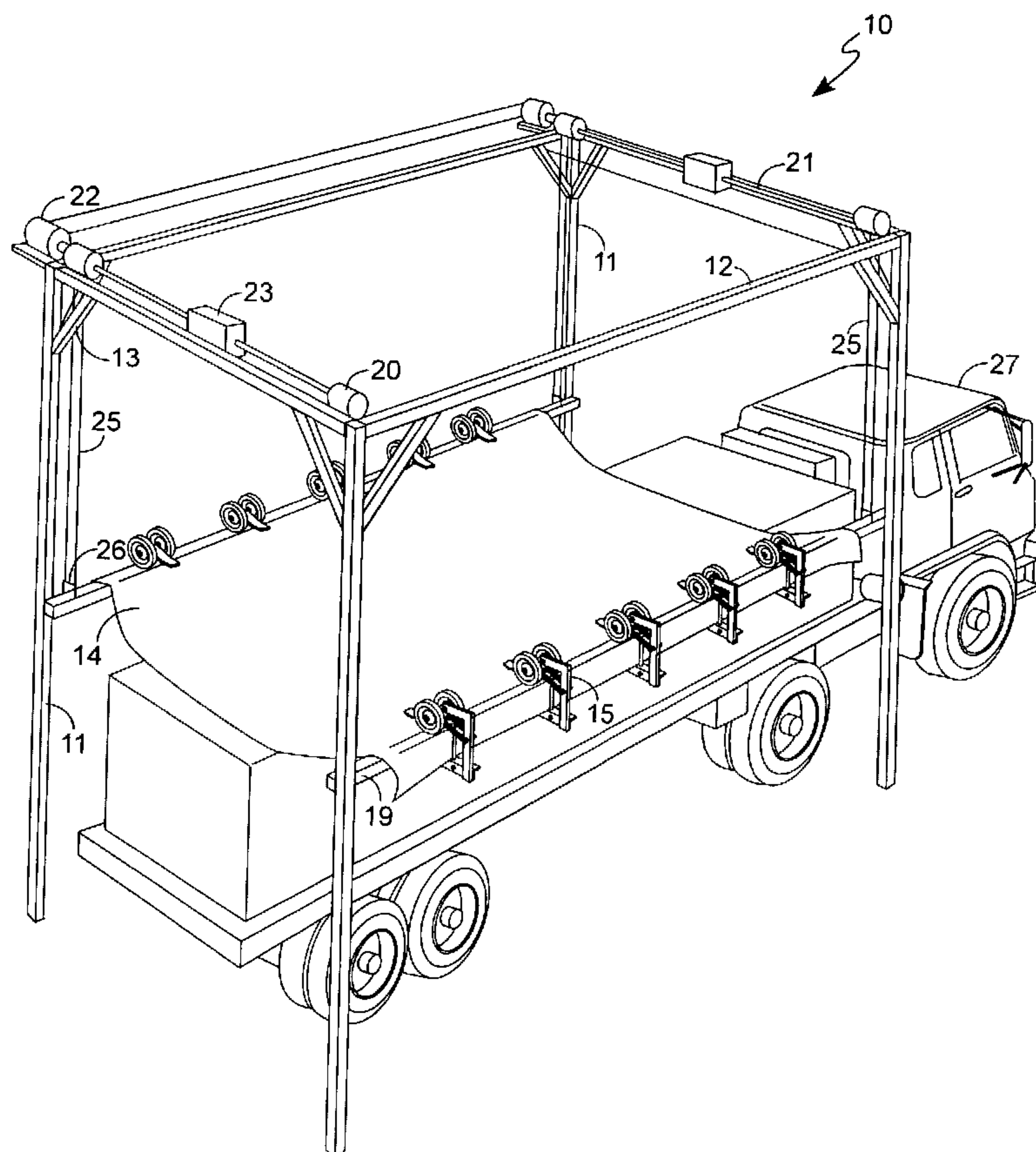




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(54) Titre : PROCÉDE ET APPAREIL DE MISE EN PLACE DE BACHE DE CAMION
(54) Title: A METHOD AND APPARATUS FOR TRUCK TARP LOADING



(57) Abrégé/Abstract:

An apparatus (10) and method for covering truck beds, rail cars, or other large objects (27) with a tarp or other covering (14). The cover (14) is secured to one or more fastening roller members (15) mounted to a plurality of movable arms (19) which are then lifted thereby lifting said covering (14). The large object (27) is then placed under the covering (14), which is lowered, then

(57) **Abrégé(suite)/Abstract(continued):**

disengaged from the fastening roller members (15) and secured. The fastening roller members (15) comprises a vertical support member (36) with first and second ends; a first horizontal member (38) secured to the first end; a second horizontal member (43) secured to the second end; a cover (14) grasping mechanism.

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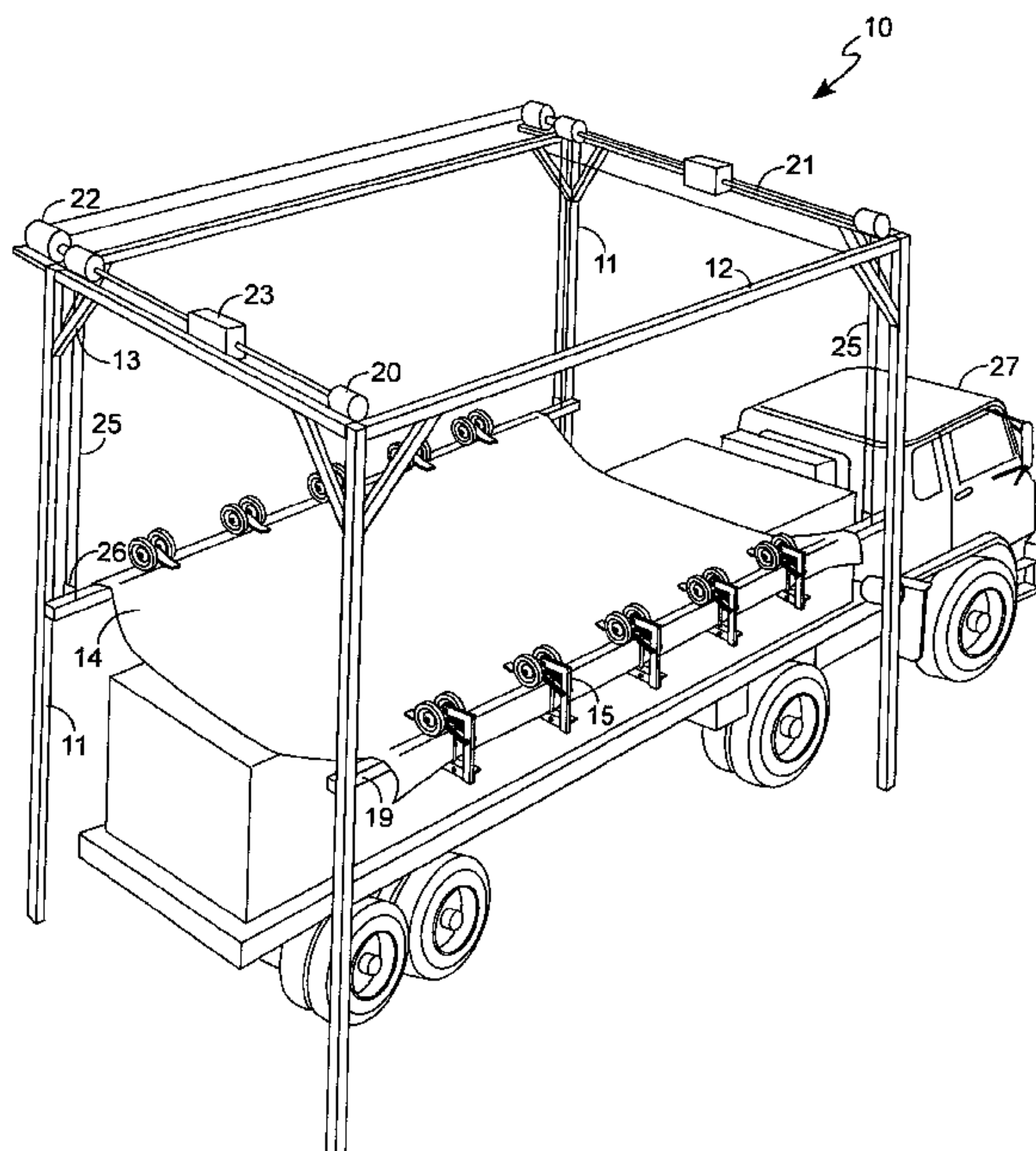
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(54) Title: A METHOD AND APPARATUS FOR TRUCK TARP LOADING



(57) Abstract: An apparatus (10) and method for covering truck beds, rail cars, or other large objects (27) with a tarp or other covering (14). The cover (14) is secured to one or more fastening roller members (15) mounted to a plurality of movable arms (19) which are then lifted thereby lifting said covering (14). The large object (27) is then placed under the covering (14), which is lowered, then disengaged from the fastening roller members (15) and secured. The fastening roller members (15) comprises a vertical support member (36) with first and second ends; a first horizontal member (38) secured to the first end; a second horizontal member (43) secured to the second end; a cover (14) grasping mechanism.

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TITLE

A METHOD AND APPARATUS FOR TRUCK TARP LOADING

DESCRIPTIONField of the invention

5 The present invention generally relates to an apparatus and method for covering large containers and more particularly to the process of covering loaded trucks and rail cars with tarps or related coverings.

Background of the Invention

10 Covering trucks and other large objects such as rail cars with tarpaulins, or tarps, is a common problem. In fact, climbing on high trailers to secure the tarp is a dangerous operation. Moreover, dragging the tarp across the trailers can cause the tarp to be damaged or cut.

15 Therefore, a need is felt for an apparatus for truck tarp loading.

Summary of the invention

20 It is an object of the present invention to provide an apparatus for truck tarp loading that allows the tarper to remain on the ground, without requiring dragging the tarp across the load.

 The above objects are achieved by the apparatus and method for truck tarp loading according to the appended claims 1 and 18.

25 Advantageous characteristics are further defined by the appended claims 2-17 and 19.

Brief description of the drawings

30 Other aspects, objects, and advantages of the present invention will become evident on reading the following best mode for carrying out the invention, given by way of example and made with reference to the accompanying drawings, in which:

- Figure 1 depicts an overall aerial view of one

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fundamental unit of the truck covering apparatus without fastening roller members being present on the arms.

- Figure 2 depicts an overall aerial view of one fundamental unit, with the covering secured by fastening roller members and raised above the height of the loaded truck.
- Figure 3 depicts a side view of one of the fastening roller members securing a covering.
- Figure 4 depicts a perspective side view of a plurality of fastening roller members mounted to one of the arms of the truck covering apparatus, with the cover grasping mechanism in the closed or partially closed position.
- Figure 5 depicts a perspective top view of the cover grasping mechanism.
- Figure 6 depicts a perspective side view of a plurality of fastening roller members mounted to one arm of the truck covering apparatus with the cover grasping mechanism in the open position.

Description of a preferred embodiment

Referring now to the drawings in detail, for the ease of the reader, like reference numerals designate identical or corresponding parts throughout the views depicted in the drawings.

Figure 1 shows an overall aerial view of an embodiment of one fundamental unit of truck covering apparatus 10. The unit can also be used to cover other large objects such as rail cars. In a preferred embodiment, four vertical support members 11 are attached to rectangular top frame 12 to form the framework for truck covering apparatus 10. Other numbers of vertical support members or other shapes of the top frame can be used, adapted to the shape of the cover and the object to be covered. In one alternative, the frame can be suspended

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from roof supports without the use of vertical supports. In another alternative, an overhead crane lifts the unit and suspends it above the object to be covered.

In one embodiment, the framework has the addition of support beams 13 at each corner to provide greater strength and stability. In a preferred embodiment, secured to two corners of top frame 12, on opposite ends of a long side of the rectangular top frame 12, are two gear motors 22. Each gear motor 22 rotates keyed shaft 21 that is fixedly secured on both ends to spool 20. Coupling device 23 is located in the middle of the short side of rectangular top frame 12 and stabilizes keyed shaft 21. Gear motors 22 can be placed anywhere on or near the frame such that they remain in functional contact with keyed shaft 21.

In a preferred embodiment, fixedly secured to spools 20 are lifting connectors 25 that extend downward from spools 20 and are attached to arms 19 through the use of lifting U-hooks 26. Each spool 20 is attached to lifting connector 25 by a lifting connector attachment member (not shown). In a preferred embodiment, lifting connectors 25 are straps, but can, alternatively, be chains, ropes, cable, link belt, or any other material capable of lifting the weight involved. Arms 19 are lifted when spools 20 are rotated and lifting connectors 25 wrap around spools 20, keeping arms 19 substantially parallel to top frame 12. Each of spools 20 operates at the same speed so as to allow smooth and simultaneous lifting of arms 19. Preferentially, there are four spools 20 mounted to the 4 corners of top frame 12, but other numbers and locations may be used and may be required for alternative shaped frames. Alternative lifting mechanisms include, but are not limited to, chain falls, an overhead crane, ropes and pulleys, and winches. The means by which the tarp or other

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covering is secured to arms 19 will be discussed below.

In an alternative embodiment, a laser detection system is added to truck covering apparatus 10 to prevent injury when entering the intended travel path of lift arms 19. If the laser path is interrupted by an object or person, power to the device is severed, halting the ascent or descent of arms 19. Once the object or person has been removed, the device is reset and the tarp loading procedure is continued. In another alternative embodiment, proximity switches are added at the top and/or bottom of vertical support members 11 to control the upper and lower allowable height traveled by arms 19. An alternate safety feature that can be used independent from or in conjunction with the proximity switches is a braking system for stopping the free fall of arms 19 in the event lifting connector 25 breaks.

Figure 2 shows an overall aerial view of an embodiment of truck covering apparatus 10, with covering 14 secured to arms 19 by fastening roller members 15 and raised above the height of loaded truck 27 to be covered. As described in Figure 1, the rotation of spools 20 wraps lifting connectors 25 around spools 20 and allows for the smooth and simultaneous lifting of arms 19 above loaded truck 27. Covering 14 is secured in place by a plurality of fastening roller members 15. The number of fastening roller members 15 varies according to the size and material of covering 14. Covering 14 can be plastic, cloth, canvas, or any other fabric commonly known in the art for covering truck loads. If covering 14 is long and/or made of a heavy material, a greater number of fastening roller members 15 may be required than if covering 14 is short or made of a light material.

As shown in Figure 1,. Figure 2 shows truck covering

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apparatus 10 in operation without the use of web straps, quick release hangers, and U-hooks. However, in an alternative embodiment, truck covering apparatus 10 employs both fastening roller members 15 and a combination
5 of quick release hangers, U-hooks, and web straps to secure cover 14 to arms 19. Web straps are typically made of nylon, but can be made of any flexible and strong material commonly known in the art.

Figure 3 shows a side view of one fastening roller
10 member 15 securing covering 14. In a preferred embodiment, fastening roller member 15 is made of steel tubing. Alternatively, it can be made of any other strong metal such as aluminum. Fastening roller member 15 is generally comprised of: vertical support member 36, having a first
15 and second end, first horizontal member 38 fixedly secured to the first end of vertical support member 36, forming a first L-shape, second horizontal member 43 fixedly secured to the second end of vertical support member 36, forming a second L-shape and having a fastening mechanism (not
20 shown, concealed by covering 14) for attaching fastening roller member 15 to truck covering apparatus 10, handle 30 with a rectilinear wall pivotally attached to first horizontal member 38, an axle (not shown, concealed by wheels 31) going through the rectilinear wall, a pair of
25 wheels 31 attached to the axle and ending with cap 33 to secure wheels 31 to the axle, and a pair of tensioners 35 connecting the axle to first horizontal member 38. Tensioners 35 are attached to vertical support member 36 by a screw, bolt, rivets, fastening posts, pins, or any
30 other means on one end and attached to the axle on the other end. In a preferred embodiment, tensioners 35 are a pair of springs. Alternatively, tensioners 35 can be electric solenoids, hydraulic cylinders, air cylinders, or any other device commonly known in the art, allowing a

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more positive control and a tighter grasp of covering 14.

Tensioners 35, wheels 31, axle 37, and handle 30 form a cover grasping mechanism. As shown in Figure 3, because of tensioners 35, wheels 31 exert a downward force
5 on covering 14, pinching it between wheels 31 and arm 19, securing covering 14 in place. Handle 30 is shown in the closed position, which is in a lower position than first horizontal member 38, and is substantially in parallel with first horizontal member 38 and second horizontal
10 member 43.

Figure 4 shows a perspective side view of an embodiment of a plurality of fastening roller members 15 mounted to arm 19 of truck covering apparatus 10. Figure 4 also shows one lifting connector 25 attached to U-hook 26
15 which permits arm 19 to be raised and lowered. In this view, most of the same features shown and described in Figure 3 can also be seen. It can be better appreciated in Figure 4 that when handle 30 is in the closed position, it is substantially parallel to first horizontal member 38
20 and second horizontal member 43. It can also be clearly seen that cover grasping mechanism (tensioners 35, wheels 31, axle (not shown), and handle 30) is positioned below first horizontal member 38.

The lack of a covering in Figure 4 allows for a view
25 of fastening mechanism 34. Fastening mechanism 34 wraps around a portion of arm 19 and is secured to second horizontal member 43 (second point of attachment to arm 19 concealed by arm 19). Fastening mechanism 34 can fixedly secure fastening roller member 15 to arm 19 or be such
30 that, when loosened, the device can be slid along arm 19 to adjust for different sizes, shapes, and weights of the tarp or covering. Fastening mechanism 34 also allows for fastening roller members 15 to be added to or removed from

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truck covering apparatus 10. Fastening mechanism 34 is made of any sound and strong structural material. In a preferred embodiment, fastening mechanism 34 is a U-bolt with the two ends secured to second horizontal member 43 and wrapping around arm 19, but it can be appreciated that other means of attachment known in the art can be used.

Figure 5 shows a perspective top view of fastening roller member 15, including first horizontal member 38, handle 30, and tensioners 35. First horizontal member 38 has slot 39 at the end away from the vertical support member (not shown). Handle 30 has small rectilinear wall 40 extending perpendicularly from handle 30. In a preferred embodiment, handle 30 is elongated with a slight curve at tip 49. In another embodiment, handle 30 and rectilinear wall 40 are one contiguous piece. Axle 37 passes through rectilinear wall 40 with wheels 31 and cap 33 attached to it. Tensioners 35 are attached to axle 37 on one end and to vertical support member on the other end. Figure 5 shows fastening roller member in the closed position. Tensioners 35 pull axle 37 and wheels 31 downward towards the arm (not shown), holding the covering (not shown) between wheels 31 and arm. The pressure exerted by wheels 31 against arm is sufficient to hold the cover in place, but still allows removal of the cover with a pull or tug by an operator.

When moved to the open position, handle 30, axle 37, wheels 31, and rectilinear wall 40 pivot around pivot bolt 47. Tensioners 35 stretch to allow rotation around pivot bolt 47 and then pull axle 37 and wheels 31 toward vertical support member, holding wheels 31 in a lifted position to leave space to manipulate the covering between wheels 31 and the arm.

Figure 6 shows a perspective side view of a

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plurality of fastening roller members 15 mounted to arm 19 of truck covering apparatus 10 with handle 30 in the open position. When in the open position, wheels 31 are lifted and retracted. It can be appreciated that cover grasping
5 mechanism (tensioners 35, wheels 31, axle (not shown), and handle 30) is above first horizontal member 38. The amount of space left to manipulate the covering between arm 19 and wheels 31 can also be appreciated. It can further be appreciated that when fastening roller member 15 is in the
10 open position, handle 30 is extending in an opposite direction from the axle, though still generally parallel to first horizontal member 38 and second horizontal member 43.

Although the invention is described by reference to
15 a specific preferred embodiment, it is obvious to one skilled in the art that variations can be made without departing from the spirit and scope of the invention as claimed.

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CLAIMS

1. An apparatus (10) for covering a large object (27) comprising:

a top frame (12);

5 a support (11) for said top frame (12);

a lifting device (20,21,22,23) attached to said top frame (12), said lifting device (20,21,22,23) operatively engaging a plurality of arms (19), said plurality of arms (19) substantially parallel to
10 said top frame (12);

a plurality of hanging members (26) attached to said plurality of arms (19);

a plurality of lifting connectors (25), each of said plurality of lifting connectors (25) attached on a first end to said plurality of hanging members (26)
15 and operatively attached on a second end to said lifting device (20,21,22,23); and

one or more fastening roller members (15), mounted to said plurality of arms (19), to which a cover (14) can
20 be secured.

2. The apparatus (10) for covering a large object (27) of claim 1, wherein said support for said top frame (12) is selected from a group comprising: roof supports, an overhead crane, and a plurality of vertical supports (11).

25 3. The apparatus (10) for covering a large object (27) according to claim 1, wherein said support comprises a fundamental unit having a plurality of vertical support members (11) attached to said top frame (12).

4. The apparatus (10) for covering a large object (27)
30 according to claim 3, wherein said top frame (12) has a length,

wherein said arms (19) substantially extend the length of said top frame (12) between a first vertical support member (11) and a second vertical support

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member (11) of said plurality of vertical support members (11);

and wherein said lifting device (20,21,22,23) operatively engages said plurality of arms (19) to move said plurality of arms (19) in a vertical fashion while keeping said plurality of arms (19) substantially horizontal.

5. The apparatus (10) for covering a large object (27) according to claims 3 or 4, wherein

10 said plurality of arms comprises a first arm (19) and a second arm, said first arm (19) and said second arm (19) substantially extending between said plurality of vertical support members (11).

6. The apparatus (10) for covering a large object (27) according to claim 5, wherein a plurality of straps is provided secured to said first arm (19) at a plurality of fixed attachment members and attached to said second arm (19) at a plurality of quick-release attachment members.

7. The apparatus (10) for covering a large object (27), according to any of the previous claims, wherein said lifting device is selected from a group comprising one or more chain falls, an overhead crane, a rope and pulley system, and one or more winches.

8. The apparatus (10) for covering a large object (27) according to any of claims from 1 to 6, wherein said lifting device comprises:

a shaft (21);

one or more motors (22) mounted to said top frame (12), operatively engaging said shaft (21); and

30 a plurality of spools (20) mounted to said shaft (21), said plurality of spools (20) each having a lifting connector attachment member operatively engaging one of said plurality of lifting connectors (25).

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9. The apparatus (10) for covering a large object (27), according to any of the previous claims, wherein said plurality of lifting connectors (25) is selected from a group comprising straps, ropes, chains, cables, and link
5 belts.

10. The apparatus (10) for covering a large object (27), according to claim 1, wherein said one or more fastening roller members (15) are comprised of:

10 a vertical support member (36), having a first end and
a second end;

a first horizontal member (38) fixedly secured to said first end of said vertical support member (36), forming an L shape with said vertical support member (36) and having portions forming a slot
15 (39);

a second horizontal member (43) fixedly secured to said second end of said vertical support member (36), forming an L shape with said vertical support member (36);

20 a fastening mechanism (34) for attaching said one or more fastening roller members (15) to said plurality of arms (19); and

a cover (14) grasping mechanism (30,31,35,37).

11. The apparatus (10) for covering a large object (27) according to claim 10, wherein said fastening mechanism is
25 a U-bolt (34) with a first end and a second end, said U-bolt (34) engaging an arm (19) of said plurality of arms (19) and said first end and said second end of said U-bolt (34) secured to said second horizontal member (43).

30 12. The apparatus (10) for covering a large object (27) according to claim 10, wherein said cover (14) grasping mechanism is comprised of:

a handle (30) with a tip (49), said handle (30) having
a rectilinear wall (40) extending perpendicularly

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from said handle (30) and pivotally engaged to said first horizontal member (38) by a pivot bolt (47) inside said slot (39), lowering a pair of wheels (31) whenever said handle (30) is in a closed position, and raising said pair of wheels (31) whenever said handle (30) is in an open position, said pair of wheels (31) rolls to allow a cover (14) upon said large object (27) to be released and is operatively attached to an axle (37), said axle (37) penetrating said rectilinear wall (40); and

a pair of tensioners (35), each having a first end and a second end, said pair of tensioners (35) secured to said vertical support member (36) at said first ends and to said axle (37) at said second ends.

13. The apparatus (10) for covering a large object (27) of claim 12, wherein said pair of tensioners is selected from a group comprising springs (35), air cylinders, hydraulic cylinders, and electric solenoids.

14. The apparatus (10) for covering a large object (27) of claim 12, wherein said tip (49) is curved.

15. The apparatus (10) for covering a large object (27) of claim 12, wherein said cover (14) is made of a material selected from a group comprising plastic and canvas.

16. The apparatus (10) for covering a large object (27) of claim 12, wherein said large object is selected from a group comprising a loaded bed of a truck (27) and a rail car.

17. The apparatus (10) for covering a large object (27) according to claim 1, wherein said apparatus (10) comprises a safety device, said safety device selected from a group comprising a laser detection system for detecting one or more obstructions and halting said lifting device (20,21,22,23), and a braking system

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functionally engaging said plurality of arms (19).

18. A method for covering a large object (27) comprising:

securing a covering (14) to one or more fastening
roller members (15) mounted to a plurality of
movable arms (19);

lifting said plurality of movable arms (19) and thereby
lifting said covering (14);

placing said large object (27) under said covering
(14);

lowering said covering (14) over said large object
(27);

disengaging said covering (14) from said one or more
fastening roller members (15); and

securing said covering (14) to said large object (27).

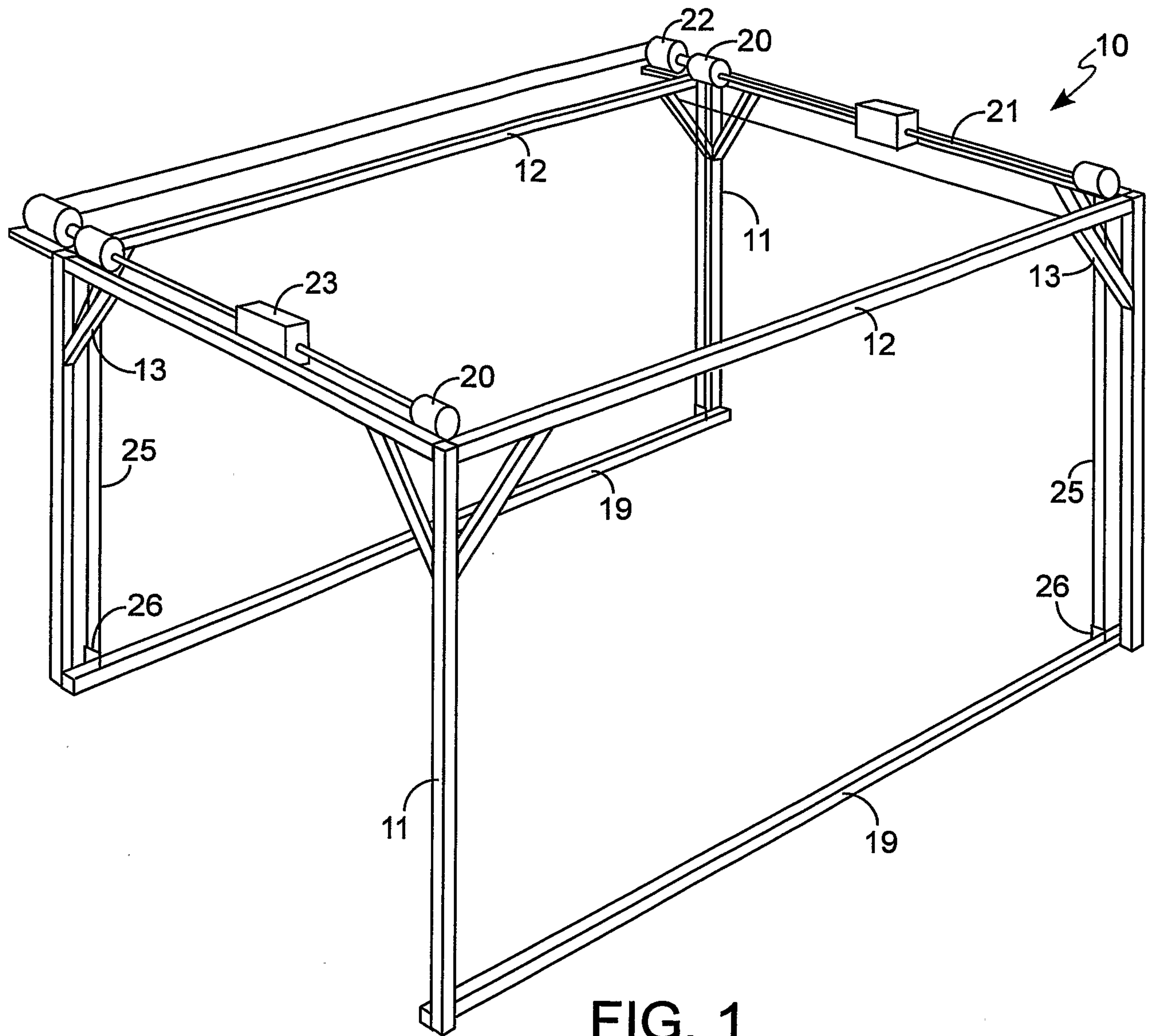
19. The method for covering a large object (27) according
to claim 18, wherein said step of securing a covering (14)
to one or more fastening roller members (15) comprises the
further steps of:

providing a handle (30) moving from an open and a
closed position,

lowering a pair of wheels (31) whenever said handle
(30) is in said closed position, and raising said
pair of wheels (31) whenever said handle (30) is in
said open position,

rolling said pair of wheels (31) to allow a cover (14)
upon said large object (27) to be released.

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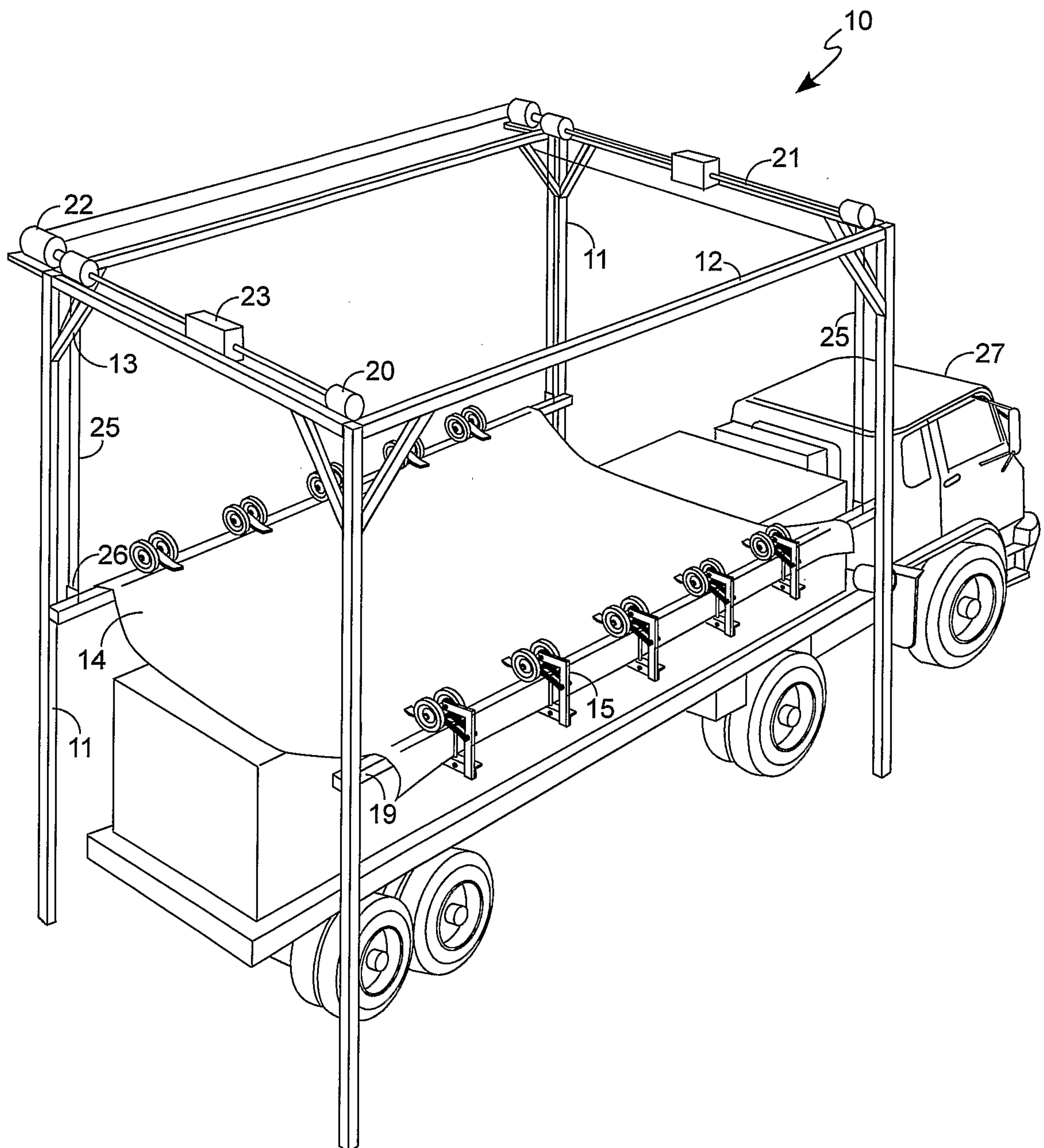


FIG. 2

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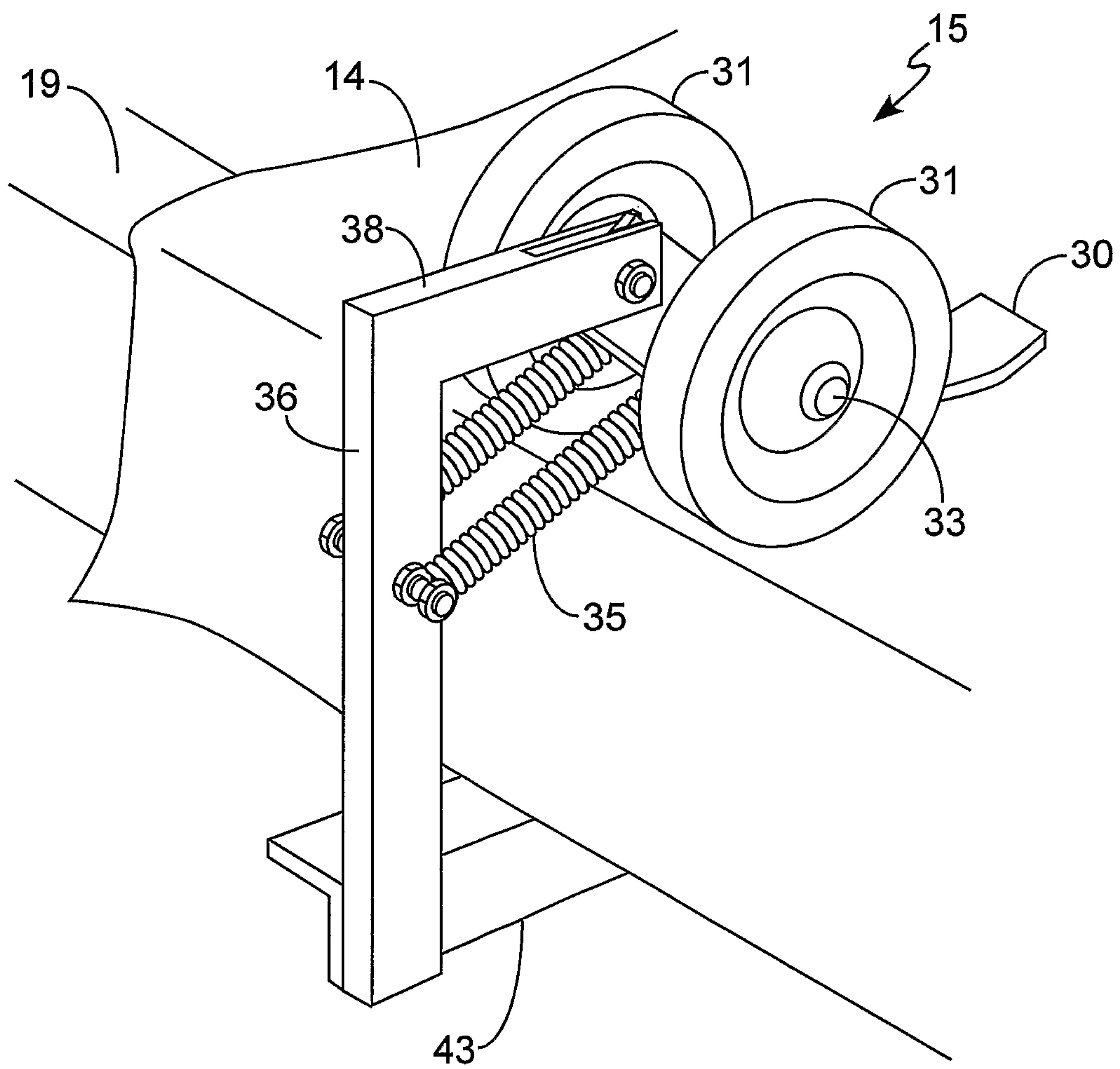


FIG. 3

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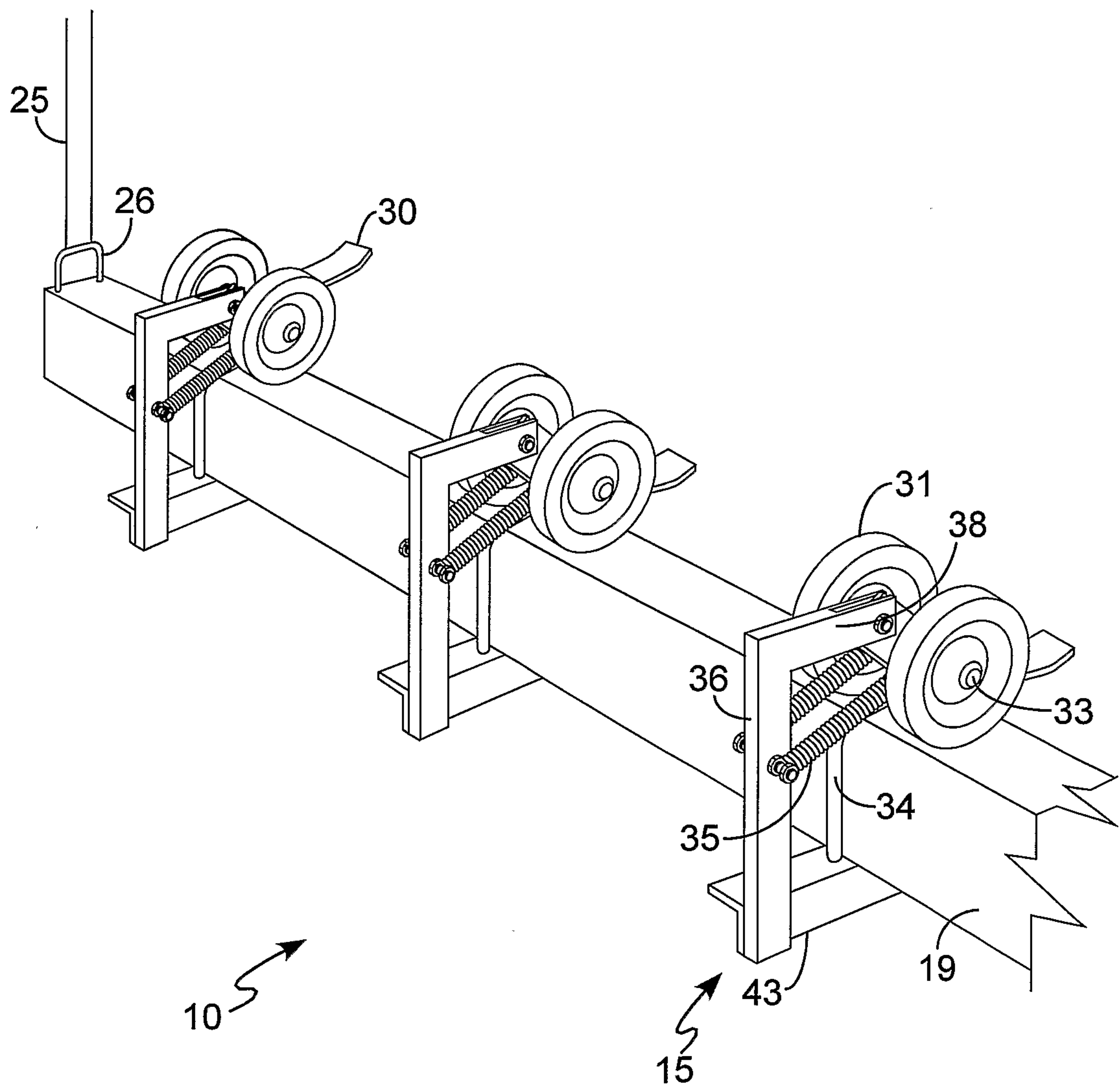


FIG. 4

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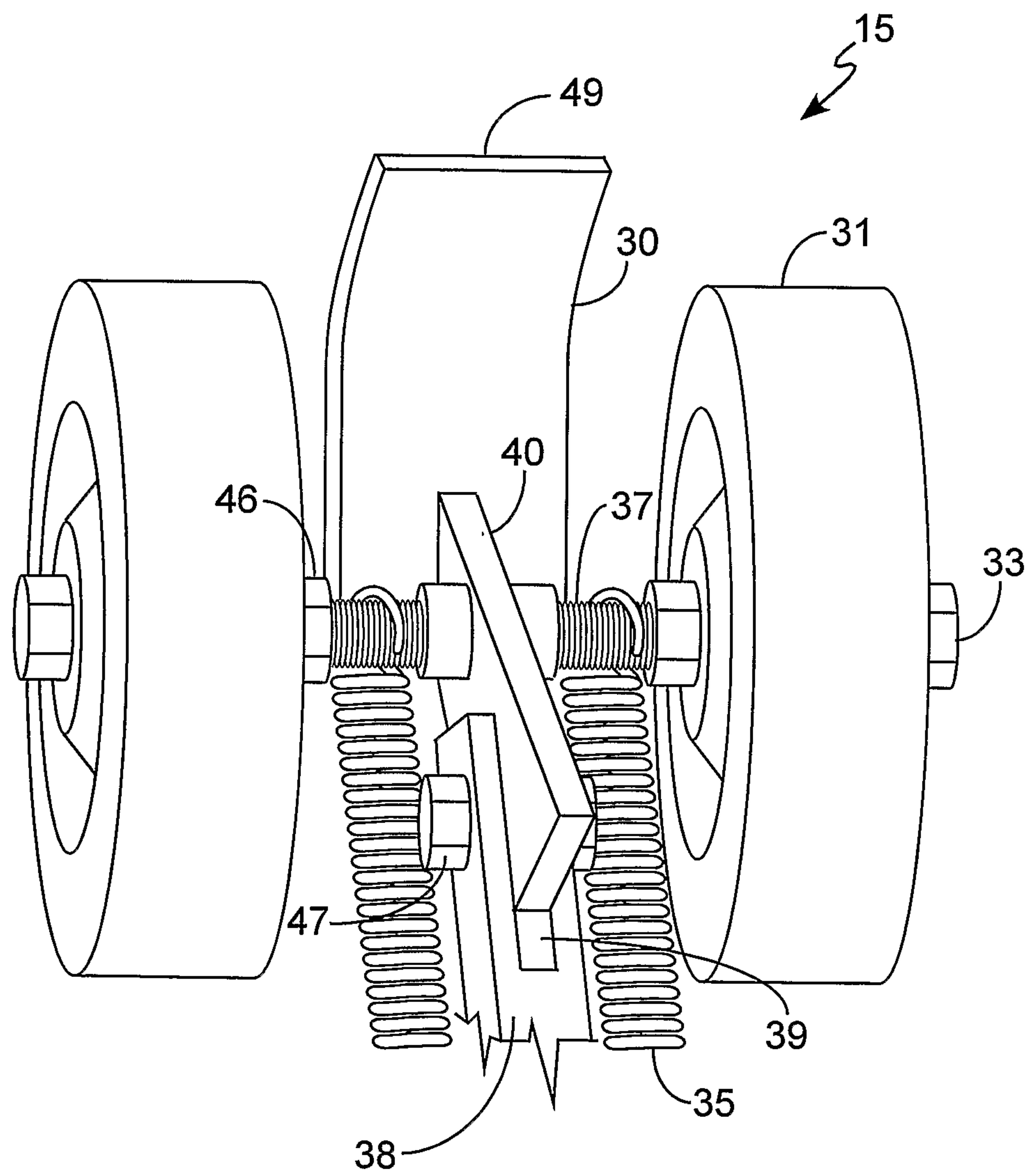


FIG. 5

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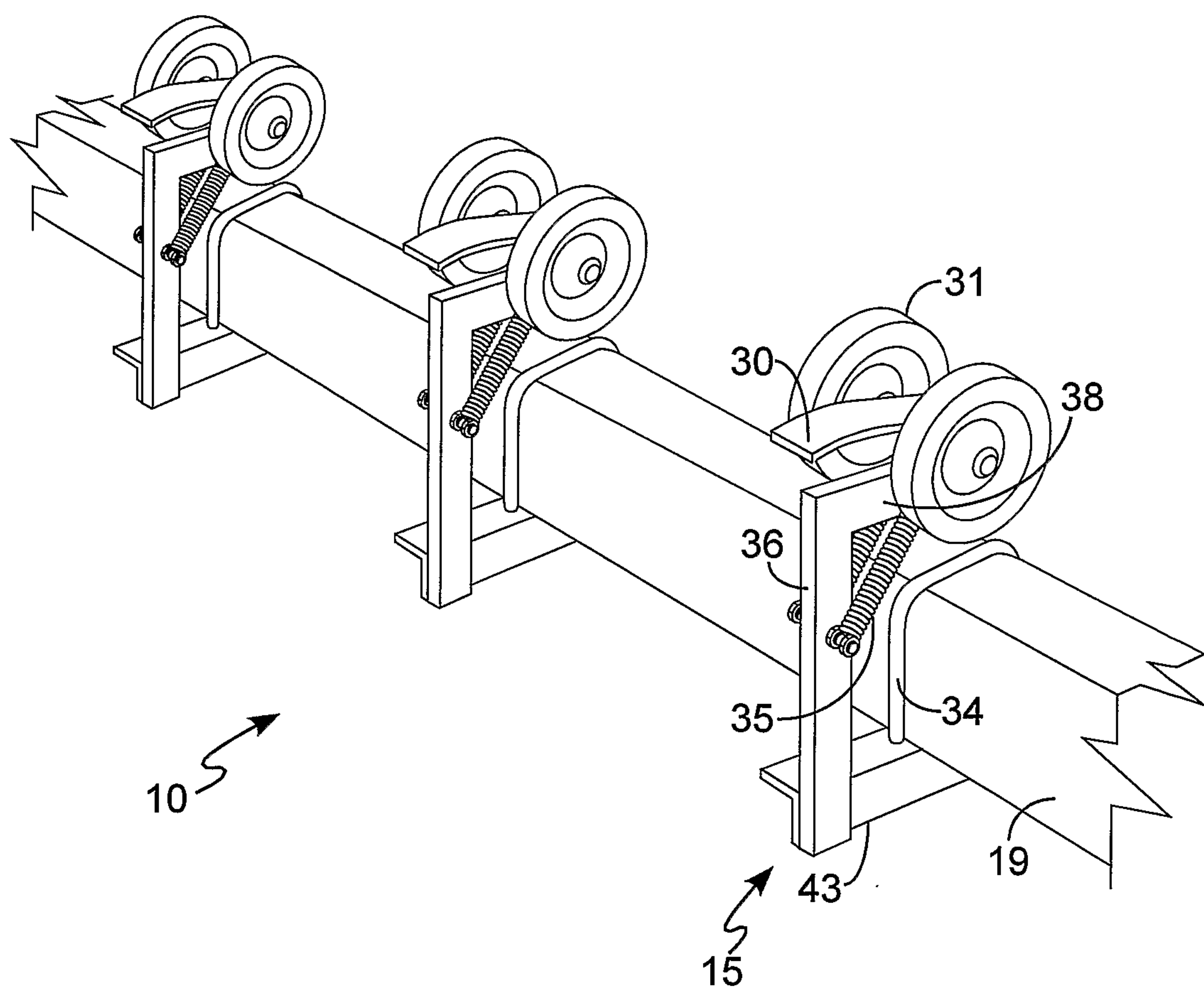


FIG. 6

