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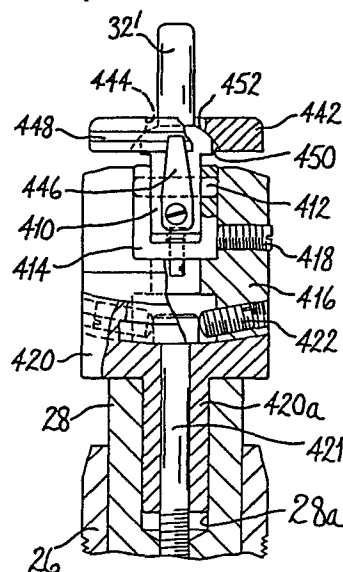
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**Machine for lasting heel seat portions of shoes.**

In tack seat lasting machines, operator skill is often required because of irregularities in last manufacture, especially in drilling the last pin hole. Thus automatic presentation is difficult. In accordance with the invention the last pin (32') is mounted for limited rocking movement about an axis extending lengthwise of the shoe bottom, and shoe centralising means (424) engages edges of the shoe, at opposite sides of the last pin, to ensure alignment with a longitudinal centre line of the machine. Furthermore, the rocking axis can be adjusted angularly, about a heightwise axis, to locate it substantially in the heel-to-toe plane of the shoe. The centralised shoe is then clamped by a holddown (406), the centralising means released, and the shoe heel end clamped by a heel band (520) which, by equalised pressure being applied to both "legs" thereof, holds the shoe in position as presented.



1        Machine for lasting heel seat portions of shoes

          This invention is concerned with machines  
5 for lasting heel seat portions of shoes comprising a  
shoe support, for supporting, bottom uppermost, a shoe  
comprising an upper positioned on a last and an insole on  
the last bottom, said support comprising heel support means  
including a last pin which can be received in a hole there-  
10 for formed in the heel end of the last, and a toe support  
member, which can be positioned widthwise of the machine  
according to whether the shoe is a left or a right, holddown  
means between which end the shoe support heightwise relative  
movement can take place, whereby the heightwise position of  
15 the shoe bottom can be set by engagement of the heel seat  
region thereof with said holddown means, a heel band arrange-  
ment, between which and the shoe support relative movement  
can take place lengthwise of the shoe bottom, to cause the  
heel end of the shoe to be clamped, and heel seat lasting  
20 instrumentalities, including wiper plates movable in a wiping  
plane, whereby lasting marginal portions of the upper can be  
wiped over and pressed against corresponding marginal portion  
of the insole.

          One such machine is described in UK patent  
25 specification No. 8020133, in which machine shoes are loaded  
onto the shoe support by hand, the operator holding the shoe  
in a desired orientation, both in relation to a longitudinal  
centre line of the lasting instrumentalities and also in  
relation to said wiping plane, until the shoe is clamped in  
30 such position by the holddown means and the heel band arrange-  
ment.

          When, on the other hand, it is a question of  
automatic presentation, a problem frequently arises where  
the shoe support comprises a last pin for supporting the  
35 last, because the hole formed in the heel end of the last  
for receiving the last pin is often carelessly drilled,  
with a result that it is either not arranged with its

1 longitudinal axis normal to the surface of the cone of  
the last, or is not positioned centrally of the cone, or  
both. Thus, in the case of automatic presentation, where  
location of the shoe relies solely on the position of the  
5 last pin hole, misalignment of the shoe with the heel seat  
lasting instrumentalities often arises; in the manually  
fed machines, of course, this can be readily corrected for  
by the operator presenting the shoe.

For assisting the operator, furthermore, it has  
10 been proposed in a number of cases, for overcoming this  
particular problem, to enable the last pin to rock about  
an axis extending lengthwise of the shoe bottom in order to  
facilitate the orientation of the shoe by the operator as  
he presents it to the heel seat last instrumentalities.  
15 Such an arrangement in itself, however, is not satisfactory  
alone where the shoe is to be presented automatically.

It is therefore the object of the present  
invention to provide an improved heel seat lasting machine  
in which shoes can be reliably presented automatically to  
20 the heel seat lasting instrumentalities.

This object is resolved in accordance with the  
invention in that the last pin is mounted for limited rock-  
ing movement about an axis extending lengthwise of the shoe  
bottom, and in that shoe centralising means is provided  
25 comprising two shoe-engaging elements, arranged at opposite  
sides of the last pin, and means for moving them, through  
equal distances, to engage the shoe supported by said last  
pin.

Using this arrangement, it will be seen that,  
30 regardless of the last pin hole position, the heel seat of  
the shoe can be accurately oriented in relation to the  
longitudinal centre line of the machine and the wiping  
plane. Furthermore, the invention is especially, but not  
exclusively, suited to a machine as described in the afore-  
35 mentioned specification, wherein the heel band arrangement  
is such that, by equalised pressure being applied to the  
"legs" of the heel band, the shoe is clamped substantially

1 in the position in which it is presented to the heel band  
arrangement, thereby ensuring that the orientation of the  
shoe, as determined by the operation of the shoe central-  
ising means as aforesaid, is maintained when the shoe is  
5 clamped in the machine.

Conveniently, the shoe centralising means is  
supported by a carriage by which also the heel band arrange-  
ment and the heel seat lasting instrumentalities are  
supported, the arrangement being such that relative movement  
10 is effected between the heel band arrangement and the shoe  
support only after the holddown means is operative and the  
shoe centralising means has then been rendered inoperative.  
In this way, it will be appreciated, once the shoe has  
been centralised and its position established by the opera-  
15 tion of the holddown means, the shoe centralising means can  
be moved to an out-of-the-way position, in which it will not  
interfere with the further operation of the machine, and  
this is readily achieved in accordance with the invention  
by mounting the centralising means on said carriage.

20 The axis about which the last pin can rock as  
aforesaid may be aligned with the longitudinal centre line  
of the heel seat lasting instrumentalities. Where, however,  
the toe end of the shoe bottom is significantly offset from  
the longitudinal centre line of the heel end portion of the  
25 shoe bottom, and thus the toe support means of the shoe  
support is significantly offset from the longitudinal centre  
line of the machine, the support for the shoe may become  
unstable. This instability is believed to arise primarily  
because of the lack of symmetry of the last about its heel-  
30 to-toe plane, in combination with the bulk of the material  
of the last being disposed about the rocking axis of the  
last pin, with the result that the last pin is urged by the  
bulk of the last to rock about its axis, this rocking being  
such that the less bulky portion of the last, on the opposite  
35 side of the heel-to-toe plane, tends to lift off the toe  
support means. At the same time, rocking of the last in an  
opposite direction, which may be desirable in order to orient

1 correctly the shoe bottom in the plane of the heel seat  
lasting instrumentalities, is strongly opposed because of  
the relationship between the rocking axis of the last pin  
and the heel-to-toe plane of the last.

5                 With a view to overcoming this problem, in  
accordance with the further feature of the present invention,  
the last pin is mounted on a support member for rocking move-  
ment as aforesaid, said member being itself mounted for move-  
ment about an axis extending heightwise of the shoe bottom.  
10 By thus aligning the rocking axis of the last pin in the  
heel-to-toe plane of the shoe, the tendency of the shoe to  
rock in an undesirable manner as above described is resist-  
ed, while limited rocking in both directions about the rock-  
ing axis, for purposes of orienting the shoe bottom to the  
15 heel seat lasting instrumentalities, is permitted.

For securing the support member in adjusted  
position as aforesaid, locating means may be provided,  
comprising a locating pin engageable in one or more recesses  
provided therefor, the pin being inserted by the operator  
20 after he has positioned the support member in a desired  
position. Alternatively, the locating pin may comprise  
a spring-urged detent, which yields as the operator rotates  
the support member. Again, clamping means may be provided  
for clamping the support member after it has been positioned  
25 as aforesaid.

In one embodiment of the invention, the last pin  
is carried by a support block supported by the support member  
inter-engaging faces of said block and member being arcuate,  
the centre of curvature thereof extending widthwise of the  
30 shoe bottom, and locking means being provided for holding the  
block in adjusted position on the member. Such adjustment of  
the support block assists in setting the heel-to-toe orient-  
ation of the shoe, according to the different styles of shoe  
to be accommodated, especially taking into account variations  
35 in the heel height.

Similarly, in one embodiment of the invention the  
support block supports a cradle for the last pin, said cradle

1 being slidable, widthwise of the shoe bottom, in said block  
and locking means being provided for locking said cradle  
in adjusted position. Such setting of the cradle, widthwise  
of the shoe bottom, serves to compensate for the difference,  
5 widthwise of the shoe bottom, between the longitudinal centre  
line of the cone surface of the last and the longitudinal  
centre line of the heel seat of the shoe bottom.

In order adequately to support the last on the  
last pin, furthermore, preferably a last support plate is  
10 provided on the shoe support, the under-side of said plate  
and a co-operating surface of a mounting for the last pin  
being complementarily part-spherical. Furthermore, the  
last support plate is preferably resiliently held on said  
mounting. Thus, regardless of the orientation of the last  
15 on the shoe support, an overall surface contact can be  
achieved between the shoe-engaging surface of the last  
support plate and the corresponding last cone surface.

There now follows a detailed description, to  
be read with reference to the accompanying drawings, of  
20 one machine in accordance with the invention, which  
machine has been selected for description by way of non-  
limiting example.

In the accompanying drawings:-

Figure 1 is a fragmentary left hand side view  
25 of the machine in accordance with the invention, showing  
details of shoe centralising means thereof;

Figure 2 is a front view, showing details of  
said shoe centralising means;

Figure 3 is a fragmentary view partly in section,  
30 showing details of heel support means of a shoe support of  
the machine in accordance with the invention;

Figure 4 is a diagram of a shoe bottom, indicat-  
ing the heel-to-toe plane thereof in relation to a rocking  
axis of a last pin of the heel support means.

35 The machine in accordance with the invention now  
to be described is a machine for lasting heel seat portions  
of shoes using tacks, said machine comprising toe support

1 means (not shown) and heel support means generally designated  
30. The toe support means may be of any conventional design  
and may comprise a V-shaped toe end engaging member 48 (see  
figure 4) and a toe pad (not shown) which can be urged up-  
5 wardly against the toe cap portion of a shoe supported by a  
heel support means 30, thus to set the toe-to-heel orientation  
of the shoe bottom. The position of the toe support means,  
widthwise of the shoe bottom, can be adjusted in a convent-  
10 ional manner to accommodate a left or a right shoe.

10 The heel support means 30 comprises an upstanding  
sleeve portion 24 carrying at its upper end a threaded collar  
portion 26 for heightwise adjustment thereon. Projecting  
from the collar portion 26, and slidable heightwise therein,  
is a rod 28 carrying a support member 420 (Figure 3) accomm-  
15 odated in a bore 28a provided therefor in the rod 28. The  
support member 420 is thus able to be rotated, about the axis  
of a spigot 420a and thus about an axis extending heightwise  
of the shoe bottom, clamping means, in the form of a headed  
bolt 421, being provided for clamping the support member 420  
20 in adjusted position on the rod 28. The support member 420  
has a groove portion in which is accommodated a support block  
416, inter-engaging faces of the block 416 and support member  
420 being curved, and the centre of curvature thereof extend-  
ing widthwise of the shoe bottom, the block 416 thus being  
25 able to slide relative to the support member 420 about said  
centre of curvature, thus to assist in setting the toe-and-  
heel orientation of the shoe. For adjusting the position of  
the block 416 in the support member 420, and also for clamp-  
ing it in adjusted position, two locating pins 422 are  
30 provided, threadedly secured in the block 416 and engageable  
each with the head of the clamp bolt 421. The support block  
416 in turn is provided with a groove, normal to the groove  
of the support member 420, for receiving a cradle 414 for  
sliding movement therein, a locking pin 418 being provided,  
35 in the support block 416, for locking the cradle 414 in  
adjusted position. The position of the cradle 414 can thus  
be set by the operator in a direction extending widthwise of

1 the shoe bottom. The cradle 414, which is generally U-shaped in end view, supports a pivot pin 412 on which is carried a mounting block 410, itself supporting a last pin 32', the pin 32' thus being able to rock about the axis  
5 of the pin 412 (which axis thus constitutes the rocking axis of the last pin).

For supporting each last, furthermore, the heel support means 30 also comprises a support plate 442, on which the cone surface of the last rests when a last  
10 is placed on the last pin 32'. The support plate 442 has an elongated slot 444 through which the last pin 32' projects, and spring fingers 446 are bolted to opposite sides of the block 410 and engage in grooves 448 formed at opposite sides of the plate 442, to hold it resiliently in  
15 position on the block. The under-side of the plate 422, furthermore, has a part-spherical recess 450 which engages on a complementarily shaped surface 452 of the block 410, so as to enable the plate to be universally movable relative to the last pin 32'. In this way, overall surface engagement  
20 can be achieved between the plate 442 and the cone surface of the last.

The machine in accordance with the invention also comprises a main frame 360 within which a carriage 362 is mounted, for sliding movement towards and away from a shoe  
25 presented thereto on its last support 20, on slide rods 364 carried by said frame, the carriage supporting heel seat lasting instrumentalities generally designated 366, and including wiper plates, fastener driving means associated therewith, and a heel band arrangement (not shown). The  
30 heel band arrangement is of a type (fully described in U.K. Patent Application No. 8020133) wherein the "legs" of the band are urged inwardly by means of a pressure compensating arrangement so that if one of the legs engages the shoe before the other, it will not dislodge the shoe, but rather  
35 its further inward movement will be curtailed and no significant pressure will be applied by it to the shoe until the other leg engages the shoe. In this way, the shoe is clamped



1 by the heel band arrangement in the position in which it  
has previously been located on the last pin.

The machine in accordance with the invention  
also comprises a holddown member 406 which is arranged  
5 to engage with the heel seat of a shoe positioned on the  
shoe support 20, moveable heightwise of the machine under  
the action of a piston-and-cylinder arrangement 398. For  
supporting the holddown member 406, the machine in accordance  
with the invention comprises two support arms 386, mounted  
10 on the frame 360 and supporting a cross-member 388 which  
carries a shaft 392 connected by a lever 394 to a piston  
rod 396 of a piston-and-cylinder arrangement 398, which  
is carried on the frame 360. Operation of said arrangement  
398 thus effects rotation of the shaft 392. The shaft also  
15 supports a lever 400 connected to two plates 404 to which  
the holddown member 406 is bolted, a further lever 408 being  
connected between the holddown member and the cross-member  
388, the levers 400, 408 thus forming a parallel linkage  
arrangement whereby the movement of the holddown member 406  
20 is maintained substantially vertical.

The machine in accordance with the invention  
also comprises shoe centralising means generally designated  
423 (Fig.2), comprising two forwardly projecting shoe  
engaging elements 424, arranged for movement between an  
25 operative position, in which they can engage opposite side  
portions of the heel seat of the shoe, one at either side of  
the last pin 32', and an out-of-the-way position. For  
moving the elements 424 as aforesaid, each element is  
carried on a lever 426, which is supported, at an end remote  
30 from the element, on a further lever 428 pivotally mounted  
on a cross-member 430 bolted to the front face of the  
carriage 362. In addition, pivotally connected to an inter-  
mediate portion of each lever 426 is one arm of a bell crank  
lever 432, pivoted on the cross-member 430, the other arm of  
35 which is directed inwardly towards a central region of the  
cross-member 430. Each of said other arms carries an abut-  
ment which engages with a flange member 434 carried on a

1 piston rod 436 of a piston-and-cylinder arrangement 438  
itself supported on the carriage 362. In addition, springs  
440, connected between each lever 428 and the carriage 362,  
urge the elements 424 into their out-of-the-way position,  
5 operation of the piston-and-cylinder arrangement 438, on  
the other hand, moving said elements to their operative  
position. It will thus be appreciated that, because of  
the arrangement above described, operation of the elements  
424 ensures that each moves through the same distance as  
10 the other, so that they can effect a centralising action on  
a shoe presented therebetween.

In using the machine in accordance with the  
invention, the operator locates the rocking axis 412 of  
the last pin 32' so that it lies substantially in the heel-  
15 to-toe plane of the shoe bottom, said plane of course being  
determined by the widthwise position of the V-shaped toe  
end engaging member 48 (see Figure 4). Of course, in certain  
circumstances, the rocking axis of the last pin may well lie  
along the longitudinal centre line of the heel seat lasting  
20 instrumentalities, viz. when the shoe bottom shape is such  
that the V-shaped member 48 is located on said centre line  
also. It will of course be appreciated that some misalign-  
ment between the heel-to-toe plane of the shoe bottom and  
the rocking axis 412 of the last pin 32' can be tolerated  
25 without going beyond the scope of the present invention.

Figure 4 is a diagram of a shoe bottom, showing  
the heel-to-toe plane HT of the last bottom, the location  
of which is determined by the widthwise setting of the toe  
support means 34 (indicated in this Figure by the member 48  
30 and pad 58). The longitudinal centre line of the heel seat  
(HS) is also indicated. Conventionally, using e.g. a heel  
seat lasting machine, the rocking axis 412 of the heel pin  
32' would be aligned with the line HS, so that the last pin  
would be able to rock in a plane indicated by R(HS). With  
35 a shoe having a configuration as indicated in Figure 4, how-  
ever, there would be a tendency for the last to tilt on its  
support. Thus, in accordance with the invention, the rock-

1 ing axis 412 is aligned with the heel-to-toe plane HT, the  
rocking plane now being as indicated by R(HT).

With the rocking axis thus oriented, a shoe can  
then be located on the last pin 32, with its heel seat reg-  
5 ion in a desired heightwise position. Thereafter, firstly  
the shoe centralising means 423 is operated to engage oppos-  
ite side portions of the shoe, and if necessary, by rocking  
the last pin 32' about the axis 412, to centralise the heel  
end region of the shoe with the longitudinal centre line HS  
10 of the heel seat aligned with the longitudinal centre line  
of the machine, regardless of the relationship between the  
centre line HS and the heel-to-toe plane HT of the shoe  
bottom. With the shoe centralised as aforesaid, the hold-  
down foot 312 is actuated to clamp the shoe on the last pin  
15 in a centralised condition, and the elements of the shoe  
centralising means are then moved to an out-of-the-way  
position. With the shoe thus held, the carriage 362 is  
then caused to advance, to bring the heel band 420 into  
clamping engagement with the heel end of the shoe, the  
20 shoe centralising means, which is mounted on the carriage  
362, thus being moved out of the way, so as not to impede  
the side lasting operation. With the shoe clamped by the  
heel band, the side lasting operation then takes place in a  
conventional manner.

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## 1 Claims:

1. Machine for lasting heel seat portions of shoes comprising -

5 a shoe support, for supporting, bottom uppermost, a shoe comprising an upper positioned on a last and an insole on the last bottom, said support comprising heel support means, including a last pin which can be received in a hole therefor formed in the heel end of the last, and  
10 a toe support member, which can be positioned widthwise of the machine according to whether the shoe is a left or a right,

holddown means between which and the shoe support heightwise relative movement can take place, whereby the heightwise position of the shoe bottom can be set  
15 by engagement of the heel seat region thereof with said holddown means,

a heel band arrangement, between which and the shoe support relative movement can take place, lengthwise  
20 of the shoe bottom, to cause the heel end of the shoe to be clamped, and

heel seat lasting instrumentalities, including wiper plates movable in a wiping plane, whereby lasting marginal portions of the upper can be wiped over and  
25 pressed against corresponding marginal portion of the insole,

characterised in that the last pin (32') is mounted for limited rocking movement about an axis (412) extending lengthwise of the shoe bottom, and in that shoe  
30 centralising means (423) is provided comprising two shoe-engaging elements (424), arranged at opposite sides of the last pin (32'), and means (438) for moving them, through equal distances, to engage the shoe supported by said last pin (32') and centralise the heel and thereof in relation  
35 to the longitudinal centre line of the machine.

2. Machine according to Claim 1 characterised in that the shoe centralising means (423) is supported by

1 a carriage (362) by which also the heel band arrangement  
(520) and the heel seat lasting instrumentalities (366)  
are supported, the arrangement being such that relative  
movement is effected between the heel band arrangement  
5 (520) and the shoe support (20) only after the holddown  
means (406) is operative and the shoe centralising means  
(423) has then been rendered inoperative.

3. Machine according to either one of the  
preceding Claims characterised in that the last pin (32')  
10 is mounted on a support member (420) for rocking movement  
as aforesaid, said member (420) being itself mounted for  
movement about an axis (420a) extending heightwise of the  
shoe bottom.

4. Machine according to Claim 3 characterised  
15 in that clamping means (421) is provided for clamping the  
support member (420) after it has been positioned as afore-  
said.

5. Machine according to either one of Claims 3  
and 4 characterised in that the last pin (32') is carried  
20 by a support block (416) supported by a support member  
(420), inter-engaging faces of said block (416) and member  
(420) being arcuate, the centre of curvatan thereof exten-  
ding widthwise of the shoe bottom, and locking means (422)  
being provided for holding the block (416) in adjusted  
25 position on the member (420).

6. Machine according to Claim 5 characterised  
in that the support block (416) supports a cradle (414)  
for the last pin (32'), said cradle (414) being slidable,  
widthwise of the shoe bottom, in said block (416) and  
30 locking means (418) being provided for locking said  
cradle (414) in adjusted position.

7. Machine according to any one of the preceding  
Claims characterised in that a last support plate (442) is  
provided on the shoe support (20), the under-side of said  
35 plate (442) and a co-operating surface (452) of a mounting  
(410) for the last pin (32') being complementarily part-  
spherical.

1           8. Machine according to Claim 7 characterised  
in that the last support plate (442) is resiliently (446)  
held on said mounting (410).

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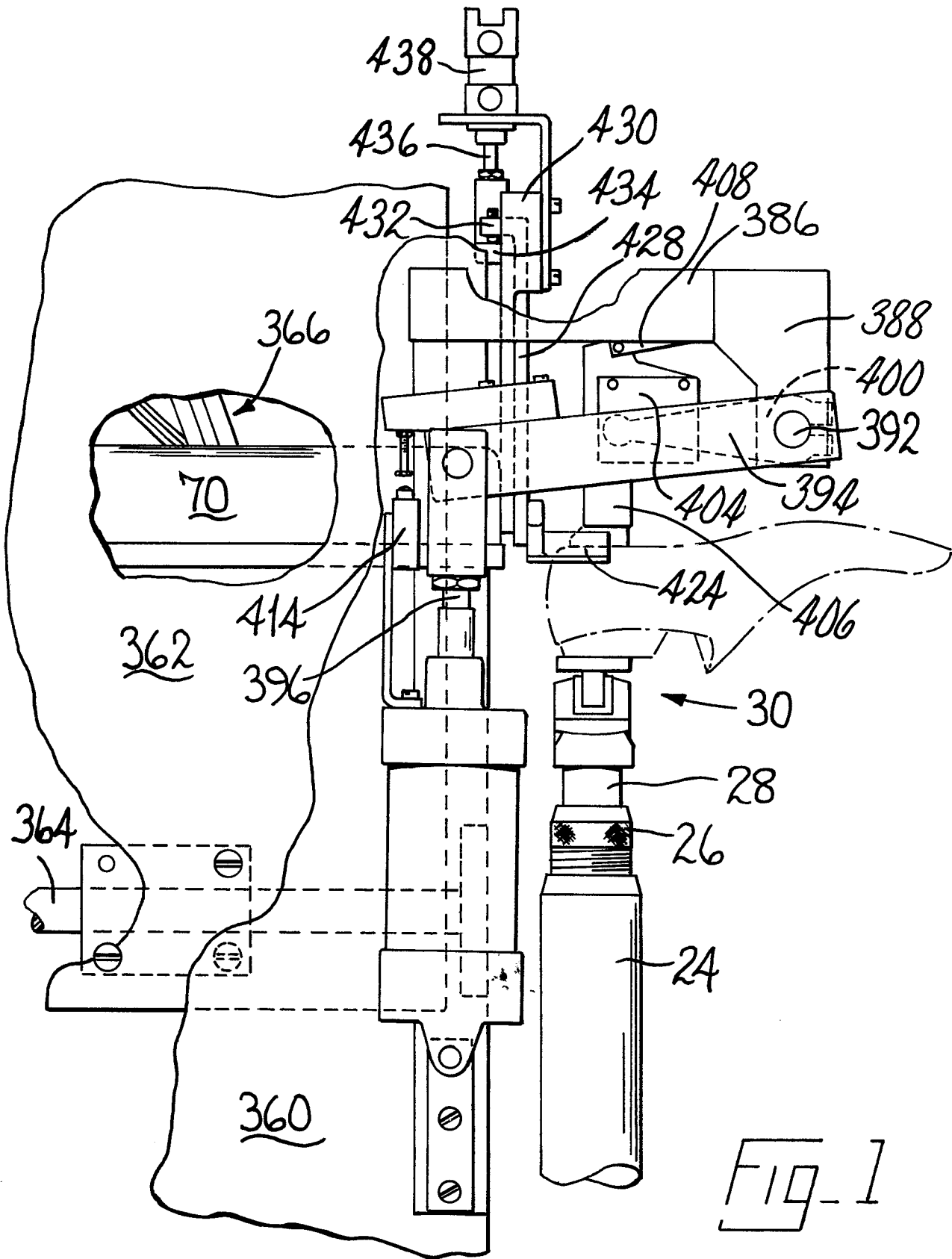


Fig. 1

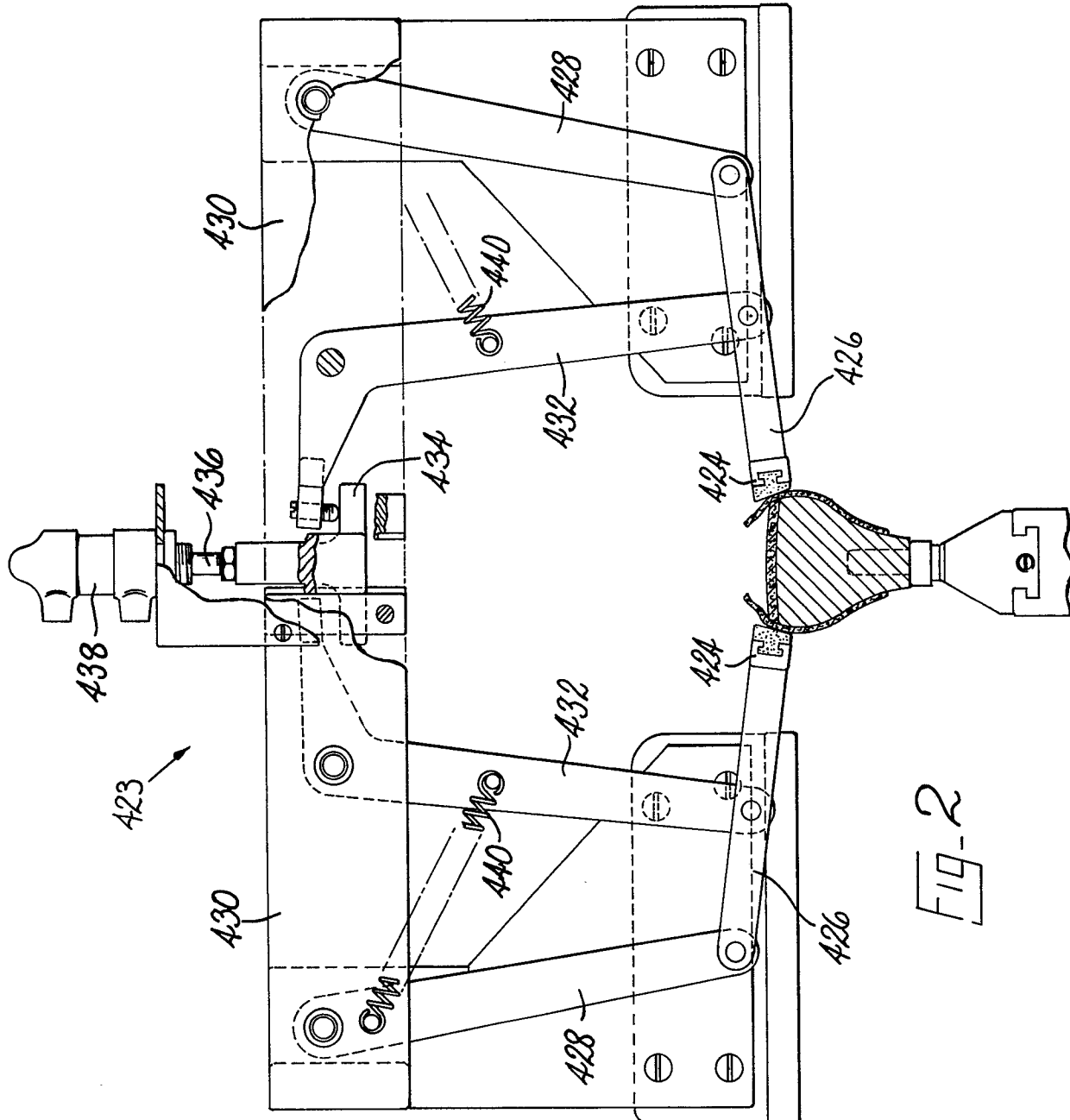


FIG. 2



