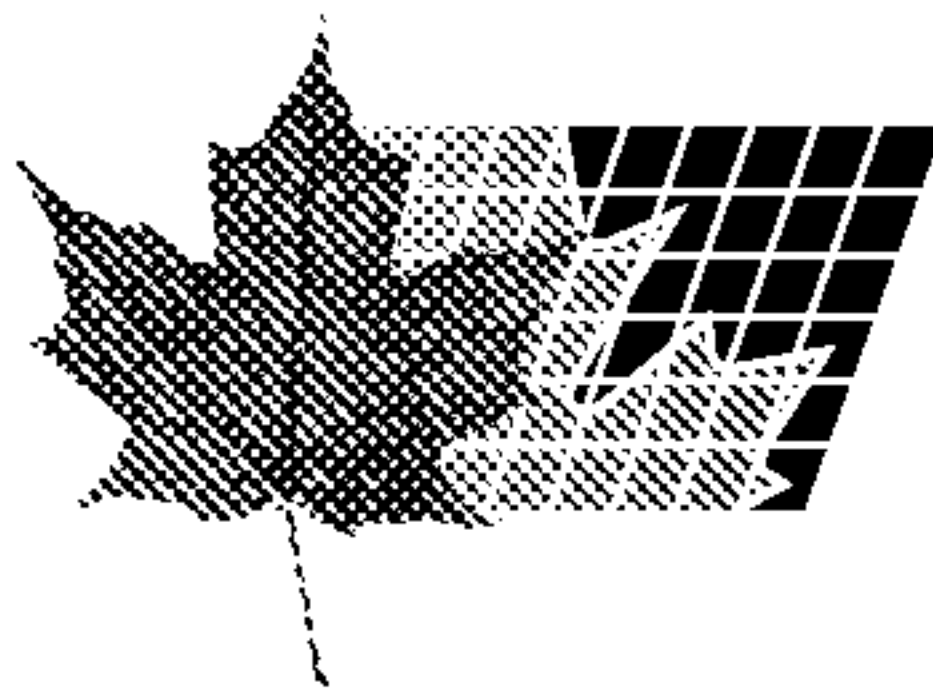




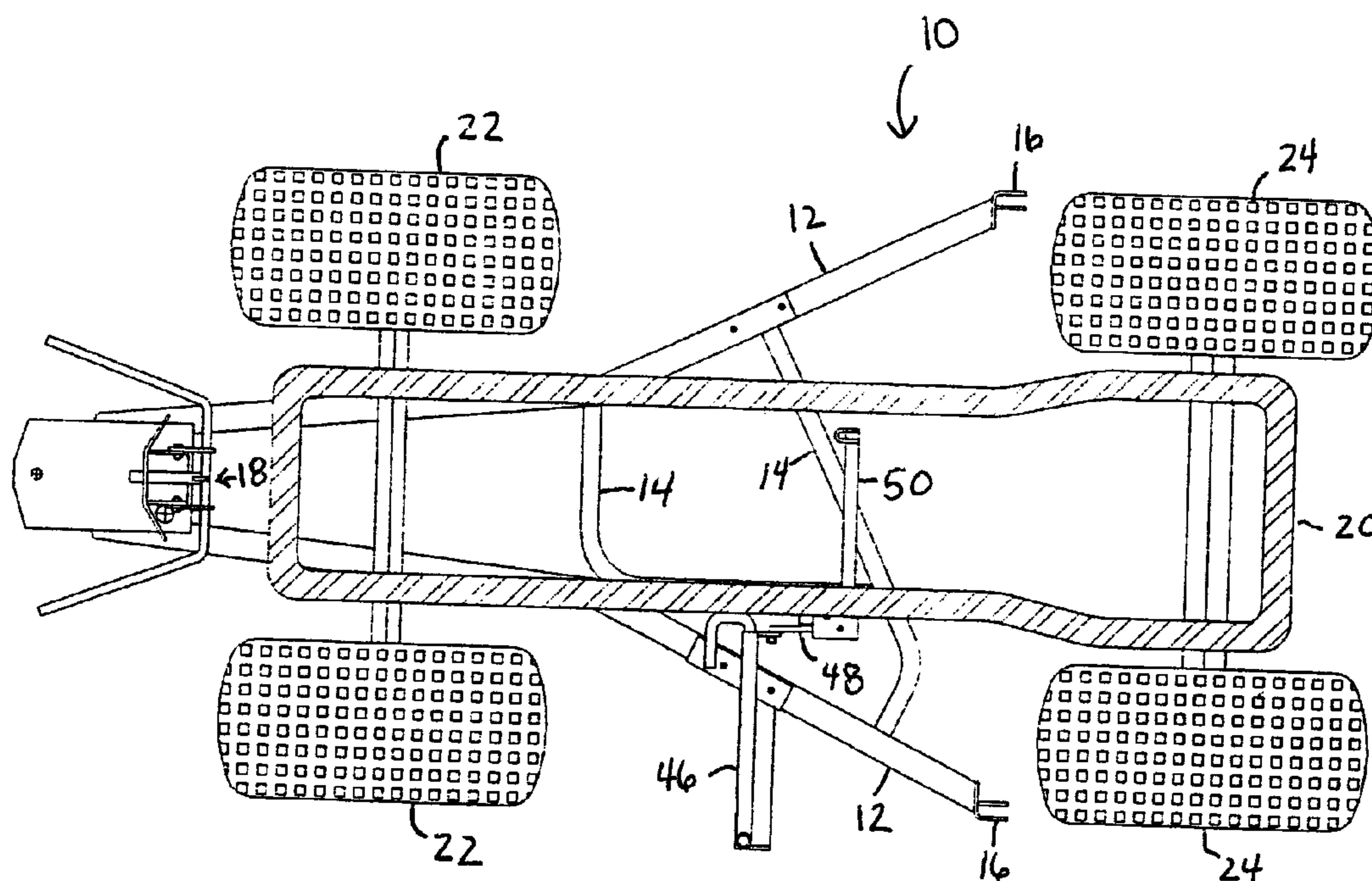
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(54) **ACCESSOIRE POUR VEHICULE TOUS TERRAINS**

(54) **ATTACHMENT FOR AN ALL TERRAIN VEHICLE**



(57) This invention discloses an attachment for an all terrain vehicle (ATV) which enables the ATV to be used for clearing away snow and other loose granular material, such as sand, earth, and crushed stones. The apparatus includes a blade with a detachable liner, and a frame which fits beneath the ATV and is releasably connected to the outer sides of the ATV by a mounting device. The angle of the blade may be adjusted using a dual-handed lever. The blade may be raised and lowered by the driver while seated at the ATV using a handle which actuates a lever and a cable and pulley apparatus.

1485-1

Abstract

This invention discloses an attachment for an all terrain vehicle (ATV) which enables the ATV to be used for clearing away snow and other loose granular material, such as sand, earth, and crushed stones. The apparatus includes a blade with a detachable liner, and a frame which fits beneath the ATV and is releasably connected to the outer sides of the ATV by a mounting device. The angle of the blade may be adjusted using a dual-handed lever. The blade may be raised and lowered by the driver while seated at the ATV using a handle which actuates a lever and a cable and pulley apparatus.

1485-1

ATTACHMENT FOR AN ALL TERRAIN VEHICLE**Field of the Invention**

The present invention relates to a device which can be attached to an all terrain vehicle ("ATV") and used for clearing away loose granular material, such as snow, sand, earth, and crushed stones.

Background of the Invention

All terrain vehicles are popularly used by consumers as recreational vehicles. However, given their ability to manoeuvre on a variety of terrains, ATVs have the potential to be adapted for practical applications, such as the removal of snow. Accordingly, there is consumer demand for an ATV attachment which enables the ATV to be used for clearing snow and other loose granular material, such as sand, earth and crushed stones.

It is desirable that the attachment be easily installed and removed, so that the vehicle does not carry any unnecessary weight when the attachment is not in use. However, the devices found in the prior art are relatively cumbersome to install and remove, or have limited applications. Typically, the attachment points for these devices are situated on the underside of the ATV, so that they are not readily accessible to the user. US Patent No. 3,688,847 teaches a frame assembly which requires the removal of the front wheels of the vehicle in order to initially install the attachment piece for hooking up the frame assembly. U.S. Patent No. 4,615,130 teaches a frame assembly suitable only for ATV's having a trailer-type hitch on the rear-end of the vehicle. Accordingly, there is a need for an assembly which can be quickly and easily attached and detached from ATV's.

In certain situations it may be desirable to change the angle of the blade on the attachment, for example, when clearing snow adjacent to a wall or fence. However, the prior art suffers from the disadvantage that it can be relatively cumbersome to adjust the angle of the blade. For example, U.S. Patent No. 4,615,130 teaches the use of retractable pins as a means for locking the blade at a desired angle. However, the removal and insertion of pins requires a certain degree of manual dexterity and may be difficult to accomplish under cold-weather conditions, when the driver of the ATV is likely to be wearing gloves. Accordingly, there is a need for a device equipped with means for quickly and conveniently adjusting the angle of the blade.

In certain situations, it may also be desirable to raise the blade, for example when travelling to a destination which needs to be cleared. Accordingly, it is desirable to have an attachment that can be easily raised and lowered by the driver while seated on the ATV.

Finally, the prior art does not teach a blade with a detachable liner, which would allow the liner to be inexpensively replaced if it becomes damaged, and which would also allow the liner to be inexpensively colour coordinated with the customer's ATV.

Summary of the Invention

The disadvantages of the prior art are obviated and mitigated by the present invention which provides an attachment for use in shovelling snow and other loose granular material, which can be quickly and easily attached and detached from an ATV; which enables the operator of the ATV to easily and quickly adjust the

blade to a desired angle; and easily raise or lower the blade of the ATV while seated on the ATV.

In a preferred embodiment, the snowblade has a coloured liner detachably secured to the blade frame, which may be colour coordinated with the body of the ATV.

In a preferred embodiment, the invention provides an apparatus which may be attached to an all terrain vehicle for use in clearing loose granular material; said apparatus comprising a frame assembly adapted to fit beneath the all terrain vehicle in a spaced apart relationship thereto, and to be releasably connected to the outer sides of the all terrain vehicle by a mounting means; blade means for use in clearing loose granular material; said blade means attached to the frame assembly at the front-end of the all terrain vehicle; angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and vertical adjustment means for raising and lowering said blade means and said frame assembly.

A further embodiment provides a kit comprising a frame assembly adapted to fit beneath the all terrain vehicle in a spaced apart relationship thereto, and to be releasably connected to the outer sides of the all terrain vehicle by a mounting means; blade means for use in clearing loose granular material; said blade means attached to the frame assembly at the front-end of the all terrain vehicle; angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and vertical adjustment means for raising and lowering said blade means and said frame assembly.

Additionally, the invention provides an attachment means for releasably securing a frame assembly and blade means to an all terrain vehicle, comprising angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and vertical adjustment means for raising and lowering said blade means and said frame assembly.

An advantage of the present invention is that the attachment points for the frame assembly are easily accessible on the outer sides of the ATV, and therefore the frame assembly can be attached and detached quickly and easily.

Preferably, the vertical adjustment means comprises a dual-handed lever which enables the operator to easily adjust the angle of the blade from either side of the ATV. Because the angle of the blade is adjusted using a simple lifting and turning motion, it is possible to adjust the angle of the blade even while wearing gloves.

A further advantage of this invention is that the driver can easily raise or lower the blade and frame assembly while seated on the ATV, through the use of an over-centering mechanism which enables the blade to stay locked in the up position without the use of latch pins or extra brackets.

Brief Description of the Drawings

A better understanding of the invention will be obtained by considering the detailed description below, with reference to the following drawings of embodiments of the present invention in which:

Figure 1A is a perspective view showing an ATV incorporating the present invention.

Figure 1B is a top view of the frame assembly, with the blade detached.

Figure 2 is a top view of the frame assembly, showing its position relative to the chassis of the ATV, which is indicated in cross-hatching.

Figure 3 is a top view of the anterior end of the frame and the locking device.

Figure 4 is a side view of the anterior end of the frame assembly and the locking device.

Figure 5 is a side view of the blade, including the detachable blade liner, which is indicated in cross-hatching, and the blade frame.

Figure 6 is a perspective view of the vertical adjustment means, in a configuration that would result in the blade and frame assembly being in the down position.

Figure 7 is a perspective view of the vertical adjustment means, in a configuration that would result in the blade and frame assembly being in the up position.

Detailed Description of the Invention

Figure 1A shows an ATV incorporating the present invention.

Referring to Figure 1B, the frame assembly 10 of the attachment has a substantially A-shaped design, consisting of two divergent arms 12 and cross-bars 14 for reinforcement. The posterior end of the frame assembly 10 terminates in an attachment point 16 on both arms 12. The anterior end of the frame assembly 10 supports the locking device, designated generally as 18.

Referring to Figure 2, it is now possible to view the position of the frame assembly 10 in relation to the chassis of the ATV, including the tube frame 20, the front wheels 22, and the back wheels 24. The anterior end of the frame assembly 10 is positioned between the front wheels 22 of the ATV and extends forwardly, beyond the front end of the ATV. At the posterior end of the frame assembly 10, the arms 12 extend beyond the ATV frame 20 between the front wheels 22 and the rear wheels 24. Thus the attachment points 16 may be quickly and easily mounted to the outer sides of the ATV frame 20.

Referring to Figures 3 and 4, the locking device 18 consists of a latch pin 26 adapted to matingly engage with notches on a connecting piece (not shown). The latch pin 26 is rotatable on a latch pivot point 28 which may be actuated by the dual-handled latch lever 30. A return spring 32 biases the latch pin 26 toward a downward position, thus facilitating engagement of the latch pin 26 in a notch of the connecting piece (not shown). The connecting piece is rotatably connected to the anterior end of the frame assembly 10 at the blade angle pivot point 34.

Referring to Figure 5, the blade 36 includes a blade liner 38 detachably connected to the blade frame 40 by bolts 42 or a similar connecting device. The blade frame 40 is affixed to a connecting piece (not shown), which is in turn rotatably

connected to the anterior end of the frame assembly 10, as described above. The detachable liner enables a damaged liner to be inexpensively replaced. It also enables a dealer to stock fewer blade frames, while providing the consumer with a variety of colour options for the liner.

As will be understood by those skilled in the art, the blade 36 may be a single direction, tapered speed blade, or a bidirectional, conventional blade. All conventional blades and blade frames adapted for use for an all terrain vehicle or similar device are within the scope of the present invention.

In use, the angle of the blade 36 may be adjusted by pulling up on either side of the dual-handed latch lever 30 to release the latch pin 26 from a notch on the connecting piece, then rotating the connecting piece about the blade angle pivot point 34 until the blade 36 is at a desired angle relative to the longitudinal axis of the ATV wherein the latch pin 26 is aligned with a notch on the connecting piece, and then releasing the dual-handed latch lever 30 so that the latch pin 26 matingly engages with the desired notch. The return spring 32 urges the latch pin 26 against the notch, and thereby assists in locking the blade 36 into position.

Referring to Figures 6 and 7, the vertical adjustment means 44 consists of a handle 46 attached by a link 48 to one end of a pivot arm 50 which is rotatable on a vertical axis 52. The pivot arm 50 can be either a first, second, or third class lever. The other end of the pivot arm 50 is attached to a lift cable 54. The lift cable 54 runs along the longitudinal axis of the ATV, through a pulley 56, and is anchored to the front grill or frame

of the ATV (not shown). The pulley 56 is attached to the anterior end of the frame assembly 10.

The position of the handle 46, link 48, and pivot arm 50 relative to the rest of the frame assembly 10 can be more easily seen with reference to Figures 1B and 2.

Referring to Figure 6, when the handle 46 is in an upright position, the pivot arm 50 is approximately 90 degrees to the longitudinal axis of the ATV, the lift cable 54 is in a relaxed state and the frame assembly 10 and blade 36 are in a down position.

Referring to Figure 7, when the handle 46 is pushed toward the back of the ATV, the link 48 is pulled toward the front of the ATV which causes the pivot arm 50 to pivot about its axis 52, thereby tightening the lift cable 54 which pulls up on the pulley 56, thereby causing the frame assembly 10 and blade 36 to raise into the up position. Once the lift cable 54 has passed over the axis 52 of the pivot arm 50, the weight of the blade 36 would tend to cause the pivot arm 50 to continue pivoting about its axis 52 thereby returning the frame assembly 10 and blade 36 to a downward position. However, a pivot arm stop 58 is situated so as to block further movement of the pivot arm 50. This over-centering mechanism holds the frame assembly 10 and blade 36 in an up position without the use of pins and extra brackets.

An assist spring (not shown) is attached between the base of the handle 46 and the end of the pivot arm 50 which is attached to the link 48, such that it reduces the effort required to lift the blade 36, ensures the pivot arm 50 achieves a positive lock in

the up or down position, and prevents the blade 36 from dropping to the ground in rough terrain.

In use, the vertical adjustment means 44 can be operated by the driver while seated on the ATV. By pulling back on the handle 46, the driver can quickly and easily raise the frame assembly 10 and blade 36. The frame assembly 10 and blade 36 remain in the up position by virtue of the over-centering mechanism, described above, until the driver returns the handle 46 to an upright position, as illustrated in Figure 6.

1485-1

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An apparatus which may be attached to an all terrain vehicle for use in clearing loose granular material; said apparatus comprising:

a frame assembly adapted to fit beneath the all terrain vehicle in a spaced apart relationship thereto, and to be releasably connected to the outer sides of the all terrain vehicle by a mounting means;

blade means for use in clearing loose granular material; said blade means attached to the frame assembly at the front-end of the all terrain vehicle;

angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and

vertical adjustment means for raising and lowering said blade means and said frame assembly.

2. An apparatus according to claim 1, wherein said frame assembly has a substantially A-shaped design, which widens toward the posterior end of the frame,

such that the anterior end of the frame assembly extends between the front wheels and beyond the front end of the all terrain vehicle for attachment to said blade means,

and the posterior end projects beyond the sides of the all terrain vehicle between the front and rear wheels thereof, and terminates in an attachment point.

3. An apparatus according to claim 2, wherein said mounting means consists of an attachment piece which is releasably connected at one end to the attachment point on the frame assembly and at the other end to the outer side of the all terrain vehicle using bolts.
4. An apparatus according to claim 1 wherein said frame assembly consists of two divergent arms and at least one cross bar for reinforcing said frame assembly.
5. An apparatus according to claim 1 wherein said blade means consists of a blade frame and a detachable blade liner.
6. An apparatus according to claim 1 wherein said angle adjustment means consists of:

a connecting means for pivotally connecting said blade means to the anterior end of said frame assembly, such that the connecting means may be pivoted to the right or left in order to adjust the angle of the blade means relative to the longitudinal axis of the all terrain vehicle;

locking means for locking the blade frame in the desired position relative to the longitudinal axis of the all terrain vehicle; and

a dual-handled lever for operating said locking means from either side of the all terrain vehicle.

7. An apparatus according to claim 6 wherein said locking means consists of:
 - a latch pin rotatable in a vertical direction on a latch pivot point and actuated by said dual-handled lever;
 - a plurality of notches at spaced apart intervals on said connecting means and adapted to matingly receive said latch pin; and
 - a spring means for biasing said latch pin toward said notches.
8. An apparatus according to claim 1 wherein said vertical adjustment means consists of:
 - a handle means for actuating said vertical adjustment means;
 - a cable and pulley mechanism for raising and lowering the frame assembly and blade means;
 - and a lever means for translating the force from movement of said handle means to said cable and pulley mechanism.
9. An apparatus according to claim 8 wherein said handle means is adapted to be operated by a driver of the all terrain vehicle.
10. An apparatus according to claim 8 wherein said cable and pulley mechanism consists of:

a pulley attached to the anterior end of the frame assembly;
and

a lift cable which runs through the pulley and is attached at one end to the front of the all terrain vehicle and at the other end to an end of said lever means.

11. An apparatus according to claim 10 wherein said lever means consists of a vertical axis pivot arm connected at one end to the handle means and connected at the other end to said lift cable.

12. An apparatus according to claim 10 wherein said vertical adjustment means further comprises an over-centre mechanism for maintaining the frame assembly and blade means in an up position.

13. An apparatus according to claim 12 wherein said over-centre mechanism consists of a pivot arm stop adapted to prevent the pivot arm from moving beyond a point wherein the lift cable has passed over the vertical axis of the pivot arm.

14. A kit comprising:

a frame assembly adapted to fit beneath the all terrain vehicle in a spaced apart relationship thereto, and to be releasably connected to the outer sides of the all terrain vehicle by a mounting means;

blade means for use in clearing loose granular material;
said blade means attached to the frame assembly at the front-end of the all terrain vehicle;

angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and

vertical adjustment means for raising and lowering said blade means and said frame assembly.

15. Attachment means for releasably securing a frame assembly and blade means to an all terrain vehicle, comprising:

angle adjustment means for adjusting the angle of the blade means relative to the longitudinal axis of the all terrain vehicle; and

vertical adjustment means for raising and lowering said blade means and said frame assembly.

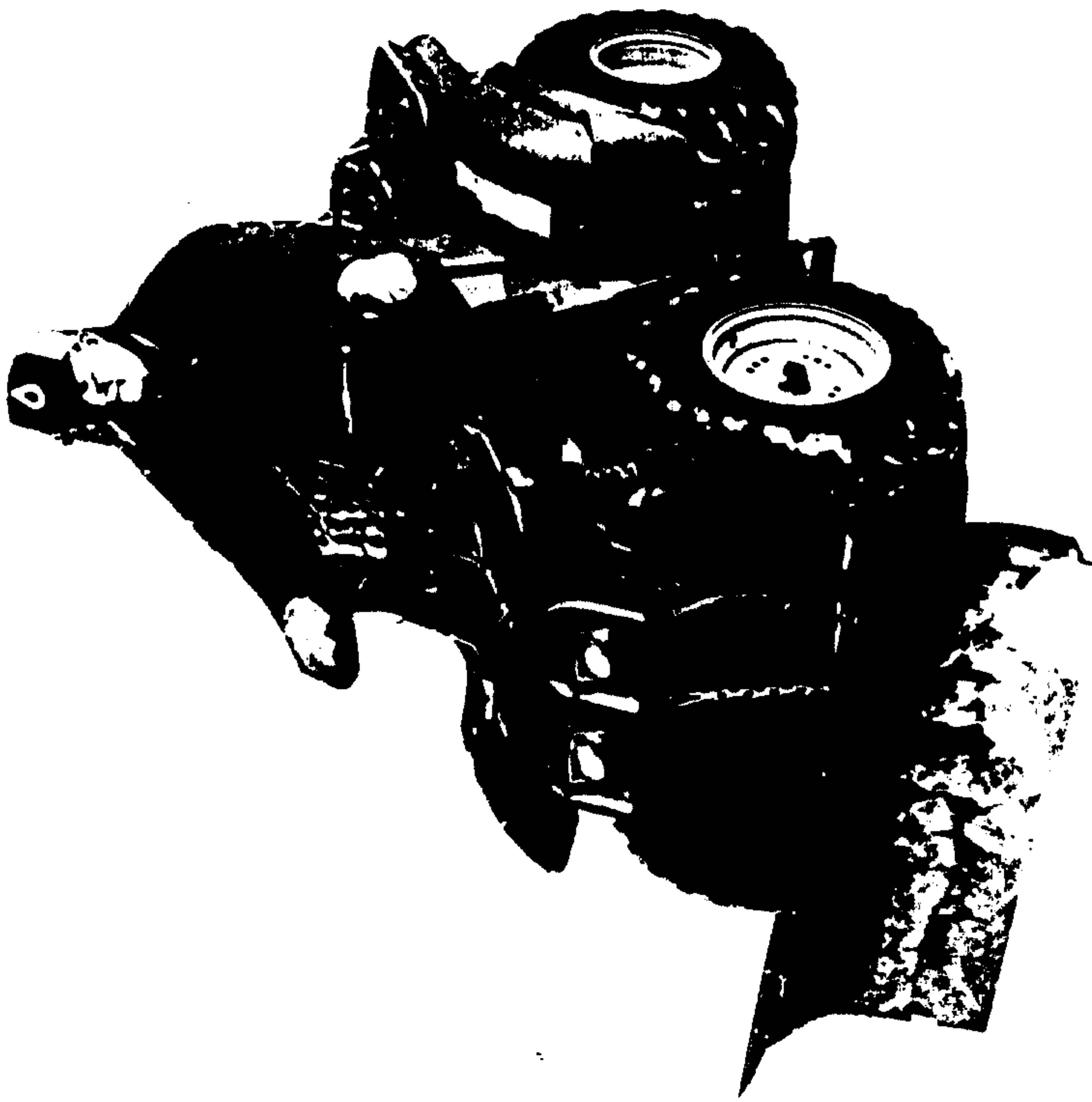


Figure 1A

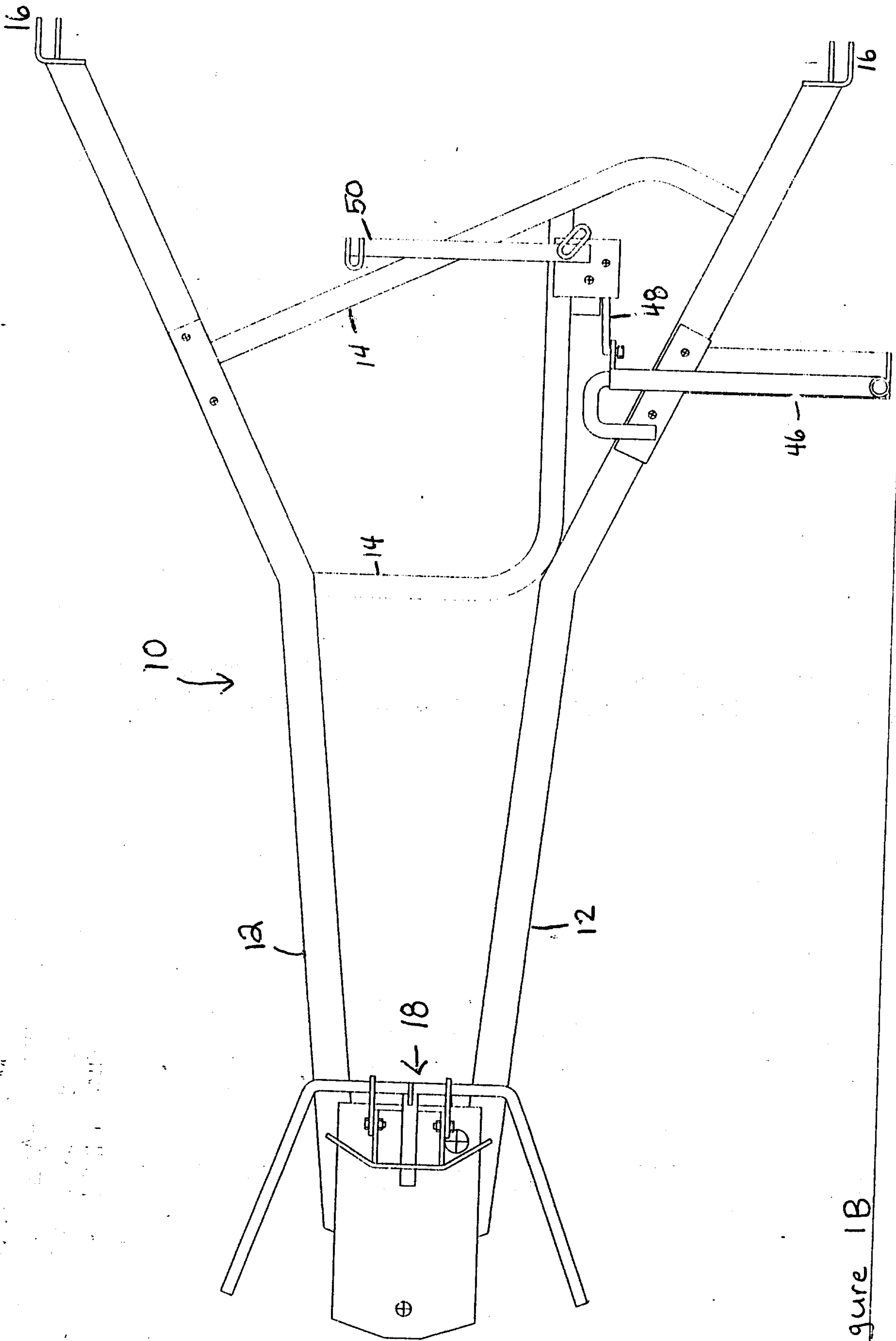


Figure 1B

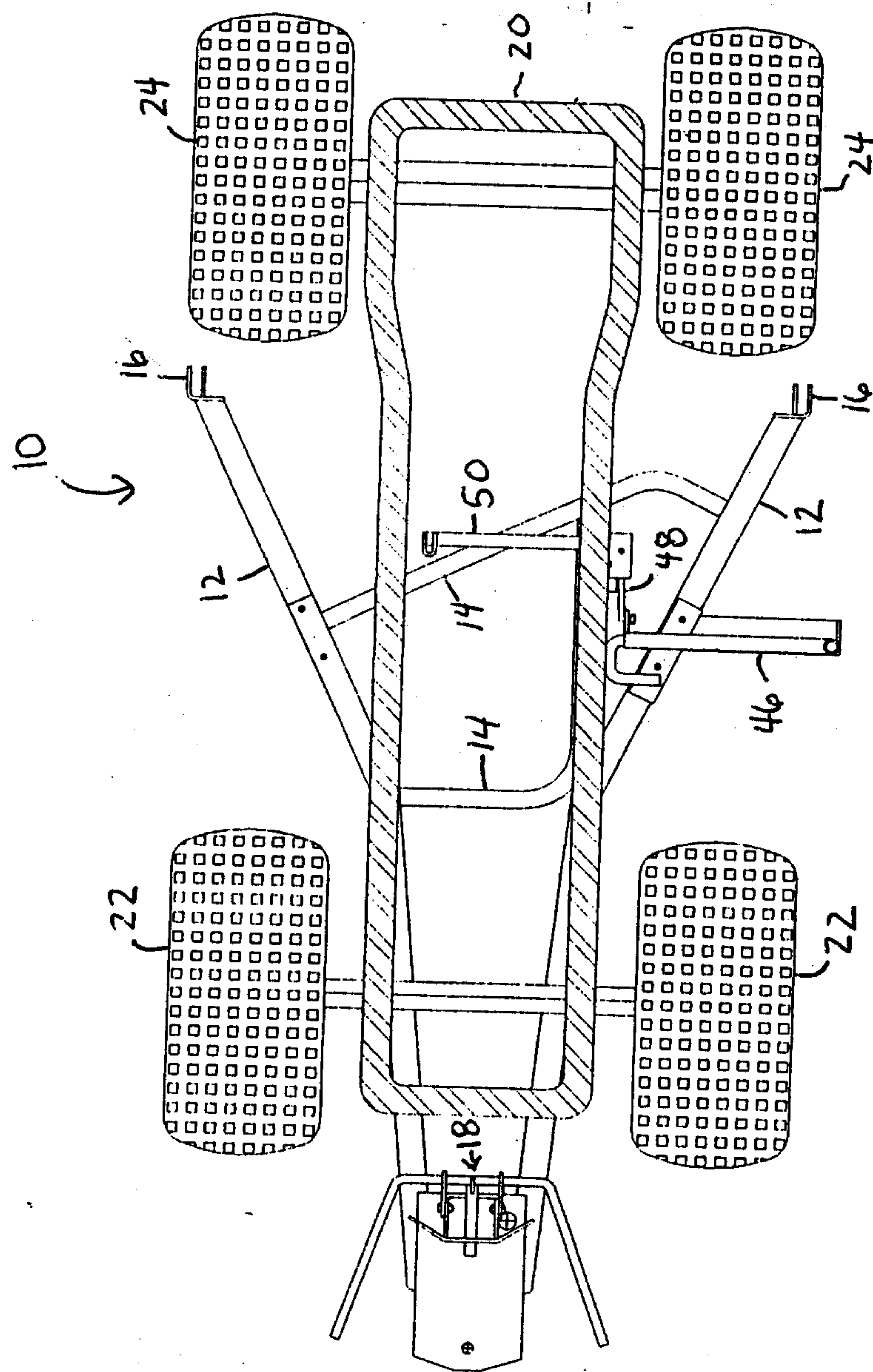


Figure 2

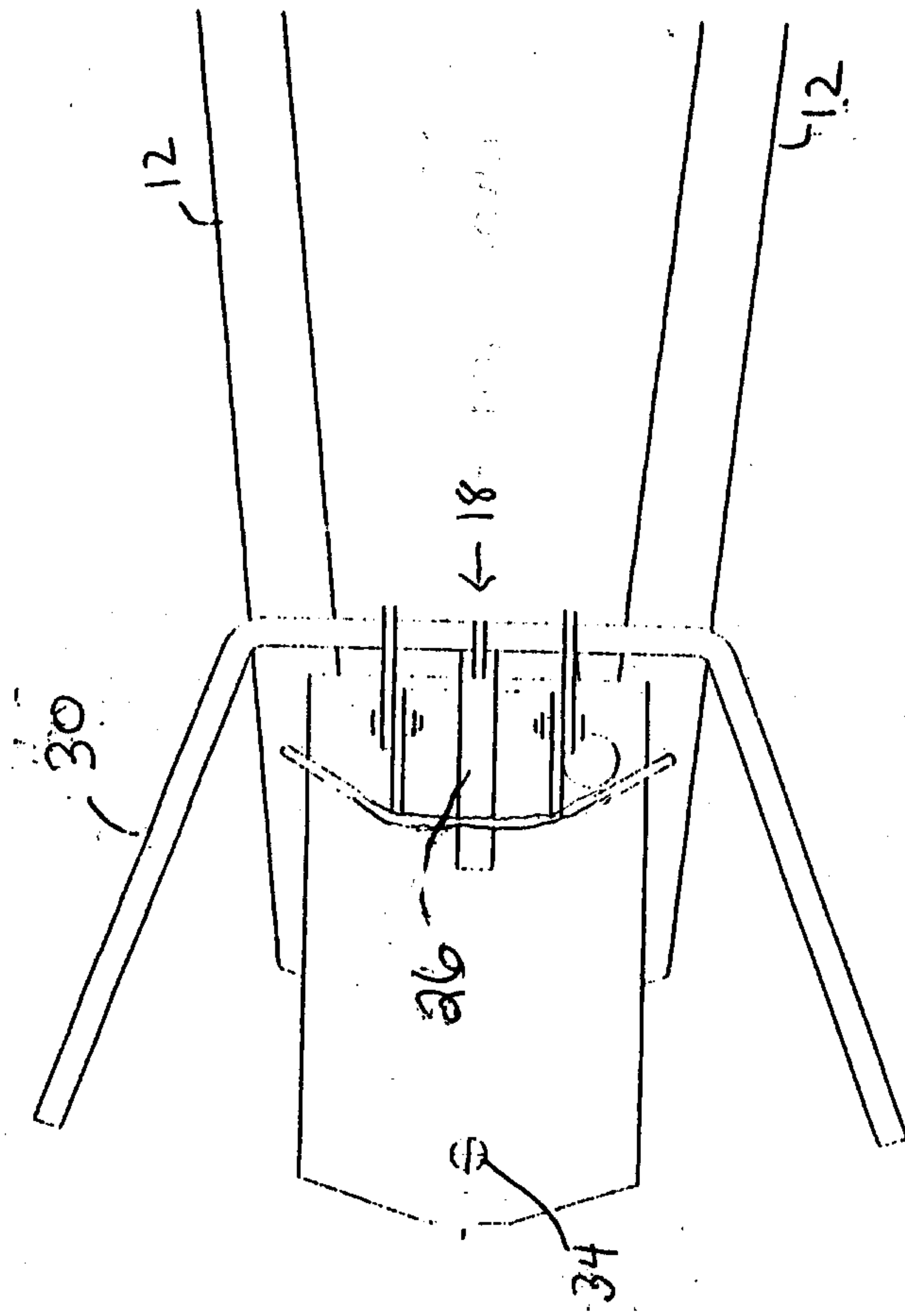


Figure 3

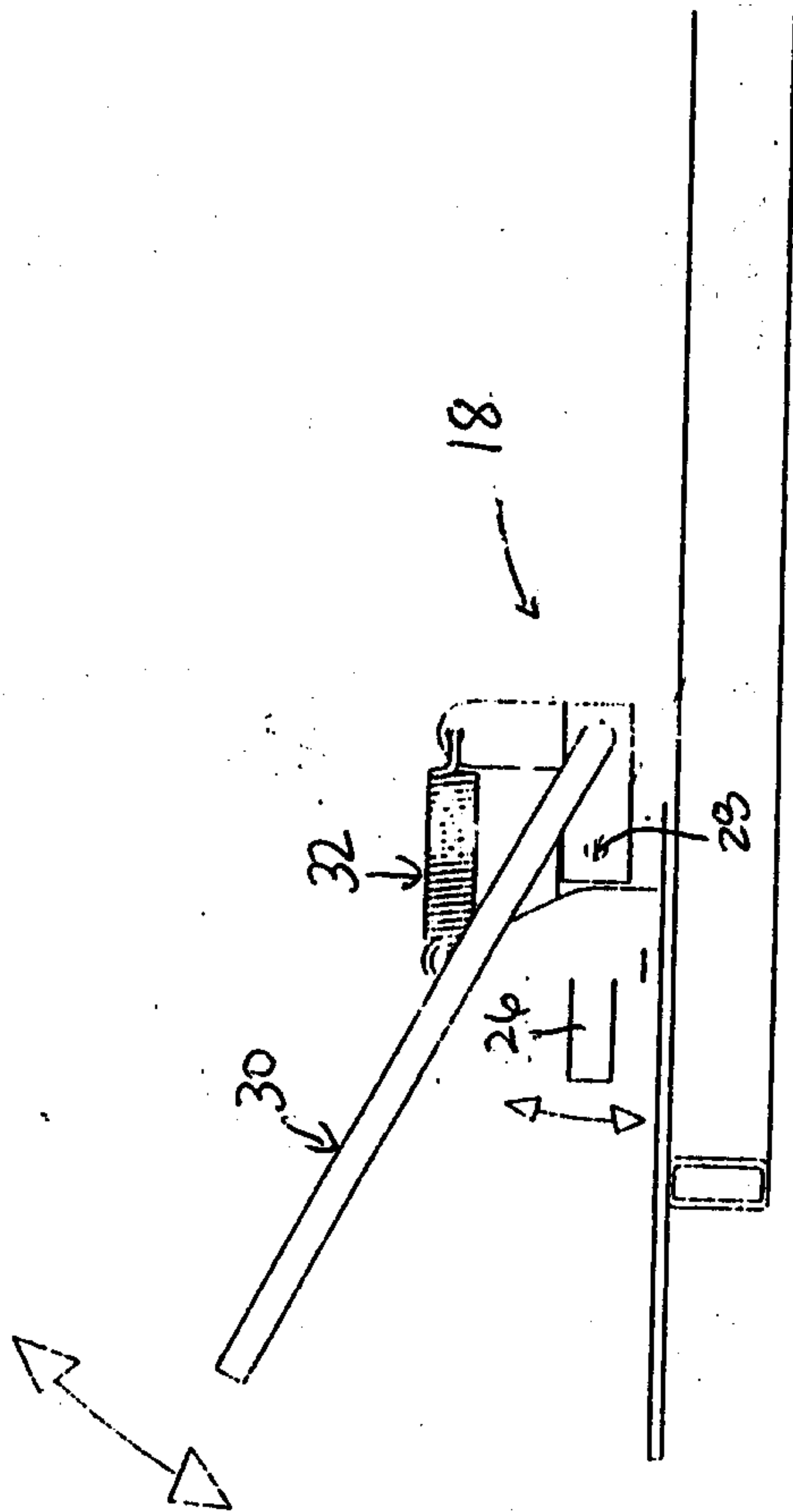


Figure 4

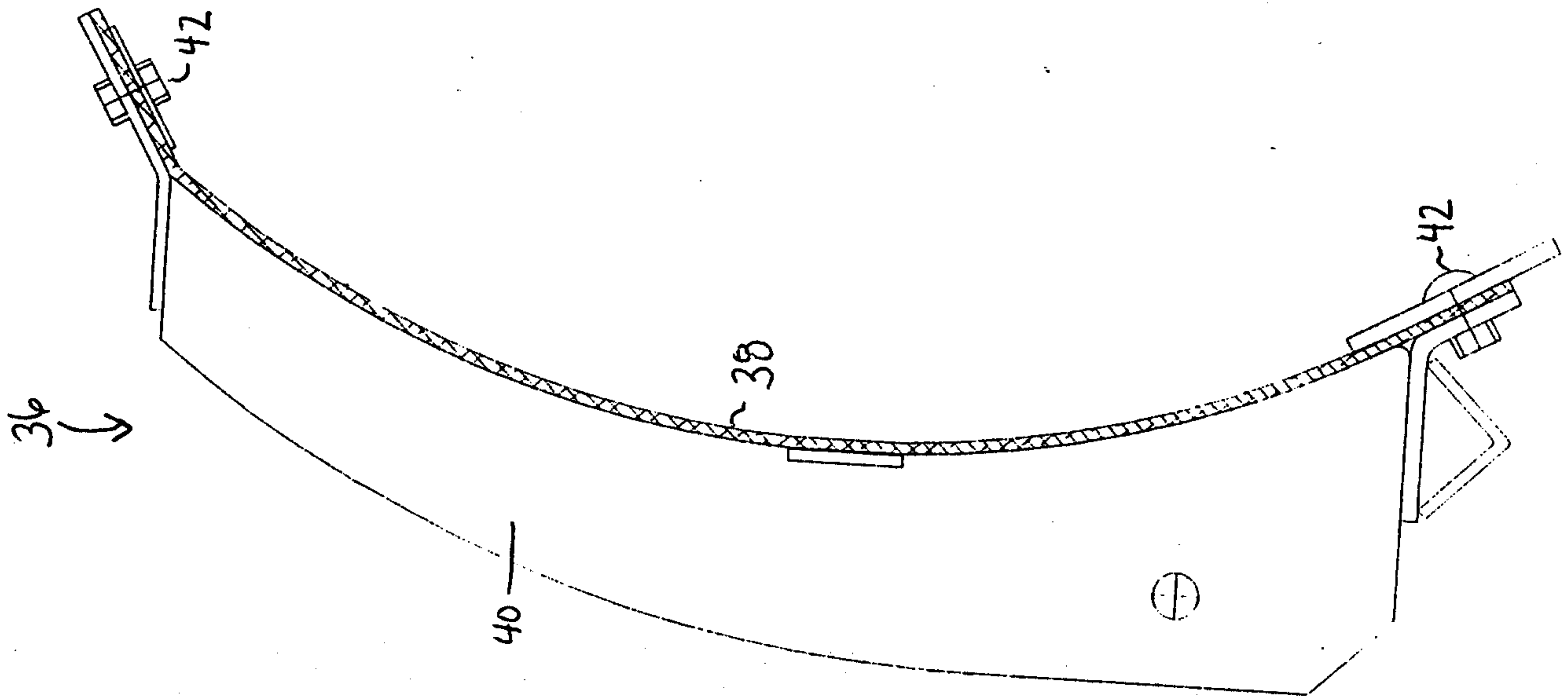


Figure 5

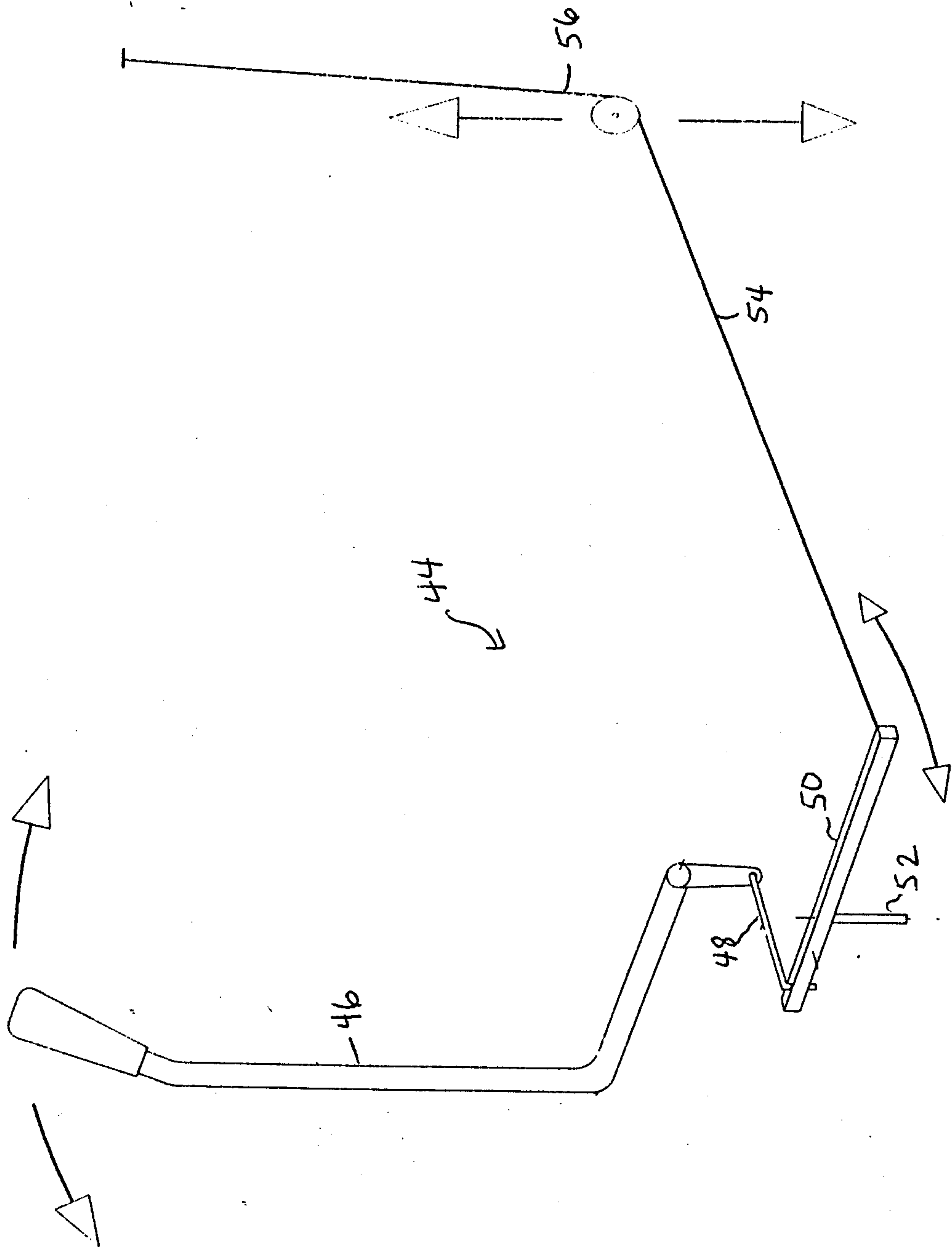


Figure 6

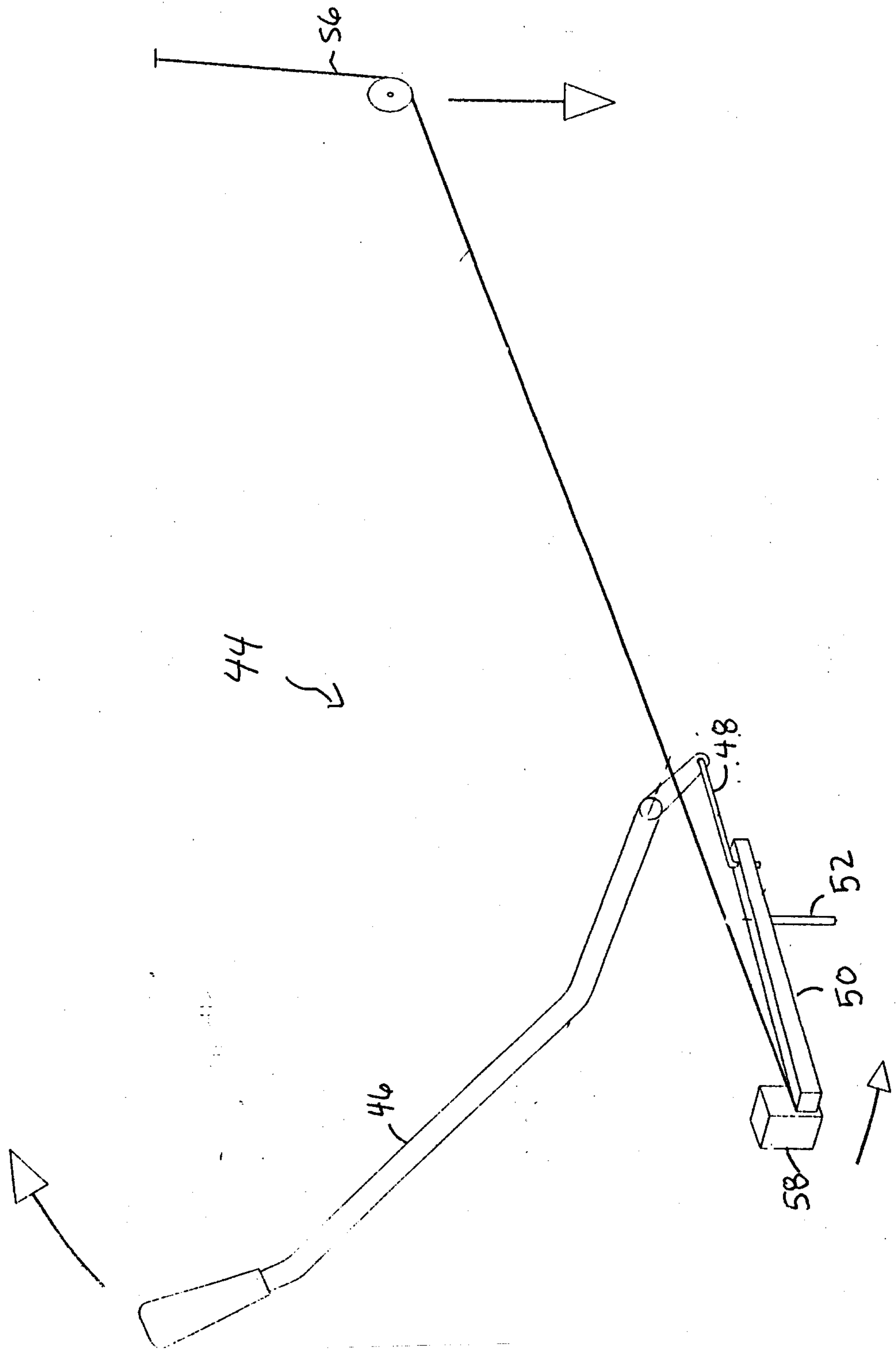


Figure 7

