pliées de manière préliminaire sur le bord de la première,
caractérisée en ce que chaque contre-épaulement (178a) est prévu par une face d'extrémité de l'un des doigts (178).

4. Machine selon la revendication 3, caractérisée en ce que le support (118a) pour les épaulements (112) est monté pour effectuer un mouvement, dans le sens de la longueur de la chaussure, entre deux positions de travail fixes,
en ce que en plus des contre-épaulements (178a) prévus par des faces des doigts (178) deux contre-épaulements supplémentaires (66a) sont prévus, chacun par une face de l'un des outils (64) d'insertion de fixation,
et en ce que dans la première desdites positions de travail fixes l'épaulement (112) coopère avec les contre-épaulements (178a) et dans la seconde position ils coopèrent avec les contre-épaulements supplémentaires (66a),

un moyen (180, 181, 182) étant prévu destiné à déplacer le support (118a) dans une position sélectionnée parmi ses positions fixes.

5. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce qu'au début d'un cycle de fonctionnement les épaulements (112) sont déplacés vers le bas en direction du fond de chaussure tout en étant sollicités vers l'intérieur en direction les uns des autres, un moyen de commande de séquence (154) étant prévu destiné à amorcer un mouvement transversal vers l'extérieur des épaulements (112) comme susmentionné et également destiné à amorcer un mouvement des ensembles à monter les flancs (30 ; 30') en leur position de travail en réponse a ce mouvement vers le bas des épaulements (112).

6. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce qu'un doigt palpeur (104) est monté sur chaque outil (64) d'insertion de fixation destiné à un engagement avec le bord de la chaussure, engagement lors duquel le doigt provoque la génération d'un signal grâce auquel l'arrêt du mouvement vers l'intérieur de l'outil (64) d'insertion de fixation est provoqué, l'actuation de l'outil est provoquée, et le déplacement des épaulements (112) en leur position écartée est provoqué.

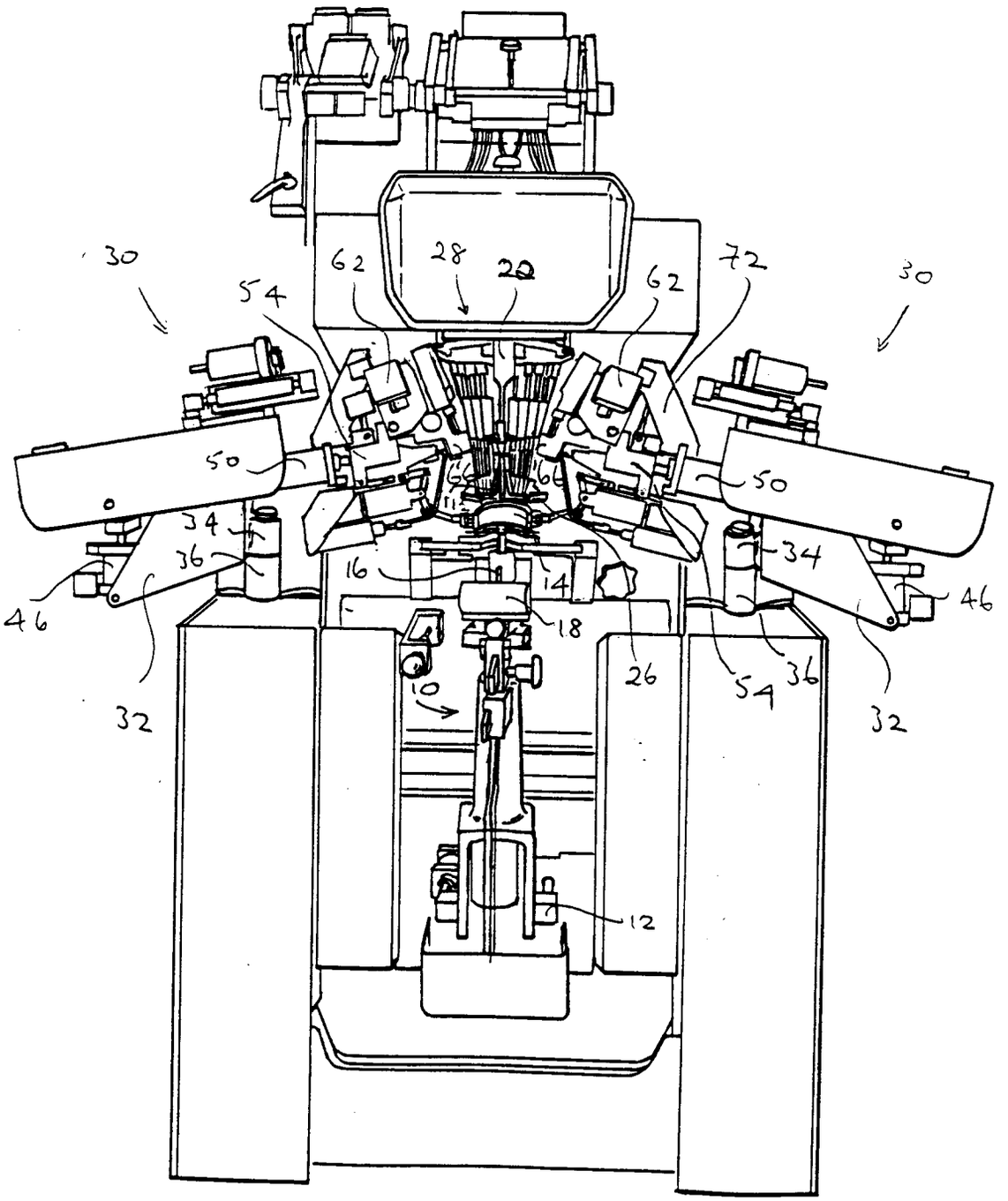
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Fig. 1

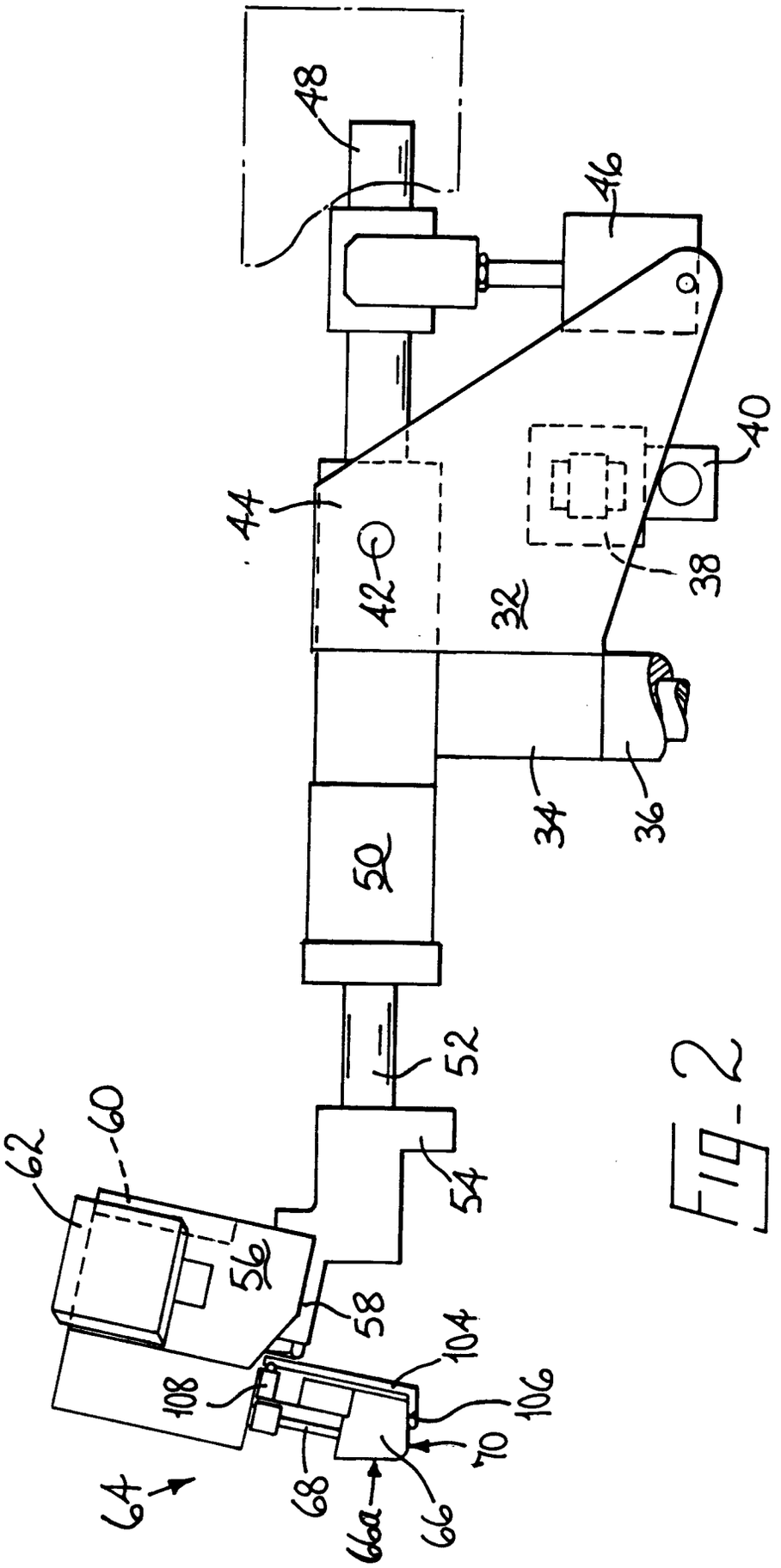
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FIG-2

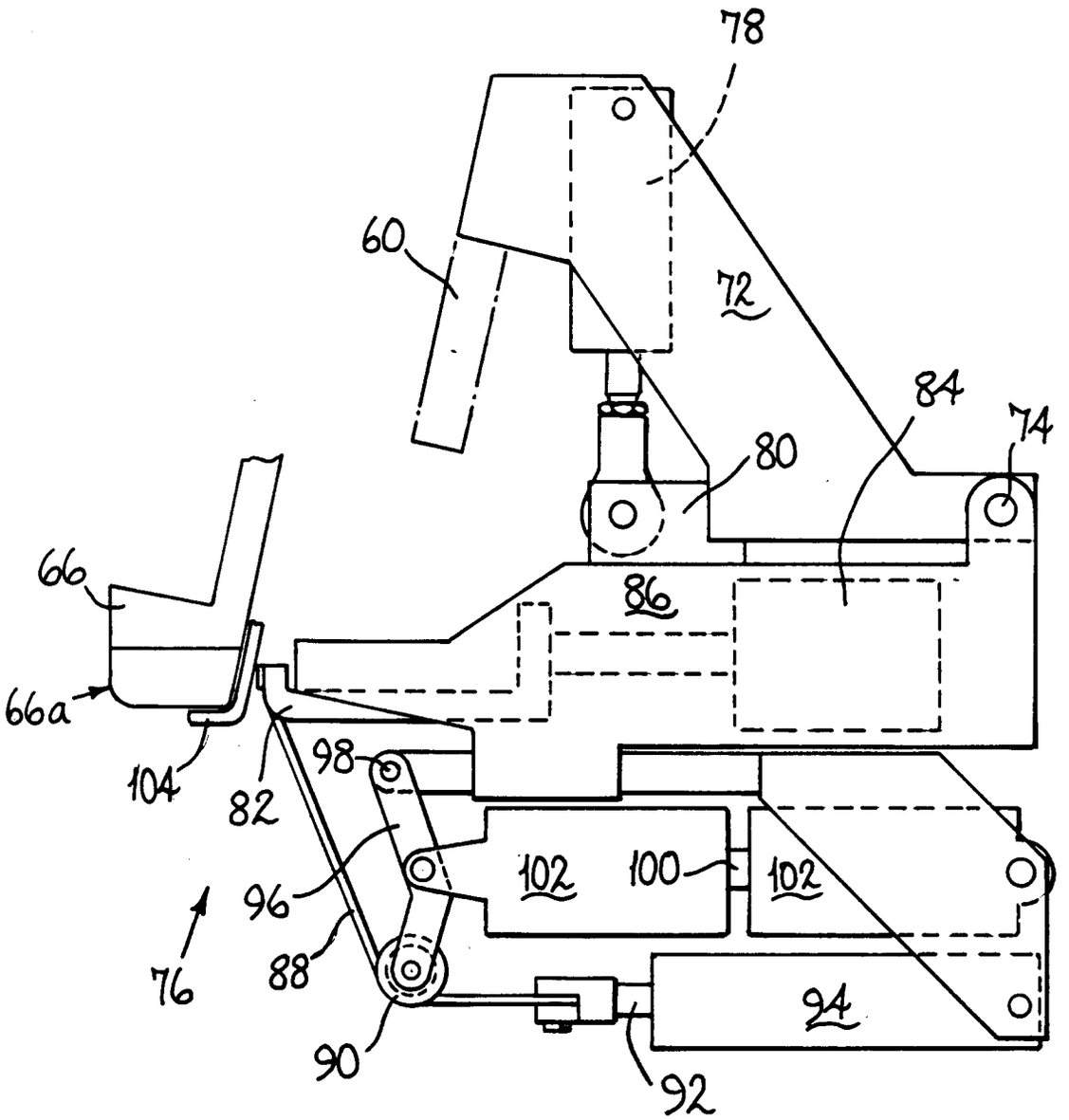

Fig. 3

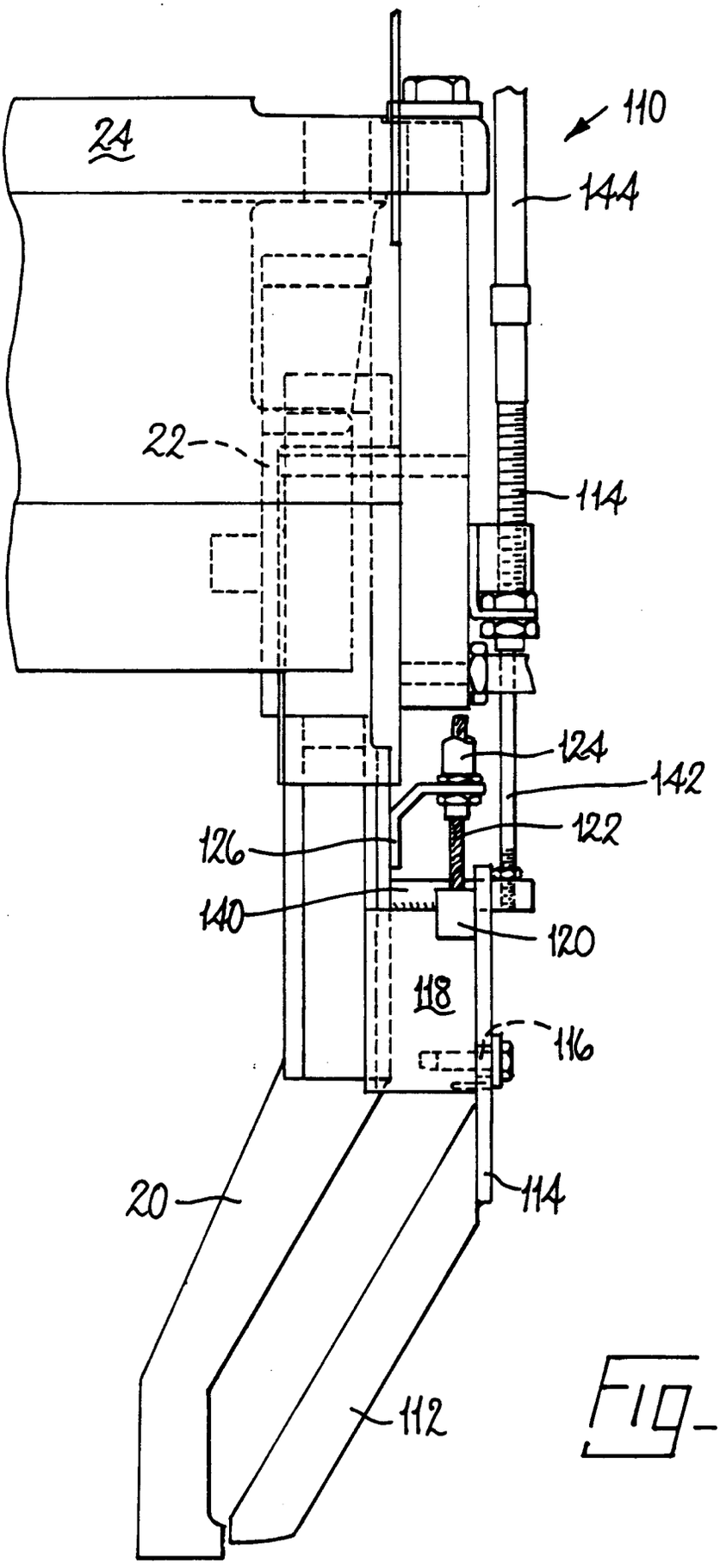

Fig. 4

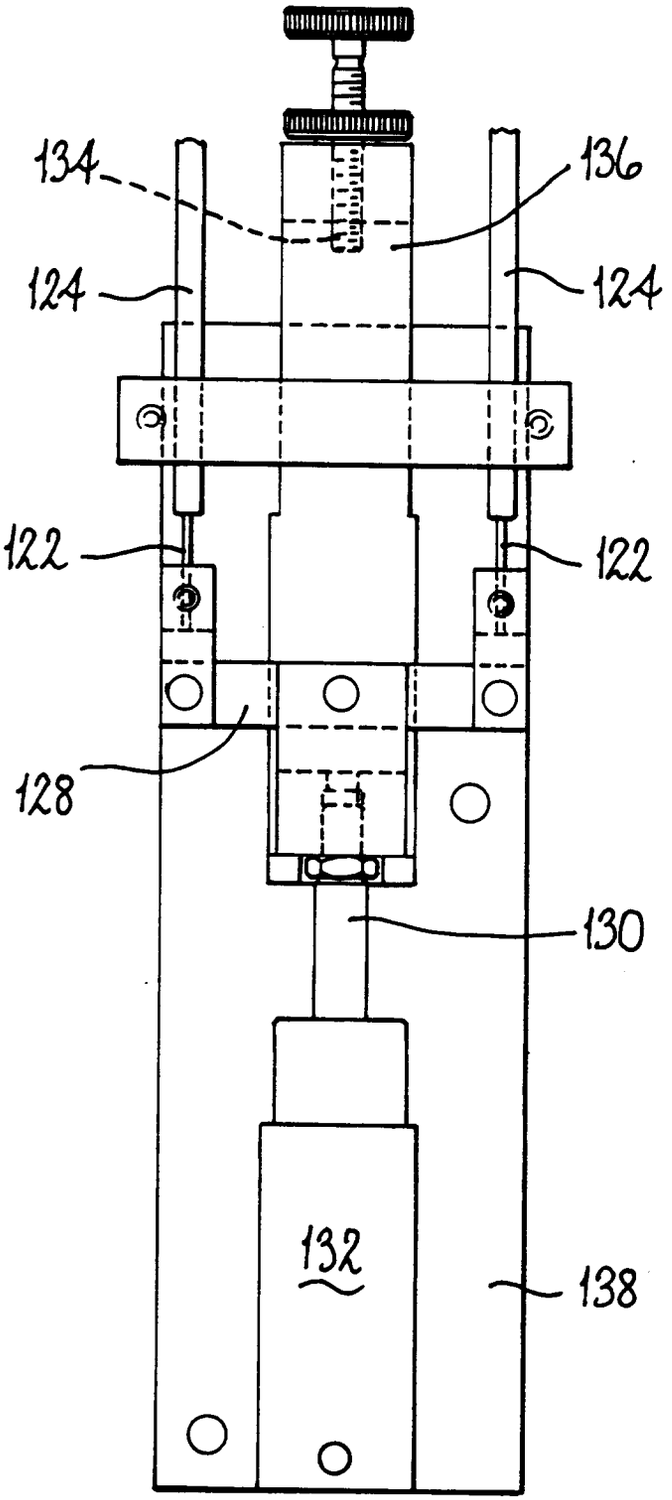

Fig_5

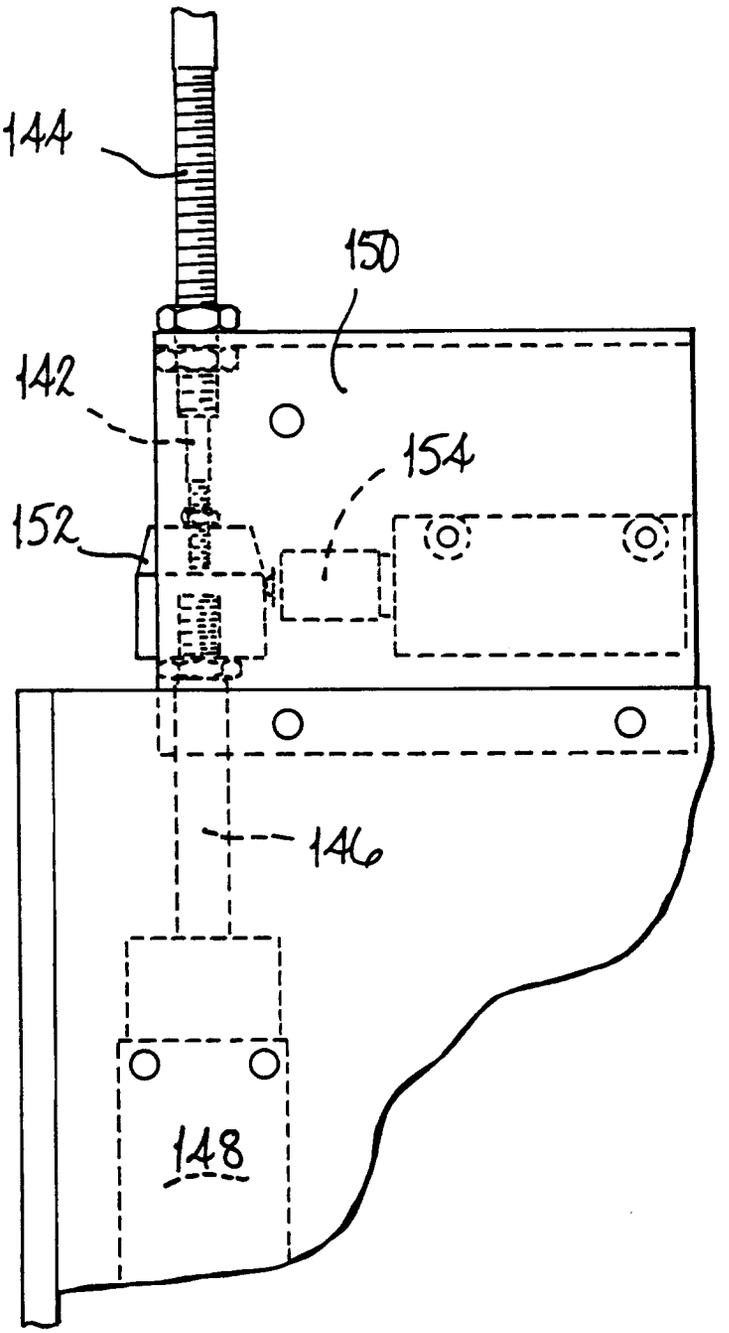

Fig_6

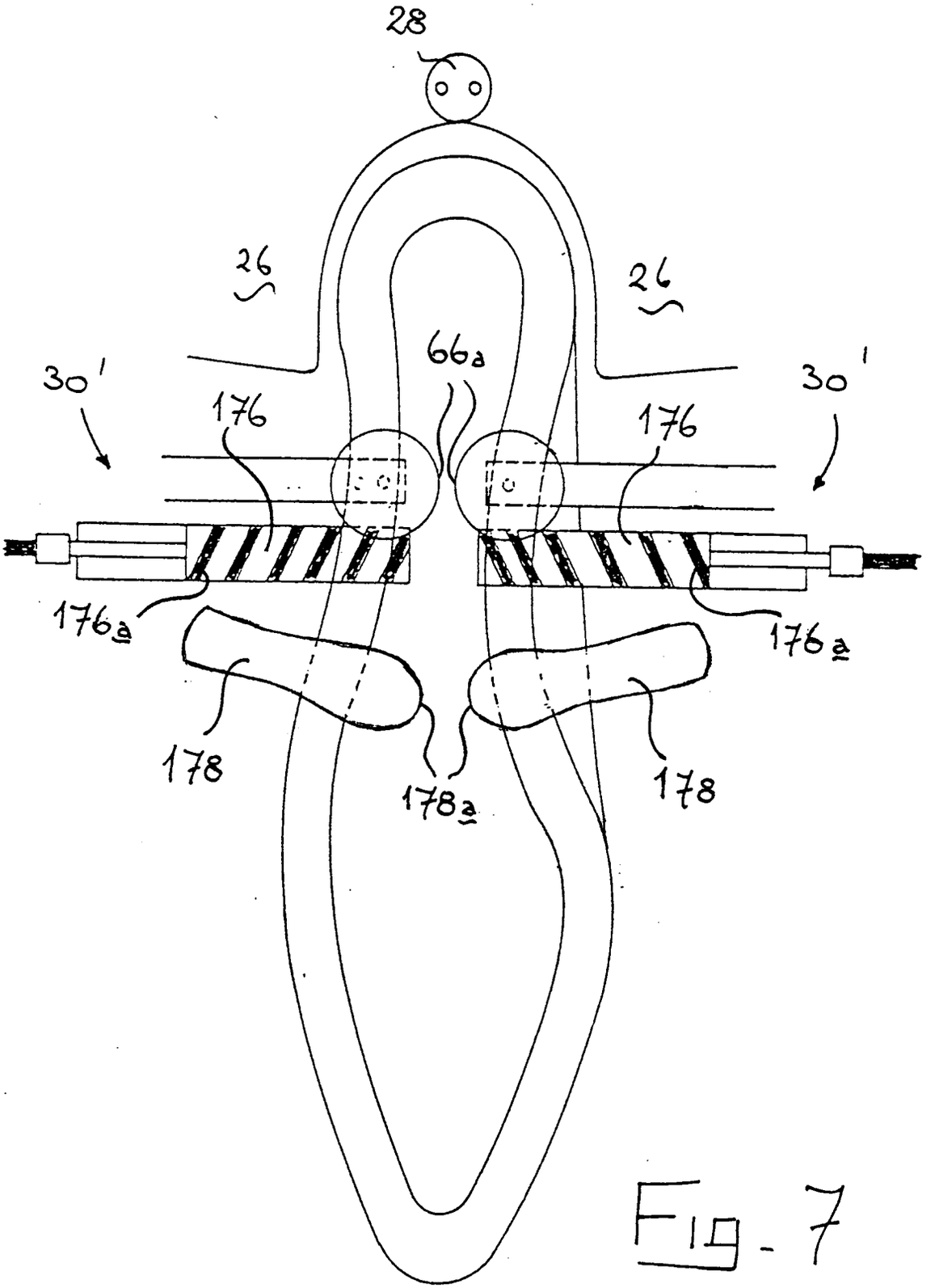

Fig. 7

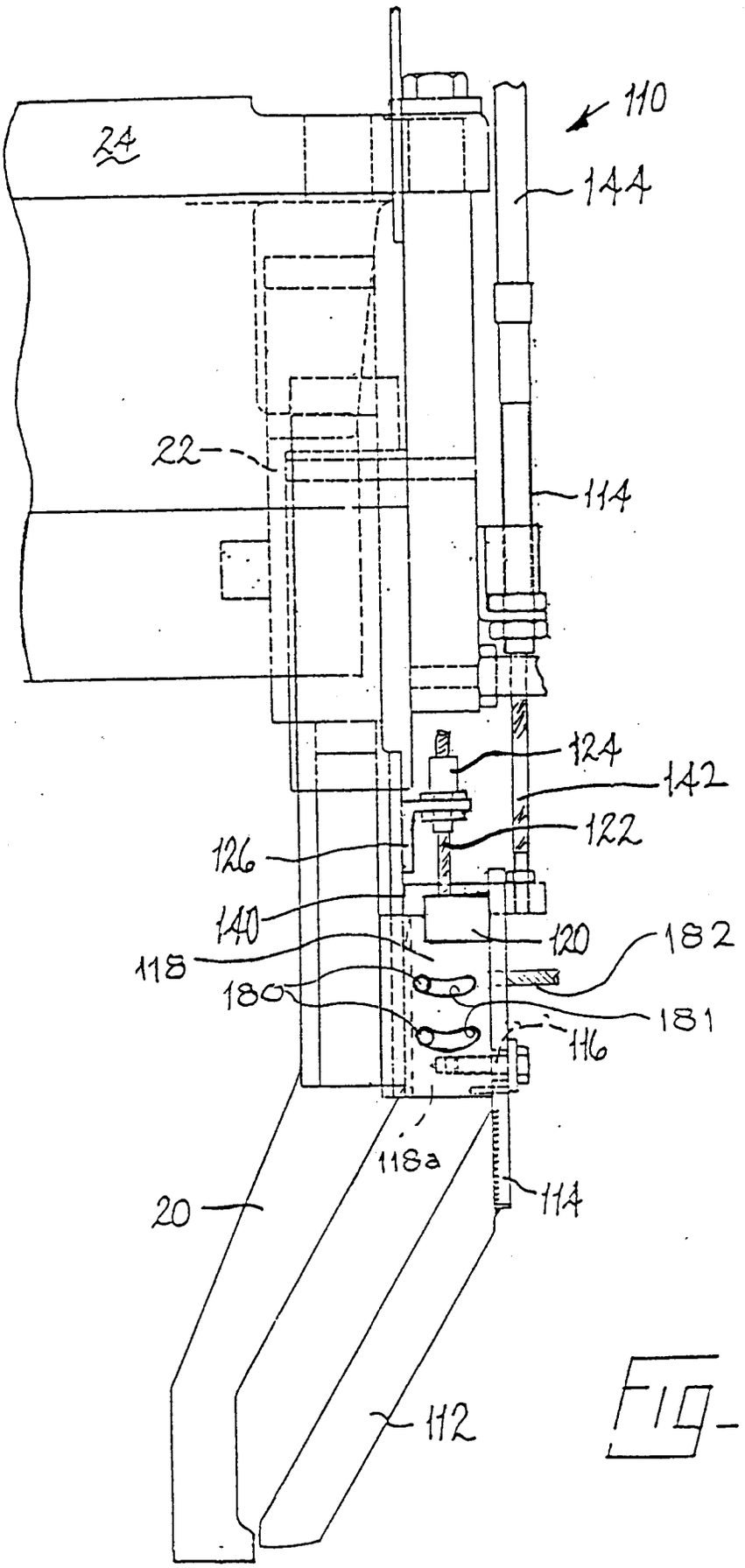
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FIG. 8