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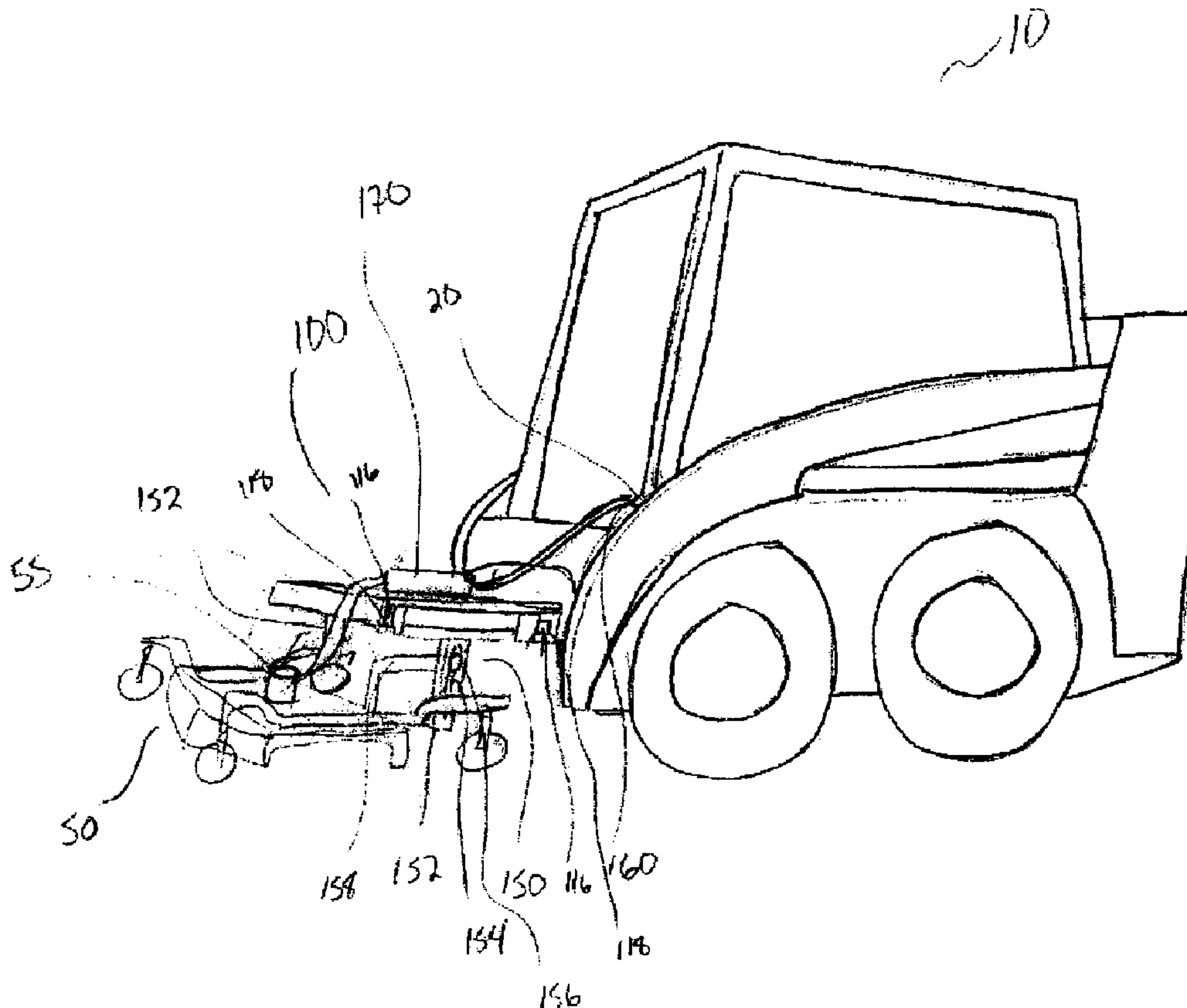
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(54) Titre : EQUIPEMENT CONCU POUR DEPLACER LATERALEMENT UN INSTRUMENT DE TRAVAIL

(54) Title: ATTACHMENT FOR LATERALLY SHIFTING A WORKING IMPLEMENT



## ATTACHMENT FOR LATERALLY SHIFTING A WORKING IMPLEMENT

The present invention relates to an attachment mechanism for connecting a working implement to a vehicle wherein the attachment mechanism can move the working implement laterally relative to the vehicle.

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### BACKGROUND

Many different types of working implements are attachable to skid steers and other vehicles. Often these working implements are driven by a supply of hydraulic fluid from the vehicle and can include augers, snow blowers, roto-tillers, mowers, etc.

10      Typically, these working implements are attached to the front of the vehicle and centered in front of the vehicle. If an operator wants to direct the working implement to a certain spot, he or she drives the vehicle to that spot and aims the working implement which is centered in front of the vehicle at the spot the operator wants to direct the working implement to.

15      However, in some cases it may be desirable to be able to shift the working implement laterally and extend it beyond either side of the vehicle. For example, an operator of the vehicle may want to pass the working implement under a tree or other obstacle or an operator may find it easier to slowly shift the working implement laterally while the operator continues to drive the vehicle in a forward direction. In other cases, an

operator may want to pass the working implement close to an obstacle, such as a building, ditch, etc. without driving the vehicle as close to the obstacle.

### SUMMARY OF THE INVENTION

5        In one aspect, an attachment mechanism can be provided for shifting a working implement, such as a mower deck, laterally relative to a vehicle. The attachment mechanism can have a primary frame that is fixedly attachable to a vehicle, a secondary frame which is laterally moveable relative to the primary frame and an extension frame which is laterally moveable relative to the secondary frame. A working implement can  
10      be connected to the extension frame and the working implement extended beyond either side of the vehicle by moving the extension frame laterally relative to the secondary frame and the secondary frame laterally relative to the primary frame.

      In a further aspect, a hydraulic splitter can be provided on the attachment mechanism to route hydraulic fluid supplied from the vehicle between hydraulic actuators  
15      which can move the secondary frame and the extension frame and a hydraulic motor on the working implement.

      In a further aspect, an attachment point can be provided on the attachment mechanism that allows the working implement to move vertically relative to the

attachment mechanism, allowing the working implement to follow a ground surface while the attachment mechanism remains at substantially one vertical position.

#### DESCRIPTION OF THE DRAWINGS

5 A preferred embodiment of the present invention is described below with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a vehicle using an attachment mechanism to couple a working implement to the vehicle;

Fig. 2 is a front view of the vehicle and attachment mechanism shown in Fig. 1;

10 Fig. 3 is a top view of an attachment mechanism for laterally shifting a working implement relative to a vehicle;

Fig. 4 is a top view of the attachment mechanism shown in Fig. 3 in an extended position; and

15 Fig. 5 is a front view of the vehicle and attachment mechanism shown in Fig. 2 with the attachment mechanism in a partially extended position; and

Fig. 6 is a front view of the vehicle of Fig. 5 with the attachment mechanism in a fully extended position.

**DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS**

Figs. 1 and 2 illustrate a vehicle 10, such as a skid steer, tractor, etc. with an attachment mechanism 100 used to couple a working implement 50 to the vehicle 10.

5 The attachment mechanism 100 can be used to move the working implement 50 laterally relative to the vehicle 10 and allow the working implement 50 to be extended beyond the width of the vehicle 10.

Figs. 3 and 4 illustrates the attachment mechanism 100. Fig 3 illustrates the attachment mechanism 100 in a centered position and Fig. 4 illustrates the attachment mechanism 100 extended laterally to one side. The attachment mechanism 100 can have a primary frame 110, a secondary frame 120 and an extension frame 130. The primary frame 110 can be fixedly attachable to a vehicle (not shown) so that when the primary frame 110 is attached to a vehicle, the primary frame 110 will not move relative to the vehicle. The extension frame 130 can be attachable to a working implement (not shown), 15 so that the working implement is moved with the extension frame 130. The primary frame 110, secondary frame 120 and extension frame 130 can be connected to each other so that the secondary frame 120 and extension frame 130 can be moved in relation to the primary frame 110 and allow the extension frame 130 (along with a working implement attached to the extension frame 130) to extend to one side of the primary frame 110.

The primary frame 110 can have a first side 112, a second side 114 and a width, W. In one aspect, the width, W, of the primary frame 110 can be substantially equally to the width of a vehicle the attachment mechanism 100 is attached to.

The secondary frame 120 can have a first side 122 and a second side 124 and can 5 be attached to the primary frame 110 so that the secondary frame 120 can move relative to the primary frame 110. The secondary frame 120 can move relative to the primary frame 110 so that part of the secondary frame 120 can be extended beyond one side of the primary frame 110, with a portion of the secondary frame 120 being extendable beyond either the first side 112 of the primary frame 110, the second side 114 of the primary 10 frame 114 or both. In this manner, the first side 122 of the secondary frame 120 can be extended beyond the first side 112 of the primary frame 110 or the second side 124 of the secondary frame 120 can be extended beyond the second side 114 of the secondary frame 120 (as shown in Fig. 4).

In one aspect, the secondary frame 120 can be slidably attached to the primary 15 frame 110 so that the secondary frame 120 can slide laterally relative to the primary frame 110. In one aspect, this slidable attachment can be achieved by having roller wheels 116 attached to the secondary frame 120 running along a track 118 from in the primary frame 110.

The extension frame 130 can have a first side 132 and a second side 134 and can 20 be attached to the secondary frame 120 so that the extension frame 130 can move

laterally relative to the secondary frame 120. An attachment point 150 can be provided on the extension frame 130 so that a working implement can be attached to the attachment point 150.

Referring to Figs. 2, 5 and 6 the attachment mechanism 100 can be used to move the working implement 50 laterally relative to the vehicle 10 while the vehicle 10 is in operation. The attachment mechanism 100 can be used to center the working implement 50 approximately in front of the vehicle 10, as shown in Fig. 2, or move the working implement 50 so that it extends past either one of the sides of the vehicle 10 as shown in Figs. 5 and 6. For example, the attachment mechanism 100 can be used to move the working implement 50 laterally so that it extends past the right side of the vehicle 10, or alternatively, the attachment mechanism 100 can be used to extend the working implement 50 laterally so that it extends past the left side of the vehicle 10 as shown in Figs. 5 and 6.

In some aspects, the attachment mechanism 100 can be configured so that the working implement 50 can be extended to only one side of the vehicle 10. In other aspects, the attachment mechanism 100 can be configured so that the working implement 50 can be moved laterally to either side of the vehicle 10.

## HYDRAULIC ACTUATORS

Referring again to Figs. 3 and 4, in one aspect, actuators 152, 154, such as hydraulic cylinders, can be used to control the movement of the secondary frame 120 and the extension frame 130. A first actuator 152, such as a double acting hydraulic cylinder, 5 can be connected between the primary frame 110 and the secondary frame 120 to control the movement of the secondary frame 120 relative to the primary frame 110. A second actuator 154, such as a double acting hydraulic cylinder 154, can be connected between the secondary frame 120 and the extension frame 130. The second actuator 154 can be used to move the extension frame 130 relative to the secondary frame 120.

10 By supplying hydraulic fluid to the first actuator 152, the secondary frame 120 can be moved relative to the primary frame 110 using the first actuator 152. By using a double acting hydraulic cylinder for the first actuator 152, the secondary frame 120 can be extended past either side 112, 114 of the primary frame 110.

## HYDRAULIC SYSTEM

15 Referring to Figs. 2, 3 and 4, commonly, skid steers and other vehicles that the attachment mechanism 100 can be used with have hydraulic connections 20 that can be used to supply hydraulic fluid to the attachment mechanism 100.

Hydraulics connections 160 provided on the attachment mechanism 100 can be used to connect to the hydraulic connections 20 on the vehicle 10 and route pressurized

hydraulic fluid supplied by the vehicle 10 to the attachment mechanism 100 and thereby to the first actuator 152 and the second actuator 154 to control the motion of the secondary frame 120 and the extension frame 130.

In one aspect, if the working implement 50 attached to the attachment mechanism 100 can use a hydraulic motor 55 to power the working implement 50, a hydraulic splitter 170 can be provided. The hydraulic splitter 170 can be provided on the attachment mechanism 100 to split the hydraulics being supplied from the vehicle 10 between the actuators 152, 154 and the hydraulic motor 55 provided on the working implement 50. In this manner, the hydraulics supplied by the vehicle can be used to drive the hydraulic motor 55 on the working implement 50 and then some of the hydraulic fluid can be routed to the first actuator 152 and the second actuator 154 when the operator desires to extend or retract the working implement 50 attached to the attachment mechanism 100.

#### ATTACHMENT POINT

The attachment point 150 can be provided on the extension frame 130 of the attachment mechanism 100. In one aspect, the attachment point 150 can be a floating attachment point allowing the working implement 50 to track along a ground surface. The attachment mechanism 100 can be configured to attach to the vehicle 10 so that the primary frame 110, secondary frame 120 and the extension frame 130 are positioned approximately horizontally and spaced above the ground surface.

The attachment point 150 can comprise two members 152 extending downwards from the extension frame 130. Each member 152 can have an elongated slot 154 passing through the member 152. An attachment point 150 on the working implement 50 can be provided with a shaft 156 that passes through the elongated slot 154 of the member 152.

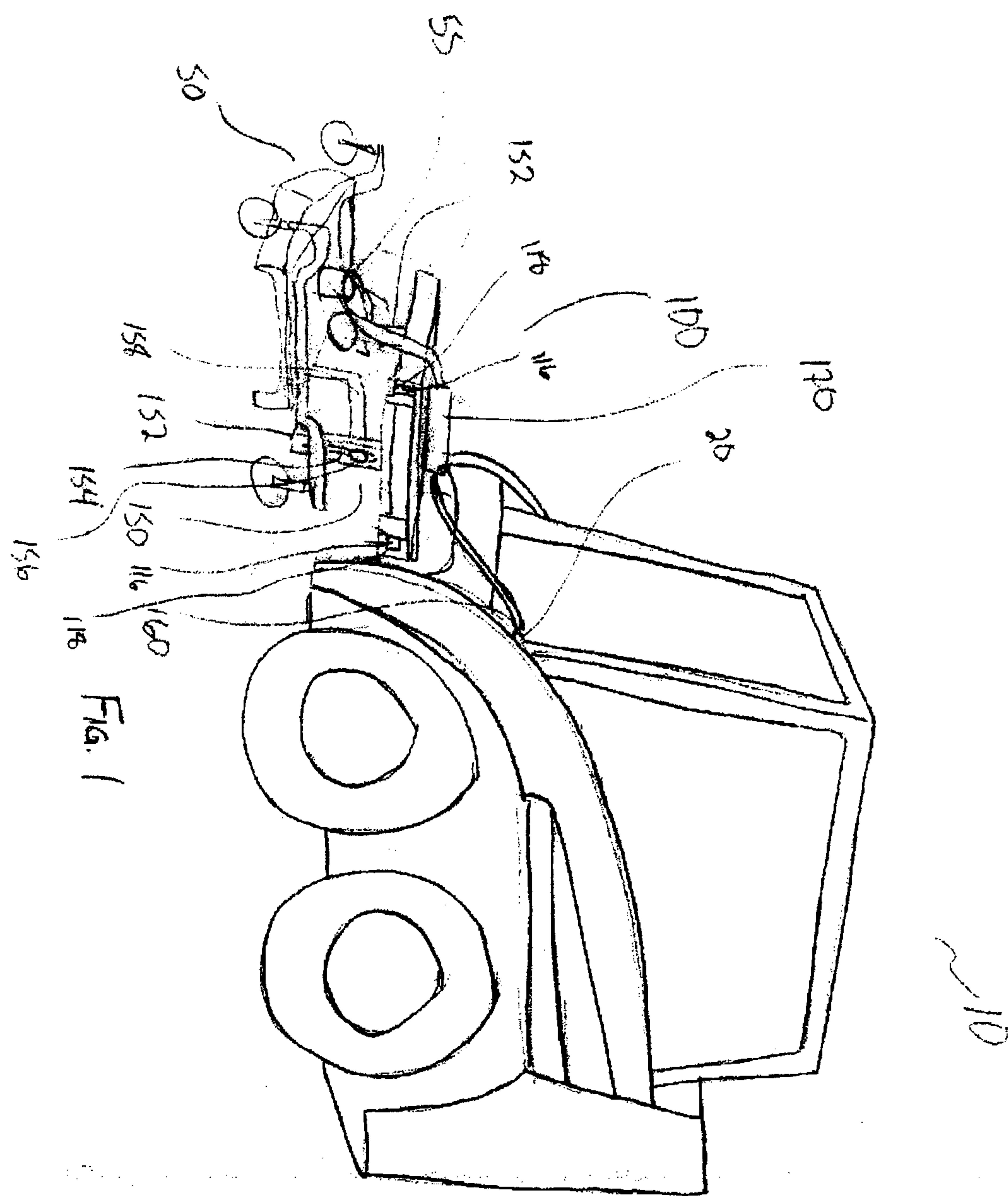
- 5 The shaft 156 can be connected to a secondary member 158 that is fixedly attachable to the working implement 50. In this manner, the working implement 50 which is connected to the attachment point 150 can move vertically relative to the extension frame 130 with the shafts 156 on each member 152 passing through the elongated slots 154 in the members 152. In this manner, the attachment mechanism 100 can remain at
- 10 substantially one vertical position while the vehicle 10 and working implement 50 are in use. While the attachment mechanism 100 remains at one vertical position, the working implement 50 that is travelling along the ground surface can move vertically relative to the attachment mechanism 100 or float relative to the attachment mechanism 100.

#### MOWER ATTACHMENT

- 15 In one aspect, the working implement 50 can be a mower deck. An operator can mow grass, etc. by driving the vehicle 10 with the attachment mechanism 100 in the centered position as shown in Fig. 2. When the operator wants to extend the mower deck past either side of the vehicle 10, such as when the operator wants to mow under a tree or obstacle or does not want to drive the vehicle 10 too close to an object, the operator can

use the attachment mechanism 100 to extend the mower deck to either side of the vehicle 10.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous changes and modifications will readily occur to those skilled in 5 the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all such suitable changes or modifications in structure or operation which may be resorted to are intended to fall within the scope of the claimed invention.



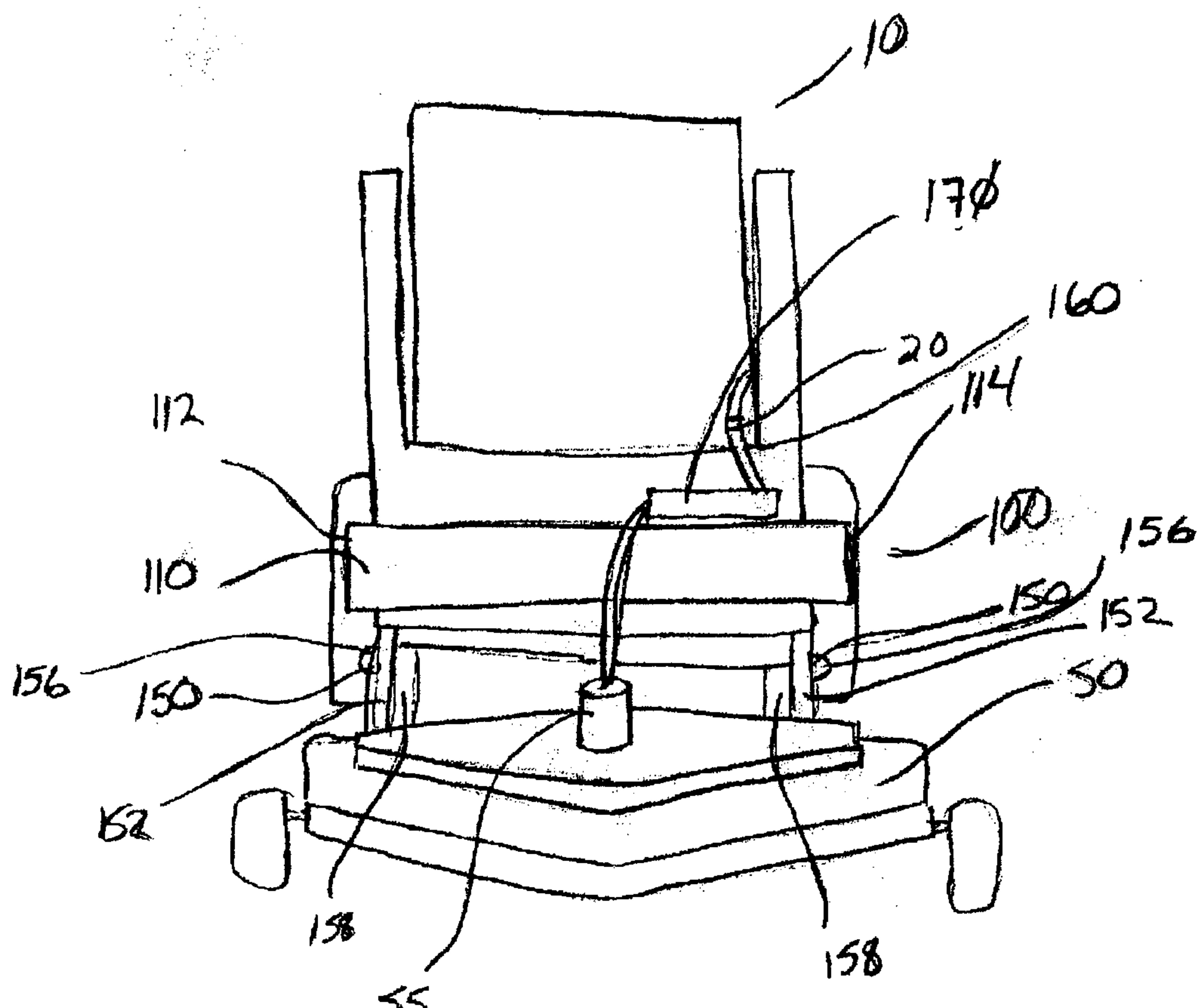


Fig. 2

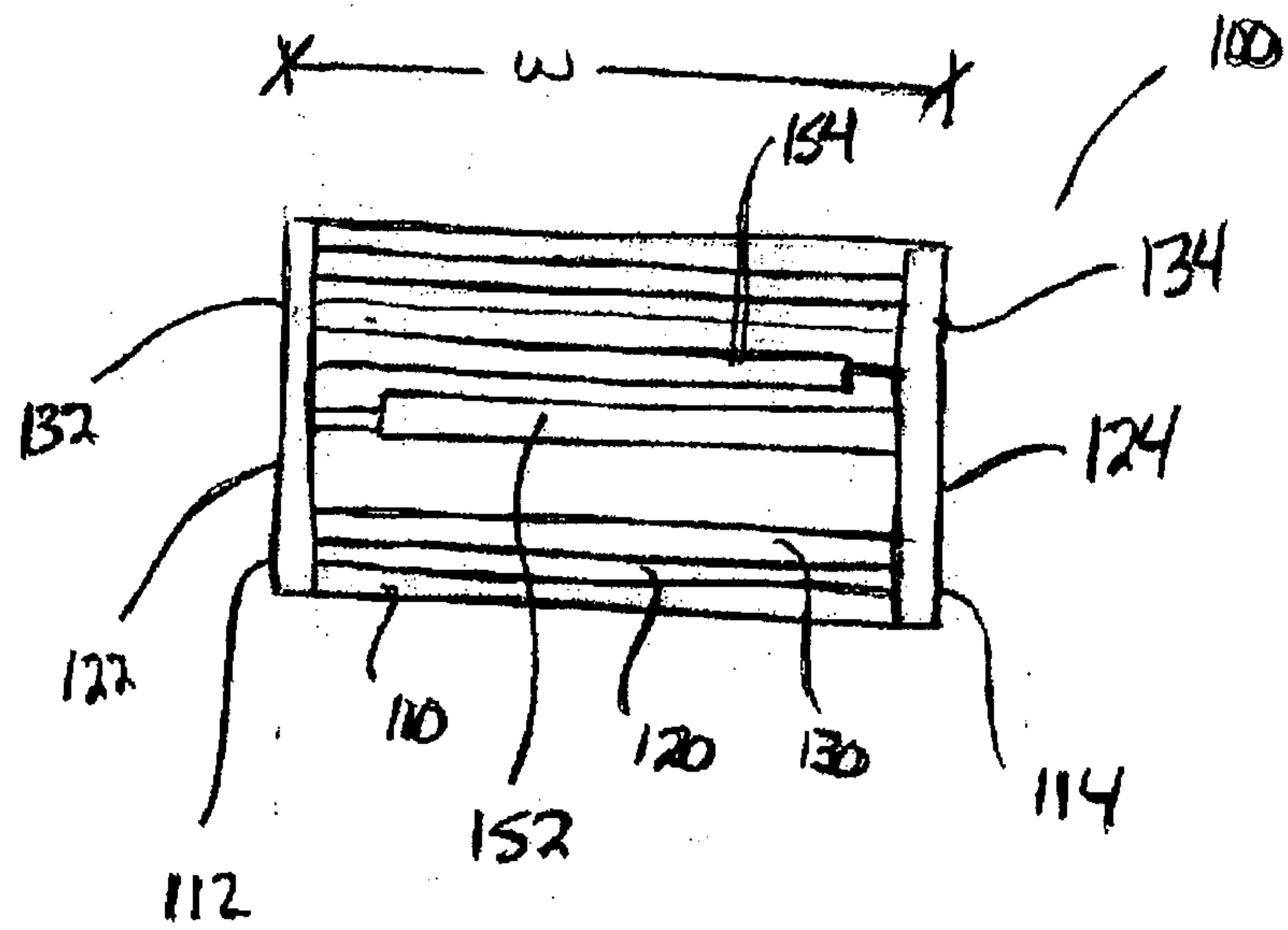


FIG. 3

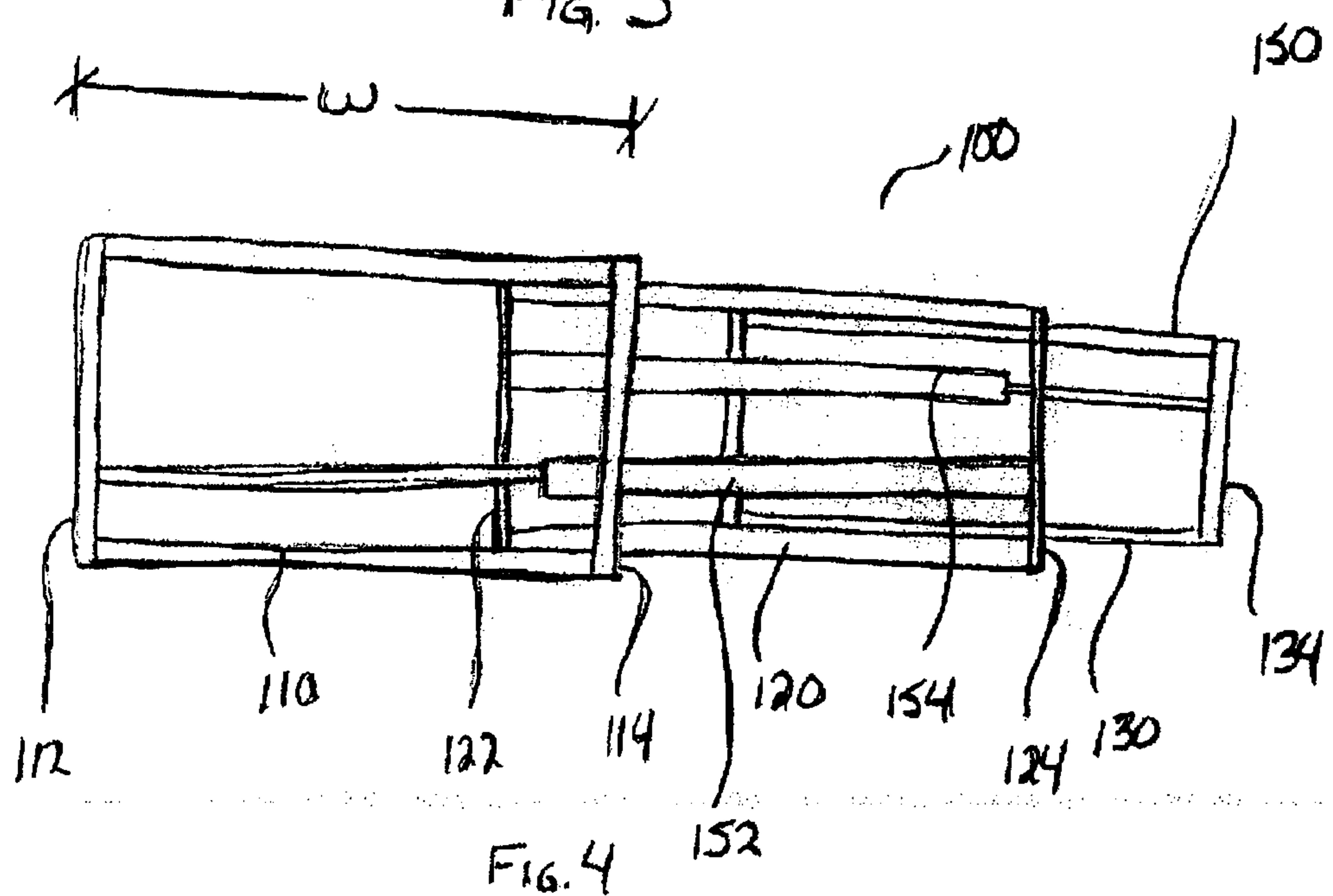


FIG. 4

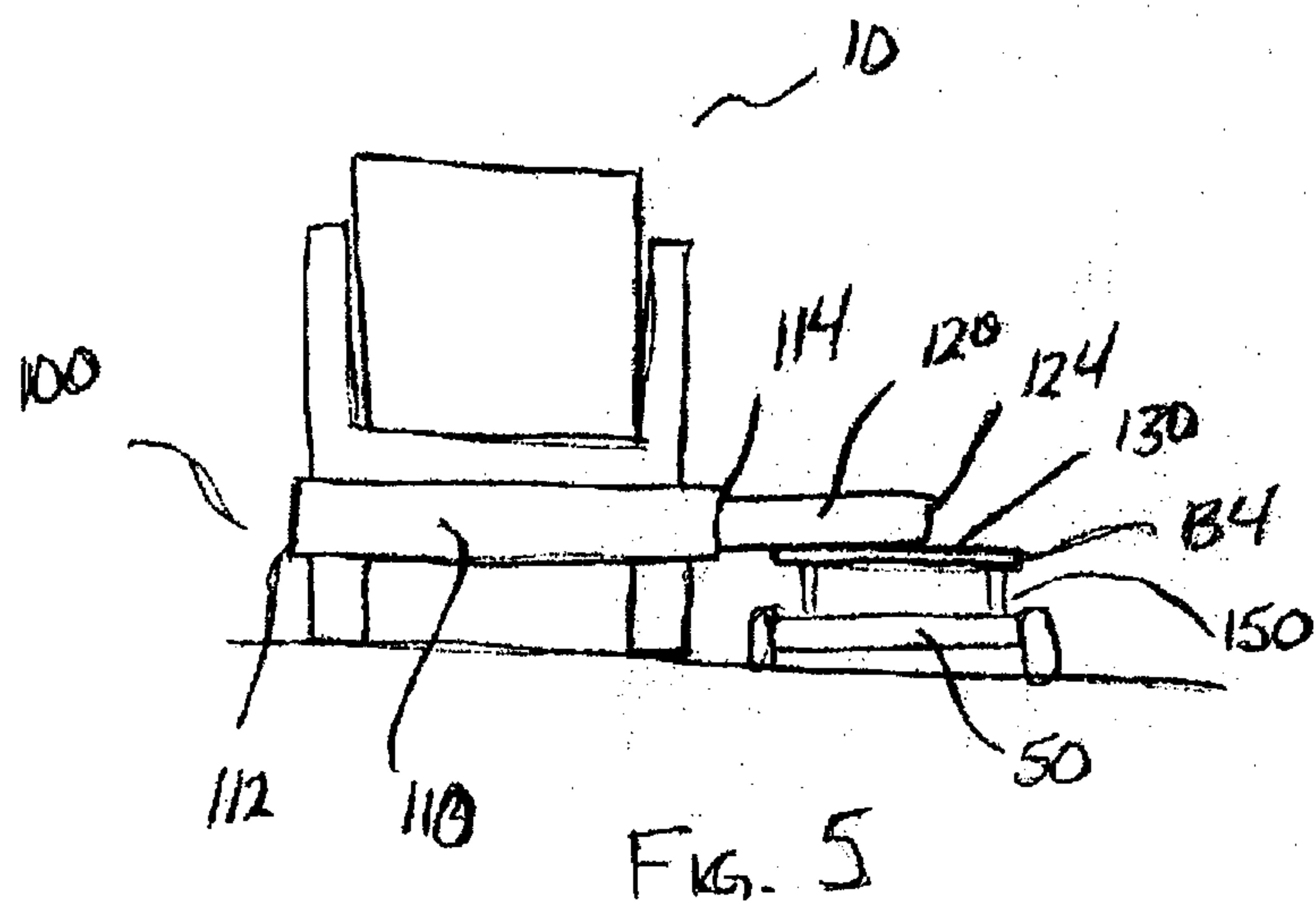


FIG. 5

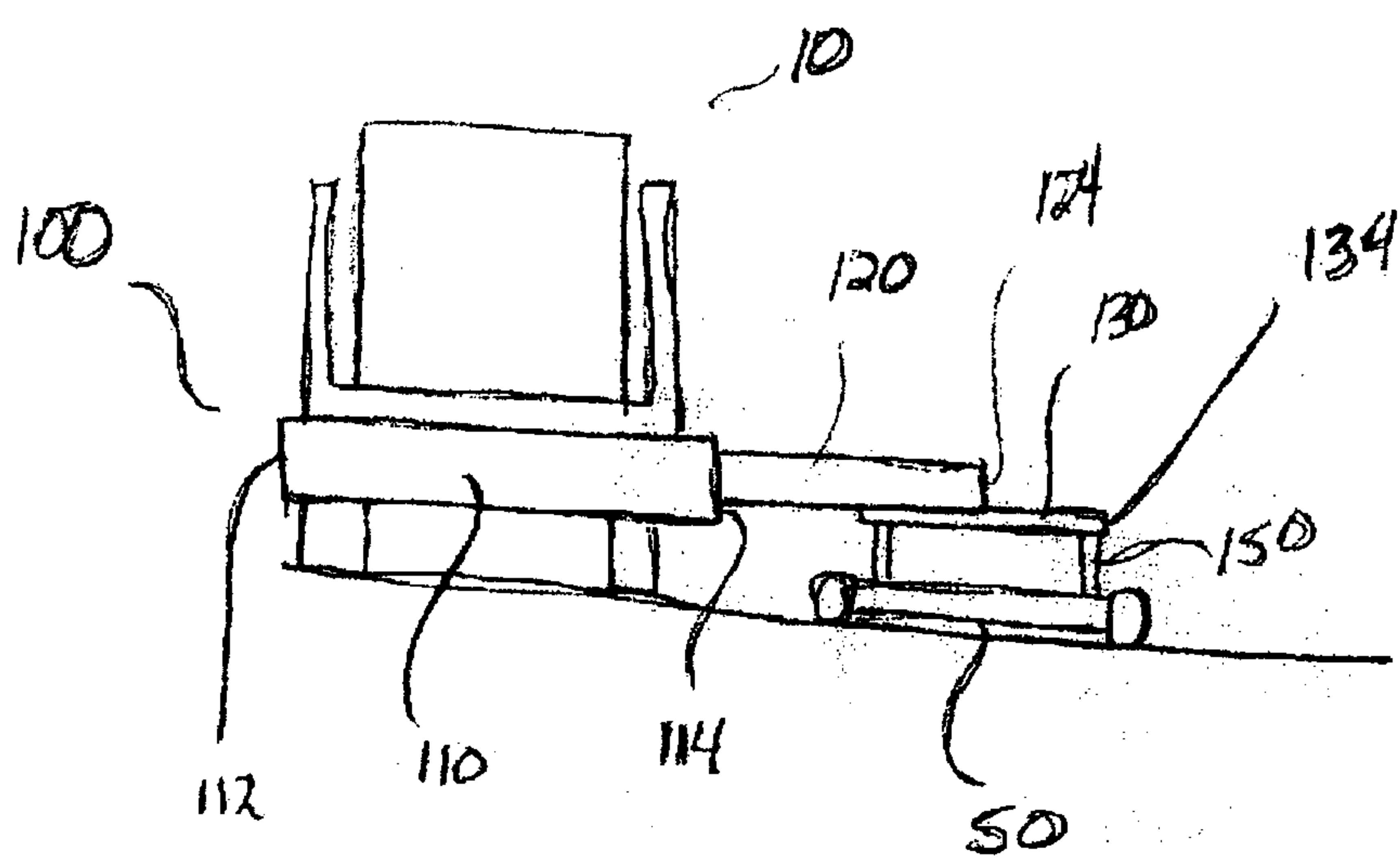


FIG. 6

