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TRANSPORTER FOR ATTACHMENT TO A VEHICLE

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Abstract

A transporter for fitting to a vehicle, said transporter including a support frame which in use is rigidly secured to a vehicle; a multipart front frame which includes a first section having a plane parallel to that of the support frame and adapted to slide up or down relative to the support frame; said multipart front frame further including a second section which is pivoted along one edge to the adjacent edge of the first section; said multipart front frame further including a third section which is pivoted along one edge to the second section; and means for moving the front frame up or down relative to the support frame, with plane of the front frame and the plane of the first section of the support frame substantially parallel.

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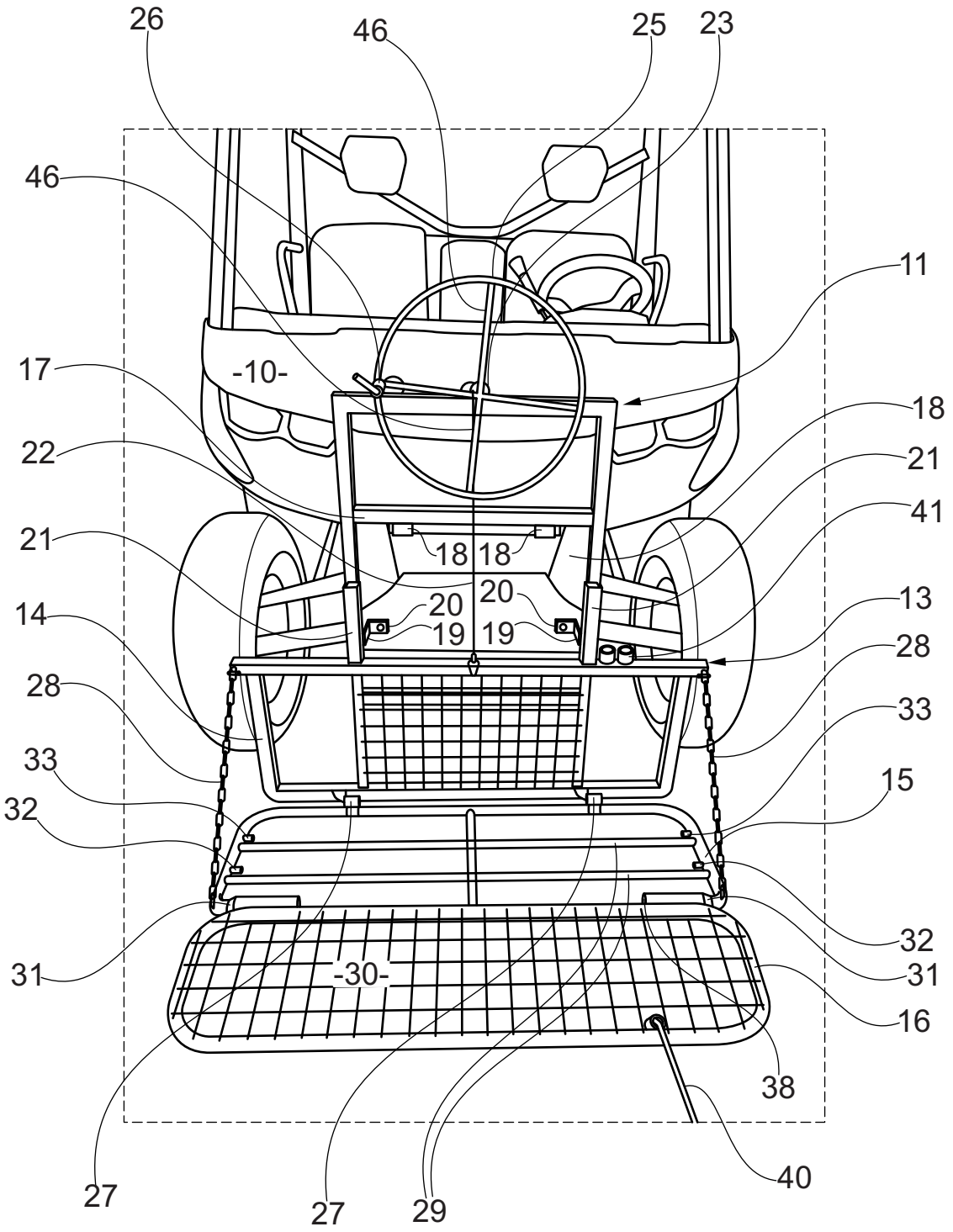

Fig. 2

TRANSPORTER FOR ATTACHMENT TO A VEHICLE

Technical Field

The present invention relates to a transporter which can be attached to the front or rear of a vehicle, in particular a vehicle such as a Utility Terrain Vehicle (UTV), to allow easy loading and safe transport of heavy and/or delicate loads such as live animals.

Background Art

Many vehicles are equipped with load transporting areas or surfaces (for example utility vehicles) but the loads have to be lifted onto these areas or surfaces, and if the load is heavy and/or requires delicate handling, two or more people may be needed to lift the load. This is inconvenient if the vehicle driver is on his or her own.

Some vehicles may be equipped with hoists or small cranes for loading, but such vehicles are relatively heavy and expensive.

Disclosure of Invention

An object of the present invention is the provision of a transporter which can be inexpensively fitted to a commonly available lightweight vehicle such as a UTV, but which is designed to allow heavy and/or delicate loads to be loaded easily by one person, and carried safely.

The present invention provides a transporter for fitting to a vehicle, said transporter including:

- a support frame which in use is rigidly secured to a vehicle;

- a multipart front frame which includes a first section having a plane parallel to that of the support frame and adapted to slide up or down relative to the support frame;

- said multipart front frame further including a second section which is pivoted along one edge to the adjacent edge of the first section;

- said multipart front frame further including a third section which is pivoted along one edge to the second section; and

- means for moving the front frame up or down relative to the support frame, with plane of the front frame and the plane of the first section of the support frame substantially parallel.

Preferably, the planes of the support frame and the first section of the front frame are substantially vertical.

The means for moving the front frame up or down relative to relative to the support frame may be powered (e.g. a winch) or may be manual (e.g. a rotatable wheel or handle).

Preferably, the second section of the front frame is provided with two or more positions across the width of the second section at which the third section may be pivoted.

Preferably, releasable ties or stays are securable between the outer edges of the third and first sections.

Brief Description of Drawings

By way of example only, a preferred embodiment of the present invention is described in detail, with reference to the accompanying drawings in which:

Figure 1 is a front view of a small vehicle fitted with a transporter in accordance with the present invention;

Figure 2 is a front view similar to Figure 1, but with the transporter in the “ready to load” position;

Figure 3 is a side view, showing the transporter of Figures 1 and 2 in the “ready to transport” position;

Figure 4 is a detail of Figure 3, on a larger scale;

Figure 5 is a perspective view showing the transporter adjusted for a smaller load;

Figure 6 is a side transporter folded and raised into the “out of use” position; and

Figure 7 is a plan view of an alternative arrangement for raising and lowering the transporter.

Best Mode for Carrying Out the Invention

Referring to the drawings, vehicle 10 is a small off road vehicle of the type generally referred to as a “Utility Terrain Vehicle (UTV)”. The transporter 11 of the present invention includes a support frame 12 which is rigidly secured across the front of the vehicle 10, and which supports a front frame 13 which is formed in three hinged parts 14/15/16.

The support frame 12 is rectangular in front view and is made of heavy duty square section pipe or bar welded together. The support frame 12 may be secured to the front of the vehicle 10 in any suitable way e.g. by bolting or welding a cross piece 17 extending across the width of the frame to lugs 18 which are provided on the vehicle for securing a bull bar, and by bolting or welding lugs 19 secured to the sides of the support frame 12 to further securing points 20 provided on the vehicle.

It is envisaged that the plane of the support frame 12 normally would be substantially vertical, but this is not in fact essential, and the support frame 12 could be mounted with its plane at an angle to the vertical if required.

The front frame 13 is also rectangular in front view. The front frame 13 is wider than the support frame 12 and extends across a major portion of the front of the vehicle 10. The first part 14 of the front frame is rectangular in front view and is formed of heavy duty square section pipe or bar welded together.

A pair of spaced angle irons 21, spaced apart by a distance equal to the distance between the sides of the support frame 12, are rigidly secured to the upper and lower rails of the front frame 13, and are arranged to project above the upper rail, so as to provide a pair of spaced sliders engaging the sides of the support frame 12, on which the front frame can slide up or down the support frame, as hereinafter described.

A cable 22 is secured at one end to the midpoint of the upper rail of the front frame 13 and extends around a pulley 23 which is mounted on the midpoint of the upper rail of the support frame 12 so as to project above the front frame 13. The cable 22 is made of a lightweight but high tensile strength material such as a titanium alloy.

The outer end 24 of the pulley 23 carries a handwheel 25 which is manually rotatable by a handle 26. The centre of the handwheel 25 is rigidly secured to the outer end of

the pulley 23, and rotation of the handwheel 25 by means of the handle 26 rotates the pulley 23; the respective sizes of the handwheel 25 and the pulley 23 are such that the system provides a mechanical advantage of approximately 20:1.

An alternative arrangement is shown in Figure 7. In this arrangement, the handwheel 25 is omitted and is replaced by a straight tube 50 which is secured to the outer end 24 of the pulley 23 approximately two thirds of the way along its length. One end of the tube 50 is connected to a handle 51 by means of which the bar may be used to rotate the pulley 23. The end of the tube 50 opposite to the handle 51 carries a socket 52 which is positioned and dimensioned so that it can engage the end of a spring loaded pin 45 (as used in combination with the handwheel 25). Engagement between the end of the spring loaded pin 45 and the socket 52 prevents rotation of the tube 50. To rotate the pulley 23 in either direction, the handle 45a of the spring loaded pin is used to withdraw the pin 45 from the socket 52 and the handle 51 is used to rotate the tube 50 in either direction, to raise or lower the front frame 13 as required.

To provide additional mechanical advantage, the handle 51 is mounted on one end of an inner bar 53 which can slide within the tube 50 and the effective length of the tube 50 can be lengthened if necessary by removing a retaining pin 54 which passes through corresponding holes in the tube 50 and the bar 53, adjusting the bar 53 to the required length and securing the relative positions of the bar 53 and the tube 50 by replacing the pin 54.

In a further variant, the pulley 23 may be rotatable by a winch (not shown) in known manner.

The second section 15 of the front frame 13 is pivoted along one edge to the lower edge of the front frame by two spaced pivots 27. More than two pivotal connections may of course be used if necessary. The second section 15 is rectangular in plan and is made of spaced tubes to form a rectangular shape with rounded corners and with cross members 29 to provide a supporting surface within the frame. Depending upon the types of loads which it is envisaged the transporter will be carrying, the second section 15 may be provided with more cross members or may have the whole of the interior filled in e.g. with plate or netting.

The angle to which the second section can pivot relative to the first section is limited by a pair of spaced safety chains 28, each of which is secured between one edge of the first section 14 and the corresponding edge of the second section 15.

The third section 16 of the front frame 13 is rectangular in plan and is made from heavy duty metal tube which forms the perimeter of the frame; the centre of the frame is filled in with a wire mesh 30. The third section 16 is pivoted along its lower edge to one of three pivot positions 31, 32, 33 located across the second section 15. Each of the pivot positions 31, 32, 33 provides a pair of sockets one at each side of the second section 15; the third section 16 is provided at one end with a fixed protruding pin 35 (Fig, 3) sized to enter one of the sockets and at the other end with a spring-loaded retractable pin 38. The third section 16 may be secured at any of the positions 31, 32, 33 by inserting the pin 35 in one of the sockets at the selected position, and then retracting the pin 38 so that the pin 38 can be inserted after into the other of the sockets at the selected position. Figure 5 shows the third section 16 engaged with the sockets 33 at the position closest to the first section 14; Figure 3 shows the third section connected to the sockets 31 furthest from the first section 14.

The third section 16 can pivot to lie flat on top of the second section 15, and the second and third sections both can be pivoted to the position shown in Figures 1 and 6, to lie flat on top of the first section 14. In this position, the transporter is securely folded away when not in use, and can be kept closed by engaging a tie 40 which is secured at one end to the third section 16, with a pair of cleats 41 mounted on the top rail of the first section 14. Two or more ties 40 and corresponding pairs of cleats can be fitted if required, spaced along the edge of the third section 16.

The above described transporter is used as follows:– to pick up a load (e.g. an injured sheep) on the transporter, the vehicle 10 is driven close to the animal, and the front frame 13 is lowered down to the ground by winding the handle 26 to extend the cable 22. The tie 40 is released from the cleats 41, so that the second and third sections 15, 16 of the front frame 13 can be pivoted to lie flat on the ground, as shown in Figure 2.

The animal is then slid gently across onto the frame 13 until it lies on its back on the second section 15, and the third section is pivoted upwards to the position shown in Figure 3, to hold the animal securely in place between the first and third sections. The tie 40 is secured between the cleats 41 to hold the third section in the desired position.

The third section can be pivoted towards or away from the second section by any required degree, to accommodate different sizes of animal.

Once the animal is secured on the transporter, the handwheel 25 is rotated to slide the front frame 13 up the support frame 12, so that the transporter and the animal are clear of the ground. Once the front frame 13 is at the desired height, the handwheel 25 is locked in that position using a spring-loaded pin 45 which engages one of the four cross members 46 of the handwheel 25, and prevents the handwheel from rotating.

The vehicle 10 is then driven to the required destination, and once the destination is reached, the front frame 13 is slowly lowered to the ground by rotating the handle 26 and the tie(s) 40 released from the corresponding cleats 41 to allow the third section 16 to be pivoted away from the second section and release the animal.

The above described transporter may be mounted at other positions on a vehicle (e.g. rear or side) providing there are suitable strong points for mounting the support frame.

It will be appreciated that the transporter provides a safe and secure method of transporting a heavy and/or awkward load, and the transporter can be operated by one person without putting either the operator or the load at risk.

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Claims

1. A transporter for fitting to a vehicle, said transporter including:

- a support frame which in use is rigidly secured to a vehicle;

- a multipart front frame which includes a first section having a plane parallel to that of the support frame and adapted to slide up or down relative to the support frame;

- said multipart front frame further including a second section which is pivoted along one edge to the adjacent edge of the first section;

- said multipart front frame further including a third section which is pivoted along one edge to the second section; and

- means for moving the front frame up or down relative to the support frame, with plane of the front frame and the plane of the first section of the support frame substantially parallel.

2. The transporter as claimed in claim 1, wherein the planes of the support frame and the first section of the front frame are substantially vertical.

3. The transporter as claimed in claim 1 or claim 2, wherein the means for moving the front frame up or down relative to the support frame are selected from the following: a winch, a handle secured to a rotatable wheel, which is in turn secured to a pulley, a handle secured to a pulley.

4. A transporter as claimed in any one of the preceding claims, wherein the second section of the front frame is provided with two or more positions across the width of the second section at which the third section may be pivoted.

5. A transporter as claimed in any one of the preceding claims, wherein a pair of spaced safety chains is secured between the outer edges of the first and second sections of the front frame, to limit the angle between the plane of the front section and the plane of the second section.

6. The transporter as claimed in any one of the preceding claims, wherein releasable ties or stays are provided to be securable between the outer edges of the third and first sections.

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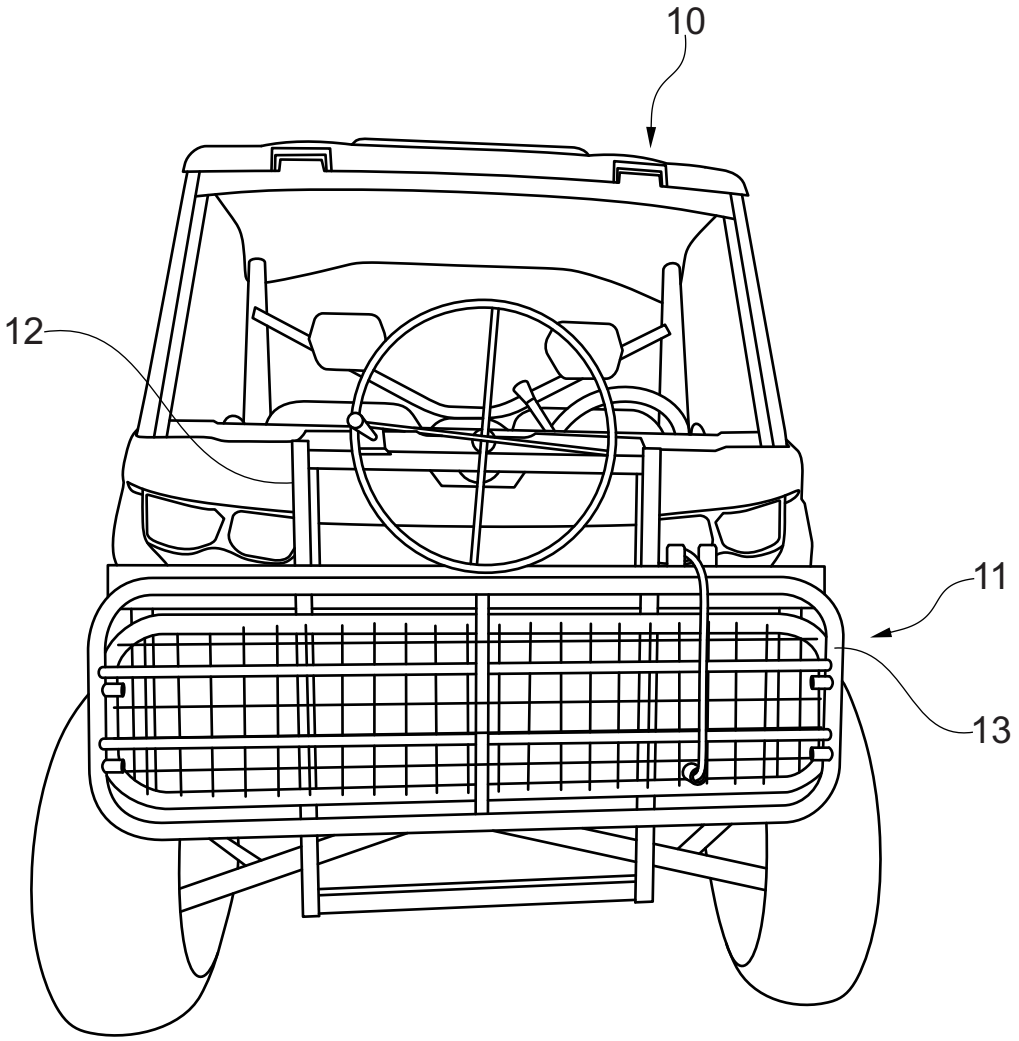

Fig. 1

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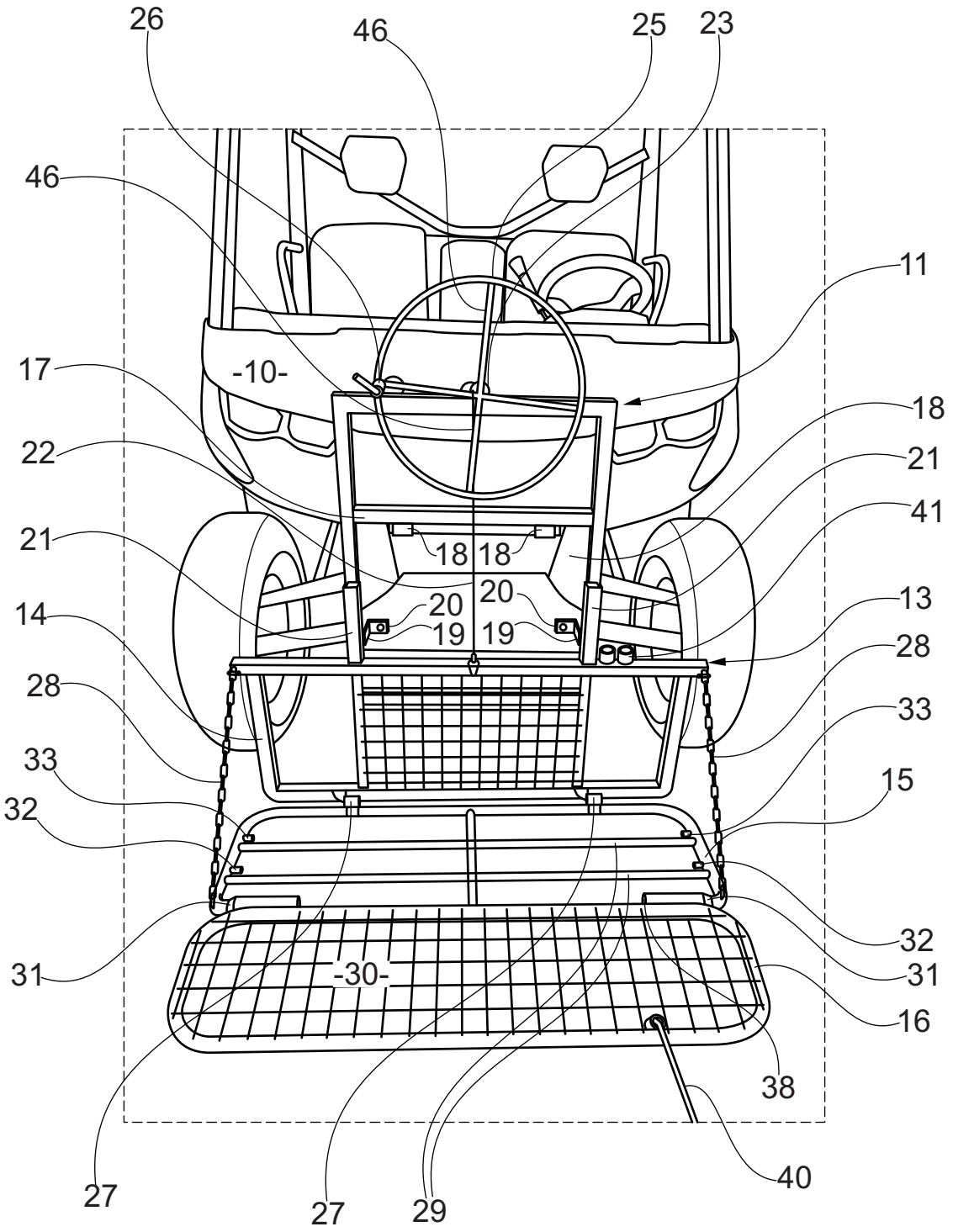

Fig. 2

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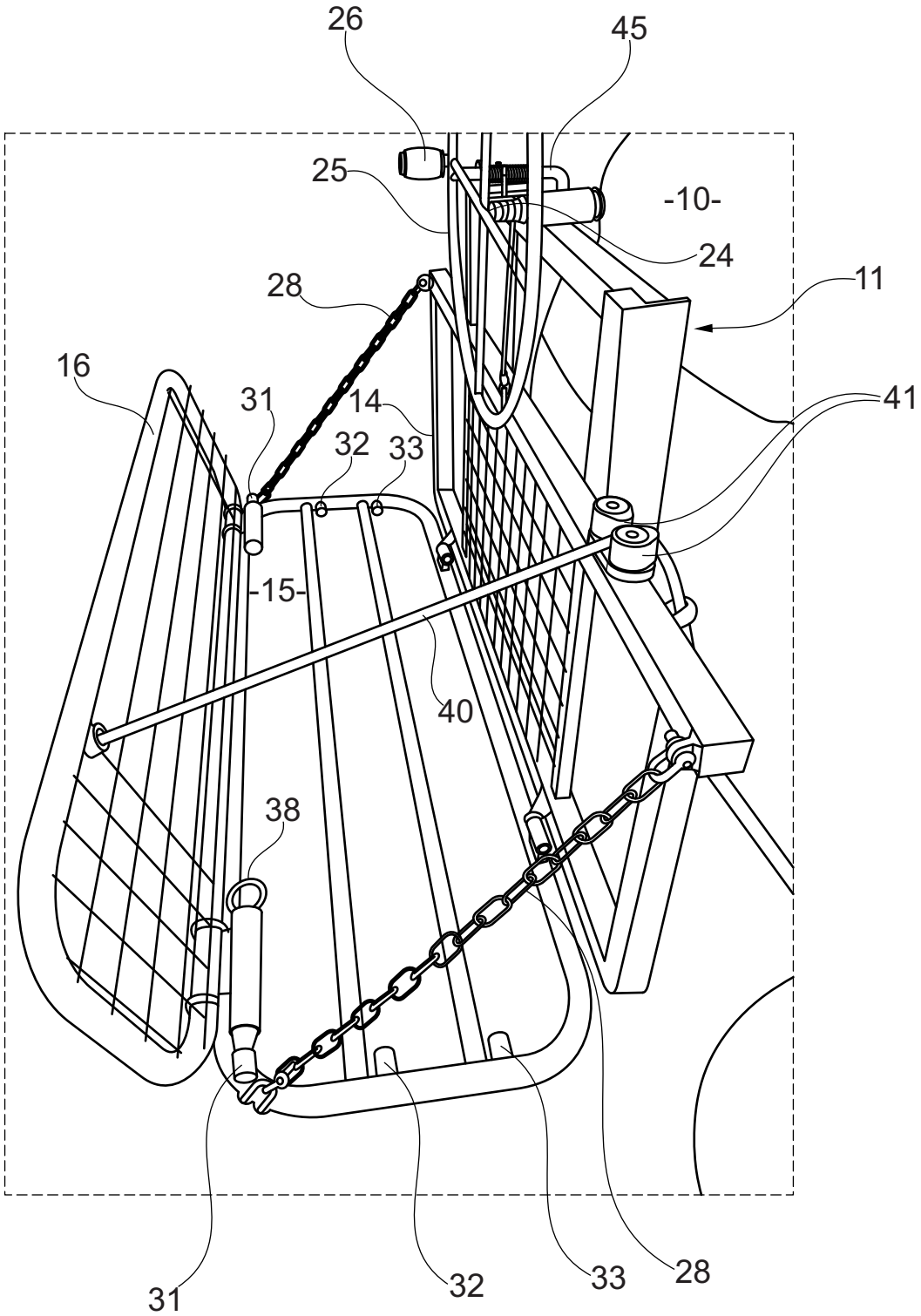

Fig. 3

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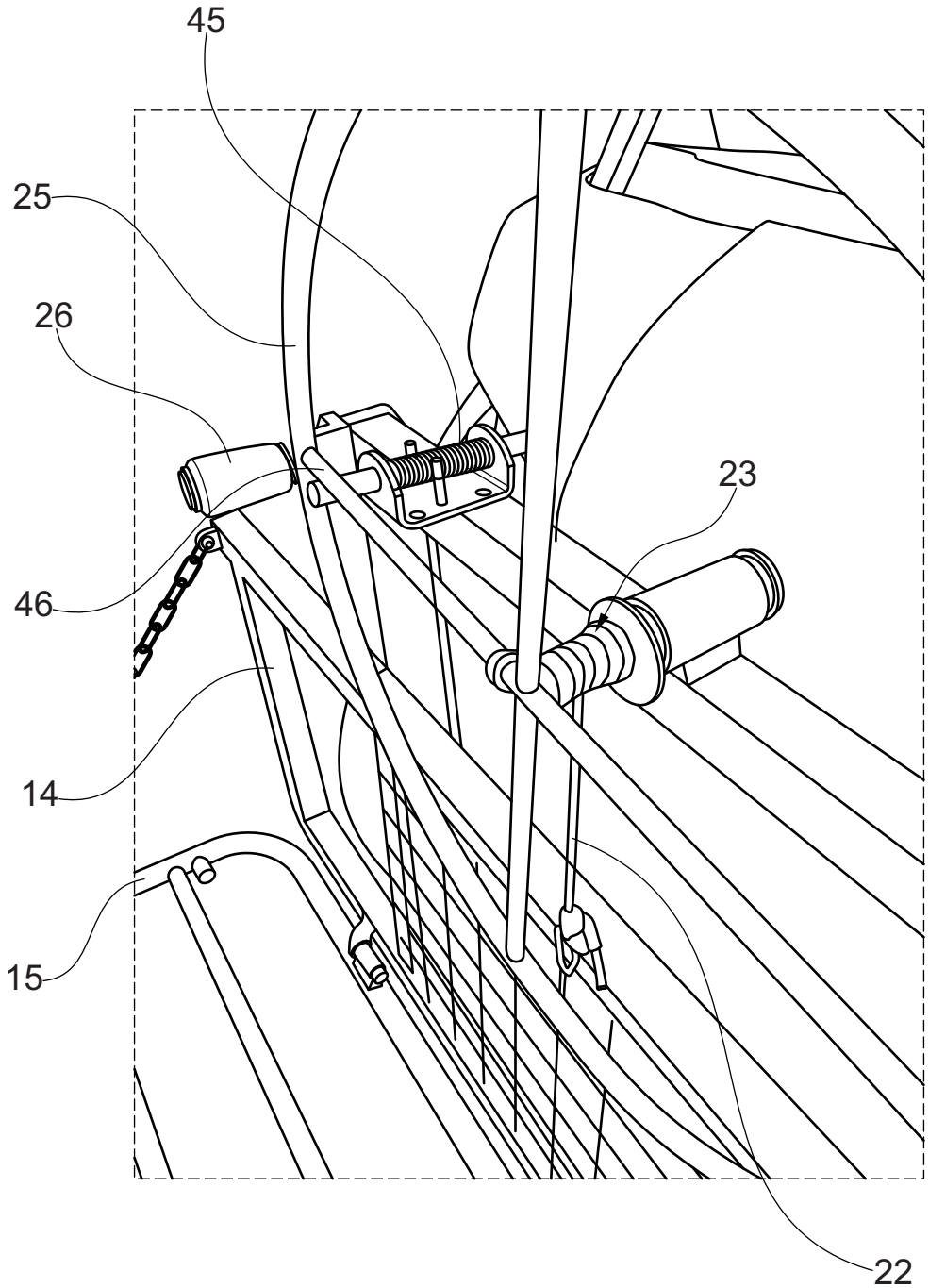

Fig. 4

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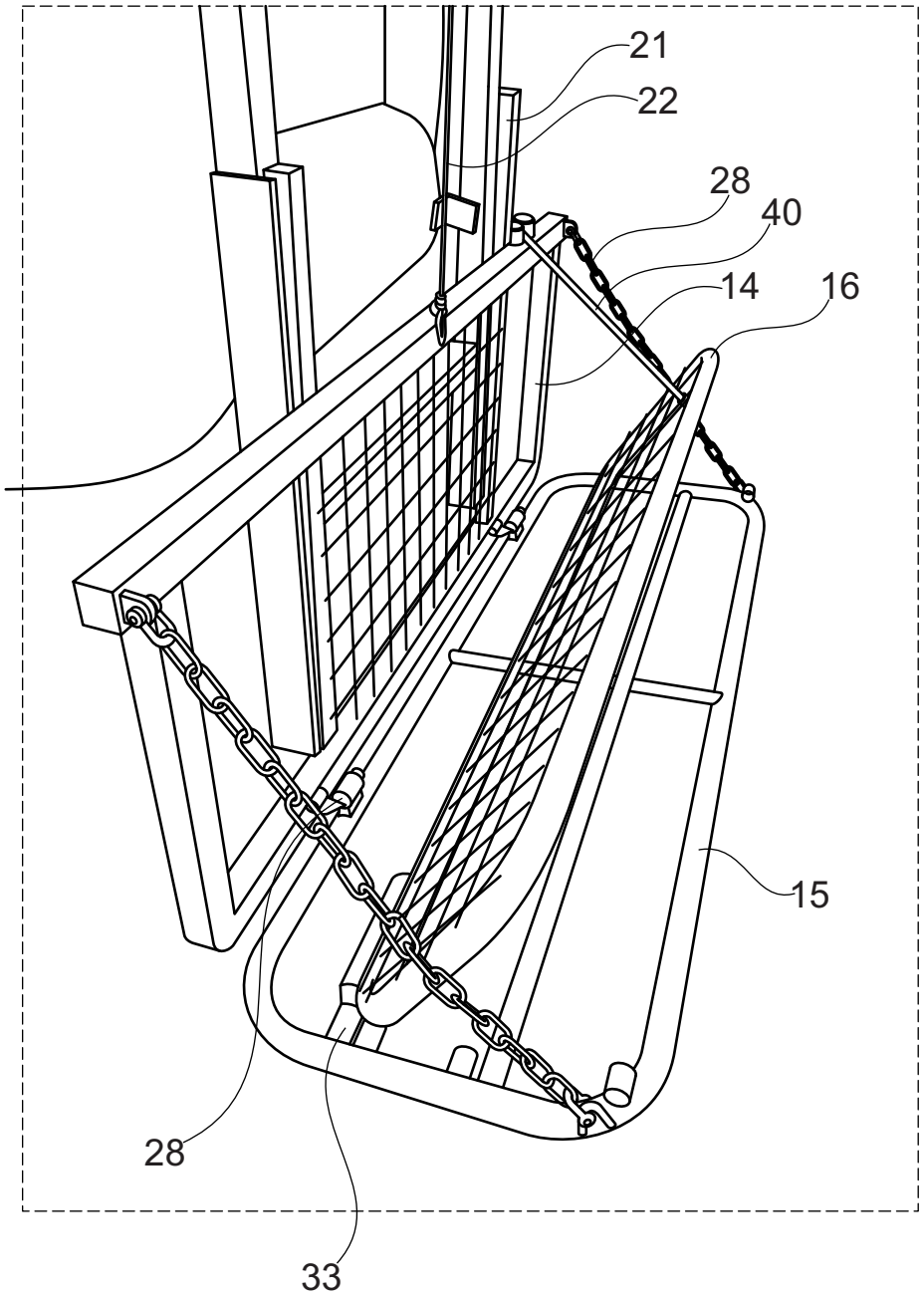

Fig. 5

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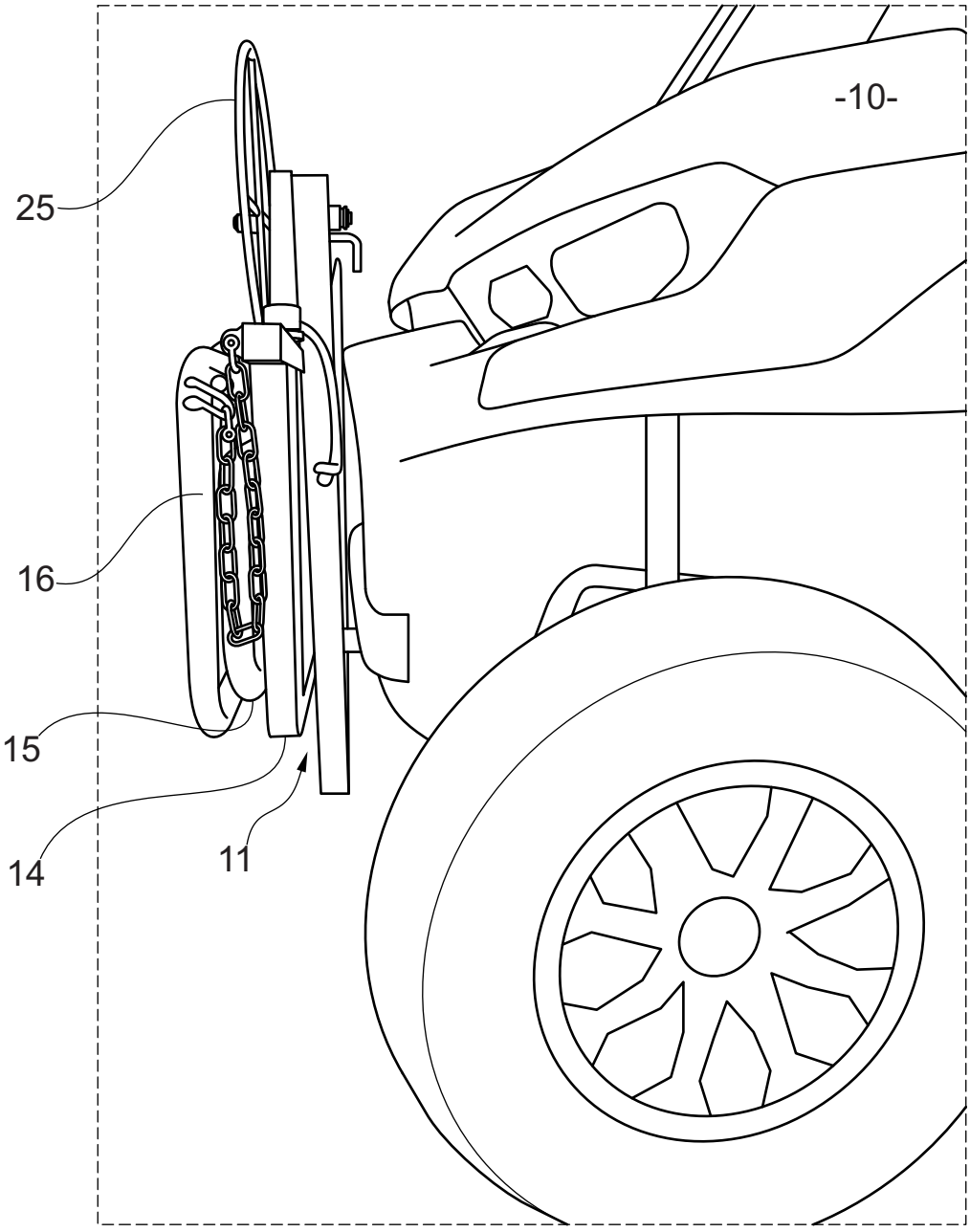

Fig. 6

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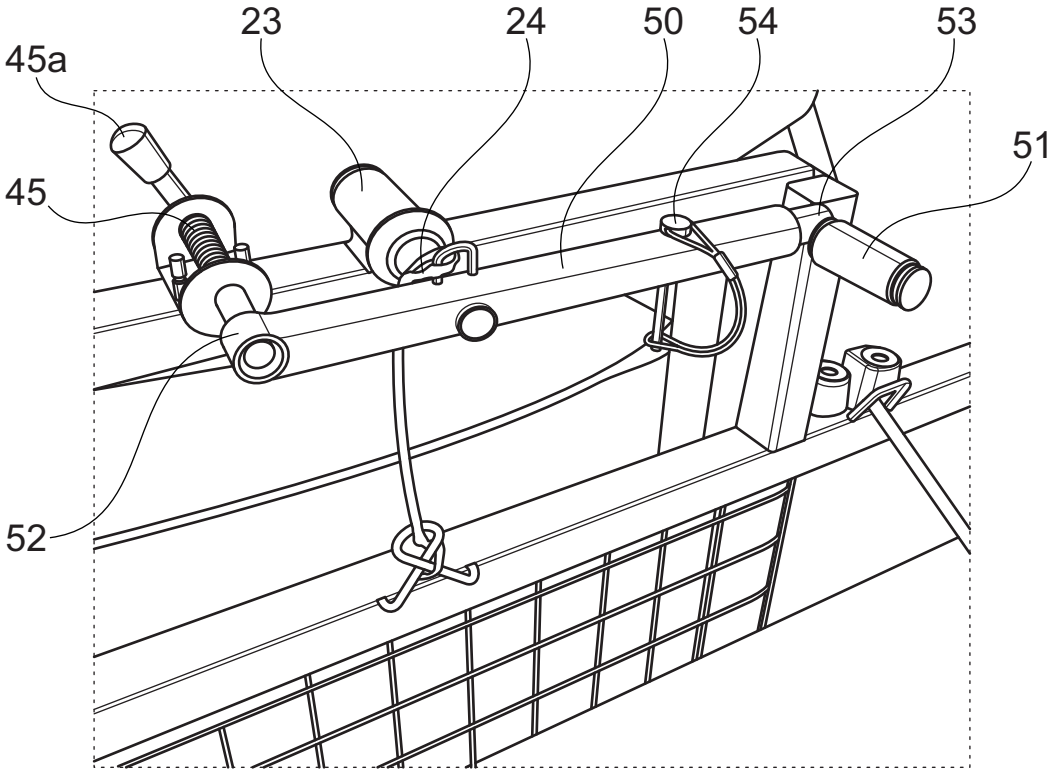

Fig. 7