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(54) **A HOISTING DEVICE**

HUBVORRICHTUNG

DISPOSITIF D'EXTRACTION

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Description

[FIELD OF THE INVENTION]

[0001] A hoisting device comprising: a holding compartment where the holding compartment comprises: a base having a proximal end that is adapted to be positioned on a surface area and a distal end that is adapted to receive at least one stackable container; an upper part comprising a hoisting coupling that provides a connection between the hoisting device and a lifting device allowing the hoisting device to be lifted and lowered via the lifting device; at least one support structure extending between the base and the upper part creating a spacing between the base and the upper part and creating an inner volume of the holding compartment; an opening in a boundary of the holding compartment that is adapted to provide access to the holding volume of the holding compartment.A hoisting device such as this is disclosed in US5,181,756.

[BACKGROUND]

[0002] In the transport, shipping and/or fishing industries there are a number of situations that require the unloading of goods or items that are hoisted from the transport vehicle or vessel using a lift or a crane.

[0003] There are a number of different situations that require items to be stacked on top of each other in order to reduce hoisting time, when there are multiple items that have to be unloaded from a vehicle or a vessel. Such stacking is commonly used when the items to be hoisted are identical and the top of one item is adapted to slot into the bottom of another item. Such adaptation may be seen for example for the stacking of crates that are adapted to carry the goods temporarily and is reusable, such as a plastic bottle crate, that is stackable.

[0004] In the fishing industry, fish is often unloaded from a fishing vessel, by packing the fish in ice into containers, such as, plastic tubs, where the tub is used to transport the fish from the fishing vessel and into a fish processing plant. The tubs are vary in size, from approximately 200 litre to 1400 litre, where a common size of a tub may be in the vicinity of 700 litre. The tubs are often provided with loading slits, that allow a forklift to slide between the bottom of the holding tank and the feet of the tub, in order to safely lift the tubs when they are transported.

[0005] Furthermore, the tubs are often arranged in such a way that the bottom of the tub, or the feet of the tub have a dimension so that the outer dimension of the feet have a size that is equal to or smaller than the inner dimension of the top of the tub, so that the tubs may be stacked during transport, and in order to allow a plurality of tubs to be unloaded from a vessel at any one time. The stacking is done by placing one or more tub on top of a first tub, where the unloading is done by lifting the first tub with a crane fork, and the stack of tubs is hoisted from the vessel, and upwards to the docks or onto a transport vehicle.

[0006] However, there have been numerous instances, where the hoisting of a fish tub stack has gone wrong, and the tub stack has disjoined during the hoisting process, causing one or more tubs to fall from the stack fall towards the vessel, or the dock, causing serious hazard for the personnel assisting in with the hoisting process. There are reported instances where the stack has been lifted from a holding bay in a fishing vessel, and the tub has hit loading personnel that is standing in the holding bay below the crane fork.

[0007] Thus, there is a necessity of providing a hoisting device that allows the stacking of a number of holding containers, while reducing the risk that the containers will fall from the stack should there arise complications during the hoist.

[GENERAL DESCRIPTION]

[0008] In accordance with the invention, there is provided a hoisting device comprising: a holding compartment where the holding compartment comprises: a base having a proximal end that is adapted to be positioned on a surface area and a distal end that is adapted to receive at least one stackable container; an upper part comprising a hoisting coupling that provides a connection between the hoisting device and a lifting device allowing the hoisting device to be lifted and lowered via the lifting device; at least one support structure extending between the base and the upper part creating a spacing between the base and the upper part and creating an inner volume of the holding compartment; an opening in a boundary of the holding compartment that is adapted to provide access to the holding volume of the holding compartment; where the hoisting device further comprises a closing mechanism having a closed position adapted to block at least part of the opening when the hoisting device is lifted from the surface area, and an open position adapted to unblock the opening when the hoisting device is positioned on the surface area, wherein the closing mechanism is coupled to the connection between the hoisting device and the lifting device, where an initial tension in the connection moves the closing mechanism into its closed position and/or where an initial absence of tension moves the closing mechanism into its open position, or the closing mechanism is connected to a lever that comes into contact with the surface area where the hoisting is being placed, where the lever transmits mechanical energy to the closing mechanism to move the closing mechanism into its open and/or closed position..

[0009] The upper part and the base make up the upper and the lower boundaries for the holding compartment, where the base is adapted to carry the load one or more of the stackable containers, and the upper part constricts how many containers may be stacked inside the holding compartment. The peripheral area of the upper part and the base may also be seen as defining the radial bound-

ary of the holding compartment, where the radial boundary may be seen as the boundary extending in a radial direction away from a radial axis of the device, where the radial axis extends in a direction between the base and the upper part, and may be normal to the lower boundary of the base part.

[0010] The opening may be positioned in a radial boundary of the holding compartment, where the opening provides access to the inner volume of the holding compartment, and allows the stackable containers to be introduced into and extracted from the holding compartment at will.

[0011] The support structure is attached to the upper part and the base and is adapted to transmit loads from the upper part and towards the base, so that the base and the upper part are inseparable during the operation of the hoisting device. This means that when the lifting device provides tension to the upper part, the load of the tension is transmitted to the base, ensuring that the tension applied to the upper part results in that the entire holding device is lifted from the surface. The support structure may be one or more support bars that extend between peripheral areas of the upper part and the base, so that the support bars may define parts of the radial boundary of the holding compartment. The support bars may be vertical support bars, that extend between the upper part and the base in parallel to the radial axis of the hoisting device. The support bars may further be diagonal support bars extending from diagonally from the upper part to the base, to provide both structural integrity in a vertical direction but also in a horizontal direction. The support structure may further be in the form of one or more diagonal support bars, that intersect each other in an area that is between the upper part and the base, in order to provide additional structural strength for the hoisting device, to ensure that the upper part and the base are rotationally fixed (in the plane normal to the radial axis of the hoisting device) in relation to each other, when the hoisting device is fully loaded.

[0012] The opening of the holding compartment, may be arranged in an area between the upper part and the base, where items may be placed inside the holding compartment. The opening may be positioned in a radial boundary of the hoisting device, so that when items are loaded into the inner volume of the compartment, the items cross a radial area of the opening, and the vice versa when the items are unloaded. When the items, such as a plastic tub is placed inside the holding compartment it may be advantageous that the item does not intersect the area of the opening, ensuring that the closing mechanism may block off the opening.

[0013] The closing mechanism is adapted to allow access to the inner volume of the holding compartment, via the opening, when the hoisting device is safely positioned on a surface, allowing one or more items to be safely stacked inside the holding compartment, while the hoisting device is in a safe position. Furthermore, the closing mechanism is adapted to ensure that when the hoisting device is to be lifted from a vessel, a ground surface area and/or other areas where the hoisting device may be used, the opening of the holding compartment is blocked off, so that the items arranged inside the holding compartment cannot fall from the inner volume, while the hoisting device is being lifted. Thus, should a stacked item topple from the stack, the closing mechanism ensures that the item is prevented from exiting the holding compartment via the opening.

[0014] Thus, a number of stackable containers may be hoisted from a vessel, and lifted into the air without risking that any imbalance or shock to the containers will result in the containers toppling over and risking harm to any personnel standing below the hoisting device, during the unloading of the containers from while it is being unloaded from the vessel.

[0015] In one embodiment the upper part and the base may have substantially the same dimensions in the areas that are normal to the radial axis of the hoisting device, so that a radial boundary of the holding compartment that may be defined by the peripheral areas of the upper part and the base may be substantially parallel to the radial axis of the hoisting device.

[0016] In one embodiment the holding compartment may further comprise a second opening providing a second access to the holding compartment. The second opening may allow the holding compartment to be accessed from more than one areas. This means that when items are being introduced into the holding compartment, the introduction may be performed from two separate sides of the hoisting device, which may be advantageous in a small space such as a holding area for a fishing vessel. Furthermore, the second access may reduce the risk of injury to the personnel as the second access may reduce the amount of rotation necessary to position the hoisting device correctly for loading and unloading, while the hoisting device is in the air.

[0017] In one embodiment the opening may have a dimension that is substantially rectangular, where the horizontal dimension X is larger than the horizontal dimension Y, where X may be at least 2 times larger than Y, or more specifically 3 times larger than 1. The horizontal dimension of the opening thus controls the maximum width of item that may be introduced into the holding compartment, while the vertical dimension controls the maximum height of the items to be introduced into the compartment. By having the horizontal dimension larger than the vertical dimension, items having a given width may be stacked on top of each other until the maximum height is reached. As an example, if the opening has a horizontal dimension of just over 1.5 metre and a vertical dimension of just over 3 metres, a single stackable item having a width of 1.5 meter, and a height of approximately 1 meter, may be stacked along with two other items to form an approximately 3 meters stack, may be introduced into the opening of the holding compartment. Thus, in this example the maximum amount of items that may be stacked are three, while the compartment can without

problem both hold a single item or a stack of two items. Alternatively, in another example, the height of the stackable items may be higher or lower, which means that fewer or more items may be stacked inside the holding compartment, where the amount of stackable items depends on the height of the stackable item and the height (vertical dimension) of the holding compartment.

[0018] In one embodiment the holding compartment may comprise one or more side walls extending between the base and the upper part constituting an outer boundary of the holding compartment. The side wall may be seen as a radial boundary of the holding compartment that does not provide an item access to the inner volume of the compartment, and is adapted to ensure that the item cannot exit the holding compartment via the side wall. I.e. the side wall may be seen as the part of the radial boundary of the holding compartment which is void of an opening for providing access to the holding compartment. The side wall may be of any form envisioned by the person skilled in the art, such as diagonal support bars, solid piece of material, a plurality of vertical and/or horizontal bars, or any suitable construction that ensures that the stackable items that are positioned inside the holding compartment are prevented from falling out of the holding compartment via the side wall.

[0019] In one embodiment the closing mechanism may comprise a moveable boom that is adapted to be moved to into the area of the opening to block at least part of the opening. The boom may be adapted to intersect the area of the opening, so that when the closing mechanism is in its closed position, the moveable boom is in a locked position crossing the opening, ensuring that any items arranged inside the holding compartment cannot exit the holding compartment, by blocking the items, while the closing mechanism is in its closed position. The moveable boom may be arranged diagonally, vertically or horizontally across the opening, to prevent the items from exiting the holding compartment. The moveable boom may be adapted to ensure that there is no area of the opening that is larger than the height or the width of a single item positioned or stacked inside the holding compartment.

[0020] Furthermore, the closing mechanism may be provided with a two or more moveable booms across a single opening, in order to reduce the risk that an item will exit the holding compartment when the closing mechanism is in its closed position, and to adapt the hosting device for carrying items that are may be of a dimension that is significantly smaller than the width and/or height of the opening. The two or more booms may be used to ensure that there are no areas of the opening that are large enough to allow an item to exit the holding compartment while the closing mechanism is in its closed position.

[0021] In one embodiment the closing mechanism may comprise a moveable boom where a first end of the moveable boom may be rotatably fixed to the base and a second end is moveably attached to the upper part, and is adapted to pivot across the area of the opening by sliding along a part of the upper part. Thus, when the closing mechanism is in its open position the moveable boom may be rotated to a vertical position, that is parallel to the radial axis of the hoisting device, and thus abutting the vertical boundary of the opening, ensuring that the movable boom does not reduce the area of the opening. However, when the closing mechanism is in its closed position, the moveable boom pivots across the area of the opening, where the first end is attached to the base at the periphery of the opening, while the second end slides along the upper part, allowing the boom to extend across the opening of the holding compartment, and blocking access of the items inside the holding compartment to the outside via the opening. Such a moveable boom provides a reliable repeatable closing of the opening, as only one end of the boom is adapted to move, while the other end is fixed in its position.

[0022] In one embodiment the closing mechanism may be coupled to the connection between the hoisting device and the lifting device, where an initial tension in the connection moves the closing mechanism into its closed position and/or where an initial absence of tension moves the closing mechanism into its open position. This means that when tension is brought to the hoisting device, the closing mechanism initiates the closing and vice versa. This provides a reliable closing mechanism that reduces the need of personnel to operate the closing mechanism, and furthermore ensures that while the hoisting device is in the air, the closing mechanism cannot be opened by accident, and therefore ensures that the opening is blocked while the hoisting device is in the air.

[0023] The closing mechanism may be mechanically coupled to the connection between the lifting device and the hoisting device, so that the tension provided by the lifting device is transferred to the closing mechanism. As an example, the tension of the lifting device may provide mechanical force on a lever, where the lever may transfer the mechanical force to a moveable boom so that the transferred mechanical force moves a moveable boom from an open position to a closed position.

[0024] In one embodiment the closing mechanism may be coupled to the lifting device, ensuring that the closing mechanism remains in its closed position at all times when there is tension between the hoisting device and the lifting device. The closing mechanism may be provided with a locking mechanism that ensures that when there is tension between the lifting device and the hoisting device, the closing mechanism is prevented to move into its open position. This is to ensure, that the force of an item toppling over, tipping or tilting inside the holding compartment, cannot force the closing mechanism from its closed position to its open position. The locking mechanism may be activated and deactivated by the tension between the lifting device and the hoisting device.

[0025] In one embodiment the closing mechanism may comprise a spring mechanism that ensures that the closing mechanism is moved into its open position when the

hoisting device is positioned on a surface area. This means that when the mechanical forces that move the closing mechanism into its closed position are not present, the spring will counteract the forces and move the closing mechanism into its open position. The person skilled in the art may adapt the forces of the spring to be less than the mechanical forces adapted to get the closing mechanism into its closed position. This ensures that the forces of the spring are not large enough to prevent the closing mechanism to move into its closed position when the hoisting device is being lifted, but are enough to move the mechanism into its open position when the device is ready to be unloaded.

[0026] In one embodiment the dimensions of the area of the distal end of the base may be adapted to receive a EUR-pallet. This means that the stackable items may be placed onto a standardized pallet, in order to ensure that the hoisting device may be loaded and unloaded using a forklift. In another embodiment the dimensions of the area may be adapted to receive different sizes of stackable containers.

[BRIEF DESCRIPTION OF DRAWINGS]

[0027] The invention is explained in detail below with reference to the drawings, in which

Fig. 1 is a perspective view of the hoisting device in accordance with the invention,

Fig. 2 is a perspective view of the same in its open position, loaded with containers ,

Fig. 3 is a perspective view of the same in its closed position, loaded with containers,

Fig. 4 is a perspective view of the same in its open position, ready to be unloaded,

Fig 5A and 5B are perspective views of parts of the hoisting device, showing the movement of the closing mechanism, and

Fig. 6 shows a perspective view of one embodiment of the hoisting device in accordance with the invention, where the base has an opening.

[DETAILED DESCRIPTION OF DRAWINGS]

[0028] Fig. 1 shows a perspective view of a hoisting device 1, where the hosting device comprises an upper part 2 and a base 3. The upper part 2 is connected to the base 3 via support structures, 4,5,6, where the supporting structure comprises a first side wall 4, a second side wall 5, and a vertical support bar 6. The supporting structure ensures that the base 3 is fixed to the upper part 2 and further provides a radial boundary for the inner volume of a holding compartment 7.

[0029] Alternatively, the device may be provided with vertical support bars 6 at every corner of the base, allowing the upper part 2 to be fixed to the base, and providing a radial boundary for the inner volume. Furthermore, the hoisting device 1 may be provided with fixed structures between the horizontal posts, in order to prevent access of stackable items into and outer of the holding compartment in any areas other than those specifically intended for access, such as openings 12 and 13. Thus, the stackable items are not capable of toppling over and exiting the device 1 via the sides of the device that is provided with the fixed structures. The fixed structures may be bars, mesh, solid wall, and any other type of fixed structure that can close off access to the holding compartment via the non-intended sides.

[0030] The base 3 has a first end 8 or a first surface, that is adapted to be positioned on a surface area (not shown) to provide a stable fundament for the hoisting device when it is positioned on the ground. The base 3 has a second end 9, or a second surface, that is adapted to receive an item, which may be stackable, and provides a stable foundation for that item to be positioned on. The second end 9 may also be adapted to hold a EUR-pallet, onto which items may be stacked upon.

[0031] The upper part 2 and the base 3 are rectangular in shape, having substantially right angled corners 10, and straight elements 11 extending between the four corners 10. The outer surface of the straight elements and the corners form the radial boundary of a holding compartment, where the holding compartment is bound by the upper part 2 the base 3 and the side walls 4,5 and vertical bar 6, so that the inner volume of the holding compartment 7 is substantially cubic, in that its boundary is defined by opposing parallel planes.

[0032] The holding compartment 7 of the device 1 is provided with a first opening 12 and a second opening 13, that are defined by the radial boundary between the side walls 4,5 and the vertical bar 6. The openings 12,13 are positioned on two sides of the radial boundary, allowing access to the holding compartment 7 from two different positions.

[0033] The side walls 4,5 ensure that the items that are placed inside the holding compartment 7 cannot exit the holding compartment 7 in a direction from the radial axis A of the device 1 towards the side walls, but is only accessible via the openings 12,13.

[0034] The upper part 2 is provided with connecting means 14 in the form of eyes, that allow a lifting device (not shown) to connect to the hoisting device 1 and thereby allow the hoisting device 1 to be lifted off the ground. The openings are provided with a closing bar 18, that in its open position is arranged vertically in an area near the side walls 4,5 abutting the opening, so that the bars do not reduce the area of the openings 12,13.

[0035] Fig. 2 shows the hoisting device of Fig. 1, where three stackable plastic tubs 15,16,17 have been introduced into the holding compartment 7 of the device 1, via the openings 12,13. The openings 12,13 are of such

a dimension that the plastic tubs 15,16,17 may be introduced into the compartment 7 in stacked position, and ensure that the tubs 15,16,17 are within the radial boundary of the holding compartment 7. This means therefore that the width of the openings 12,13 are larger than the width of the tubs 15,16,17. The bottom tub 17 is securely positioned on the second end 9 of the base, and the first end of the base is positioned on a surface area, while the tubs are introduced into the device 1. The number of plastic tubs may be different, depending on the height of the tub. I.e. When higher tubs are being stacked, it may only carry one or two, while when lower tubs are being stacked, the capacity of the hoisting device may be such that more tubs can be stacked, i.e. 4, 5 or more.

[0036] Fig. 3 shows the hoisting device of Fig. 1 and Fig. 2 when the lifting device has provided tension to the connecting means 14, and the device has been lifted in the direction of arrow B. When the device is lifted from the surface area, the bars 18 pivot in a direction of arrows C and D, where the first end 19 is rotatably fixed to the base while the second end 20 slides along the horizontal beam 21 of the upper part, in a direction away from the side wall 4, and side wall 5.

[0037] The bars 18 may be mechanically connected to the lifting eyes 14, so that any tension applied between the lifting device and the eyes 14 is transferred to the closing mechanism, to actuate the bars in sliding across the horizontal beam, and thereby blocking the opening 12,13. Thus, the blocked openings 12,13 ensure that the tubs 15,16,17 cannot exit the holding compartment 7 while the hoisting device is off the ground. Thus, should an accident happen, where the uppermost tub 15, topples from the abutting tub 16, then the bars 18 and the side walls 4,5, ensure that the tub cannot fall out of the holding compartment and towards the ground, as the bar 18 blocks the tub from entering the opening.

[0038] Alternatively, the closing mechanism may be connected to a lever that comes into contact with the surface area where the device 1 is being placed, where the lever transmits mechanical energy to the closing mechanism and causing the bar to pivot as shown in Fig. 3.

[0039] Fig. 4 shows the device 1, when it has been positioned on the ground in a direction shown by arrow B', causing the bars 18 to pivot in the opposite direction as shown in Fig. 3, or directions C' and D'. The pivot in the opposite direction, ensures that the openings 12,13 are free and unblocked, and allow personnel to remove the tubs 15,16,17 from the holding compartment.

[0040] Fig. 5 shows a hoisting device 1, where the base 3 is shown in part, the support structures 6 in the form of opposing vertical bars are shown, where the vertical bars 6 are positioned on opposing corners of the base. The first end 19 of the bar is roatably fixed to the base, while the second end is adapted to slide along the horizontal beam as shown in Fig. 3. Fig. 5A corresponds to the position of the bars shown in Fig. 4 while Fig 5B corresponds to the position of the bars shown in Fig. 3.

[0041] The second end 20 of the bars has an attachment means 22, that is attached to a mechanical connection 23, i.e. a strand, where the strand is in one end attached to a weight 24 and in the opposite end connected to a lifting connection (not shown) that allows the lifting device, e.g. a hook of a crane, to be mechanically connected to the hoisting device 1. The strands are threaded through pulley like structures 25, 26, 27 allowing the direction of the strands to be changed, and the ends of the strands are allowed to mechanically connect to the weight 24 and the lifting device.

[0042] When the hoisting device is positioned on a surface, in the situation shown in Fig. 5A and there is no force applied from a lifting device to the hoisting device, the weights 24 pull the bars 18 into a vertical position, allowing access to the holding compartment 7. This means that the strands 23 are in a first position where the force applied at the weight end of the strand 23 is higher than the force applied at the opposite end. The force applied by the weight 24 to the strands is shown by arrows E. This force E ensures that the second end 20 of the bar 18 is pulled in the direction shown by arrows F, so that the bars clear the openings 12, 13 of the hoisting device.

[0043] However, when the hoisting device 1 is being lifted from the surface, as shown in Fig. 5B, the pulling force applied by the weight to the first end of the strand 23 is lower than the force applied by the lifting device, which pulls on the opposite end 28 of the strand, where the direction of the force is shown by arrow G. Thus the weight 24 is lifted, the strand 23 is shifted in the direction G of the force, causing the second end 20 of the bar 18 to move in the direction show by arrow H, as the attachment means 22 on the second end 20 is attached to the strand 23. Thus, the bar is pivoted from its first end 19 connection, so that the bar 18 blocks the openings 12, 13, ensuring that the tubs (shown in Fig. 3 and 4) cannot fall out of the holding compartment.

[0044] The strands 23, may be in the form of a rope, a cable, a chain, belt or any other type of mechanical connection that allows force to be transferred from the lifting device to the bars 18 or the weights 24.

[0045] Fig. 6 shows an alternative embodiment of the present invention, where the base 3 is provided with an opening 28, allowing access into the holding compartment 7 along the surface area onto which the device 1 positioned upon. The opening 28 is open in one side of the base, allowing access to a central area of the base, where the stackable items are held by the base at the peripheral edges 29, 30, 31 of the base 3. By providing such an opening 28, a trolley, a lifting device, a handlift or a pallet lift may be rolled on the surface area and into the holding compartment via the opening 28, where the forks of the pallet may and/or the wheels of the lifting device may access the holding compartment via the opening 28. The forks may be raised, so that the bottom of the stackable item is high enough so that it will not intersect the peripheral areas 29, 30, 31 of the base, and

may be lowered, when the stackable item is inside the holding compartment 7, so that the peripheral areas of the stackable item are resting on top of the peripheral areas, i.e. the second end, 29, 30, 31 of the base 3. The remaining parts of the hoisting device in Fig. 6 are similar to that shown in Fig. 1 - 5.

[0046] Also, in Fig. 6 it is shown how the strand 23, shown in more detail in Fig. 5A and 5B, extends through and above the upper part of the device 1, and may be in a mechanical connection to the lifting device, a hook, or a hoisting intermediate apparatus that connects the hoisting device to the lifting device.

Claims

1. A hoisting device (1) comprising:

- a holding compartment where the holding compartment comprises:
  - ◦ a base (3) having a proximal end that is adapted to be positioned on a surface area and a distal end that is adapted to receive at least one stackable container;
  - ◦ an upper part (2) comprising a hoisting coupling (14) that provides a connection between the hoisting device and a lifting device allowing the hoisting device to be lifted and lowered via the lifting device;
  - ◦ at least one support structure (4,5) extending between the base and the upper part creating a spacing between the base and the upper part and creating an inner volume of the holding compartment;
  - ◦ an opening (12,13) in a boundary of the holding compartment (7) that is adapted to provide access to the holding volume of the holding compartment;

- where the hoisting device further comprises a closing mechanism (18) having a closed position adapted to block at least part of the opening when the hoisting device is lifted from the surface area, and an open position adapted to unblock the opening when the hoisting device is positioned on the surface area, **characterised in that** the closing mechanism is coupled to the connection between the hoisting device and the lifting device, where an initial tension in the connection moves the closing mechanism into its closed position and/or where an initial absence of tension moves the closing mechanism into its open position, or the closing mechanism is connected to a lever that comes into contact with the surface area where the hoisting is being placed, where the lever transmits mechanical energy to the closing mechanism to move the closing mechanism into its open and/or closed position.

2. A hoisting device in accordance with claim 1, where the holding compartment further comprises a second opening providing a second access to the holding compartment.

3. A hoisting in accordance with any of the preceding claims device where the opening has a dimension that is substantially rectangular, where the vertical dimension X is larger than the horizontal dimension Y, where X may be at least 2 times larger than Y, or more specifically 3 times larger than 1.

4. A hoisting device in accordance with any of the preceding claims, where the holding compartment comprises one or more side walls extending between the base and the upper part constituting an outer boundary of the holding compartment.

5. A hoisting device in accordance with claim 1, where the closing mechanism comprises a moveable boom that is adapted to be moved to into the area of the opening to block at least part of the opening.

6. A hoisting device in accordance with any of the preceding claims where the closing mechanism comprises a moveable boom where a first end of the moveable boom is rotatably fixed to the base and a second end is moveably attached to the upper part, and is adapted to pivot across the area of the opening by sliding along a part of the upper part.

7. A hoisting device in accordance with any of the preceding claims where the closing mechanism is coupled to the lifting device, ensuring that the closing mechanism remains in its closed position at all times when there is tension between the hoisting device and the lifting device.

8. A hoisting device in accordance with any of the preceding claims where the closing mechanism comprises a spring mechanism that ensures that the closing mechanism is moved into its open position when the hoisting device is positioned on a surface area.

9. A hoisting device in accordance with any of the preceding claims where the dimensions of the area of the distal end of the base is at least adapted to receive a EUR-pallet.

10. A hoisting device in accordance with any of the preceding claims, where the hoisting device is further provided with a cable that is connected to the closing mechanism, where a first end of the cable is adapted to receive mechanical force from a lifting device, so

that the closing mechanism moves to its closing position.

11. A hoisting device in accordance with claim 10, where the cable is further provided with a counter weight, allowing the closing mechanism to return to its open position when the force from the counter weight is larger than the force applied by the lifting device.

12. A hoisting device in accordance with any of the preceding claims, where the base has an opening in one side, that allows access to a central area of the base.

Patentansprüche

1. Eine Hubvorrichtung (1), umfassend:

- ein Haltefach, wobei das Haltefach umfasst:

  ◦ eine Basis (3)
  mit einem proximalen Ende, das geeignet ist, auf einem Oberflächenbereich positioniert zu werden, und einem distalen Ende, das geeignet ist, mindestens einen stapelbaren Behälter aufzunehmen;
  ◦ einen oberen Teil (2), umfassend eine Hubkupplung (14), die eine Verbindung zwischen der Hubvorrichtung und einer Anhebevorrichtung bietet, was der Hubvorrichtung erlaubt, durch die Anhebevorrichtung angehoben und gesenkt zu werden;
  ◦ mindestens eine Stützstruktur (4,5), die sich zwischen der Basis und dem oberen Teil erstreckt, was einen Abstand zwischen der Basis und dem oberen Teil erzeugt und ein inneres Volumen des Haltefachs erzeugt;
  ◦ eine Öffnung (12, 13) in einer Begrenzung des Haltefachs (7), die geeignet ist, Zugang zum Haltevolumen des Haltefachs zu bieten;

- wobei die Hubvorrichtung außerdem einen Schließmechanismus (18) umfasst, mit einer geschlossenen Position, die geeignet ist, mindestens einen Teil der Öffnung zu versperren, wenn die Hubvorrichtung von dem Oberflächenbereich angehoben wird, und einer offenen Position, die geeignet ist, die Öffnung zu entsperren, wenn die Hubvorrichtung auf dem Oberflächenbereich positioniert ist, **dadurch charakterisiert, dass** der Schließmechanismus mit der Verbindung zwischen der Hubvorrichtung und der Anhebevorrichtung gekoppelt ist, wobei eine anfängliche Spannung in der Verbindung den Schließmechanismus in seine geschlossenen Position bewegt und/oder wobei ein anfängliches Fehlen von Spannung den Schließmechanismus in seine offene Position bewegt oder der Schließmechanismus mit einem Hebel verbunden ist, der in Kontakt mit dem Oberflächenbereich kommt, wo der Hub platziert ist, wobei der Hebel mechanische Energie an den Schließmechanismus überträgt, um den Schließmechanismus in seine offenen und/oder geschlossene Position zu bewegen.

2. Eine Hubvorrichtung gemäß Anspruch 1, wobei das Haltefach außerdem eine zweite Öffnung umfasst, die einen zweiten Zugang zum Haltefach bietet.

3. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, die Vorrichtung, wobei die Öffnung eine Abmessung hat, die im Wesentlichen rechteckig ist, wobei die vertikale Abmessung X größer ist als die horizontale Abmessung Y, wobei X mindestens zweimal größer als Y, oder spezifischer dreimal größer als 1, sein kann.

4. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei das Haltefach eine oder mehrere Seitenwände umfasst, die sich zwischen der Basis und dem oberen Teil erstrecken und eine äußere Begrenzung des Haltefachs bilden.

5. Eine Hubvorrichtung gemäß Anspruch 1, wobei der Schließmechanismus einen beweglichen Ausleger umfasst, der geeignet ist, in den Bereich der Öffnung bewegt zu werden, um mindestens einen Teil der Öffnung zu versperren.

6. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei der Schließmechanismus einen beweglichen Ausleger umfasst, wobei ein erstes Ende des beweglichen Auslegers drehbar an der Basis befestigt ist und ein zweites Ende beweglich an dem oberen Teil angebracht ist und geeignet ist, durch Gleiten entlang eines Teil des oberen Teils über den Bereich der Öffnung zu schwenken.

7. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei der Schließmechanismus an die Anhebevorrichtung gekoppelt ist, was sicherstellt, dass der Schließmechanismus immer dann in seiner geschlossenen Position bleibt, wenn es Spannung zwischen der Hubvorrichtung und der Anhebevorrichtung gibt.

8. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei der Schließmechanismus einen Federmechanismus umfasst, der sicherstellt, dass der Schließmechanismus in seine offene Position bewegt wird, wenn die Hubvorrichtung auf einem Oberflächenbereich positioniert wird.

9. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Abmessungen des Bereichs des distalen Endes der Basis mindestens geeignet sind, eine Europalette aufzunehmen.

10. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Hubvorrichtung außerdem mit einem Seil bereitgestellt wird, das mit dem Schließmechanismus verbunden ist, wobei ein erstes Ende des Seils geeignet ist, mechanische Kraft von einer Anhebevorrichtung aufzunehmen, sodass der Schließmechanismus sich in seine geschlossene Position bewegt.

11. Eine Hubvorrichtung gemäß Anspruch 10, wobei das Seil außerdem mit einem Gegengewicht bereitgestellt wird, das dem Schließmechanismus erlaubt, in seine offene Position zurückzukehren, wenn die Kraft vom Gegengewicht größer ist als die Kraft, die durch die Anhebevorrichtung ausgeübt wird.

12. Eine Hubvorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Basis eine Öffnung an einer Seite hat, die Zugang zu einem zentralen Bereich der Basis gewährt.

Revendications

1. Dispositif de hissage (1) comprenant :

- un compartiment de retenue, dans lequel le compartiment de retenue comprend :
  - ◦ une base (3) qui présente une extrémité proximale adaptée de façon à être positionnée sur une surface, et une extrémité distale adaptée de façon à recevoir au moins un contenant empilable ;
  - ◦ une partie supérieure (2) qui comprend un accouplement de hissage (14) établissant une connexion entre le dispositif de hissage et un dispositif de levage qui permet de lever et d'abaisser le dispositif de hissage par l'intermédiaire du dispositif de levage ;
  - ◦ au moins une structure de support (4, 5) qui s'étend entre la base et la partie supérieure, créant un espace entre la base et la partie supérieure, et créant un volume intérieur du compartiment de retenue ;
  - ◦ une ouverture (12, 13) dans une frontière du compartiment de retenue (7) adaptée de façon à fournir un accès au volume de retenue du compartiment de retenue ;

- dans lequel le dispositif de hissage comprend en outre un mécanisme de fermeture (18) qui présente une position fermée adaptée de façon à bloquer une partie au moins de l'ouverture lorsque le dispositif de hissage est levé à partir de la surface, et une position ouverte adaptée de façon à débloquer l'ouverture lorsque le dispositif de hissage est positionné sur la surface, **caractérisé en ce que** le mécanisme de fermeture est couplé à la connexion entre le dispositif de hissage et le dispositif de levage, dans lequel une tension initiale de la connexion déplace le mécanisme de fermeture dans sa position fermée, et / ou dans lequel une absence initiale de tension déplace le mécanisme de fermeture dans sa position ouverte, ou le mécanisme de fermeture est connecté à un levier qui entre en contact avec la surface où est placé le dispositif de hissage, dans lequel le levier transmet une énergie mécanique au mécanisme de fermeture de façon à déplacer le mécanisme de fermeture dans sa position ouverte et / ou fermée.

2. Dispositif de hissage selon la revendication 1, dans lequel le compartiment de retenue comprend en outre une seconde ouverture qui fournit un second accès au compartiment de retenue.

3. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel l'ouverture présente une forme sensiblement rectangulaire, dans lequel la dimension verticale X est supérieure à la dimension horizontale Y, dans lequel la dimension X peut être au moins 2 fois plus grande que la dimension Y, ou plus particulièrement 3 fois plus grande que la dimension Y.

4. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel le compartiment de retenue comprend une ou plusieurs parois latérales qui s'étendent entre la base et la partie supérieure, constituant une frontière extérieure du compartiment de retenue.

5. Dispositif de hissage selon la revendication 1, dans lequel le mécanisme de fermeture comprend un bras mobile qui est adapté de façon à être déplacé dans la zone de l'ouverture de façon à bloquer une partie au moins de l'ouverture.

6. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel le mécanisme de fermeture comprend un bras mobile dans lequel une première extrémité du bras mobile est fixée de manière rotative sur la base, et une seconde extrémité est fixée de manière mobile sur la partie supérieure, et est adaptée de manière à pivoter sur la surface de l'ouverture en coulissant le long d'une partie de la partie supérieure.

7. Dispositif de hissage selon l'une quelconque des re-

vendications précédentes, dans lequel le mécanisme de fermeture est couplé au dispositif de levage, en garantissant que le mécanisme de fermeture demeure en permanence dans sa position fermée quand il y a une tension entre le dispositif de hissage et le dispositif de levage.

8. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel le mécanisme de fermeture comprend un mécanisme à ressort qui garantit que le mécanisme de fermeture est déplacé dans sa position ouverte lorsque le dispositif de hissage est positionné sur une surface.

9. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel les dimensions de la zone de l'extrémité distale de la base, sont au moins adaptées de façon à recevoir une palette Europe.

10. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel le dispositif de hissage est doté en outre d'un câble connecté au mécanisme de fermeture, dans lequel une première extrémité du câble est adaptée de façon à recevoir une force mécanique en provenance d'un dispositif de levage, de telle sorte que le mécanisme de fermeture se déplace dans sa position fermée.

11. Dispositif de hissage selon la revendication 10, dans lequel le câble est doté en outre d'un contrepoids, qui permet au mécanisme de fermeture de revenir vers sa position ouverte lorsque la force du contrepoids est supérieure à la force appliquée par le dispositif de levage.

12. Dispositif de hissage selon l'une quelconque des revendications précédentes, dans lequel la base présente une ouverture dans un côté qui permet d'accéder à la zone centrale de la base.

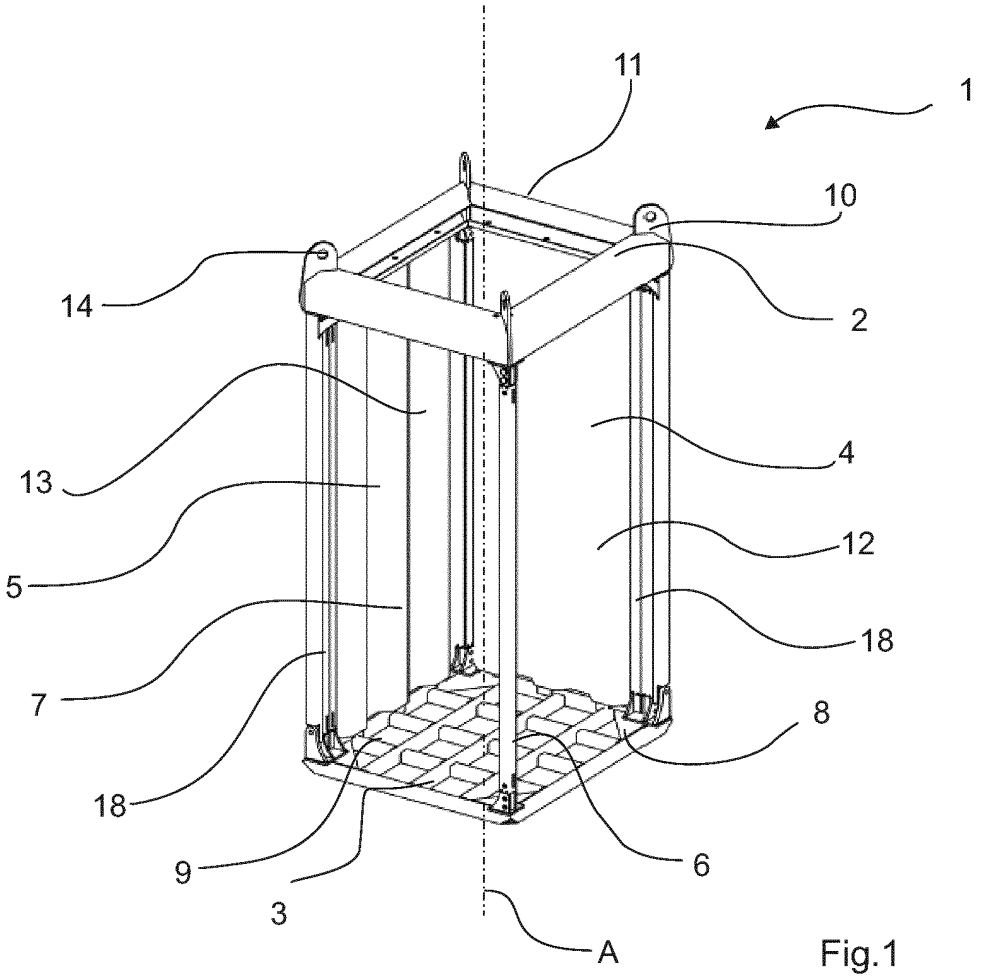

Fig.1

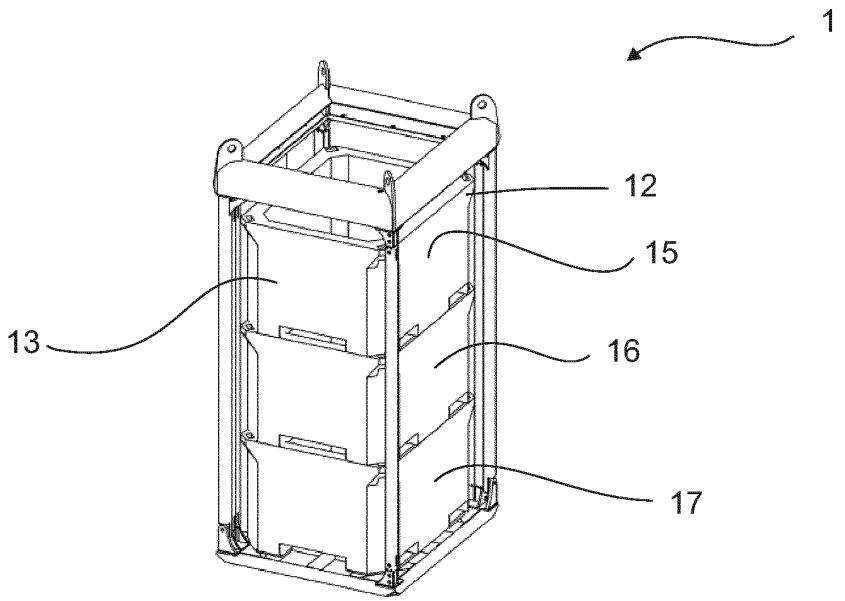

Fig.2

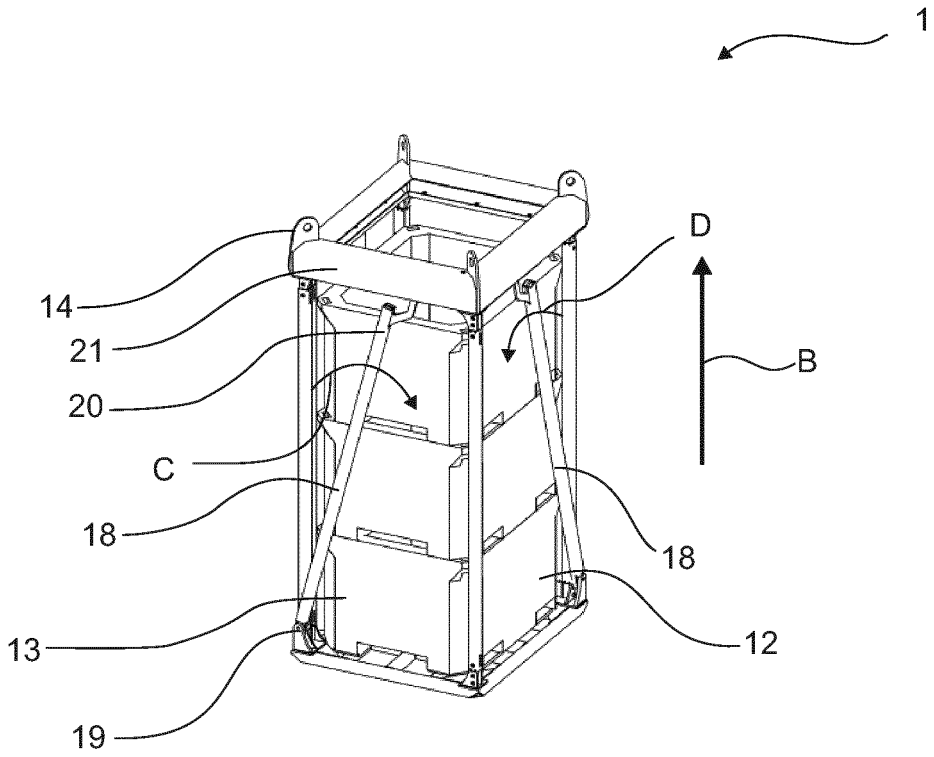

Fig.3

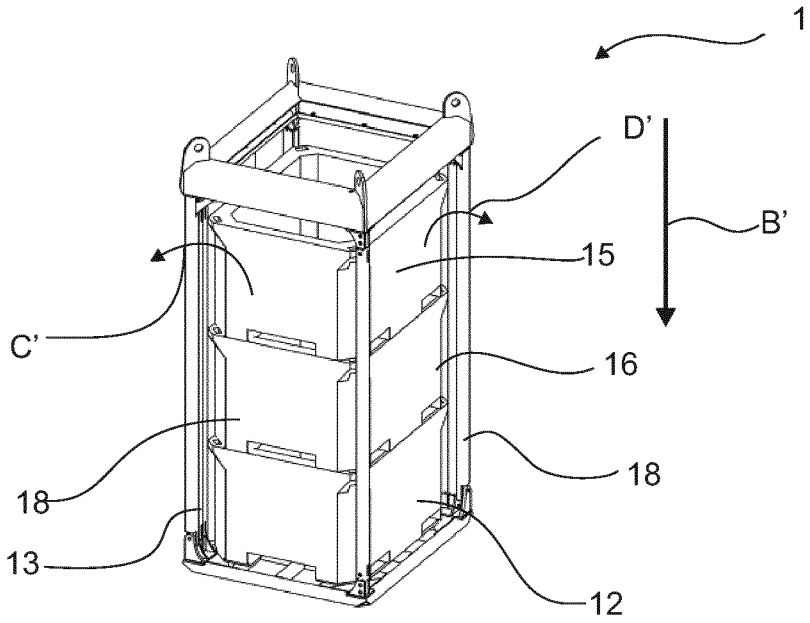

Fig.4

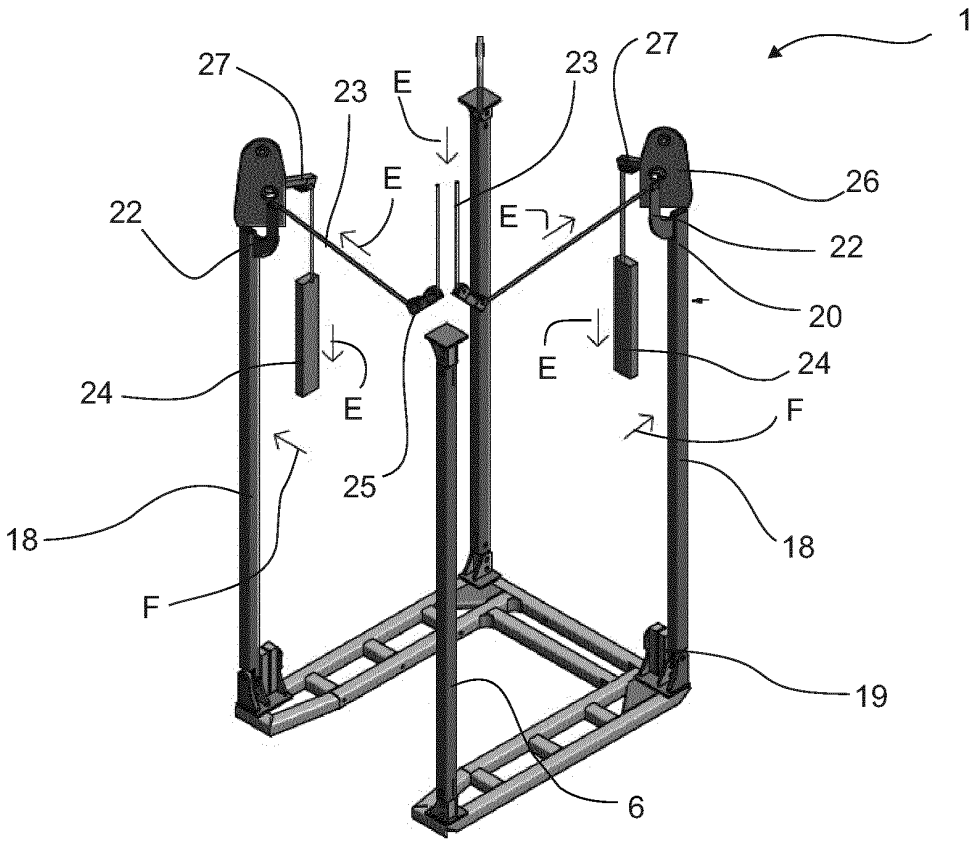
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Fig.5A

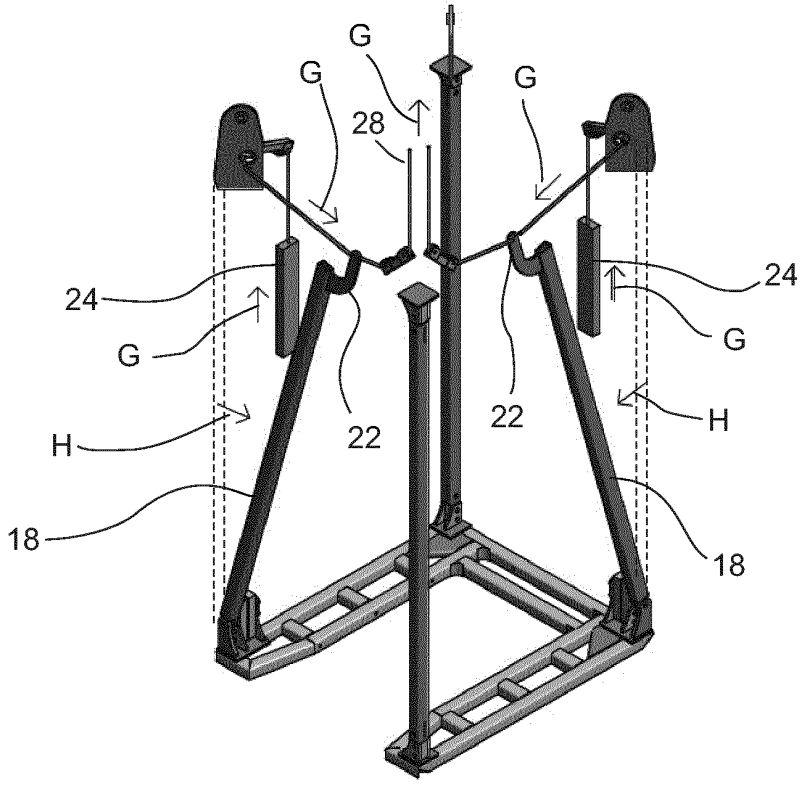
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Fig.5B

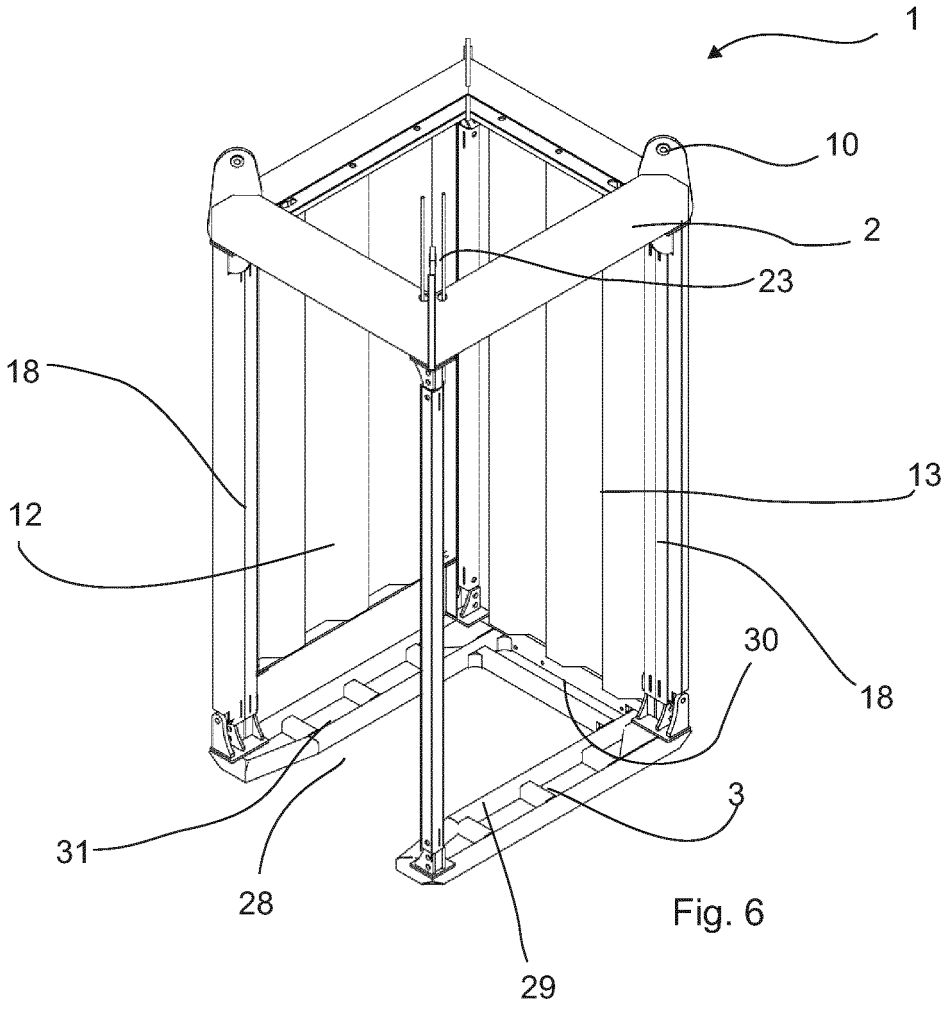

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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