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(54) Side and heel seat lasting machine.

(57) Side and heel seat lasting machine has two side lasting assemblies (30;30′) each having a fastener-inserting tool (64) and a wiper arrangement (76;176). For providing an updraft at a pre-set location, two abutments (112) are provided, one associated with each side lasting assembly and co-operating with counter-abutments (66a;178a) provided by the side lasting assemblies, the arrangment being such that as the side lasting assemblies are moved to their operative position over the shoe bottom, the upper margin is trapped against the abutments (112) and thus, with a slipping grip, is drawn over the insole edge. The abutments are then retracted to an out-of-the-way position. The abutments (112) may be positioned either at the heel breast line region, where each co-operates with a counter-abutment (66a) provided on the tool (64) or in the waist region, where the counter-abutment (178a) is provided on a finger (178) which is arranged adjacent the wiper arrangement (176) and effects a preliminary over-folding of the upper lasting margin.

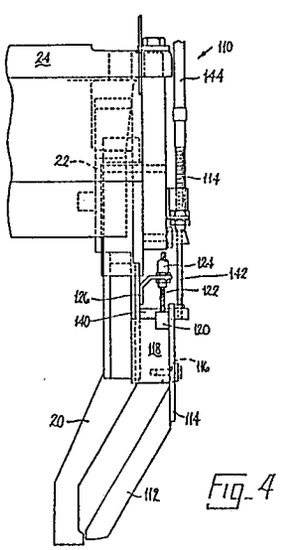

Fig. 4

EP 0 247 831 A2

Description

SIDE AND HEEL SEAT LASTING MACHINE

This invention is concerned with a side and heel seat lasting machine comprising a shoe support for supporting, bottom uppermost, a shoe comprising an upper a forepart portion of which has been lasted to an insole, heel seat lasting instrumentalities comprising a wiper assembly by which marginal portions of a shoe upper can be wiped over and secured to corresponding marginal portions of the insole, 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 arranged one at each side of the shoe support and each comprising a wiper arrangement, by which over-wiping of the upper marginal portions can be effected as aforesaid, and a fastener-inserting tool, by which such over-wiped portions can be secured to the insole, together with means, operable at the start of a cycle of operation, for moving the tool and wiper arrangement bodily from an out-of-the-way position to an operative position, in which the tool overlies the shoe bottom, at the heel breast line region thereof, and the wiper arrangement has over-wiped the upper as aforesaid, and means for moving the side lasting assemblies in a direction lengthwise of the shoe bottom whereby, starting from said heel breast line region, a succession of side lasting operations can be effected progressively along the sides of the shoe, wherein means is provided for tensioning the upper about its last at a pre-set location thereof prior to the first of said succession of side lasting operations.

By the term "heel breast line region" where used herein is to be understood the region of the shoe bottom which is transversed by leading edges of the heel seat wiper assembly, when the latter closes over the shoe bottom in a heel seat lasting operation.

Machines of the type referred to above are conventionally used after the shoe upper has been subjected to a pulling over and forepart lasting operation. Thus, the upper is correctly positioned on the shoe last and conformed thereto. 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 of respectively the heel seat lasting and side lasting instrumentalities to ensure that the upper is correctly conformed to the last, especially in the heel breast line region of the shoe. In order to avoid the formation of creases in the side portions of the shoe upper, especially in the heel breast line region (which, it will be appreciated, is the region in which the two sets of lasting instrumentalities are adjacent one another and thus in which folds are most likely to occur in the event of badly cut patterns), it has been customary to provide so-called breast line pincers, which grip the upstanding lasting margin in the heel breast line region and draw the upper upwardly prior to the start of the lasting operations. Breast line pincers also assist in ensuring the correct position of any stiffener which is incorporated in the upper, the ends (or corners) of which are located at the breast line region.

However, in the case of so-called long counters (or stiffeners) it may be desirable to apply an upward pull not at the heel breast line region but more forwardly, in the waist region, again at the locality of the stiffener corners.

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 is significantly greater. Quite apart from problems associated with the feeding of the wiper, 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.

It has also been proposed to provide, in side lasting machines wherein the whole of the side portions of a shoe upper are lasted in a single lasting operation extending along the whole of the length of the side portion (see e.g. DE-A 1685483) to provide upper tensioning means whereby the whole, or a substantial part, of the marginal portion of each side portion of the upper is gripped and the side portions thus tensioned prior to the lasting operation. One manner in which such tensioning is achieved is by the provision of one or more abutments disposed along each side portion, which abutments co-operate with side lasting wipers, as the latter move inwardly, to trap the upper with a slipping grip, each abutment yielding either inwardly or upwardly against the inward movement of its associated wiper. The provision of such abutments, however, requires not only a significant amount of space above the shoe support, but also are of relatively complicated construction, and thus expensive to provide. Furthermore, an arrangement of this sort does not readily lend itself to a machine which effects progressively a succession of side lasting operations, since the provision of abutments along the whole of the length of the side portions of the shoe will tend to impede the progressive operation of the side lasting instrumentalities. In addition, in

such machines there is no facility for moving the abutments to an out-of-the-way position to clear the way for the passage of the side lasting instrumentalities.

In the case of a machine as set out in the first paragraph above, a further disadvantage would in any event arise, if the wiper were used for initially effecting the updraw of the upper in the breast line region in co-operation with the abutment in that either such updrafting would have to take place prior to moving the fastener-inserting tool to its operative position, which would thus effectively render the updrafting once more as a distinct operation requiring a significant time, or it would take place concurrently with or after the inward movement of the tool, which latter could well impede the updrafting operation, leaving the upper still unsatisfactorily conformed to the last in the heel breast line region.

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.

This object is resolved, in accordance with the present invention, in a machine as set in the first paragraph above, in that the wiper tensioning means comprises two abutments, one associated with each side lasting assembly, disposed above the shoe support and arranged at said pre-set location, and means for urging each abutment transversely of the shoe bottom outwardly into an advanced, operative, position in which it co-operates with a counter-abutment provided by its associated side lasting assembly thus to trap the marginal portion of the shoe upper with a slipping grip and draw it over the insole edge during the movement of the fastener-inserting tool and wiper arrangement to its operative position, each abutment yielding inwardly during such movement, and means also being provided for moving the abutments to an out-of-the-way position in timed relation with the actuation of the fastener-inserting tools.

It will thus be appreciated that, by utilising a counter-abutment provided on the tool of the side lasting assembly to co-operate with the abutment, the upper marginal portion gripping and tensioning operation can take place without any significant time being additionally required, since this operation takes place effectively during the period already set aside for the movement of the tool into its operative position. Furthermore, by the time the tool is in side position, the side lasting operations 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 co-operating 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.

Conventionally in side and seat lasting machines a holddown member is disposed above the shoe support and co-operates therewith to determine the height of the heel seat region of the shoe in relation to the heel seat lasting instrumentalities. In accordance with the present invention, furthermore, 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 movements of the abutments and of the fastener-inserting tools are readily co-ordinated, 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.

If it is desired to enhance the amount of tensioning effected by means of the abutments, then, in a machine in which the wiper of each side lasting assembly is disposed closely adjacent, and toewardly of, the fastener-inserting tool, the dimension of the abutment lengthwise of the shoe may be such that it co-operates with both the abutment and the wiper.

In one embodiment of the invention the counter-abutment is provided by a surface portion of the fastener-inserting tool so that the upper marginal portions are trapped as aforesaid at the heel breast line region. In this way the conventional breast line pincers are replaced. In another embodiment of the invention, on the other hand, wherein each wiper arrangement comprises a rotary member provided with a helical wiping element which, as said member rotates, effects an inwiping force on the upper marginal portion engaged thereby, together with a finger which projects inwardly over the shoe bottom and engages the upper marginal portion in advance of the rotary member and effects a preliminary over-folding of the marginal portion, each abutment has a plurality of pre-set localities disposed lengthwise of the shoe botom, in one of which localities it co-operates with the surface portion of the fastener-inserting tool and in another of which it co-operates with the surface portion (providing a further counter-abutment) of this finger so that the upper marginal portions are trapped as aforesaid in the waist region. In this way much greater versatility of operation of the machine can be achieved.

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 heightwise 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 positionor 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 an upper a forepart portion of which has been lasted to an insole,

heel seat lasting instrumentalities (14,26) comprising a wiper assembly (26) by which marginal portions of a shoe upper can be wiped over and secured to corresponding marginal portions of the insole,

side lasting instrumentalities (30′) 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 (30;30′) arranged one at each side of the shoe support and each comprising a wiper arrangement (76;17), by which over-wiping of the upper marginal portions can be effected as aforesaid, and a fastener-inserting tool (64), by which such over-wiped portions can be secured to the insole, together with means (50), operable at the start of a cycle of operation, for moving the tool and wiper arrangement bodily from an out-of-the-way position to an operative position, in which the tool overlies the shoe bottom, at the heel breast line region thereof, and the wiper arrangement has over-wiped the upper as aforesaid,

and means (38,40) for moving the side lasting assemblies (30;30′) in a direction lengthwise of the shoe bottom whereby, starting from said heel breast line region, a succession of side lasting operations can be effected progressively along the sides of the shoe,

wherein means (112) is provided for tensioning the upper about its last at a pre-set location thereof prior to the first of said succession of side lasting operations,

characterised in that the wiper tensioning means (112) comprises two abutments, one associated with each side lasting assembly, disposed above the shoe support and arranged at said pre-set location,

and means (120-132) for urging each abutment (112) transversely of the shoe bottom outwardly into an advanced, operative, position in which it co-operates with a counter-abutment (66a;178a) provided by its associated side lasting assembly (30;30′) thus to trap the marginal portion of the shoe upper with a slipping grip and draw it over the insole edge during the movement of the fastener-inserting tool and wiper arrangement (76;176) to its operative position, each abutment yielding inwardly during such movement, and means (142-150) also being provided for moving the abutments (112) to an out-of-the-way position in timed relation with the actuation of the fastener-inserting tools (64).

2. Machine according to Claim 1 wherein a holddown member (20) is disposed above the shoe support (10) and cooperates therewith to determine the height of the heel seat region of the shoe in relation to the heel seat lasting instrumentalities(14,26), characterised in that the abutments (112) are supported adjacent the holddown (20) in such a manner that they are held out of engagement with the insole.

3. Machine according to Claim 2 characterised in that the abutments (25) are mounted on a carrier (118;118′) which is mounted on the holddown (20) for sliding movement heightwise of the shoe bottom.

4. Machine according to Claim 3 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 position in response to such downward movement of the abutments (112).

5. Machine according to any one of the preceding Claims characterised in that the means (120-132) for urging the abutments (112) outwardly as aforesaid comprises a single fluid pressure operated cylinder (132) the piston of which is operatively connected to the abutments (112), wherein the pressure of the fluid supplied to the cylinder is adjustable thus to vary the gripping force applied by each abutment (112) and counter-abutment (66a;178a) to the upper.

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.

7. Machine according to any one of the preceding Claims characterised in that the counter-abutment (66a) is provided by a surface portion of the fastener-inserting tool (64) so that the upper marginal portions are trapped as aforesaid at the heel breast line region.

8. Machine according to Claim 7 wherein each wiper arrangement (176) comprises a rotary member (176) provided with a helical wiping element (176a) which, as said member rotates, effects an inwiping force on the upper marginal portion engaged thereby, together with a finger (178) which projects inwardly over the shoe bottom and engages the upper marginal portion in advance of the rotary member (176) and effects a preliminary overfolding of the marginal portion, characterised in that each abutment (112) has a plurality of pre-set localities disposed lengthwise of the shoe bottom, in one of which localities it co-operates with the surface portion (66a) of the fastener-inserting tool (64) and in another of which it co-operates with a surface portion (178a) (providing a further counter-abutment) of this finger (178) so that the upper marginal portions are trapped as aforesaid in the waist region.

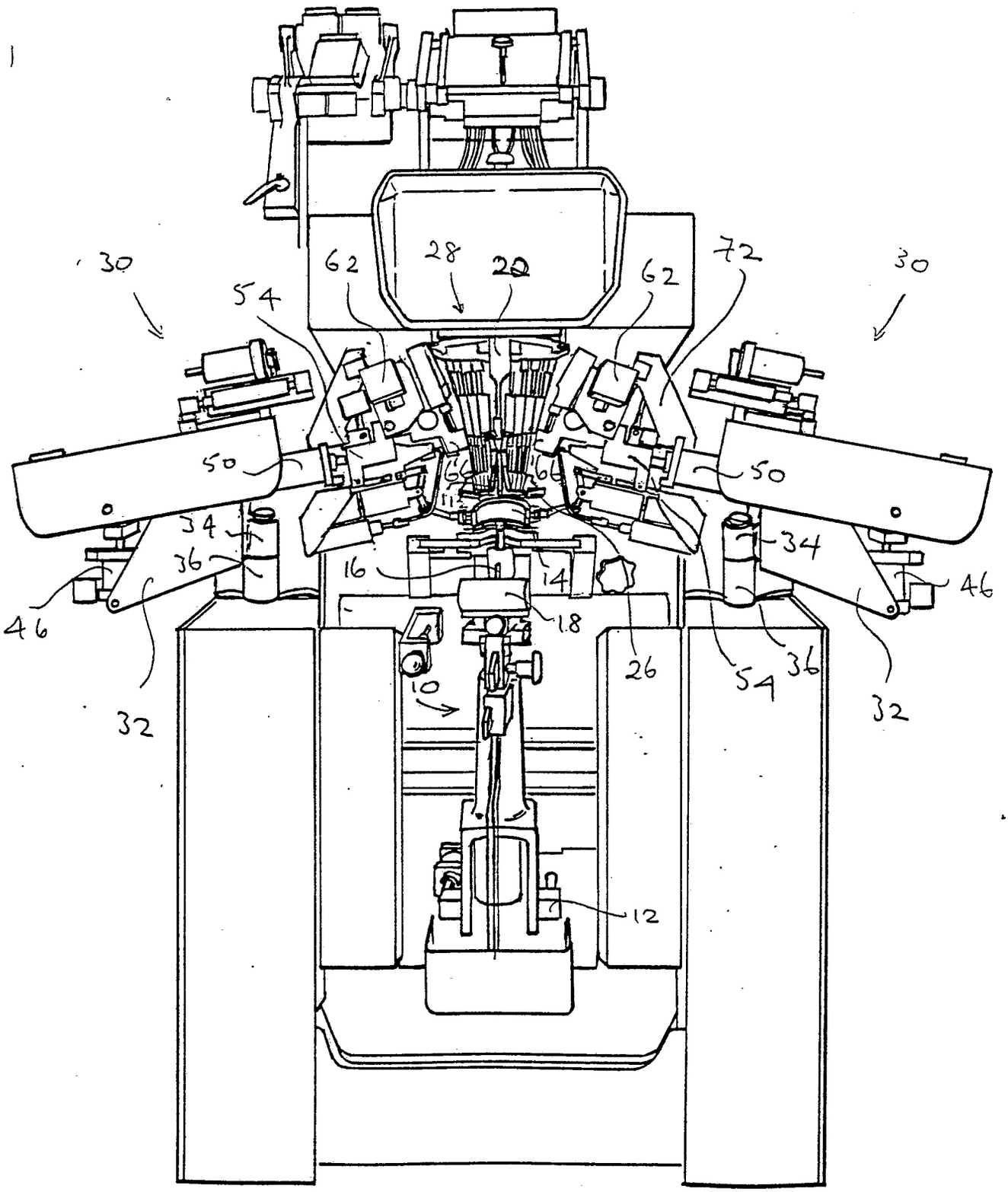
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Fig. 1

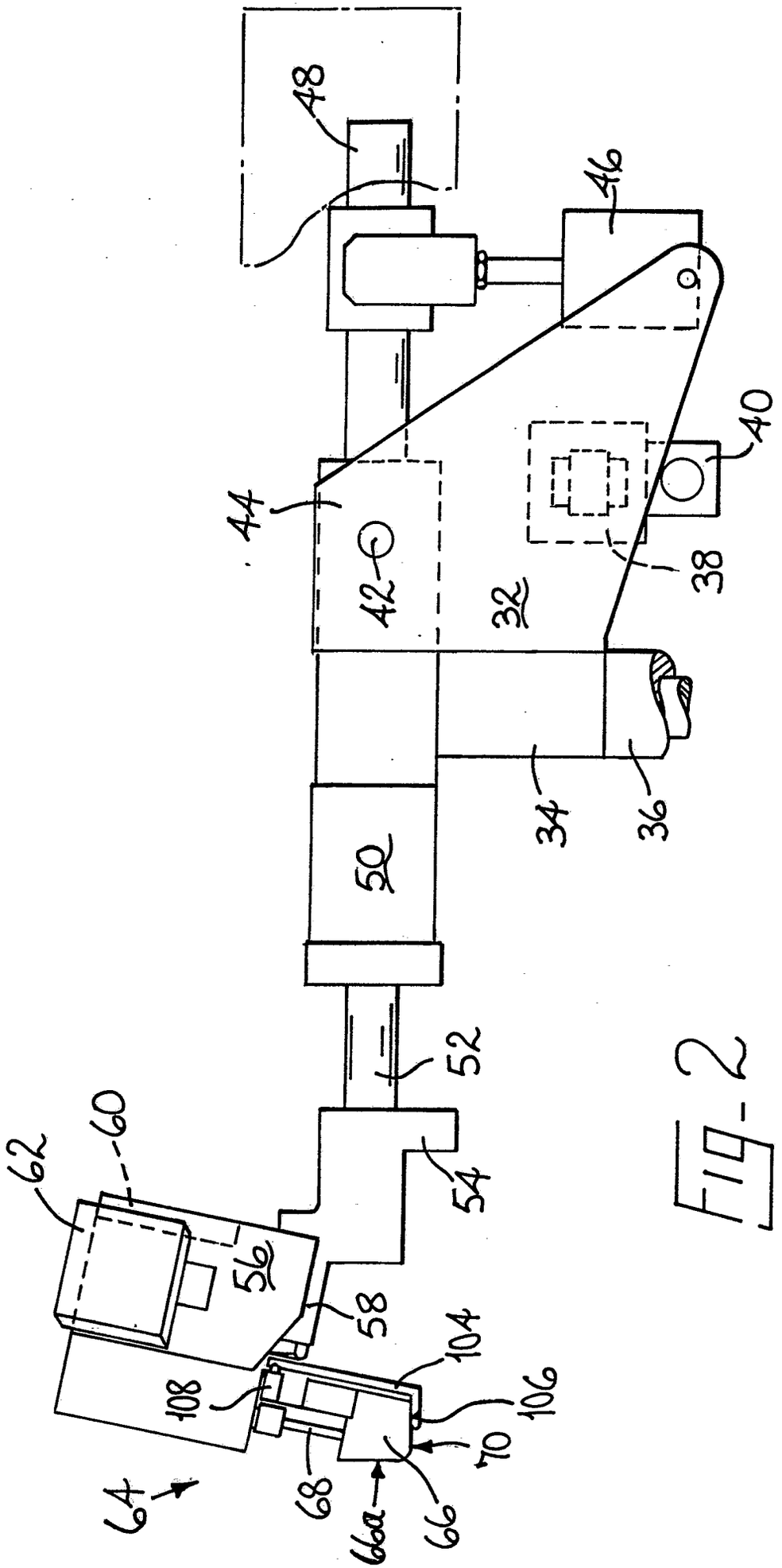
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FIG. 2

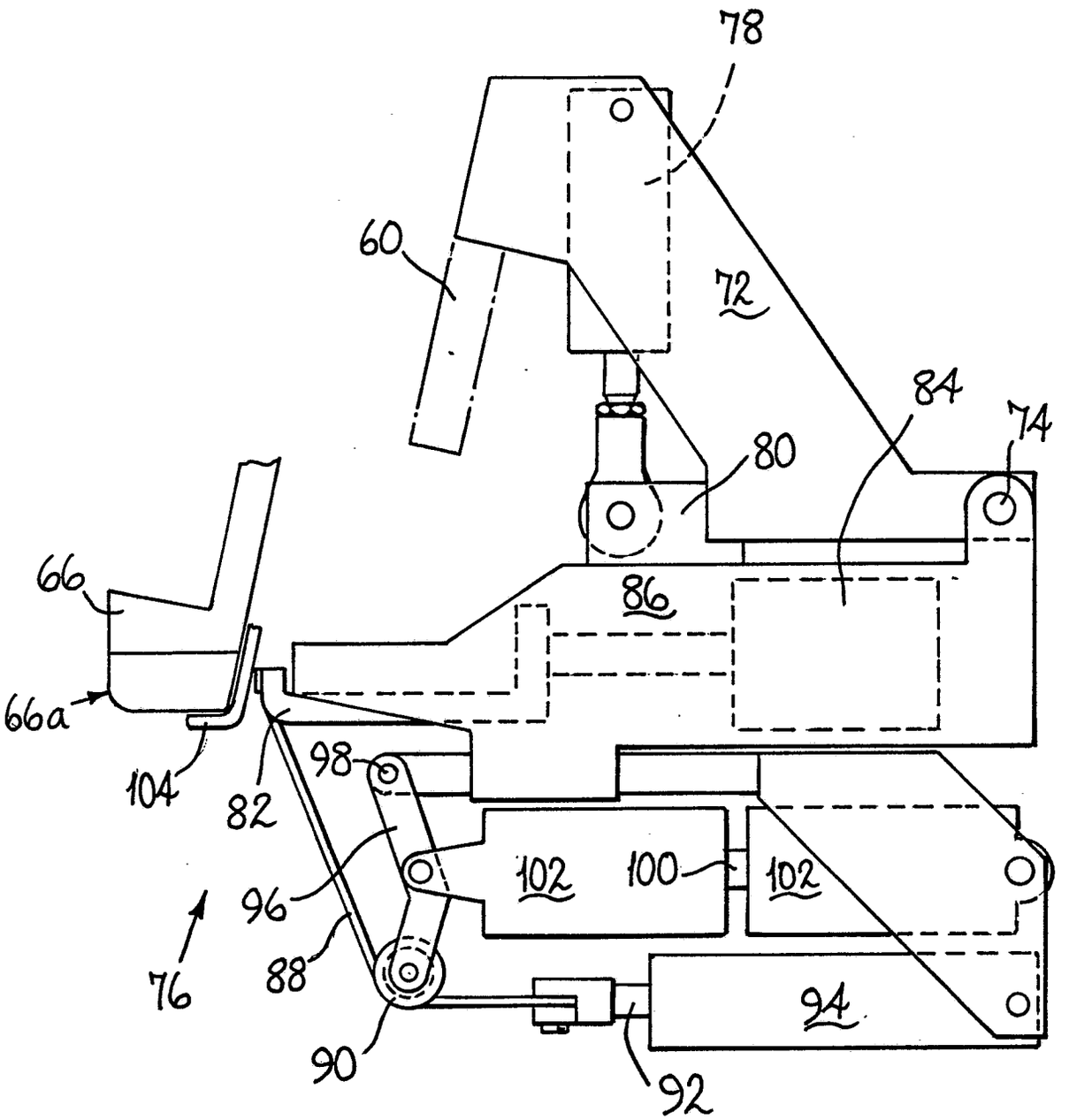

Fig_3

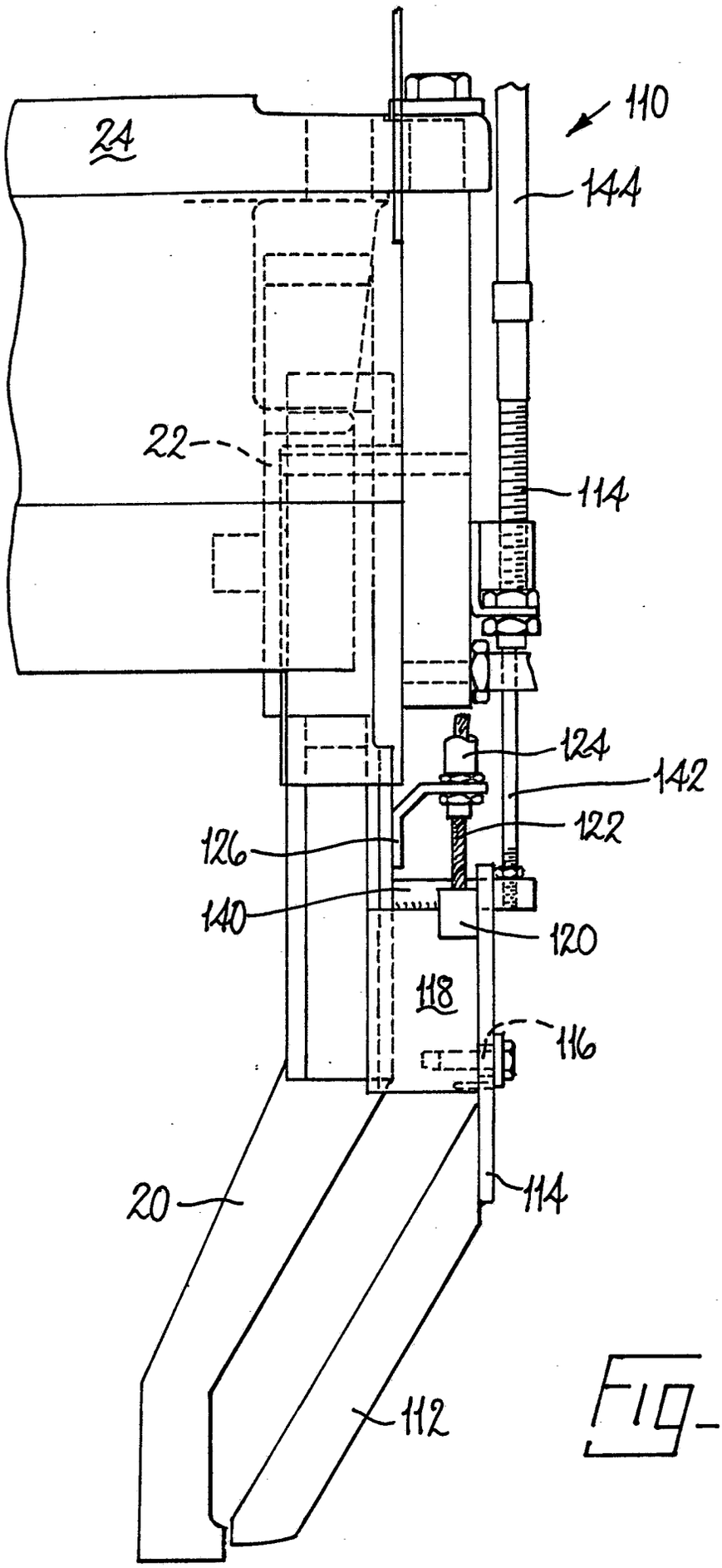

Fig_4

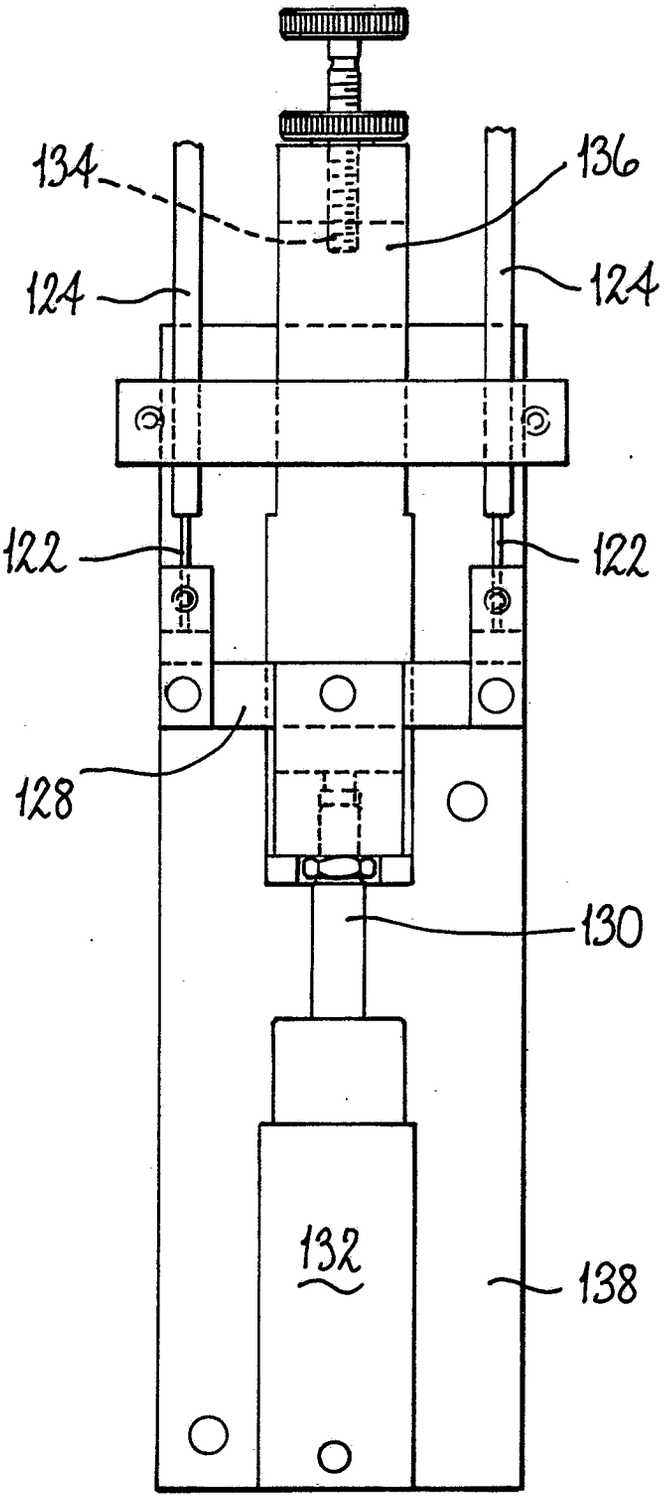

Fig_5

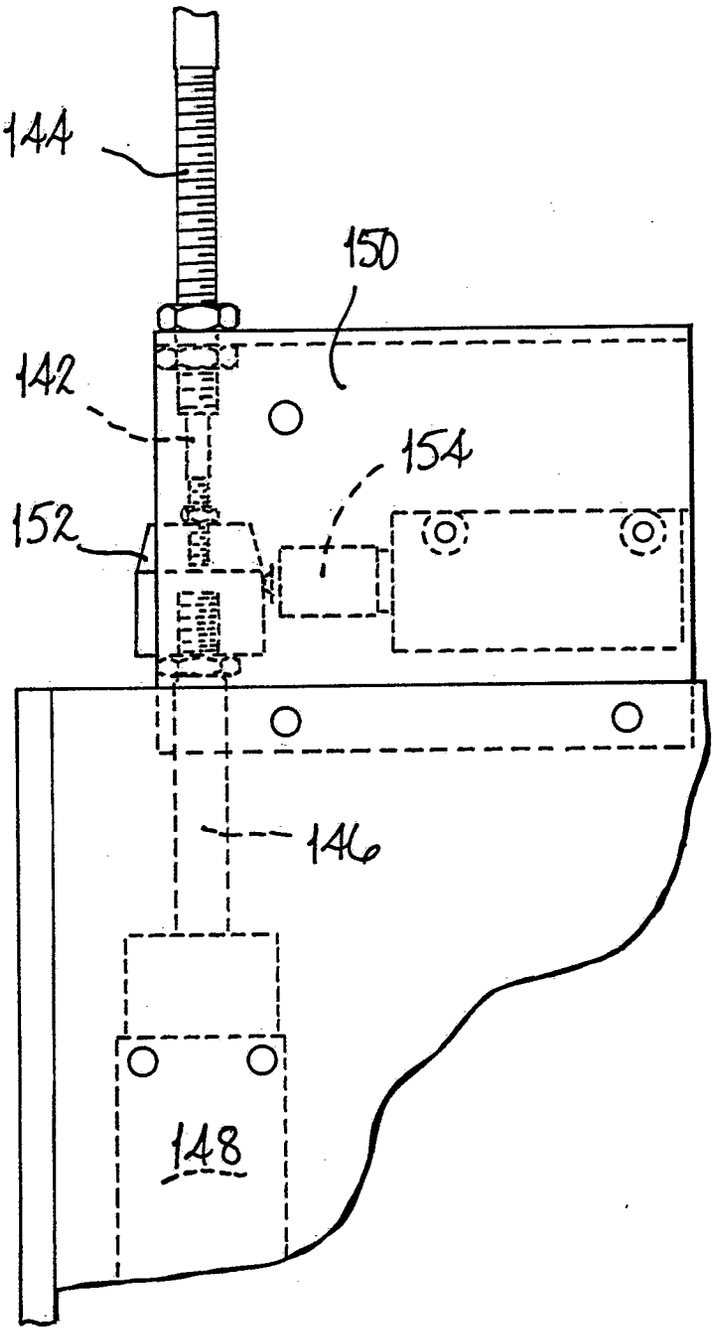

Fig_6

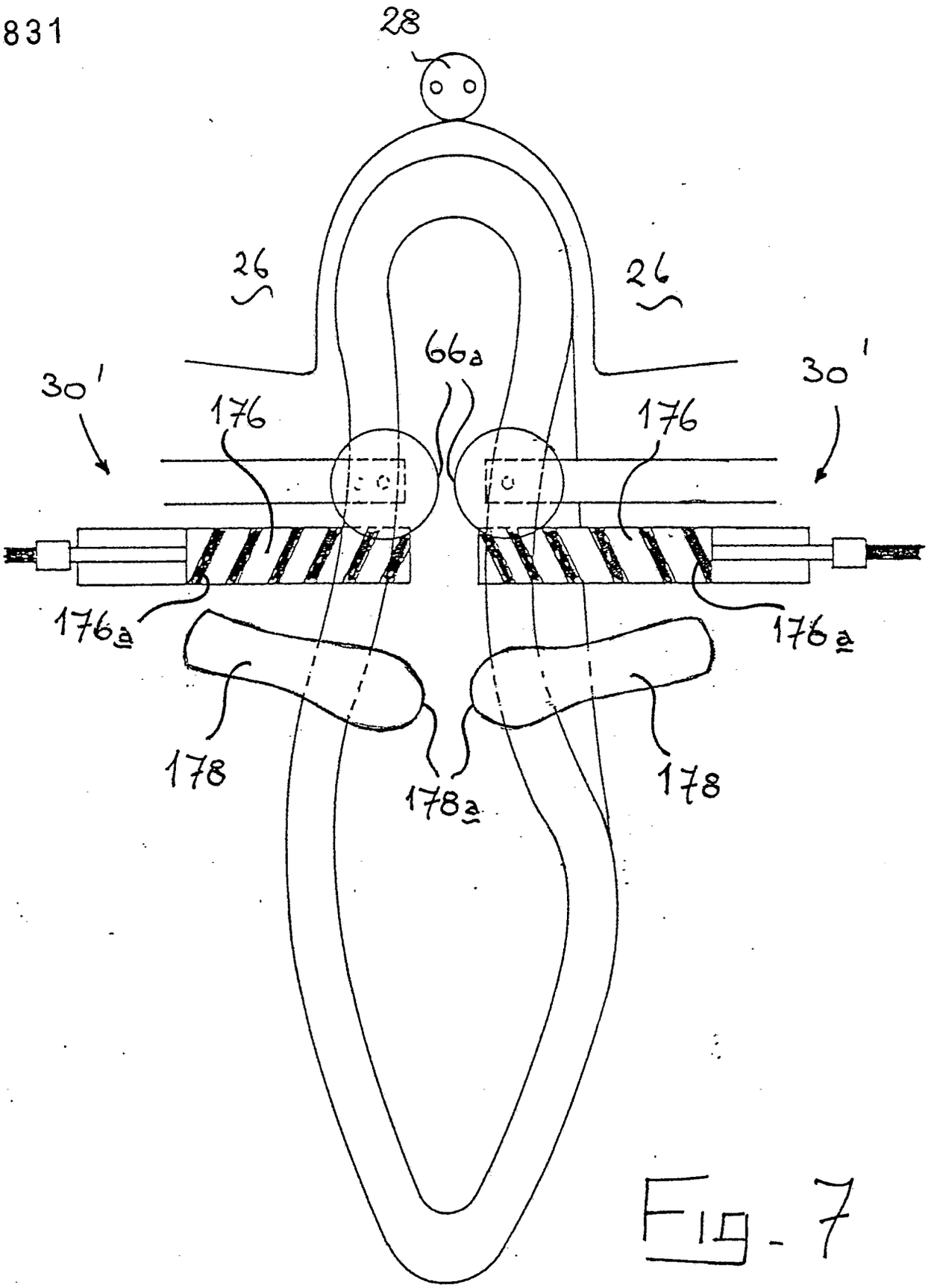

Fig. 7

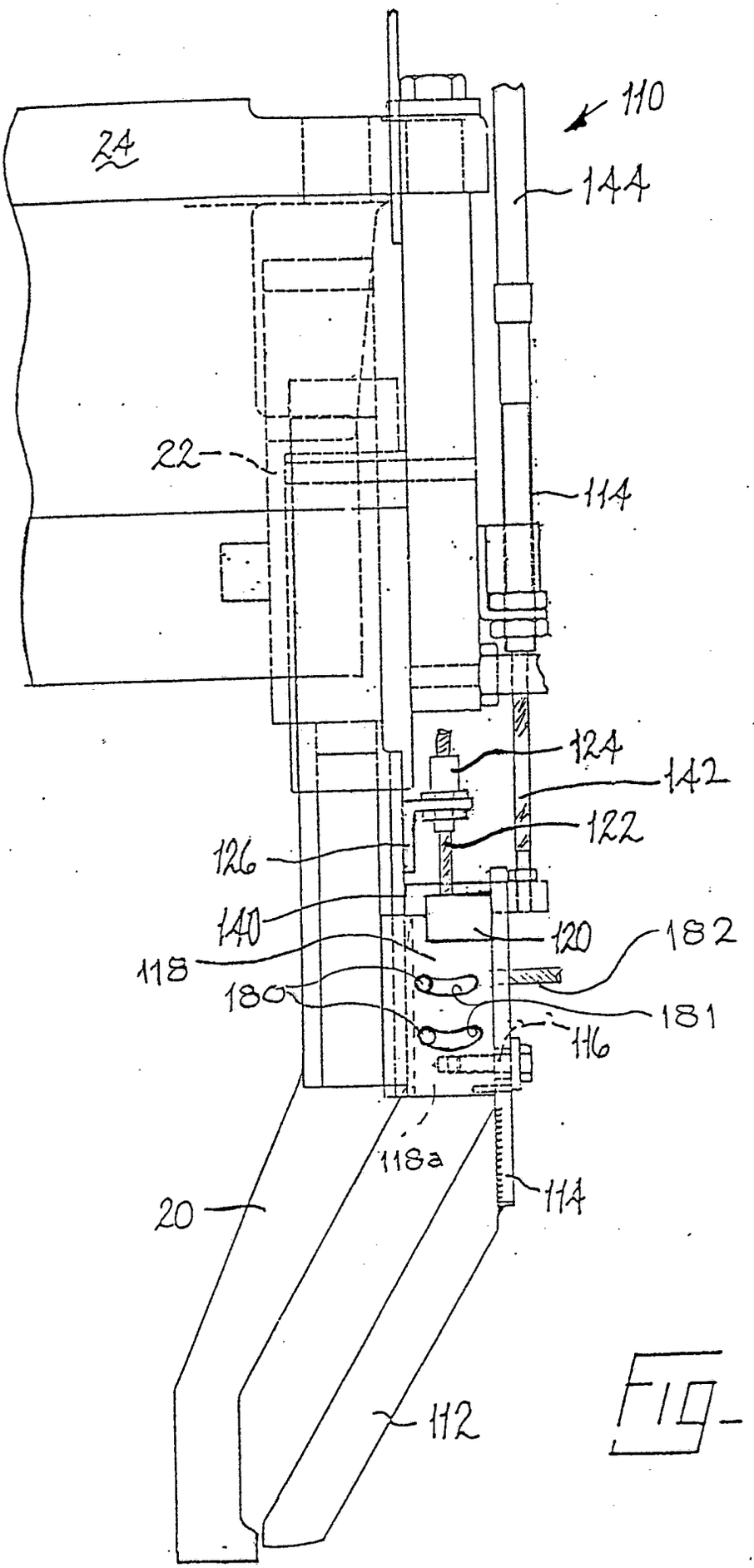
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Fig. 8