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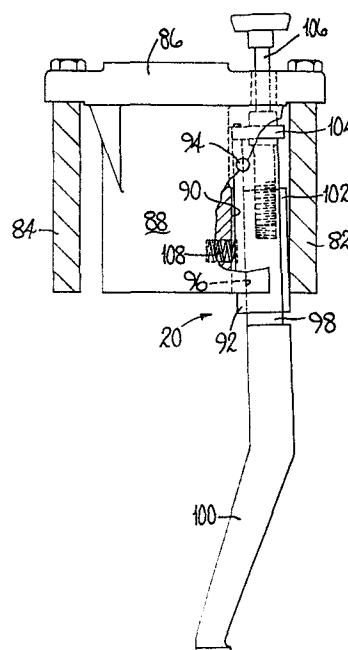
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Machines for lasting heel seat portions of shoes.

In heel seat (or combined side and seat) lasting machines, the shoe is first located relative to lasting instrumentalities (18; 112) lengthwise by a heel band (16; 114) and heightwise by a holddown (20). To prevent dislodging the upper on its last by moving it heightwise relative to the heel band, and to prevent damage to insole, e.g. by scuffing, by moving the shoe lengthwise relative to the holddown, firstly the holddown is mounted for limited pivotal movement so that, after engagement by the shoe, it can move lengthwise therewith, and secondly, the holddown is engaged by the shoe while out of engagement with the heel band. To achieve this, either the shoe is first located lengthwise by the heel band (16), is then retracted, positioned heightwise, and then returned to its lengthwise location, or, as it moves lengthwise, the shoe is caused to engage the holddown before it reaches the heel band (114).



1 Machines for lasting heel seat portions of shoes

 This invention is concerned with a machine for
lasting heel seat portions of shoes comprising a shoe sup-
5 port, for supporting, bottom uppermost, a shoe comprising an
upper on a last with an insole on the last bottom, heel seat
lasting instrumentalities, a heel band, which serves to
determine the position of a shoe supported by the shoe sup-
port, lengthwise of its bottom, in relation to the heel seat
10 lasting instrumentalities and to clamp the heel end of such
shoe thus positioned, a holddown, which serves to determine
the heightwise position of a shoe supported by the shoe sup-
port in relation to said instrumentalities, and between which
and the shoe support such shoe can be clamped thus positioned,
15 first means for moving the shoe support inwardly towards the
heel band, in a direction extending generally lengthwise of
the bottom of a shoe supported by the shoe support, and second
means for effecting relative heightwise movement between the
shoe support and the holddown, the arrangement being such
20 that a shoe positioned and clamped on the shoe support as
aforesaid in relation to the heel seat lasting instrumental-
ities can then be operated upon thereby.

 In using such a machine, if the heel end of the
shoe remains pressed against the heel band during the height-
25 wise movement between the shoe support and holddown, there
will be a tendency for the relative positions of the upper
and the last to be altered. This will be especially the case
where only toe end portions of the shoe have previously been
lasted, particularly where the upper has not been subjected
30 to a prior flanging operation in the heel seat region (which
may form part of a backpart moulding operation) or where, in
the case of a shoe to be seat-lasted using tacks, a prior
assembling operation involving the use of assembly tacks, has
not been performed.

35 To combat this problem, in one commercially avail-
able machine the relative movement of approach between the
shoe support and the support head takes place simultaneously

1 with the relative heightwise movement between the shoe support and the holddown so that, provided the machine is correctly set up, the risk of the heel band dislodging the upper on its last is minimised. However, conventionally the shoe support comprises a last pin on which the last is placed, the pin being accommodated in a hole drilled in the cone of the last. Whereas the drilling of these holes is intended to be standard, there is in practice a significant difference between successive lasts in the location of the hole. Furthermore, if the shoe bottom is brought into engagement with the holddown before the heel end of the shoe engages with the heel band, then the insole may be dislodged or damaged, e.g. by scuffing, by reason of the holddown being pressed thereagainst during continued inward movement of the shoe support. Consequently, for the machine in question to be effectively used, the setting-up of the various instrumentalities should be checked in respect of each shoe introduced to the machine. This is clearly time-consuming and thus unacceptable.

20 In U.S. Patent Specification No.3409921 is described a machine in which a carriage for the heel band, wipers and holddown is moved towards a shoe supported on a last pin to a limit determined by a sensing finger, which engages the cone of the last, beyond the top line of the upper. The shoe is then located heightwise by the holddown, and thereafter the heel band is then advanced relative to its carriage to embrace the heel end of the shoe. It will thus be appreciated that, in this machine, the sensing finger is located relative to the heel seat lasting instrumentalities. In said machine, however, a problem arises in that, especially in the case of a heel seat lasting machine using tacks, it is important that the wiper plates are properly located, in a direction extending lengthwise of the shoe bottom, in relation to the heel seat region of the shoe, and thus it is desirable that the lengthwise location of the shoe be achieved from the feather line region thereof rather than from beyond the top line region, since, because of style

1 variations, sensing from beyond the top line may require re-
setting of the position of the sensing finger lengthwise
relative to the wiper plates. Also, the orientation of the
last pin hole may affect the relationship between shoe and
5 sensing finger.

It is the object of the present invention to provide an improved machine for lasting heel seat portions of shoes in which the heel band is utilised for the lengthwise location of the shoe, but the risk of the upper being there-
10 by dislodged on its last, or of damage to the insole is minimised, this object being resolved in accordance with the invention, in a machine as set out in the first paragraph above, in that the holddown is movable relative to the heel band, in a direction extending lengthwise of the bottom of
15 a shoe supported by the shoe support, as relative movement takes place between the shoe support and heel band under the action of said first means.

In this way, the shoe can first engage with the holddown, establishing the heightwise location of the shoe
20 in relation to the heel seat lasting instrumentalities, and then engage the heel band, establishing the lengthwise location, but without the risk of dislodging the upper on its last, lengthwise movement of the holddown relative to the heel band also minimising the risk of damage to the insole.

25 In one preferred embodiment, the first means is effective firstly to movement the shoe support inwardly towards the heel band, to bring the heel end of a shoe supported by the shoe support into engagement with the band, then to separate them through a predetermined distance, the second
30 means being effective, during such separation, to cause relative movement of approach to take place between the shoe support and the holddown, and thereafter again to move the shoe support inwardly towards the heel band to return the heel end of the shoe into engagement therewith, the arrange-
35 ment being such that, during such return movement, the hold-down, held in engagement with the shoe bottom by the action of the second means, is caused to move with the shoe support

1 relative to the heel band. Thus, the shoe is first located
lengthwise in relation to the heel seat lasting instrument-
alities and then heightwise, while out of engagement with
the heel band, thereby avoiding dislodging during heightwise
5 location.

Conveniently said first means comprises a piston-
and-cylinder arrangement carried by a support linkage includ-
ing a link arrangement having an extended and a retracted
condition, the arrangement being such that firstly, with
10 said link arrangement in its extended condition, the piston-
and-cylinder arrangement is actuated to move the shoe sup-
port inwardly, then, with the piston-and-cylinder arrange-
ment locked in position by locking means, the link arrange-
ment is moved to its retracted condition thus to separate
15 the shoe support and the heel band, and thereafter, after
operation of the second means as aforesaid, the locking means
is released and the piston-and-cylinder arrangement again
actuated to move the shoe support inwardly towards the heel
band. In this way, the initial lengthwise location of the
20 shoe by engagement with the heel band remains unaffected by
the variable link arrangement, while said arrangement ensures
that the separating movement takes place through a predeter-
mined distance. By separating the shoe support and heel
band through a predetermined distance, furthermore, the
25 heightwise location of the shoe can be maintained in relation
to the heel seat lasting instrumentalities, upon the return
movement being effected between the shoe support and heel
band.

In a second preferred embodiment, on the other hand,
30 the first means is effective to move the shoe support inward-
ly towards the heel band and, during such movement, the
second means is operated to cause relative heightwise move-
ment to take place between the shoe support and the holddown,
the arrangement being such that the bottom of a shoe support-
35 ed by the shoe support is caused to engage with the holddown
prior to engagement of the heel band with the heel end of
such shoe, continued inward movement of the shoe support
after engagement of the shoe bottom with the holddown causing

1 the holddown to move with the shoe support relative to the
heel band. Thus, using this arrangement, the shoe is
effectively moved into an operative position, as determined
by engagement with the heel band and the holddown, without
5 detriment to the cycle time. Also, by first engaging the
holddown, the risk of the upper being dislodged on its last
as aforementioned is avoided, and further, because the hold-
down can move in a direction generally lengthwise of the
shoe bottom, the risk of buckling the insole or of damage
10 to the insole is minimised.

The arrangement of the second embodiment of the
invention is especially suitable, though not exclusively so,
for a machine in which the first and second means are
pneumatically operated.

15 Conveniently, in both embodiments referred to,
the holddown is resiliently urged in a direction away from
the heel band, so that effectively, at the point of first
engagement, the holddown is displaced from its desired
operating position, and the subsequent movement together
20 with the shoe as aforesaid is then effective to bring the
holddown into a desired location for the operation of the
machine.

Furthermore the holddown is conveniently mounted
for pivotal movement about an axis extending transversely of
25 the bottom of a shoe supported by the shoe support. Prefer-
ably the axis is sufficiently spaced from the shoe-engaging
surface of the holddown that the pivotal movement of the
holddown does not significantly affect the heightwise posi-
tion of said surface.

30 There now follows a detail description, to be
read with reference to the accompanying drawings, of two
embodiments of the machine in accordance with the invention,
which embodiments have been selected for description merely
by way of exemplification of the invention and not by way
35 of limitation thereof.

1 In the accompanying drawings:-

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

5 Figure 2 is a front perspective view of a second machine in accordance with the invention;

Figure 3 is a fragmentary side view, partly in section, showing details of a holddown of said machine;

10 Figure 4 is a fragmentary side view, partly in section, showing details of a toggle arrangement forming part of a support linkage for a shoe support of the machine shown in Figure 1; and

15 Figures 5a to 5d are diagrammatic representations indicating a sequence of operations in the location of a shoe lengthwise and heightwise of the machine shown in Figures 1 and 4.

The first machine in accordance with the invention now to be described is a machine for use in the combined lasting of heel seat and side portions of shoes using tacks and comprises a shoe support generally designated 10 (Figure 20 1), including a last pin 12 on which a shoe can be supported, bottom uppermost, and a toe rest 14, a heel band 16, heel seat lasting instrumentalities including two wiper plates 18, and side lasting instrumentalities generally designated 22, said instrumentalities comprising a plurality of fingers 24, a plurality of clamp pads 26 and lasting strap elements 28 extending over said fingers 24 and pads 26. The side 25 lasting instrumentalities 22 are generally similar to those described in our co-pending European Patent Application No. 81304527.5. The wiper plates 18 form part of heel seat 30 lasting instrumentalities which also include fastener-inserting devices generally designated 30 actuated by a pneumatically operated striker plate 32. The heel seat lasting instrumentalities and the heel band 16 are generally similar to those of the machine described in our U.K. Patent 35 Application No.8020133.

The shoe support 10 is mounted, on a bracket 36 (Figure 4) upstanding from a base 38 of the machine frame,

1 for swinging movement about a shaft 40 extending widthwise
of the machine. The shoe support 10 comprises a column 42
on which the last pin 12 is supported, said column being
mounted for sliding heightwise movement in a post 44 sup-
5 ported on the shaft 40. Said column also provides a sup-
port for the toe rest arrangement 14.

For effecting swinging movement of the shoe sup-
port 10, first means is provided, comprising a piston-and-
cylinder arrangement 46, a piston rod 48 of which is pivotal-
10 ly connected to the post 44. The cylinder is pivotally
mounted, by a pin 50, in a bifurcated end of an S-shaped
lever 52, itself mounted for pivotal movement about a pin
54 supported on a bracket 56 upstanding from the base 38.
At its lower end, furthermore, the lever 52 is pivotally
15 supported, through two links 58, 60, on the bracket 56. The
links 58, 60 are pivoted together to form a toggle arrange-
ment at the "knee" of which is connected a piston rod 62 of
a piston-and-cylinder arrangement 64 mounted on the bracket
56.

20 For locking the piston-and-cylinder arrangement
46 in any desired condition, locking means is also provided
comprising a rod 66 mounted on the pin 50, said rod 66
having an internal bore which receives a further rod 68
pivotally connected to the post 44 of the shoe support 10;
25 such pivotal connection may be the same as that for the
piston rod 48. Carried by the rod 66, furthermore, is a
pneumatic clamp arrangement 70, which is effective to clamp
said further rod 68 in the rod 66, and thus clamp up the
piston-and-cylinder arrangement 46 and its piston rod 48.
30 In this way, effectively a rigid link is created between the
pin 50 and the post 44 of the shoe support.

Thus, in the operation of the machine, when the
toggle arrangement 58, 60 is in its extended condition, the
lever 52 is held firm on the bracket 56, so that the piston-
35 and-cylinder arrangement 46 is securely supported. On the
other hand, when the clamp arrangement 70 is operating,
moving the toggle arrangement 58, 60 to its retracted

1 condition is effective to cause the shoe support to swing about the shaft 40, such swinging movement being through a predetermined distance determined by the stroke of the cylinder 64.

5 The first machine in accordance with the invention also comprises second means for moving the shoe support 10 heightwise to bring the bottom of a shoe supported thereby, in its heel seat region into engagement with the holddown 20. To this end, the column 42 extends through the post 10 and projects downwardly from the under-side thereof, there being pivotally connected to the lower end of the column a foot 74 which engages with a wedge member 76 movable along a horizontal path, on the base 58 of the machine frame, by means of a piston-and-cylinder arrangement 78 supported by 15 a bracket on said base. Operation of said piston-and-cylinder arrangement is thus effective, through the wedge member 76, to raise or lower the column 42 and thus the shoe support 10.

 The second machine in accordance with the in- 20 vention now to be described is generally similar, except as hereinafter described, to the machine described in the aforementioned European Patent Application and is a machine for use in the combined lasting of heel seat and side portions of shoes using adhesive. The machine thus comprises 25 a shoe support 110 (Figure 2) on which a shoe, comprising an upper U on a last with an insole I on the last bottom, can be supported bottom uppermost. The machine further comprises heel seat wiping instrumentalities 112, a heel band 114, and two side lasting assemblies generally designated 116.

30 The shoe support 110 comprises toe and heel supports for the shoe, said supports being carried on a support post (not shown) which is mounted for heightwise movement within a column 142, a piston-and-cylinder arrangement 178 being supported at the base of column 142 for effecting heightwise 35 movement of the shoe support.

 Furthermore, the column 142 is mounted for swinging movement about an axis 140 extending widthwise of the

1 machine, a piston-and-cylinder arrangement (not shown) being
mounted on the machine frame and being operatively connect-
ed to the column for effecting such swinging movement, and
thus for effecting swinging movement of the shoe support
5 from an initial, loading, position to an operative position.
The piston-and-cylinder arrangement (not shown) and the
piston-and-cylinder arrangement 178 constitute respectively
first and second means of the machine. Both piston-and-
cylinder arrangements referred to are pneumatically operated.

10 In both machines referred to above, a holddown
generally designated 20 (Figure 3) is also provided, which
is carried on a bridge member 86 supported between two
vertical plates 82, 84 of the machine frame, as now to be
described. The bridge member 86 carries a support block 88
15 having a channel 90 formed therein for receiving a support
element 92 mounted for pivotal movement on a pin 94 in side
wall portions of the block 88. The support element 92 also
has a channel 96 in which is accommodated a necked-down por-
tion 98 of a holddown foot 100, a plate 102 being secured
20 across the open side of the channel 90 thus to prevent the
necked-down portion 98 from falling out. At the upper end
of the support element 92 is secured a plate 104 which
supports, captive therein, an adjusting screw 106, a lower
end of which is threadedly received in the necked-down
25 portion 98, rotation of the screw 106 thus serving to vary
the heightwise position of the holddown foot. The support
element 92, and thus the holddown foot 100, is urged about
the pin 94 towards the front plate 82 by means of a spring
108 accommodated in a recess formed in the forward face of
30 the channel 90 of the support block.

In the operation of the first machine, with the
holddown urged forwardly on its support 88, and with the
wiper plates 18 of the heel seat lasting instrumentalities
retracted and the heel band 16 in an open position, a shoe
35 is placed on the last pin 12 and toe rest 14 while the shoe
support 10 is in a forward, loading, position, whereafter,
with the toggle arrangement 58, 60 extended, the piston-and-

- 1 cylinder arrangement 46 is operated to swing the shoe support 10 rearwardly to bring said support and the heel band 16 into an operative relationship determined by engagement of the heel end of the shoe with the heel band 16.
- 5 The shoe is thus located in a lengthwise direction relative to the heel seat lasting instrumentalities and to the hold-down 20 (Figure 5a). At the end of a delay, controlled by a timer (not shown) which is actuated with the actuation of the piston-and-cylinder arrangement 46, the
- 10 pneumatic clamp arrangement 70 is operated and the toggle arrangement 58, 60 is then moved to its retracted condition, thus effecting a forward movement of the shoe support 10 through a predetermined distance, separating the shoe support 10 from the heel band 16 to disengage the heel end
- 15 of the shoe from the latter (Figure 5b). While the shoe support and heel band are thus separated, the piston-and-cylinder arrangement 78 is operated whereby, through the action of the wedge member 76, the shoe support is raised to bring the heel seat region of the shoe bottom into
- 20 engagement with the holddown foot 100, at this time spring-urged into its forward condition. The heel seat region is thus located in a heightwise direction relative to the plane of the wiper plates 18 of the heel seat lasting instrumentalities (Figure 5c). With the shoe thus located
- 25 heightwise, the pneumatic clamp arrangement 70 is released and the piston-and-cylinder arrangement 46 is again operated to return the shoe support 10 into its lengthwise location, with the heel end of the shoe in engagement with the heel band 16 (Figure 5d). During this return movement, the
- 30 holddown 20 is caused to pivot about the pin 94, so that it remains in fixed engagement with the heel seat region of the shoe located thereby. With the shoe thus located heightwise and lengthwise, the shoe support 10 is locked in its position by means of a wedge member (not shown).
- 35 In the operation of the second machine, on the other hand, a shoe is placed on shoe support 110, in its loading position, and the first and second means are

1 actuated to move the shoe from the loading position to an
operative position, as determined by engagement with the
holddown 20 and heel band 114. The pneumatic circuitry is
so arranged that the heel end of the shoe is caused to
5 engage with the holddown foot 100 prior to its engagement
with the heel band. More particularly, the shoe support
110 is first caused to swing from its initial, loading,
position. After a short time period, timed by means of a
timer device 150 (Figure 2), the piston-and-cylinder
10 arrangement 178 is actuated to move the shoe support 110
upwardly, while said swinging movement is also continued.
The speed of the swinging movement is regulated by the
operator using a flow control valve 152, by which the
pneumatic pressure can be varied. The pressure of the
15 pneumatic fluid supplied to said arrangement 178 is regulated
by a conventional regulator valve. Instead of using a
timer device, a control arrangement responsive to the dis-
tance moved by the shoe support 110 as it swings may be
used, e.g. a trip valve, by which the supply of pneumatic
20 fluid to the arrangement 178 can be initiated. Whichever
control system is used, as the shoe support 110 is moved
inwards and upwards as aforesaid, the heel seat portion of
the insole I is first brought into engagement with the
holddown 20. Continued inward movement of the shoe support
25 110, after the holddown has been thus engaged, is then
effective to bring the shoe into engagement with the heel
band 114, at the same time causing the holddown 20 to move
rearwardly with the shoe, pivoting about the pin 94 as it is
so moved.

30 It will be appreciated that in the operation of
both machines in accordance with the invention, the holddown
foot 100 is urged by the spring 108 forwardly of the position
which it is intended it should occupy during the subsequent
lasting operation. Thus, when first engaged by the shoe, the
35 holddown foot is in its forward position and is caused to
pivot about the pin 94, during the inward movement of the
shoe support, by engagement with the shoe, so that, when the

1 heel band engages the heel end of the shoe, the holddown is
positioned appropriately for the subsequent lasting operation.
The amount of such movement of the holddown 20 will of course
depend on a number of factors, including the relationship
5 between the backseam region of the shoe and the last pin
socket formed in the cone of the last. It is not expected,
however, that the variations in holddown movement will be
sufficiently significant to warrant setting up for each shoe
style, although, if such an adjustment became necessary,
10 appropriate adjustable limit means could be provided readily
for this purpose.

The second machine described above is intended for
use with pre-cemented work, and consequently does not require
adhesive-applying means to be provided (cf. the machine
15 described in the aforementioned European Patent Application).
The invention is, however, also applicable to a machine in
which such adhesive-applying means is provided, in which case
it may be necessary, if nozzles are used to apply adhesive
from the backseam region progressively along the opposite
20 side portions of the shoe bottom, for the holddown 20 to be
temporarily retracted to allow passage of such nozzles. In
such a case, since, in returning the holddown 20 into engage-
ment with the insole after passage of the nozzles, the hold-
down can then be positioned in a desired operative location
25 in relation to the shoe bottom, it will be desirable that
the holddown is spring-urged into the position it is intended
to occupy during the subsequent lasting operation, rather
than towardly of such position.

Although the first and second machines described
30 above are for use in the combined lasting of heel seat and
side portions of shoes, it will be appreciated that the
invention is also applicable to machines for use in lasting
heel seat portions only of shoes.

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 on a last with an insole on the last bottom, heel seat lasting instrumentalities, a heel band, which serves to determine the position of a shoe supported by the shoe support, lengthwise of its bottom,
10 in relation to the heel seat lasting instrumentalities and to clamp the heel end of such shoe thus positioned, a holddown, which serves to determine the heightwise position of a shoe supported by the shoe support in relation to said
15 instrumentalities, and between which and the shoe support such shoe can be clamped thus positioned, first means for moving the shoe support inwardly towards the heel band, in a direction extending generally lengthwise of the bottom of a shoe supported by the shoe support, and
20 second means for effecting relative heightwise movement between the shoe support and the holddown, the arrangement being such that a shoe positioned and clamped on the shoe support as aforesaid in relation to the heel seat lasting instrumentalities can then be operated upon thereby,
25 characterised in that the holddown (100) is movable relative to the heel band (16; 114), in a direction extending lengthwise of the bottom of a shoe supported by the shoe support (10; 110), as relative movement takes place between the shoe support (10; 110) and heel band (16; 114) under the action of
30 said first means (46; -).

2. Machine according to claim 1 characterised in that the first means (46) is effective firstly to move the shoe support (10) inwardly towards the heel band (16), to
35 bring the heel end of a shoe supported by the shoe support (10) into engagement with the band (16), then to separate them through a predetermined distance, the second means (78)

1 being effective, during such separation, to cause relative
movement of approach to take place between the shoe support
(10) and the holddown (20), and thereafter again to move
the shoe support (10) inwardly towards the heel band (16)
5 to return the heel end of the shoe into engagement therewith,
the arrangement being such that, during such return movement,
the holddown (100), held in engagement with the shoe bottom
by the action of the second means (78), is caused to move
with the shoe support (10) relative to the heel band (16).

10

3. Machine according to claim 2 characterised
in that said first means (46) comprises a piston-and-cylinder
arrangement (46) carried by a support linkage (52 to 60)
including a link arrangement (58, 60) having an extended and
15 a retracted condition, and that firstly, with said link
arrangement (58, 60) in its extended condition, the piston-and-
cylinder arrangement (46) is actuated to move the shoe
support (10) inwardly, then, with the piston-and-cylinder
arrangement (46) locked by locking means (70) in position,
20 the link arrangement (58, 60) is moved to its retracted
condition thus to separate the shoe support (10) and the
heel band (16), and thereafter, after operation of the
second means (78) as aforesaid, the locking means (70) is
released and the piston-and-cylinder arrangement (46) again
25 actuated to move the shoe support (10) inwardly towards the
heel band (16).

4. Machine according to claim 1 characterised
in that the first means (not shown) is effective to move the
30 shoe support (110) inwardly towards the heel band (114) and,
during such movement, the second means (178) is operated to
cause relative heightwise movement to take place between the
shoe support (110) and the holddown (20), the arrangement
being such that the bottom of a shoe supported by the shoe
35 support (110) is caused to engage with the holddown (100) prior
to engagement of the heel band (114) with the heel end of
such shoe, continued inward movement of the shoe support (110)

1 after engagement of the shoe bottom with the holddown (100),
causing the holddown (100) to move with the shoe support
(110) relative to the heel band (114).

5 5. Machine according to any one of the preceding
claims characterised in that the holddown (100) is resiliently
urged (108) in a direction away from the heel band (16; 114).

10 6. Machine according to any one of the preceding
claims characterised in that the holddown (100) is mounted
for limited pivotal movement about an axis (94) extending
transversely of the bottom of a shoe supported by the shoe
support (10; 110).

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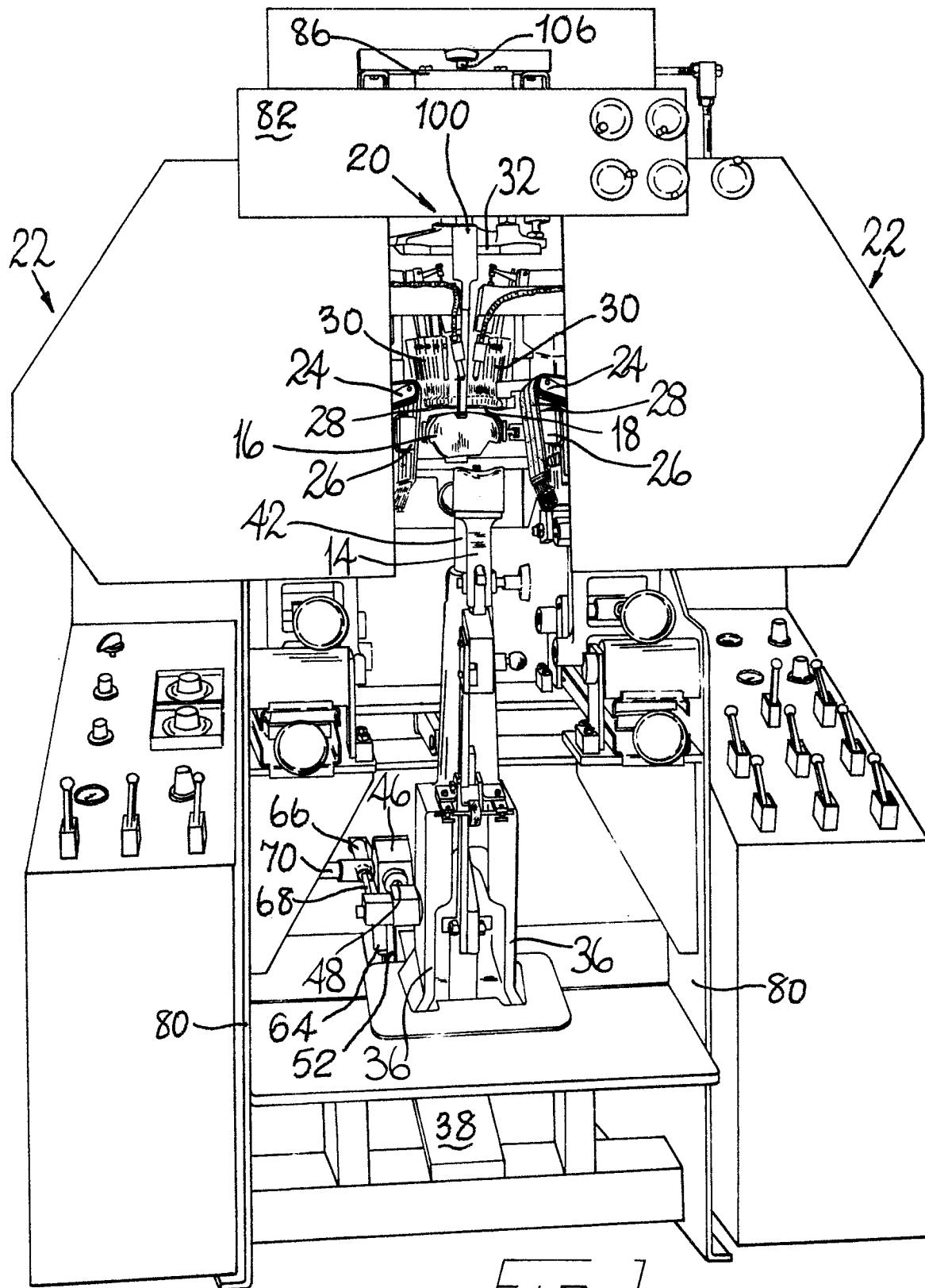
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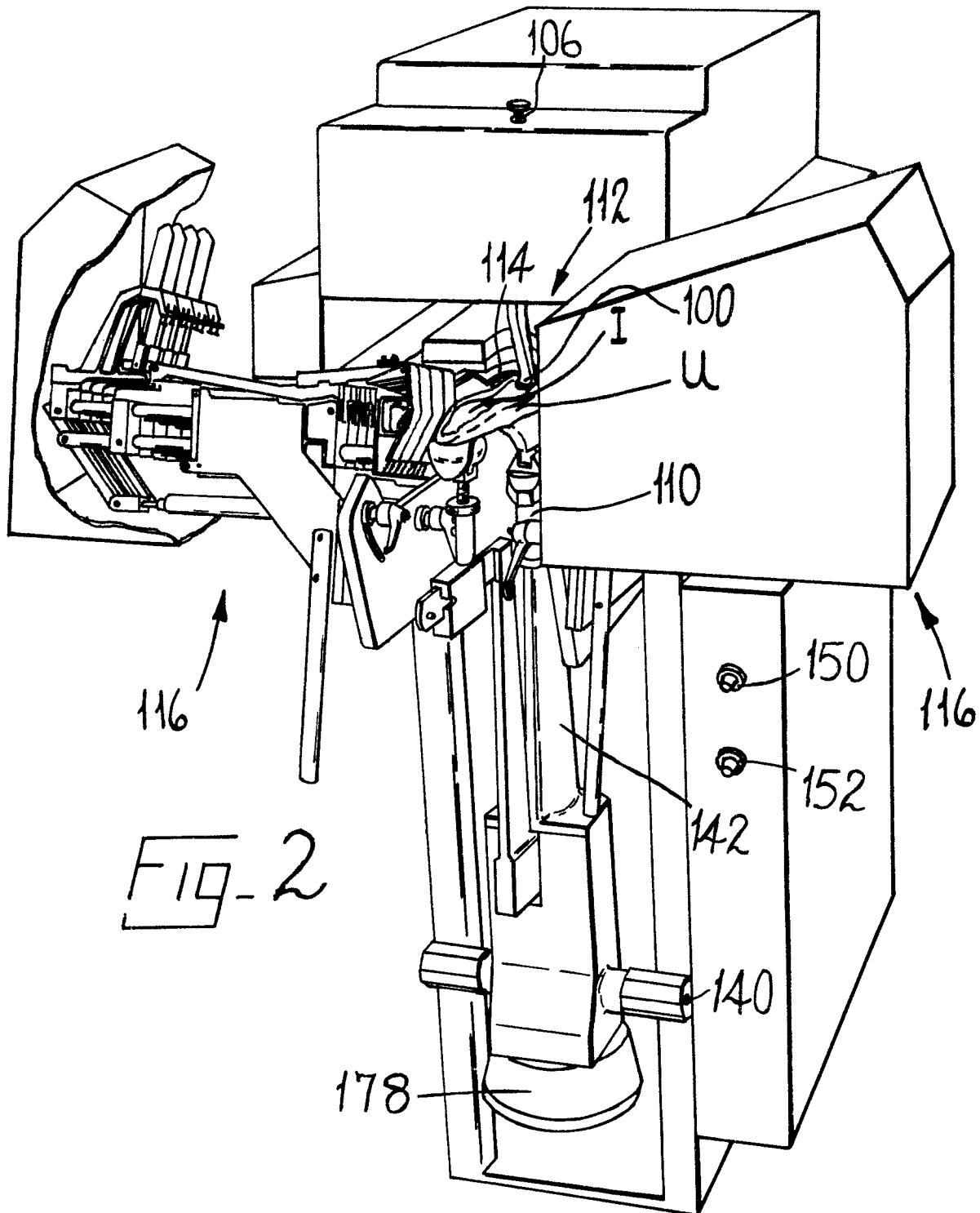
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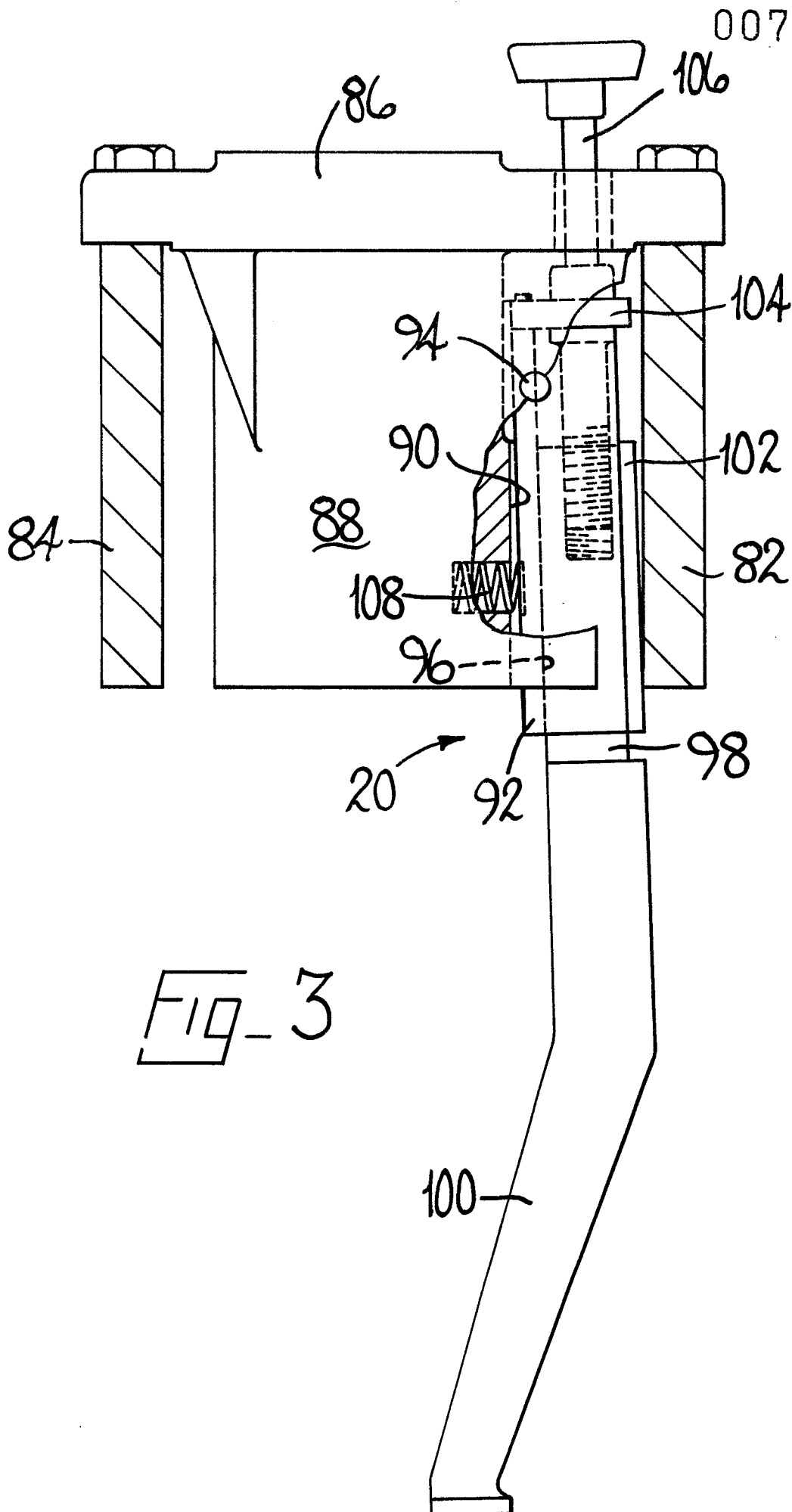
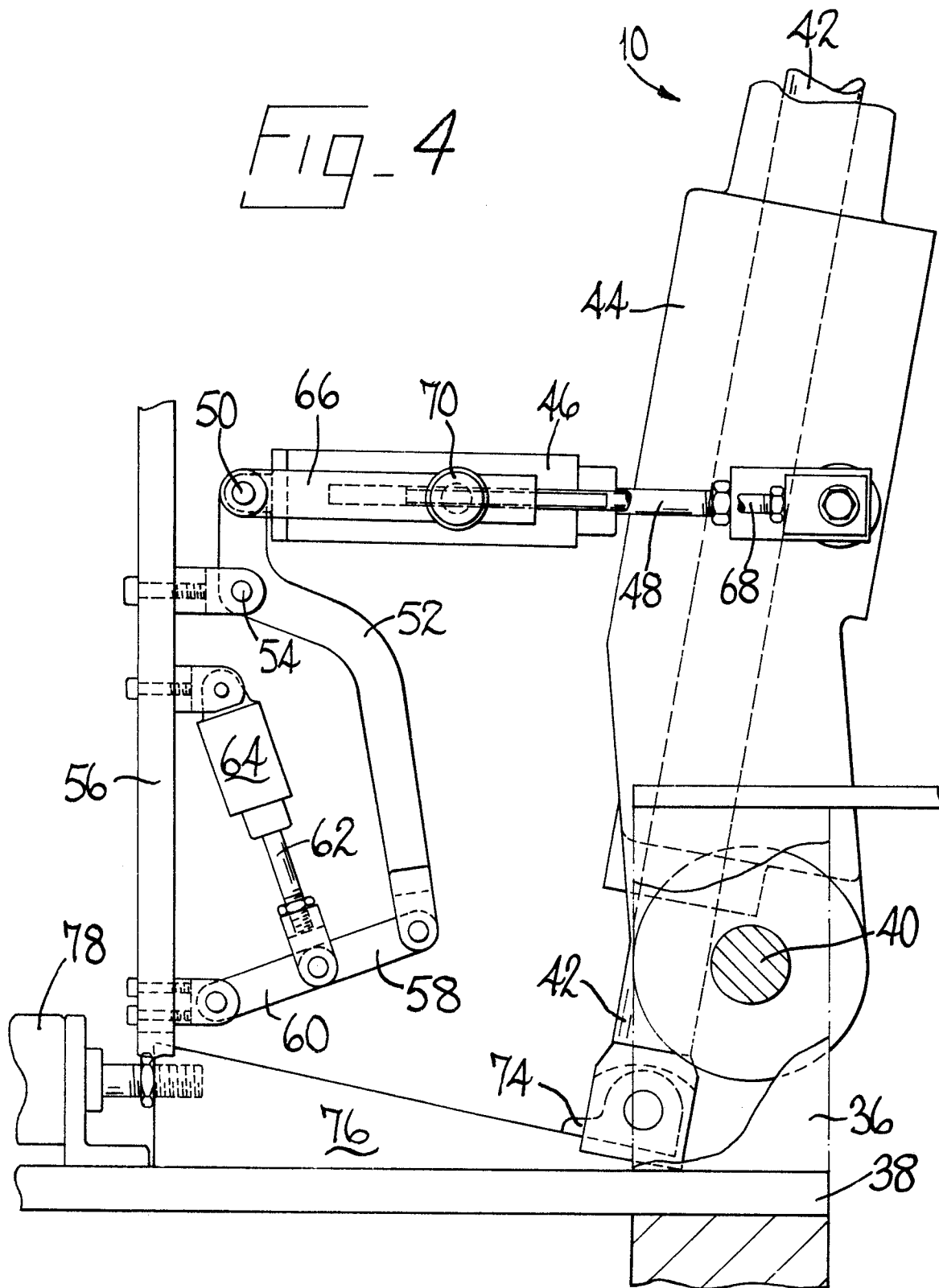
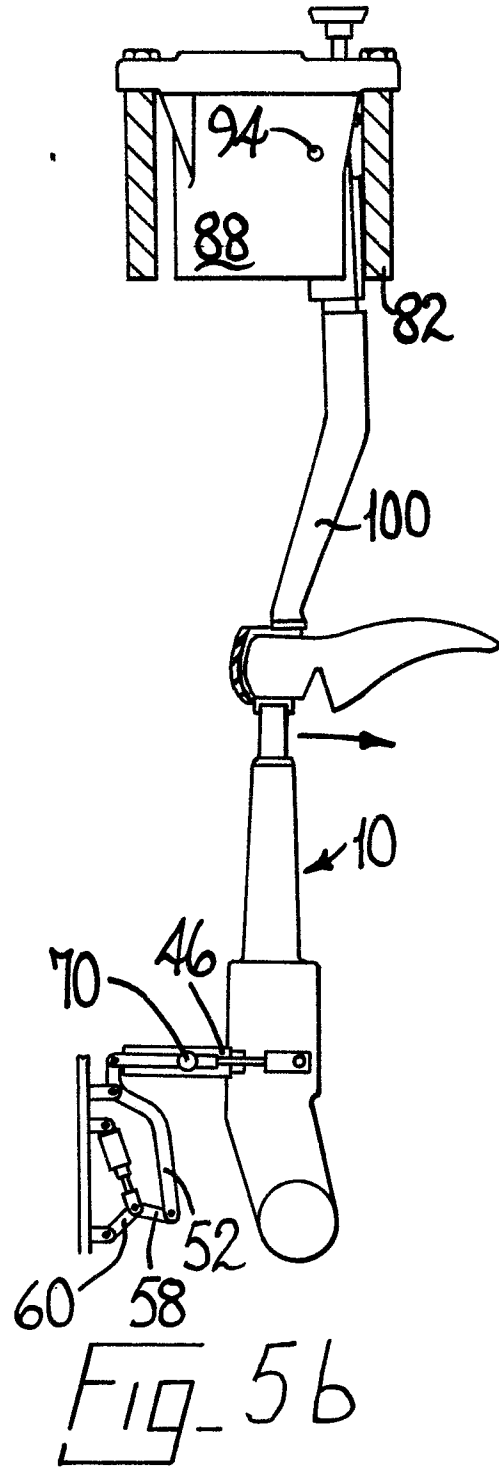
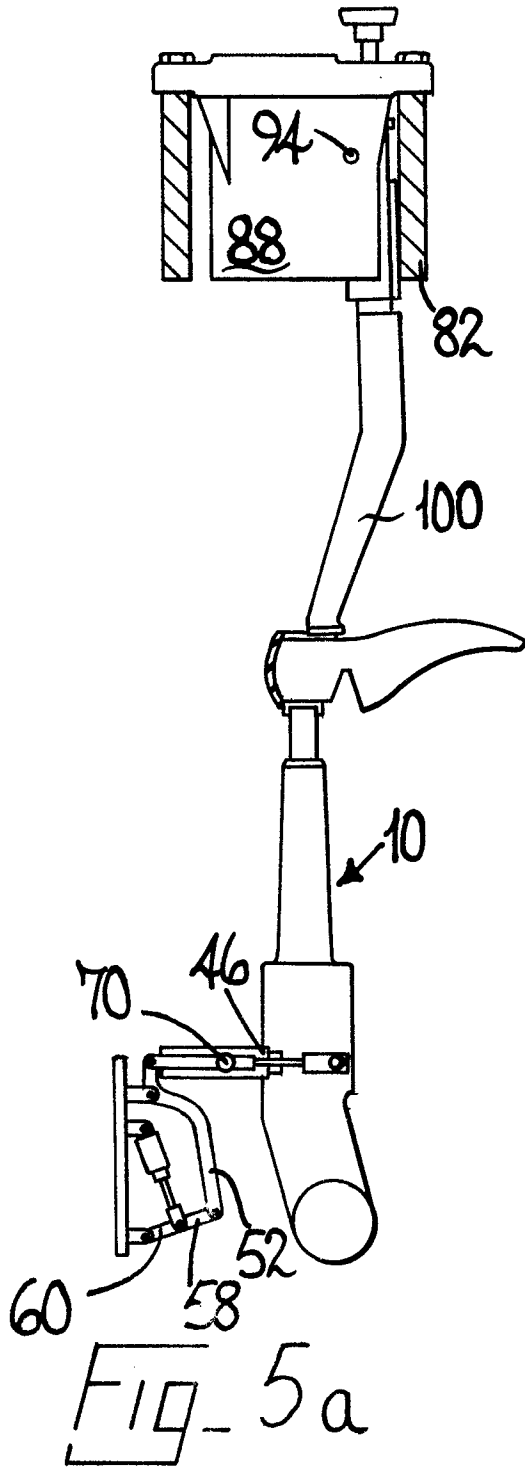


Fig. 3



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