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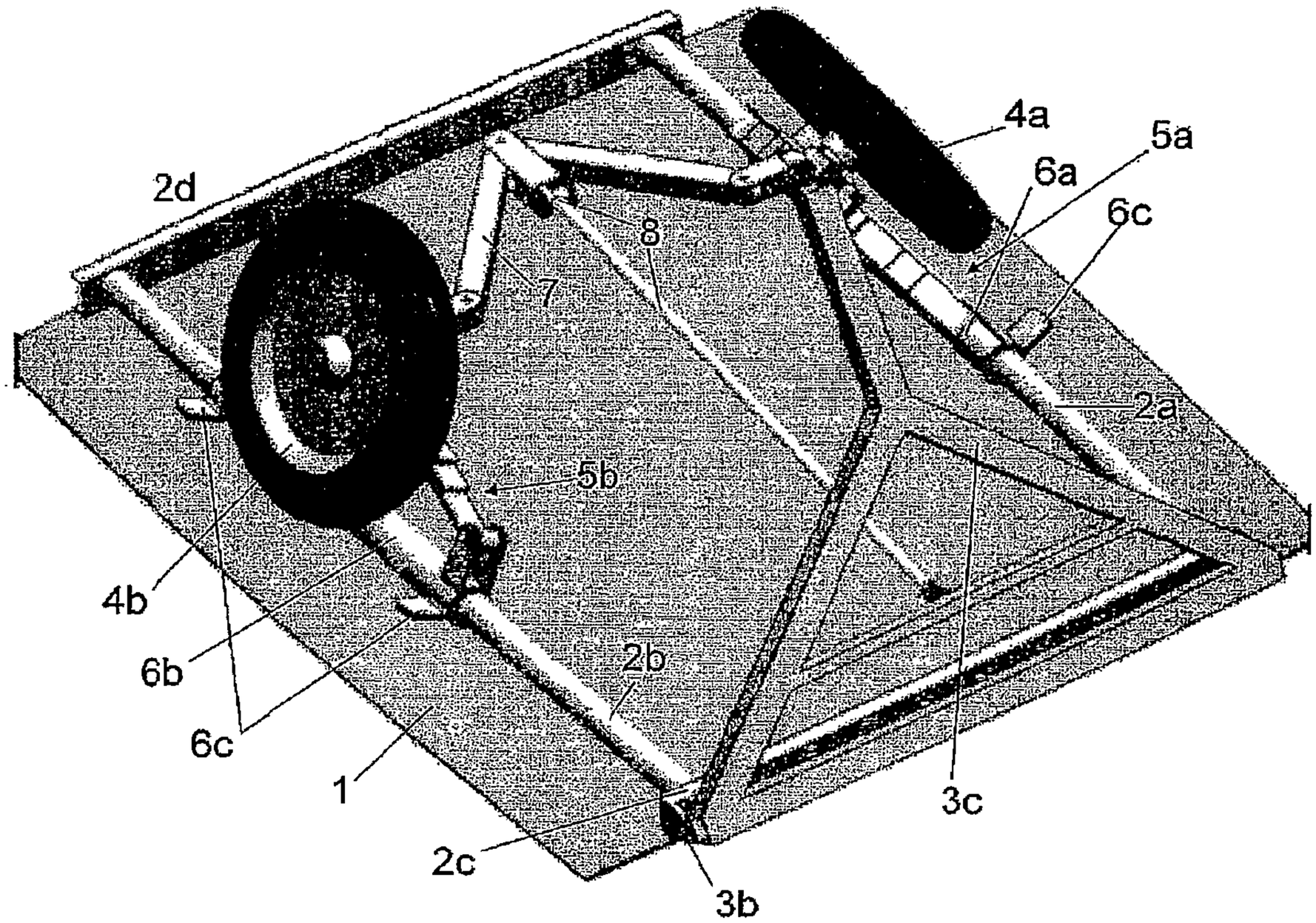

Figure 2

(57) Abrégé/Abstract:
A collapsible vehicle trailer consisting of a frame/cargo surface (2) and a draw (3c, 3d) mounted to the frame/cargo surface (2) by a hinge connection (3a, 3b) in such a manner that the draw (3c, 3d) may be folded down and pushed in underneath the frame/cargo

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(57) Abrégé(suite)/Abstract(continued):
surface (2), and that to the frame and/or cargo surface (2) a hinged wheel suspension (5) is arranged consisting of wheels, hub and spring so that the wheel (4) with suspension (5) may be rotated to become flush with the cargo surface (2), and that between wheel suspensions (5) one or more shafts (7) being articulated at the centre and at each side towards the wheels are disposed. One or more bars (8a) are arranged between the hinged draw (3c) and the center part/section of the shaft (7), whereby the bar(s) (8), when the draw (3c) is folded backwards in underneath the cargo surface (2), pushes the centre part/section of shaft (7) backwards, whereby the wheels (4a) and wheel suspensions are rotated in underneath and flush with the frame/cargo surface (2).

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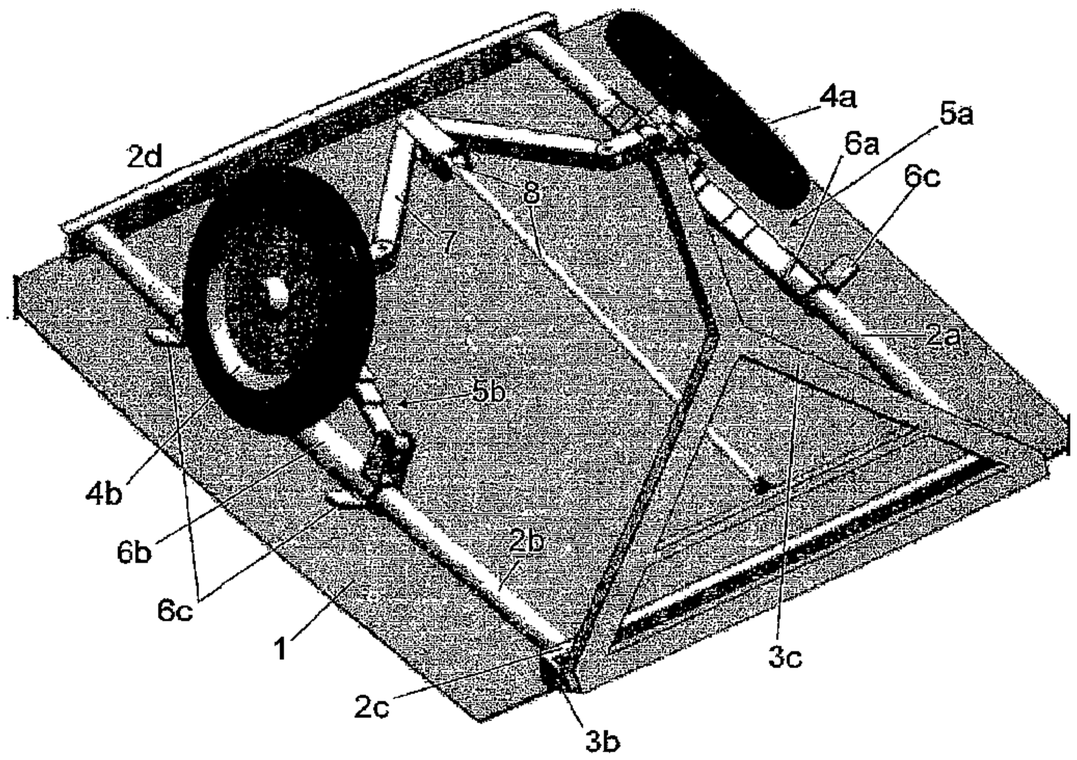

Figure 2

(57) **Abstract:** A collapsible vehicle trailer consisting of a frame/cargo surface (2) and a draw (3c, 3d) mounted to the frame/cargo surface (2) by a hinge connection (3a, 3b) in such a manner that the draw (3c, 3d) may be folded down and pushed in underneath the frame/cargo surface (2), and that to the frame and/or cargo surface (2) a hinged wheel suspension (5) is arranged consisting of wheels, hub and spring so that the wheel (4) with suspension (5) may be rotated to become flush with the cargo surface (2), and that between wheel suspensions (5) one or more shafts (7) being articulated at the centre and at each side towards the wheels are disposed. One or more bars (8a) are arranged between the hinged draw (3c) and the center part/section of the shaft (7), whereby the bar(s) (8), when the draw (3c) is folded backwards in underneath the cargo surface (2), pushes the centre part/section of shaft (7) backwards, whereby the wheels (4a) and wheel suspensions are rotated in underneath and flush with the frame/cargo surface (2).

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"Collapsible trailer"

The invention relates to a collapsible trailer.

More particularly, the invention relates to a collapsible vehicle trailer consisting of a frame and a draw mounted to the frame by a hinge connection in such a manner that the draw may be folded down and pushed in underneath a cargo surface, and that to the frame and/or cargo surface a hinged wheel suspension is arranged consisting of wheels, hub, and spring so that the wheels with suspensions may be rotated to become flush with the cargo surface, and that between the wheel suspensions, one or more shafts being articulated at the centre and at each side towards the wheels are disposed.

In the past, several solutions have been suggested for the same problem. Some of the solutions involve that only side walls/frames, draw or bottom can be folded together. Other solutions show that the trailer can be positioned on edge and that the wheels can be "hoisted up" vertically on level with the trailer box (US Patent 4 480 851). Still other solutions are based on the disassembly of a shaft between the wheels, and by means of a special hinging in the wheel suspension, the wheels can be manually rotated to become flush with the cargo surface after the trailer has been lifted up at the rear end. Reference is made here to the Norwegian Patent NO 323344.

Reference is also made to the patent application DK-B1-168371, the solution of which is based on the use of an axially displaceable draw pulling with it the wheel suspension by way of various connection bars. The handling and storage aspects of this solution are based on positioning the trailer on edge.

The object of the present invention is to provide a vehicle trailer which in a simple manner may be folded together to a flat package for space-saving parking and storage. I the collapsed (folded) position, the trailer is to occupy a minimum of storage space, e.g. by being able to be positioned on edge along the inside of a garage wall, etc.

The object of the present invention is achieved by a collapsible trailer as set forth in the introduction of the specification, being characterized in that one or more bars are arranged between the hinged draw and the center section of the shaft, whereby the bar(s), when the draw is folded backwards in underneath the cargo surface, push(es) the center section of the shaft backwards, whereby the

wheels and wheel suspensions are rotated in underneath and flush with the cargo surface.

Preferred embodiments of the collapsible trailer are detailed in claims 2 through 7, inclusive.

A preferred embodiment of the collapsible trailer is explained in more detail with reference to the attached drawings, in which:

Fig. 1a shows a trailer according to the invention in an operative position.

Fig. 1b shows the trailer before being folded together.

Fig. 2 shows the draw in the process of being folded down, with the subsequent automatic collapse of the wheel shaft.

Fig. 3 shows the trailer in a fully collapsed position.

Fig. 4 shows the folding and hoisting of the trailer vertically by means of a tensioning mechanism (wire/winch/spring or the like).

The trailer is comprised of a frame/chassis 2a, 2b, 2c, 2d to which there may be mounted cargo units such as a cargo plane with or without sidewalls, or cargo devices for other objects (boats, cars, motorbikes, etc.). When sidewalls and other supports are included, these are mounted in such a manner that they may be rotated to become flush with a cargo surface 1. In this document, the term cargo surface 1 is used as a generic term for such arrangements. A draw 3c, 3d is mounted by hinging means 3a, 3b to frame 2c, so that the draw 3c, 3d may be folded down and in underneath the cargo surface 1. Two or more wheels 4a, 4b are mounted to a commonly known wheel suspension 5a, 5b consisting, for example, of a hub, spring, and optionally a bridge, bogie, and shock absorber. The wheel suspension 5a, 5b is attached by some form of hinging means 6a, 6b to frame 2a, 2b so the wheel 4a, 4b and wheel suspension 5a, 5b rotate inwards to become flush with cargo surface 1. A shaft 7 between wheels 4a, 4b is articulated at several places so that the shaft may be folded together and simultaneously rotated about a horizontal axis. Shaft 7 is connected to draw 3c, 3d by one or more bars 8 or the like. A tensioning mechanism (winch, wire, spring, tackle, or the like) 9a, 9b is arranged so as to act between the hinged draw 3c, 3d and the cargo surface 1 of the trailer. On the draw 3c, 3d, and at the trailing edge of the trailer, wheels 10a, 10c are provided. The wheel 10c of the draw is mounted in an adjustable supporting base 11a, 11b so that this wheel may be adjusted and

locked in order to serve as a support wheel, auxiliary wheel for assisting in collapsing the trailer, etc. In the operative position, draw 3c, 3d may be locked to the frame 2c by means of intervening locking mechanisms 12.

The trailer according to the present invention represents a novel manner in which to put together a trailer using a commonly known draw 3c, 3d mounted by hinging means 3a, 3b to frame 2c. Bar 8 or another member is attached to the draw 3c, 3d and connects draw 3c, 3d to an articulated wheel shaft 7. The joints of wheel shaft 7 allow shaft 7 to be folded and rotated in suitable movements. In the operative position bar 8 will pull on wheel shaft 7 so as to lock wheel shaft 7 in the operative position. Stoppers 6c will help stabilizing the wheel suspension and shaft in the operative position. One or more wires/chains 13, located between frame 2a, 2b and wheel suspension 5a, 5b, could assist in providing stability in the operative position. When draw 3c, 3d is folded down, bar 8 will push on wheel shaft 7 so that the shaft is buckled backwards. The more draw 3c, 3d is folded down and backwards, the more the articulated wheel shaft 7 will buckle. A commonly known wheel suspension 5a, 5b is rotatably mounted relative to frame 2a, 2b by means of hinging means 6a, 6b. At the same time as shaft 7 is buckled backwards and rotated about a horizontal axis, wheels 4a, 4b and wheel suspensions 5a, 5b will be forced in underneath and be flush with the cargo surface 1 of the trailer. This operation may be controlled by means of a tensioning mechanism 9a, 9b arranged so as to act between draw 3c, 3d and cargo surface 1, so that the collapse and hoisting up of the trailer to a vertical position follows automatically and without the direct use of hand power. Wheels 10a, 10b are arranged at the trailing edge of the trailer so that the trailer easily may be positioned on edge in the partially and fully collapsed positions. One or more wheels 10c are provided on draw 3c, 3d. Such wheel(s) is/are mounted on support base 11a, which may be adjusted to a desired position by means of a hinging and/or locking mechanism 11b. Wheel(s) 10c will facilitate the collapse of the trailer in that draw 3c, 3d thus may be rolled in towards the underside of the cargo surface 1 of the trailer, and vice versa when the trailer is prepared for use. A tensioning mechanism 9a, 9b in the form of a winch, wire, hook, etc. may be arranged so as to be able to be released and used as a cargo harness or tensioning means for hoisting up a boat or another load when the trailer

is in use. Tensioning mechanism 9a, 9b may also be deployed so that it may be used for tilting the trailer backwards, e.g. when dumping a load.

The invention goes much further with regard to functionality than previous solutions and converts the trailer to a highly space-saving flat package in the collapsed position, while the solution of the invention at the same time provides a high utility value, ready to travel and load trailer and ensures the safety aspects of using a collapsible trailer. In contrast to the previous solutions, this trailer will be able to be put together and lifted up without the use of hand power, and will also have an advantage in terms of safety in that it is impossible to collapse the trailer and wheel suspension thereof when it is in the assembled condition and attached to a truck/towing bar.

CLAIMS

1. A collapsible vehicle trailer consisting of a frame (2a, 2b, 2c, 2d) and a draw (3c, 3d) mounted to the frame (2a, 2b, 2c, 2d) by a hinge connection (3a, 3b) in such a manner the draw (3c, 3d) may be folded down and pushed in underneath a cargo surface (1), and that to the frame (2) and cargo surface (1) a hinged wheel suspension (5a, 5b) is arranged consisting of wheels (4a, 4b), hub, and spring so that the wheels (4a, 4b) with the suspensions (5a, 5b) may be rotated to become flush with the cargo surface (2), and that between the wheel suspensions (5a, 5b), one or more shafts (7) being articulated at the centre and at each side towards the wheels are disposed,
c h a r a c t e r i z e d i n that one or more bar(s) (8) is (are) arranged between the hinged draw (3c, 3d) and the center section of the shaft (7), whereby the bar(s) (8), when collapsing the draw (3c, 3d) backwards in underneath the cargo surface (1), push(es) the centre section of shaft (7) backwards, whereby the wheels (4a) and wheel suspensions are rotated in underneath and flush with the cargo surface (1).

2. The collapsible vehicle trailer of claim 1,
c h a r a c t e r i z e d i n that the hinged draw (3c, 3d), when the trailer is being put together, is pushed towards the underside of the cargo surface (1) so that the draw (3c, 3d) lifts the trailer to an generally vertical position.

3. The collapsible vehicle trailer of claim 1,
c h a r a c t e r i z e d i n that the simultaneous folding together of the trailer and lifting of the trailer to a generally vertical position may be handled using a winch (9a, 9b) or the like provided between the hinged draw (3c, 3d) and cargo surface (1).

4. The collapsible vehicle trailer of claim 1,
c h a r a c t e r i z e d i n that two or more wheels (10a) are provided at the trailing edge of the frame (2a, 2b, 2d) of the trailer.

5. The collapsible vehicle trailer of claim 1, characterized in that one or more wheels (10c) are provided on the draw (3c, 3d), and that the wheel(s) (10c) is/are installed in a bracket (11a, 11b) that is lockable in several positions.

6. The collapsible vehicle trailer of claim 1, characterized in that the joint connections at the sides of shaft (7) are eccentrically arranged relative to the centre of wheels (4a, 4b).

7. The collapsible vehicle trailer of claim 1, characterized in that on each side thereof, chains (13) are arranged diagonally between the frame (2a, 2b) or cargo surface (1) at the one end and the lower part of the wheel suspension (5a, 5b) at the opposite end.

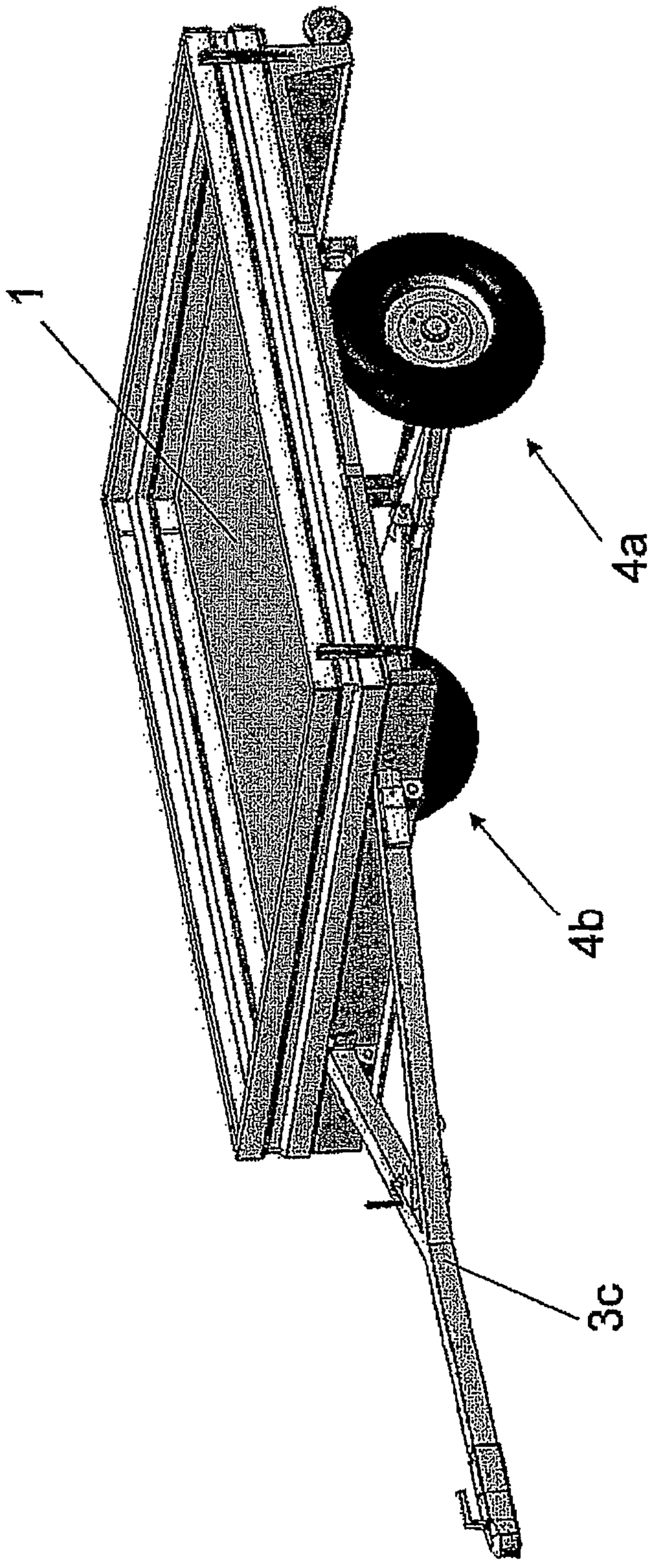

Figure 1a

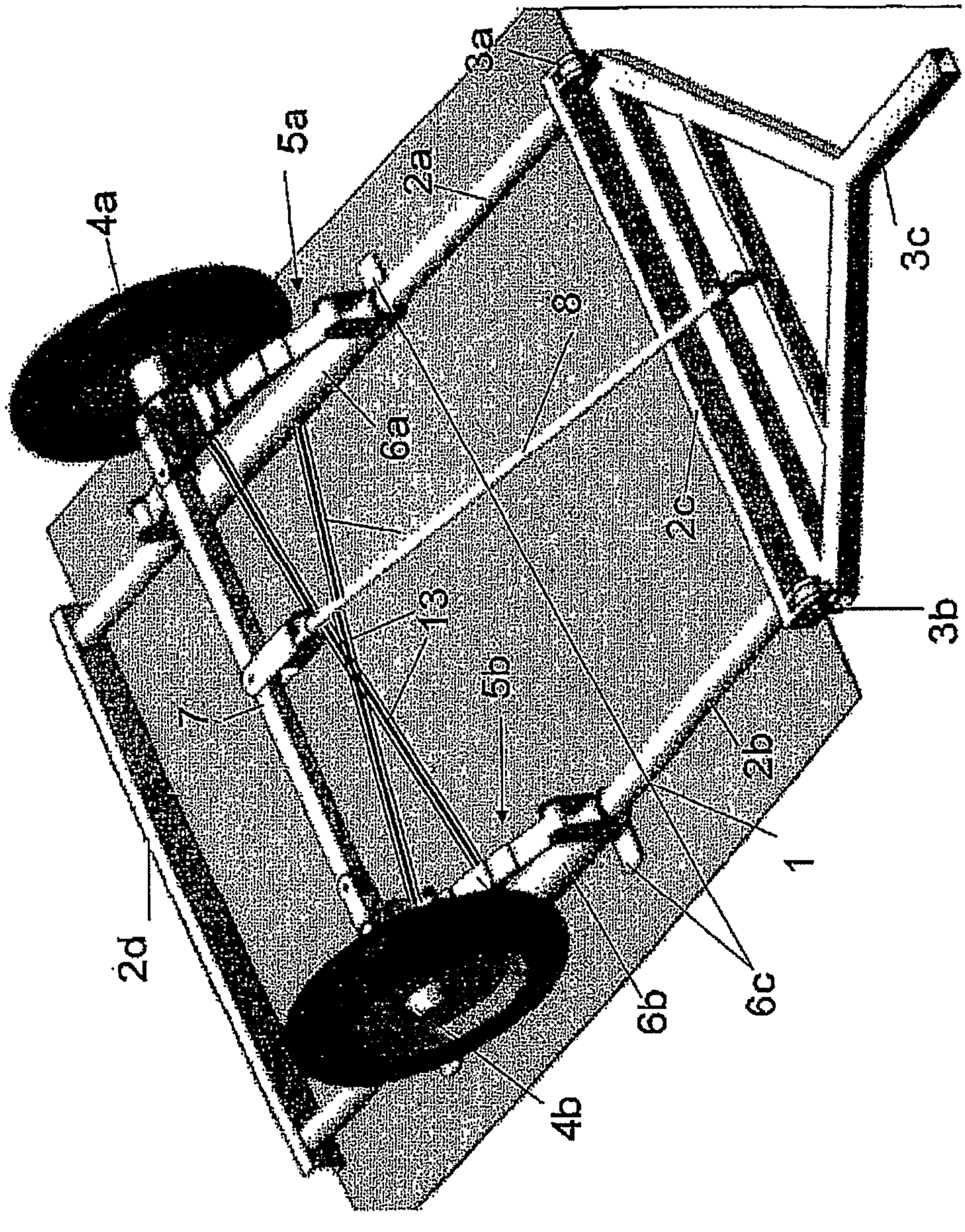

Figure 1b

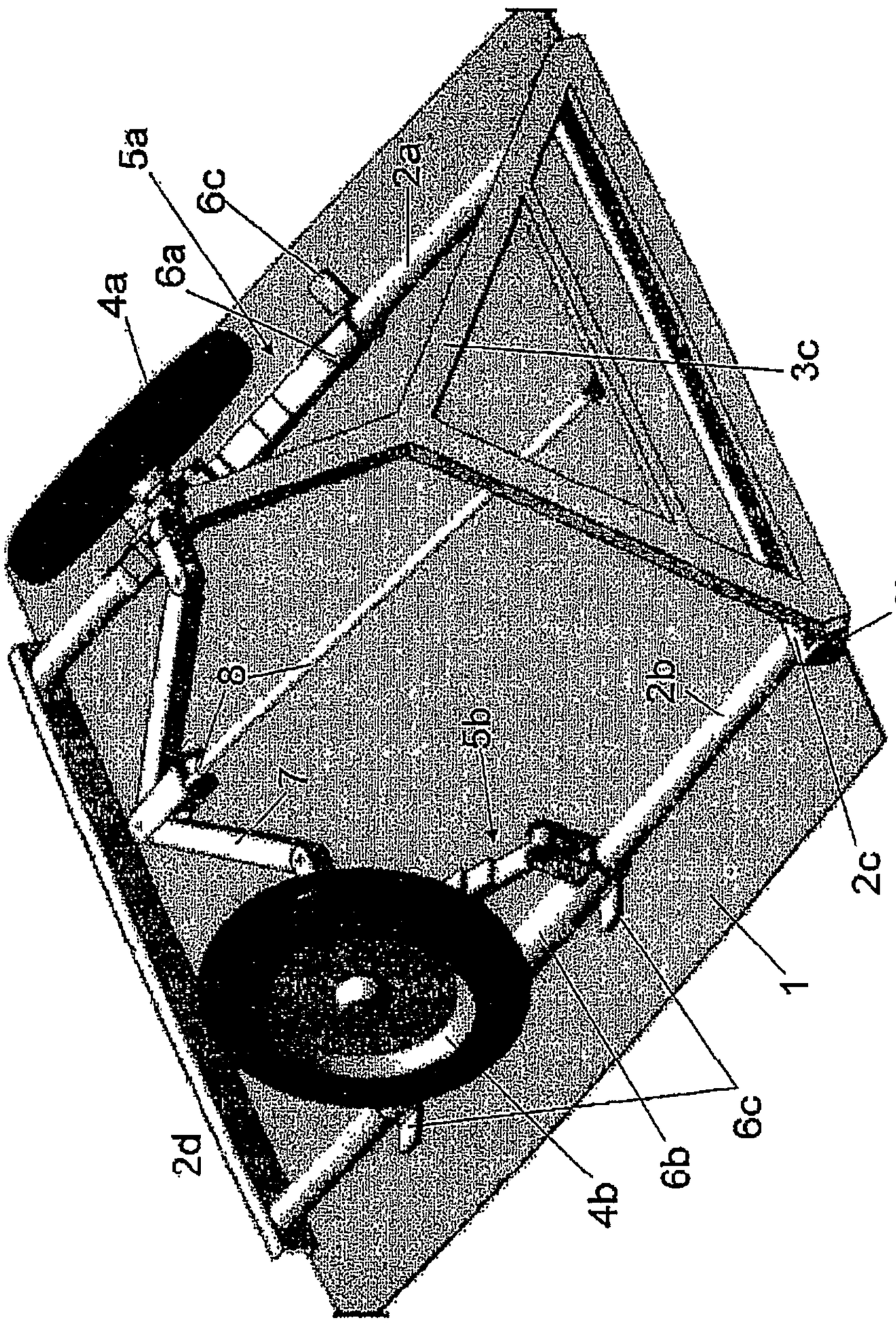

Figure 2

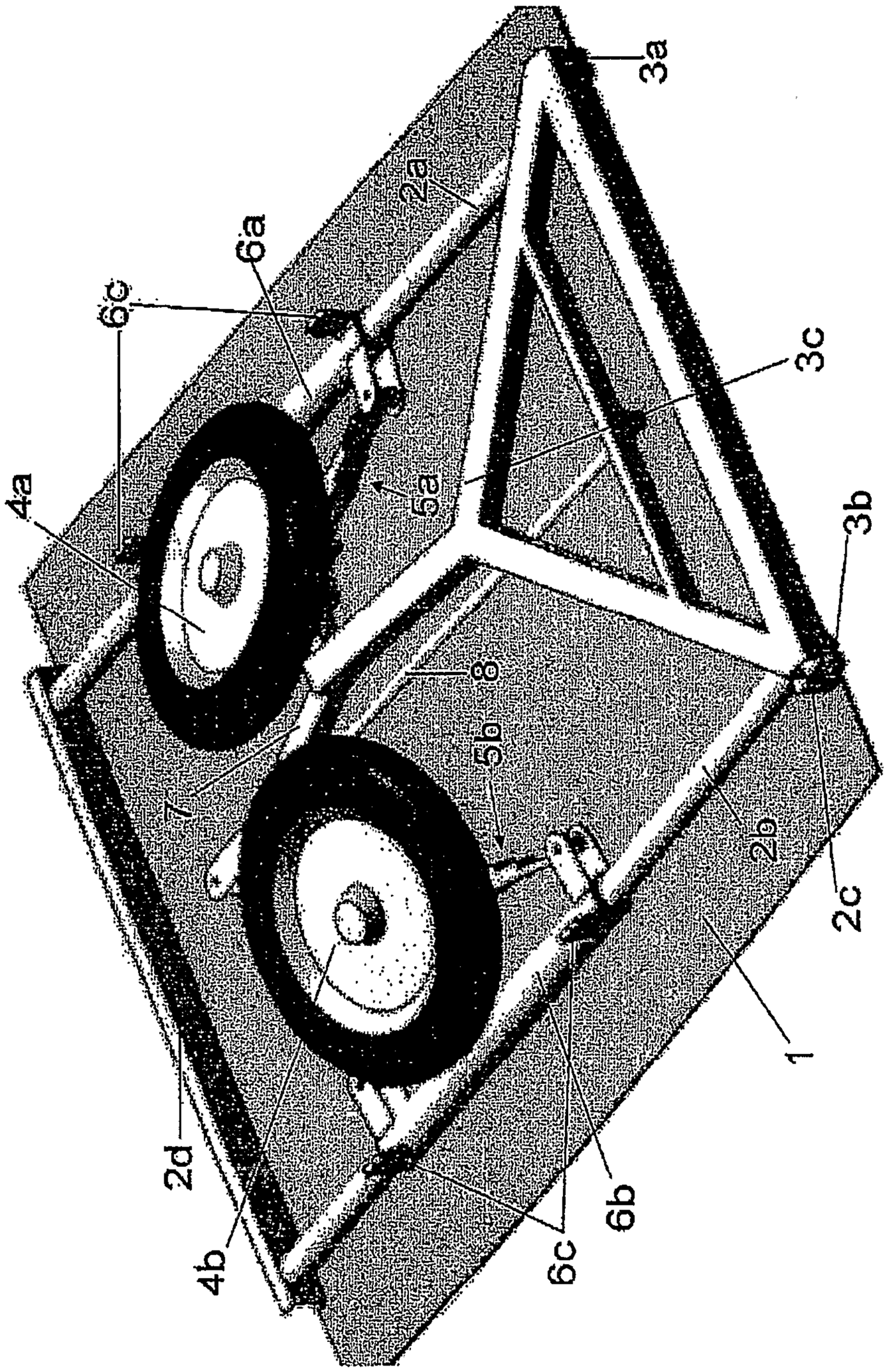

Figure 3

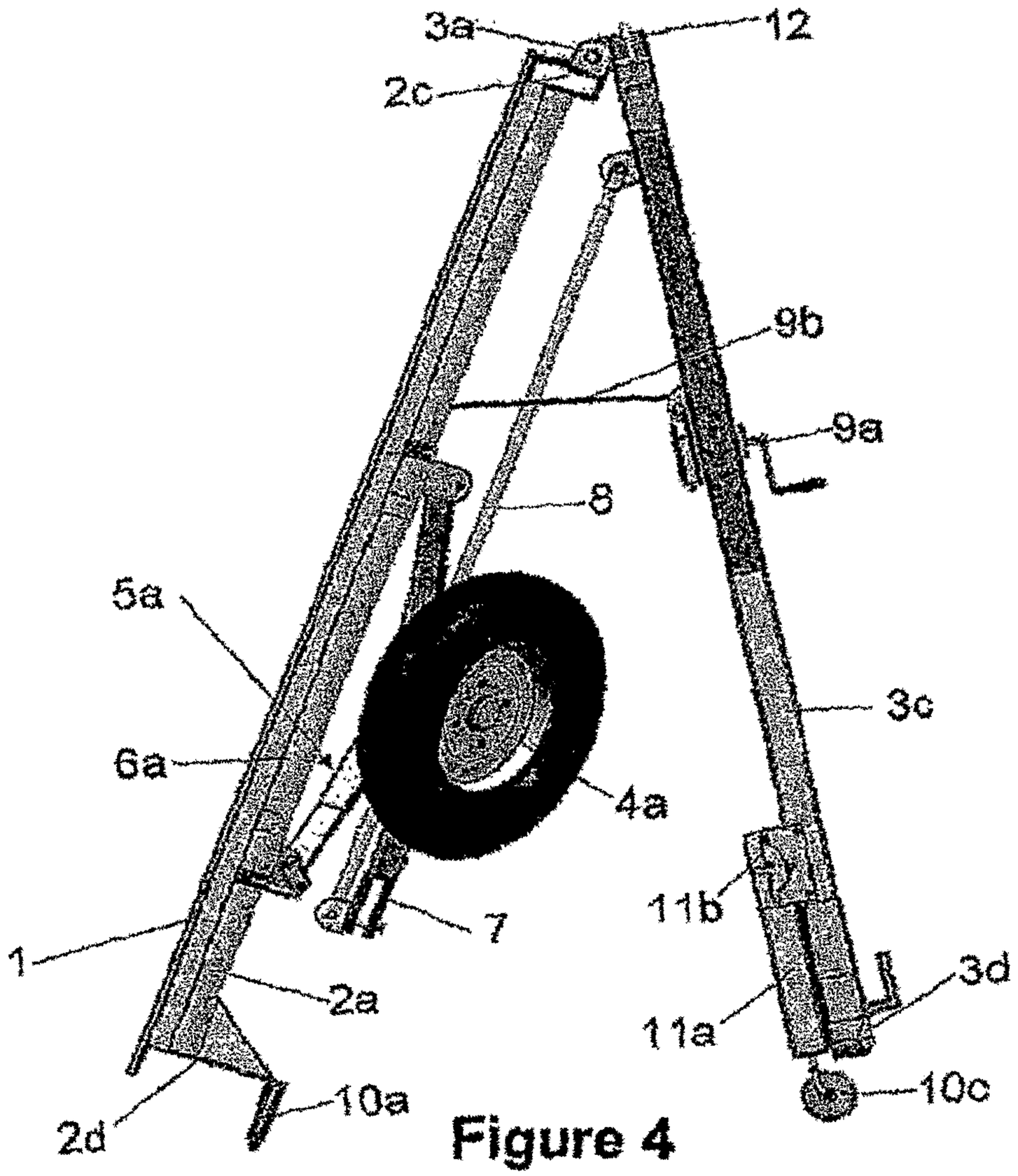

Figure 4

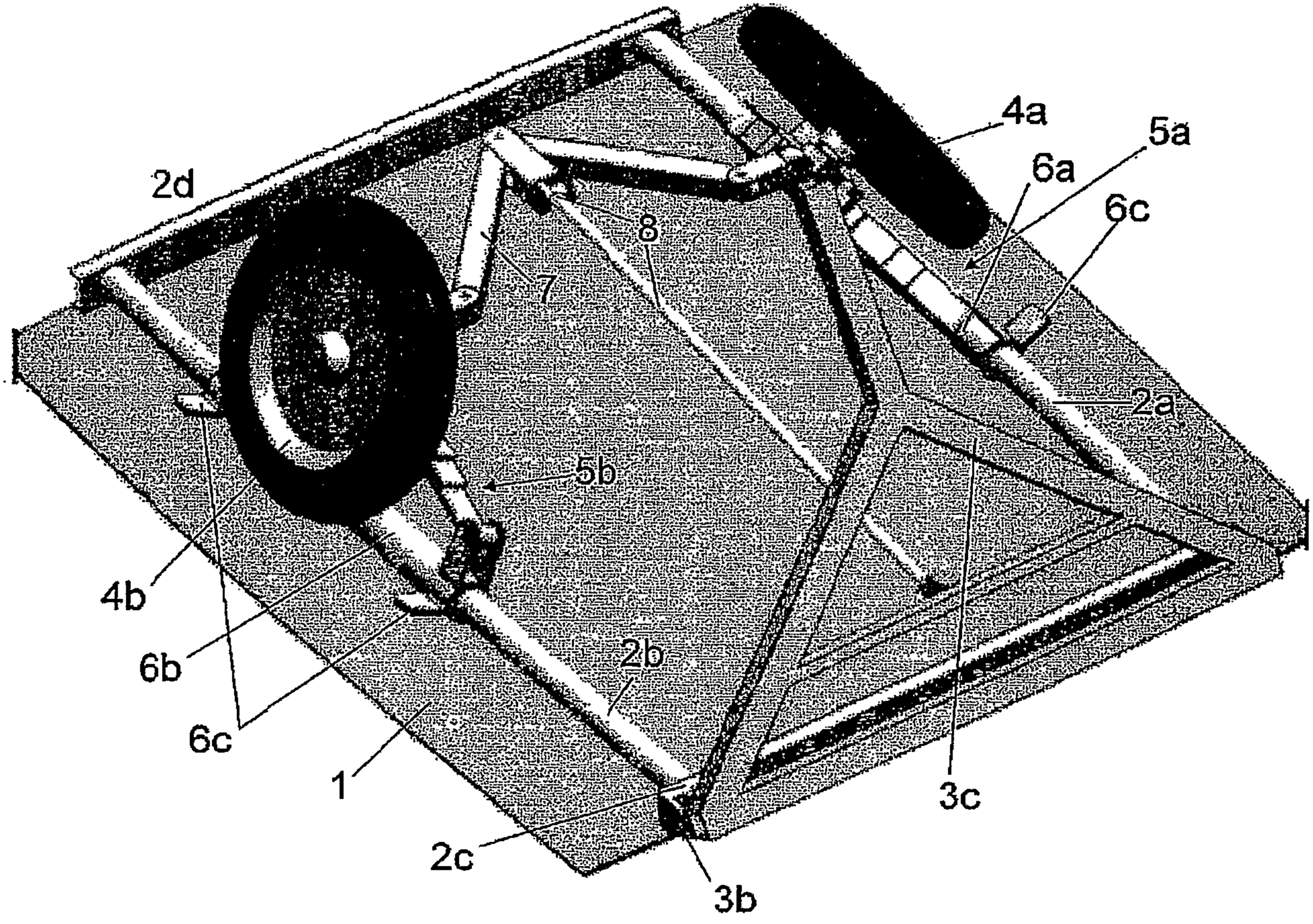

Figure 2