



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**06.02.2002 Bulletin 2002/06**

(51) Int Cl.7: **B63B 35/32, B63B 35/44**

(21) Application number: **01306698.0**

(22) Date of filing: **06.08.2001**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE TR**  
Designated Extension States:  
**AL LT LV MK RO SI**

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(30) Priority: **05.08.2000 GB 0019158**  
**12.04.2001 GB 0109379**

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(54) **Water vessel arrangement**

(57) A modular water vessel arrangement which includes a support member (1), a first module which includes a debris collection means, and a second module

which includes a work station. The support member (1) is arranged to support the first module which is interchangeable with the second module.

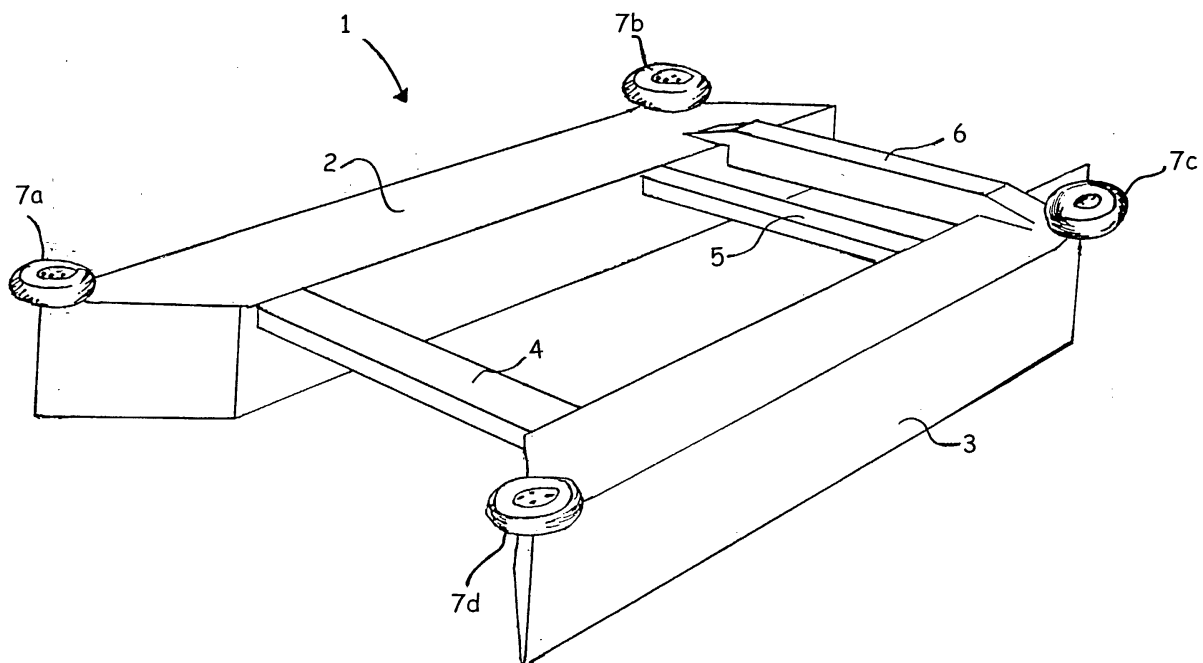


Figure 1

## Description

**[0001]** The present invention is concerned with a water vessel. In particular a water vessel which is suitable for removing debris, pollution or the like from a body of water, such as a marina, harbour, canal or the like.

**[0002]** Waterways such as canals, marinas and harbours are becoming more and more popular as areas of leisure interest and natural beauty. Cleanliness and environmental management are critical factors in the standards of services expected from such waterways. However, a major problem with such waterways is the increasing presence of wind blown debris, river debris, tidal flotsam, other pollutants (such as oil or the like) and in certain circumstances, animal carcasses all of which typically float on the surface of the water. Therefore, the swift removal of debris is essential not only for aesthetic reasons but also to prevent debris fouling boats and mechanical equipment such as lock gates.

**[0003]** In order to remove such debris, personnel have been known to attempt to remove the debris through the use of nets and/or rakes. Such a method is not only labour intensive and costly but is also an unpleasant task for the personnel involved.

**[0004]** Alternatively, the use of a debris collection boat is known. An example of such a boat is described in GB2287000. The boat described in GB2287000 collects debris in a front portion and subsequently transfers the collected debris to a holding area where the debris remains until the boat docks and the debris can be removed. Such a boat is disadvantageous as complex haulage systems are required.

**[0005]** It is therefore an aim of the present invention to alleviate at least some of the disadvantages highlighted above.

**[0006]** It is a further aim of the present invention to provide apparatus suitable for use in the removal of debris from a waterway.

**[0007]** It is yet a further aim of the present invention to provide apparatus suitable for use in the removal of debris from a waterway which does not include complicated mechanical or hydraulic systems which may malfunction.

**[0008]** It is yet a further aim of the present invention to provide a method for the removal of debris from a waterway.

**[0009]** It is yet a further aim of the present invention to provide a multi purpose water vessel arrangement.

**[0010]** Accordingly, there is provided a modular water vessel arrangement which includes: a support member, a first module which includes a debris collection means, and a second module which includes a work station, the support member being arranged to support the first module which is interchangeable with the second module.

**[0011]** The use of the term "debris" as used herein refers to any floating debris or pollution, including wind-blown debris, river debris, tidal flotsam, animal carcasses,

other pollutants (such as oil), or the like.

**[0012]** Advantageously, interchanging the first module and the second module change the functionality of the water vessel arrangement. Advantageously, the arrangement may form a water vessel which may be used for removal of debris from a waterway when the first module is supported by the support member. Alternatively, the arrangement may form a water vessel suitable for use as load carrying boat, as a working or diving platform, for use when towing, or the like, and also for emergency deployment when the second module is supported by the support member.

**[0013]** According to a preferred embodiment of the present invention, the support member includes buoyancy support means, preferably having a first hull and a second hull, such as a catamaran type water vessel.

**[0014]** It is therefore preferred that the first module and/or the second module are shaped and dimensioned to be positioned substantially between the first hull and the second hull.

**[0015]** Typically, the first hull and the second hull are substantially parallel. This feature has the advantage that the water vessel can be manoeuvred substantially adjacent the side of a marina, canal, or the like. Furthermore, it is preferred that each hull has a front portion and a rear portion, the front portion being shaped so as to not substantially impede movement through a body of water.

**[0016]** Advantageously, the first module and the second module are removable from the support member.

**[0017]** Typically, the first module and/or the second module have lifting attachments attached thereto so as to assist in removal of each module from the support member. The lifting attachments are typically hooks and/or loops.

**[0018]** It is also preferred that each module has at least one connecting portion for releasable engagement with a corresponding connecting portion arranged on the support member. It is preferred that each connecting portion on each module is of the same material as the module. Similarly, it is preferred that each corresponding connecting portion on the support member is of the same material as the support platform.

**[0019]** The arrangement may be of aluminium, galvanised steel, plastics or glass reinforced plastics. However, it is envisaged that the arrangement may be constructed from any material which provides buoyancy.

**[0020]** It is particularly preferred that the vessel is constructed from aluminium (such as marine grade aluminium which is preferred) as this enables the vessel to be lightweight, have low maintenance costs, and ease of construction. The use of aluminium has the further advantage that it permits the vessel to be constructed in a number of different sizes to suit the specific needs of each waterway without the need for expensive moulds.

**[0021]** The support member, the first module and the second module may be of the same material (such as aluminium), however, it is envisaged that each compo-

nent may be of a different material.

**[0022]** The arrangement may further include means for moving the support member through a body of water such as manual means (oars, paddles or the like), by the use of wind power (for example using sails) or by motor means (which is particularly preferred). A preferred motor means includes the type known as an outboard motor.

**[0023]** The debris collection means is preferably arranged to act as a strainer whereby debris collected in the debris collection means is retained therein whilst permitting liquid to pass therethrough.

**[0024]** The first module is preferably in the form of a basket, box or the like. The basket, box or the like typically includes a base and a plurality of upstanding panels extending from the base.

**[0025]** The upstanding panels preferably include three substantially fixed panels. It is further preferred that the upstanding panels include three substantially fixed panels and typically one movable panel. The movable panel is preferably movable between a closed position which substantially inhibits entry of debris into the box and an open position which substantially permits entry of debris into the box.

**[0026]** The movement of the movable panel is preferably controlled by control means, such as a lever (which is typically manually operated).

**[0027]** It is therefore preferred that the panels are of a mesh-like material, such as aluminium mesh. It is envisaged that the base may be of a mesh-like material and therefore be essentially the same as the panels, or the base may be a solid body, such as, for example an aluminium sheet material.

**[0028]** It is particularly preferred that the debris collection means is lined with for example, an oil absorbing material when the debris includes oil. Advantageously, the oil is retained by the oil absorbing material whilst permitting water to pass through the debris collection means.

**[0029]** The second module may be a platform (which may be substantially flat) or may have an open box configuration, which preferably includes a (preferably solid) base and four (preferably solid) upstanding walls extending from the base.

**[0030]** Typically, the base is a controlled closeable base which is movable between a closed position and an open position which permits contents of the second module to be removed (typically under gravity) therefrom.

**[0031]** The second module may be of be of aluminium, galvanised steel, plastics or glass reinforced plastics. However, it is envisaged that the second module may be constructed from any material which provides buoyancy.

**[0032]** It is also envisaged that the work station of the second module has an aperture (which may have a removable cover) therein which advantageously permits, when in use, access to a body of water below.

**[0033]** According to a further aspect of the invention, the second module substantially as described hereinbefore may be used as a boat when it does not form part of the water vessel arrangement. Advantageously, a motor, such as an outboard motor, may be attached to the second module. However, it is also envisaged that the second module may be powered by the use of wind (for example using a sail) by manual means (for example using a paddle or an oar).

**[0034]** In a particularly preferred embodiment of the present invention, the debris collection means includes a solid plate aluminium base, two side panels (typically of foraminated aluminium), a front moveable panel of aluminium mesh and a second preferably fixed rear panel of aluminium mesh.

**[0035]** It is particularly preferred that the first module further includes a moveable gate (typically of plate aluminium), arranged to be moveable between an open position to a closed position which substantially blocks the rear mesh-like panel of the debris collection means. This feature has the advantage of deflecting propeller wash when the engine is in reverse gear, so as to prevent debris being washed back out of the debris collection means.

Preferably, the water vessel arrangement further includes fender means (such as tyres or the like) arranged about the periphery of the support platform. Advantageously, the fender means substantially prevents the vessel from being damaged by walls of a marina, canal or indeed a further vessel in the waterway. A preferred fender means includes a plurality of wheels.

**[0036]** Wheels have the added advantage of assisting movement of the vessel when the vessel is adjacent the walls of the marina, canal or the like.

**[0037]** According to a further embodiment of the present invention, it is envisaged that the arrangement includes a plurality of support members, each support member arranged to support at least one first module and/or at least one second module and the support members being connected together, preferably in side by side configuration. The support member, first module and second module are substantially as described hereinbefore.

**[0038]** According to a further aspect of the present invention, there is provided a water vessel arrangement which includes a support member, a first module and a second module, substantially as described hereinbefore, the support member including a receiving portion arranged to receive the first module and the second module.

**[0039]** According to yet a further aspect of the present invention, there is provided a water vessel arrangement comprising a support member, a first module including a debris collection means, and a second module including a work station, said first and second modules being arranged for selective attachment to the water vessel so as to configure the water vessel to perform a respective function.

**[0040]** According to a further aspect of the present invention, there is provided a water vessel arranged for the selective attachment thereto of one or more of a plurality of different modules to configure the water vessel to perform a respective function, said modules comprising at least a first module including a debris collection means and a second module including a work station.

**[0041]** According to yet a further aspect of the present invention, there is provided a method of removing debris from a waterway, which method includes:

providing a water vessel arrangement substantially as described hereinbefore, the support member supporting a first module;  
manoeuvring the water vessel substantially in the general direction of the debris; and  
trapping the debris in the debris collection means.

**[0042]** Typically, the method further includes a step whereby the first module including the debris collection means is removed from the support member, for example by use of a hoist or crane, or the like. The debris is preferably subsequently removed from the first module, typically into a debris collection vessel, such as a skip.

**[0043]** The present invention will now be described by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 represents buoyancy a support member for use in a water vessel arrangement according to the present invention;

Figure 2 represents a plan view of the buoyancy support member shown in Figure 1;

Figure 3 represents a first module including debris collection device for use in a water vessel arrangement according to the present invention;

Figure 4 represents a second module include a work station for use in a vessel according to the present invention;

Figure 5 represents a side view of the second module shown in Figure 4;

Figure 6 represents an exploded view of a fender for use on the support platform according to the present invention.

**[0044]** Referring to Figures 1 and 2, a buoyancy support member is generally identified by the numeral 1. The support platform 1 comprises a first hull 2 (which is constructed from marine grade aluminium) which is connected to a second hull 3 (which is also constructed from marine grade aluminium) by aluminium bridging panels 4, 5 and 6.

**[0045]** Wheels 7a and 7b, are arranged on first hull 2

and wheels 7c and 7d on the second hull 3. The wheels 7a, 7b, 7c, and 7d act as fenders for the water vessel.

**[0046]** Referring to Figure 3, where like numerals have been used to identify like parts shown in Figures 1 and 2. The debris collection device generally indicated by the numeral 10, comprises a galvanised steel frame 11, a solid aluminium base 19, two perforated aluminium side panels 13 and 14, front movable aluminium mesh gate 12 and rear aluminium mesh panel 13. Movement of the front movable gate 12 is controlled by lever 5 (which is attached to the frame 11 and gate 12). A hinged flap 16 is arranged to cover rear panel 13 of the debris collecting basket. Therefore when the vessel (not shown in Figure 3) is manoeuvred in a backwards direction (indicated by arrow B) ie reverse thrust on the outboard motor (not shown), flap 16 lies flush against rear panel 13; the panel has the advantage of preventing the debris collected in the basket being washed back out of the basket when the vessel is manoeuvred in a backwards direction (indicated by arrow B). The frame includes shoulders 17a, 17b, 18a and 18b, which when the debris collection means 10 is in use, rest on hulls 2 and 3 of the support member (shown in Figures 1 and 2).

**[0047]** Referring to Figures 4 and 5, where like numerals have been used to identify like parts shown in Figures 1 to 3. The work station is generally indicated by the numeral 20. The work station 20 includes a hinged aluminium trap door base 21 and four aluminium wall panels 22, 23, 24 and 25. The work-station further includes shoulders 26a, 26b and 27b which are arranged to rest on hulls 2 and 3 when the work station forms part of a water vessel.

**[0048]** Referring to Figure 6, where like numerals have been used to identify like parts shown in Figures 1 to 5. The wheel 7a is attached to hull 2 by means of pipe 3 which is inserted in tube 31. The wheel 7a is secured in place by cap 32.

## Claims

1. A modular water vessel arrangement which includes a support member, a first module which includes a debris collection means, and a second module which includes a work station, the support member being arranged to support at least the first module which is interchangeable with the second module.
2. A modular water vessel arrangement according to claim 1, wherein the support member includes buoyancy support means, preferably having a first hull and a second hull (such as a catamaran type water vessel).
3. A modular water vessel arrangement according to claim 2, wherein the first module and/or the second module are shaped and dimensioned to be posi-

tioned substantially between the first hull and the second hull.

4. A modular water vessel arrangement according to any preceding claim, wherein the first module and/or the second module have lifting attachments (typically hooks and/or loops) attached thereto so as to assist in removal of each module from the support member. 5
5. A modular water vessel arrangement according to any preceding claim, wherein each module has at least one connecting portion for releasable engagement with a corresponding connecting portion arranged on the support member, preferably each connecting portion being of substantially the same material as the first module, the second module and/or the support member. 10 15
6. A modular water vessel arrangement according to any preceding claim, wherein the first module, the second module and/or the support member is of aluminium (such as marine grade aluminium), galvanised steel, plastics or glass reinforced plastics. 20 25
7. A modular water vessel arrangement according to any preceding claim, which further includes moving means (such as manual means or motor means which is preferred). 30
8. A modular water vessel arrangement according to any preceding claim, wherein the debris collection means is arranged as a strainer whereby debris collected is retained therein whilst permitting liquid to pass therethrough. 35
9. A modular water vessel arrangement according to any preceding claim, wherein
 

the first module is in the form of a basket, box or the like, preferably having a base and a plurality of upstanding walls (the walls typically of a mesh like material); and/or

the second module is arranged as a platform (which is preferably flat and optionally has an aperture therein which is preferably closeable), or may have an open box-like configuration (such as a box having a base, which optionally has an aperture therein which is preferably closeable, and a plurality of upstanding walls extending from the base). 40 45 50
10. A modular water vessel arrangement according to any preceding claim, wherein the debris collection means has an oil absorbing lining when the debris includes oil. 55
11. A modular water vessel assembly which includes a

plurality of support members arranged to be connected together (preferably in side by side configuration), each support member arranged to support at least one first module which includes a debris collection means and/or at least one second module which includes a work station.

12. A method of removing debris from a waterway, which method includes:

providing a water vessel arrangement according to any preceding claim wherein the support platform is supporting a first module; manoeuvring the water vessel substantially in the general direction of the debris; and trapping the debris in the debris collection means.

13. A water vessel arrangement comprising a support member, a first module including a debris collection means, and a second module including a work station, the first module and the second module being arranged for selective attachment to the support member so as to configure the water vessel to perform a respective function.

14. A water vessel arranged for the selective attachment thereto of one or more of a plurality of different modules to configure the water vessel to perform a respective function, the modules comprising at least a first module including a debris collection means and a second module including a work station.

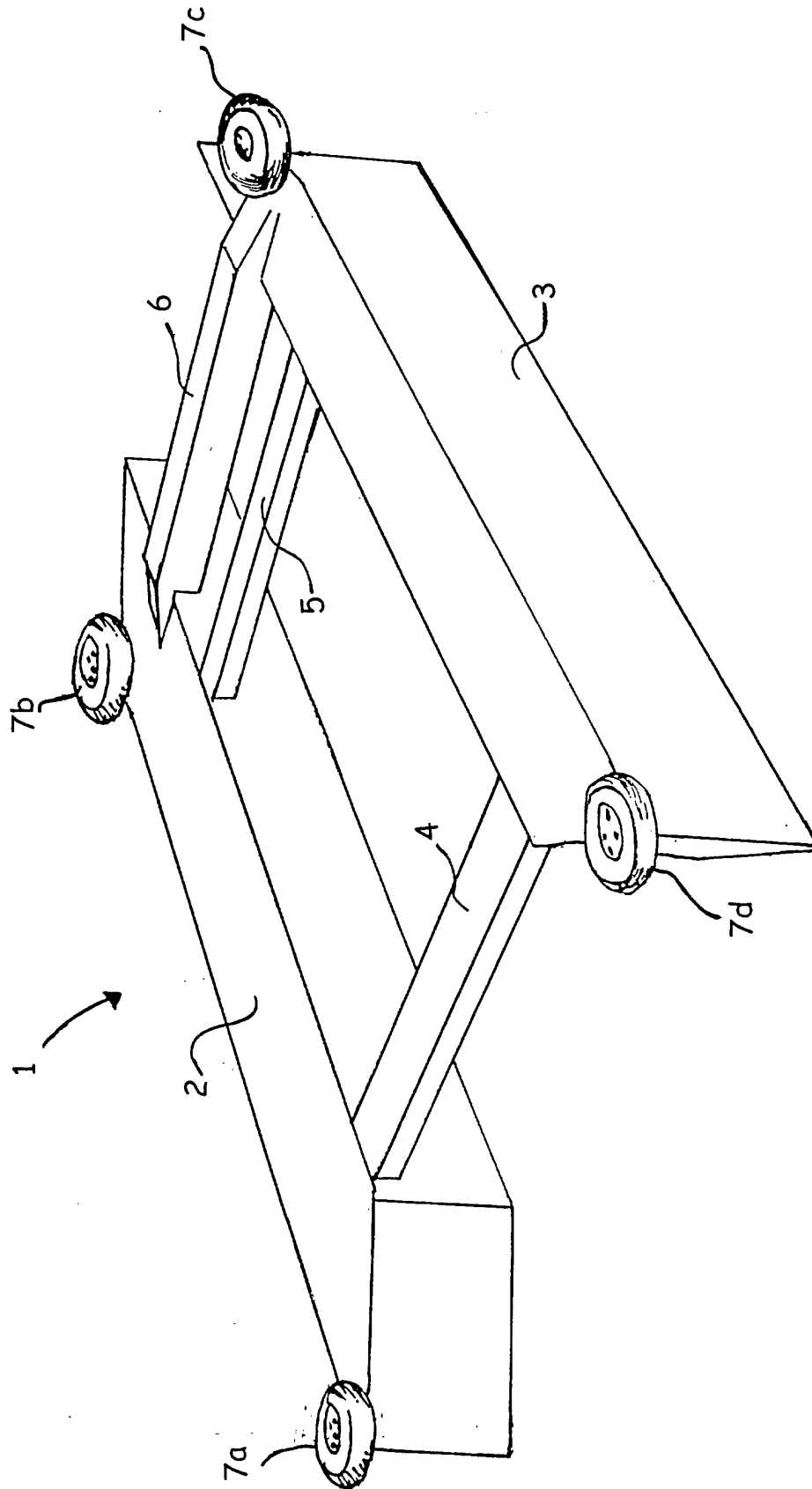


Figure 1

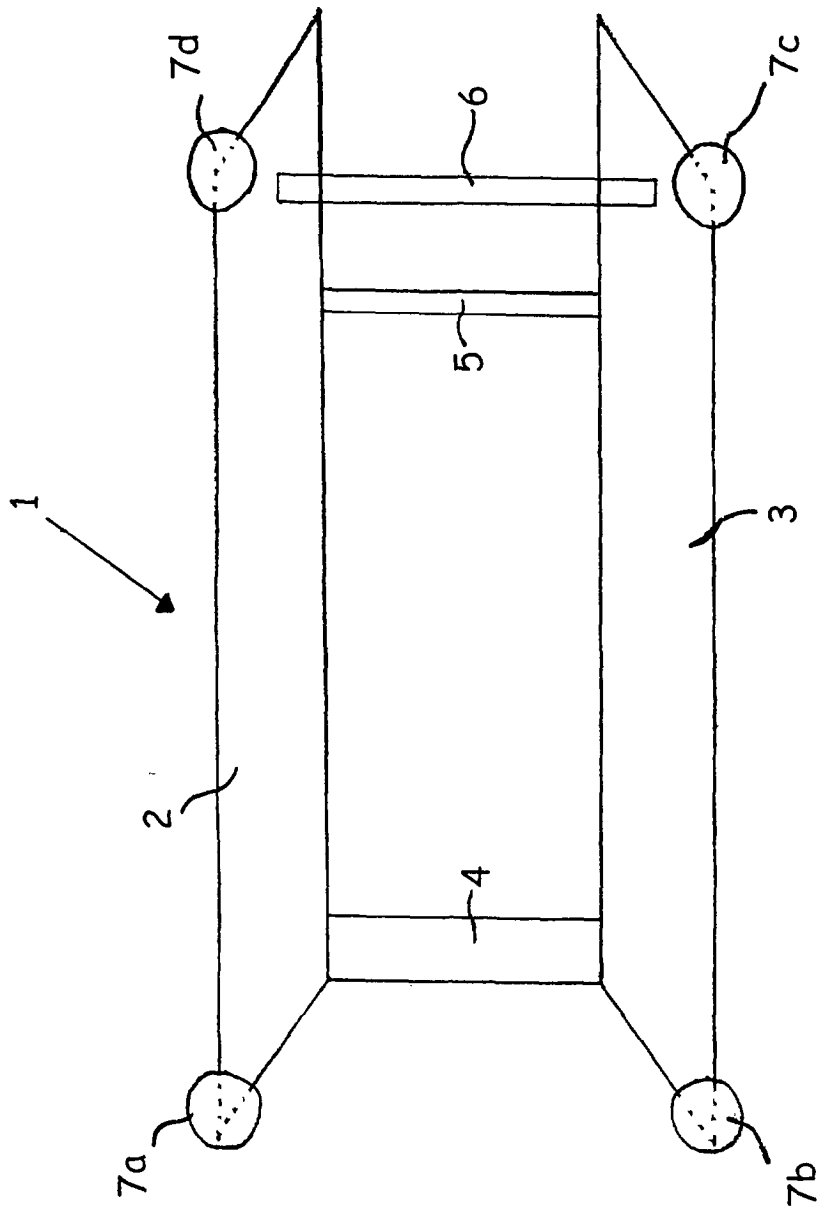


Figure 2

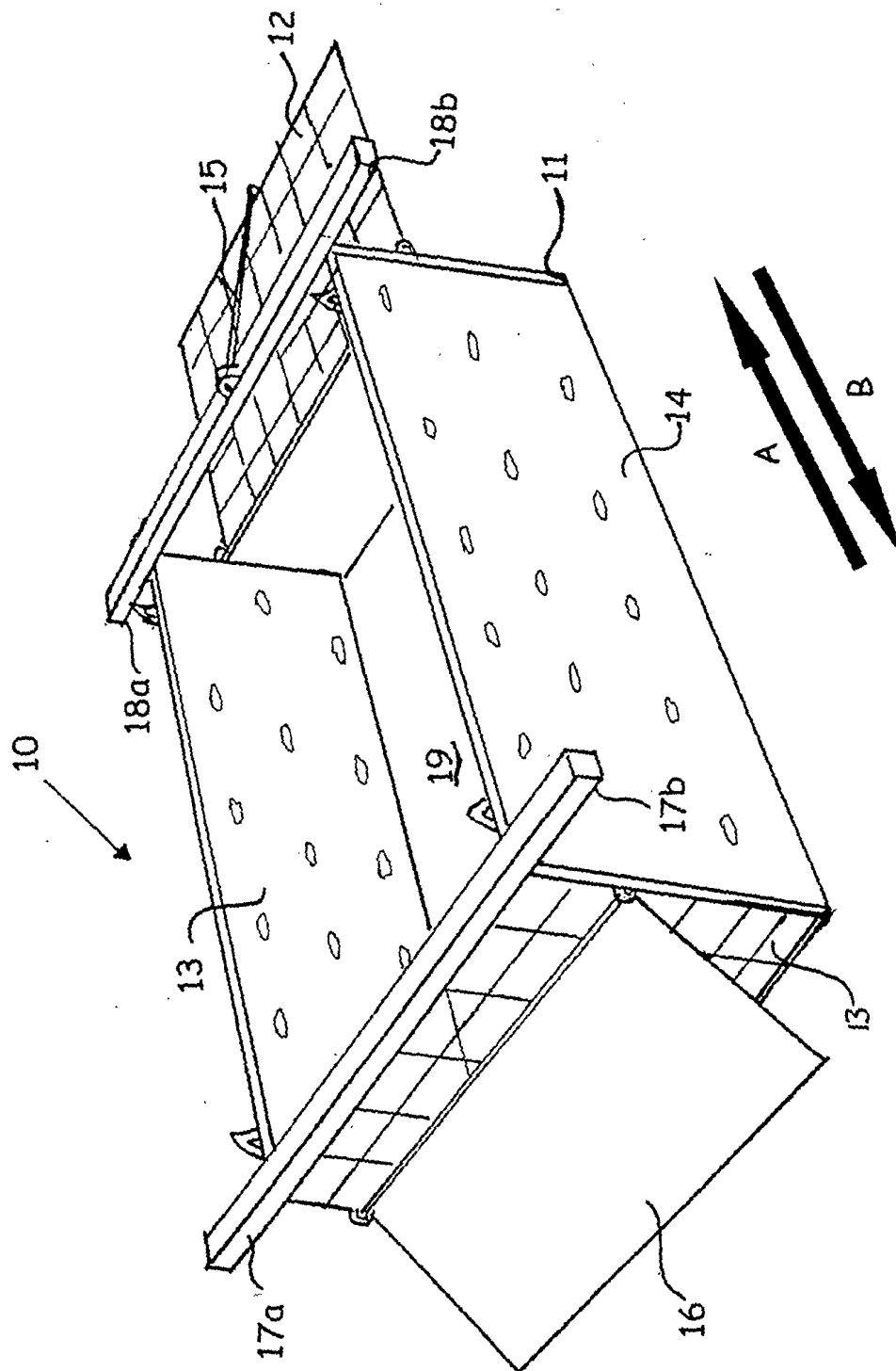


Figure 3



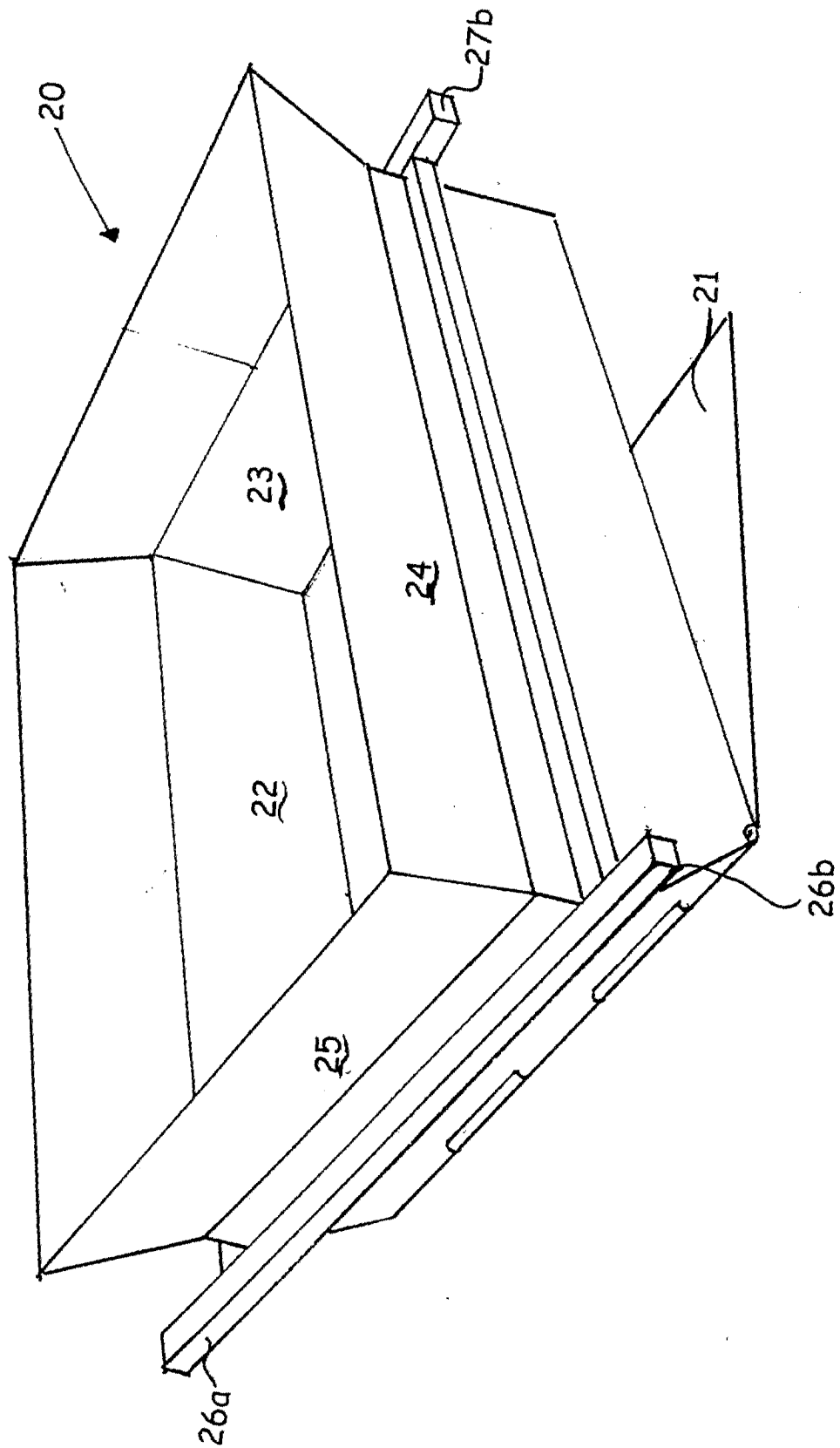


Figure 4

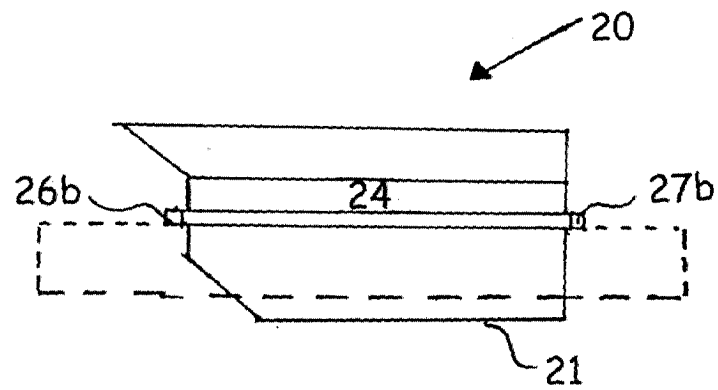


Figure 5

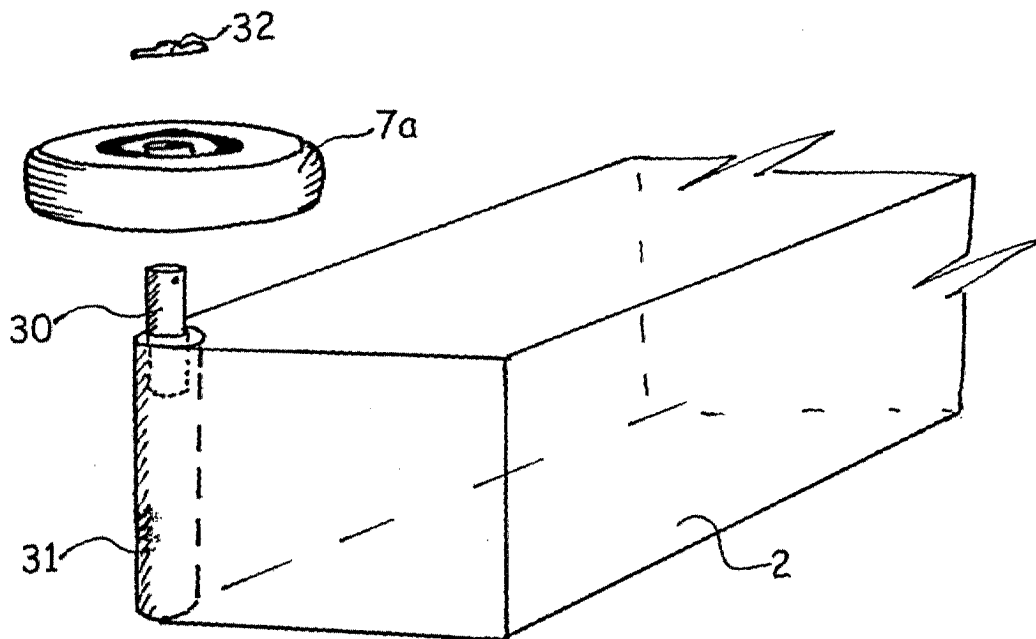


Figure 6