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(54) **A LIFTER DEVICE FOR LIFTING AND/OR MOVING OBJECTS**

(57) Device (1) for lifting and/or moving objects in general, preferably sanitary fixtures, comprising:
- A first rest plane;
- Means adapted to move said first rest plane so that it can be positioned at one or more different heights;
- a second rest plane having an extension area larger than the first rest plane is comprised, said second rest plane being configured to be removably connected with said first rest plane.

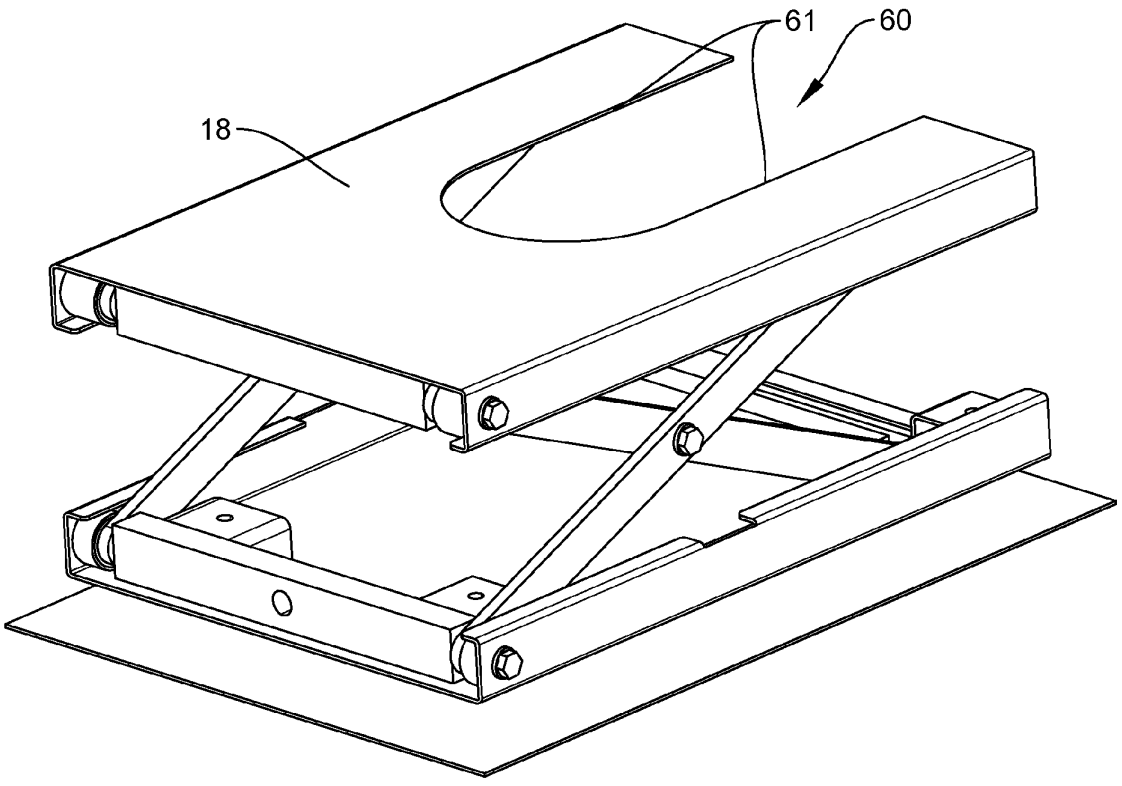

FIG. 5

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Description

Scope of the invention

[0001] The present invention concerns the technical field regarding lifters usable in the technical field of mounting objects, for example movement and mounting of suspended sanitary fixtures and bathroom furniture.

[0002] In particular, the invention refers to a new type of lifter which is versatile, in order to be able to easily lift objects even with dimensions that are strongly different from one another, to allow them to be mounted in position.

A brief outline of the prior art

[0003] In various sectors, for example in the construction one, it is often necessary to have to move certain objects in order to be able to perform the correct mounting thereof. Many objects, in fact, must be connected to other objects that are located in a specific position. It is therefore necessary to position the object to be mounted in the correct position in order to fix it.

[0004] A non-limiting example can be, for example, the one related to mounting sanitary fixtures in homes or buildings in general, for example also offices. Such sanitary fixtures may include for example the bidet or the toilet.

[0005] Some of these sanitary fixtures, in fact, are mounted in such a way as to be raised from the floor and are fixed to the wall through generally tie rods that emerge from the wall itself.

[0006] For the correct mounting in position, also in order to then connect all the pipes, it is necessary to lift the sanitary fixture to the correct position and then fix it.

[0007] It is clear that the lifting operation is quite difficult.

[0008] Generally, also given the considerable weight and also the overall dimension of the sanitary fixture itself, it is often necessary that two people intervene at the same time.

[0009] In order to facilitate the movement and the mounting, auxiliary devices are known that allow the lifting of the object, for example of the sanitary fixture, in order to then keep it at the desired height and thus be able to conveniently perform the mounting.

[0010] Many of these lifters are small in size and are objects of common use for the craftsman or the worker in general and therefore are common work equipment.

[0011] One of these lifters is for example described in the publication DE 10 2013 202 985.

[0012] In this case, a lever system allows to easily move a movable plate on which the sanitary fixture will rest, thus being able to arrange it to the desired working height.

[0013] The system is provided with wheels for easy movement thereof.

[0014] The rest plane for the sanitary fixture (for example a toilet or a bidet) is delimited through specific side arms that serve to keep the object placed on said plane in a stable position.

[0015] In view of the above, the known devices suffer from a major technical problem.

[0016] In particular, these devices can only be used for the movement of some types of objects that fall within a range of measurements as a function of the rest plane of the device. If the object is too large in size compared to the rest plane, it cannot be moved as it turns out that its correct and stable positioning would be quite difficult, if not impossible. In the event it is, therefore, necessary to move objects with dimensions different from those compatible with the rest plane of the device, the result is that the device itself is unusable or in any case, it will be usable with extreme difficulty and always with two operators being needed.

[0017] In DE 10 2013 202 985 there is even the limit of the positioning on the plane due to the side containment arms which, physically, would not allow to be able to position objects that are too wide.

Summary of the invention

[0018] It is therefore an object of the present invention to provide a device that solves, at least in part, the aforementioned technical drawbacks.

[0019] In particular, it is the object of the present invention to provide a device that is versatile, thus allowing the movement of objects in general even with dimensions that are strongly different from one another, thus allowing a movement of objects of a different nature from each other.

[0020] These and other objects are achieved with the present device for lifting and/or moving objects in general, preferably sanitary fixtures such as for example a "bidet" or a "toilet" or bathroom furniture in general, in accordance with claim 1.

[0021] This device (1) comprises:

- A first rest plane (18);
- Means adapted to move said first rest plane so that it can be positioned at one or more different heights; in accordance with the invention, it is now comprised a second rest plane (200) forming a rest surface for the objects to be moved the extension of which of said rest surface intended in use to support the object is larger than the first rest plane (18).

[0022] This second rest plane is configured to be connected, in a removable manner, with said first rest plane.

[0023] In this way, all the aforementioned technical problems are easily resolved.

[0024] In particular, the presence of the second rest plane 200, with a greater support area for the objects than that provided by the first rest plane, allows the user to be able to move objects even of dimensions that are strongly different from one another.

[0025] As long as it is necessary to move suitable ob-

jects for a movement with the first rest plane, the operator can regularly perform such movements by positioning the object onto said first rest plane.

[0026] If and when it is necessary to move objects of dimensions strongly larger than what is offered by the first rest plane, then the operator can safely use the accessory constituted by the second rest plane 200 the surface of which forming the rest plane is larger than that offered by the first rest plane.

[0027] For example, if the operator has to mount a bathroom chest of drawers (see for example Figure 14) to be positioned on the wall at a certain height, the latter is likely to have a much larger overall dimension widthwise than the width provided by the first rest plane of the device, thereby coming out abundantly from the two sides of the first rest plane and thus being very unstable.

[0028] In accordance with the proposed solution, like for example shown in Figure 14, the second rest plane 200 can be fixed stably, in a removable manner, to the first rest plane so that it is ensured that the rest area is now much larger than the initial one that one would have with the original rest plane (the first rest plane).

[0029] In this way, the chest of drawers, subject of the non-limiting example above could stably rest and be safely moved to the desired height.

[0030] This gives versatility to the device that can move, if necessary, objects having dimensions that are strongly different from one another and that cannot stay within the area offered by the first rest plane, as their dimensions are considerably larger.

[0031] Advantageously, connection means (100) can be comprised to allow to connect said second rest plane (200), in a removable manner, above said first rest plane (18) .

[0032] For example, in a first possible solution, said connection means (100) may comprise a sliding coupling system (100) .

[0033] In this way, by sliding the second rest plane over the first rest plane in one direction, this sliding system creates a connection engagement between the second plane 200 and the first plane 18 below.

[0034] A reverse sliding motion creates disengagement.

[0035] For example, in a possible solution, said sliding coupling system (100) may comprise a plate (100) fixed to a face of the second rest plane opposite to the face intended to receive in use the object to be moved.

[0036] In accordance with this solution, advantageously, said plate can form two wings (101, 102) that are spaced from the face of the second rest plane to which said plate is connected.

[0037] In this way, advantageously, two sliding channels (or corridor, whatever it may be called) are formed, each delimited precisely by a wing and the face of the second rest plane to which the plate is connected. In these corridors, elements relative to the first rest plane (18) can be inserted, thus realizing an easily removable connection.

[0038] For example, it would be possible to provide a slot (60) in the first rest plane (18) which therefore generates two flanks (61) that can each be inserted into a said sliding corridor (or channel, whatever it may be called).

[0039] It is therefore sufficient to arrange the second plane 200 in such a way that the plate 100 is above the slot taking care, by sliding, to insert the flanks 61 of the slot 60 in the corridors that are generated, as described above.

[0040] Advantageously, said second rest plane (200) can be formed by two or more parts that are decomposable from and recomposable to one another to form said second rest plane.

[0041] In this way the device as a whole is much more compact and easily transportable.

[0042] Advantageously, quick-connection means (203, 204) can be comprised which are adapted to allow said two or more parts forming said second rest plane (200) to connect to each other in a removable manner in such a way as to be able to compose or decompose said second rest plane.

[0043] In this way, the overall dimensions can be reduced when the rest plane 200 is not in use.

[0044] Advantageously, said means adapted to move said first rest plane comprise an articulated lever system.

[0045] Advantageously, as mentioned, said first rest plane (18) can form a slot (60).

[0046] Advantageously, it can be further provided an accessory (300) in the form of a second plate (300) insertable to at least partially close the slot 60 and conformed to generate an accommodating niche.

[0047] Preferably, said second plate 300 may have a V-conformation.

[0048] This accessory allows to stably position certain types of objects on the first rest plane.

[0049] It is also an object of the invention the use of a device, according to one or more of the above characteristics as described, to move and allow the installation of objects in general.

[0050] Advantageously, such objects can be sanitary fixtures such as toilets, bidets or furniture.

[0051] In the case of furniture, for example bathroom furniture such as for example chests of drawers.

[0052] It is also an object of the invention a method for installing an object in position, the method comprising the following steps:

- Arrangement of a device in accordance with one or more of the characteristics described above;
- Arrangement of the object to be moved on the rest plane (18, 200) of the device in such a way as to lift the object to the desired height;
- And wherein the rest plane is constituted by the original first rest surface (18) of the device or by the accessory constituted by the second rest surface (200) which can be fixed in a removable manner on the first rest surface as a function of the overall dimen-

sion of the object to be moved.

[0053] Obviously, also in this case, everything that has been said so far applies, such that, advantageously, such objects can be sanitary fixtures such as toilets, bidets or furniture.

[0054] In the case of furniture, for example bathroom furniture such as for example chests of drawers.

Brief description of the drawings

[0055] Further characteristics and advantages of the present lifter device, according to the invention, will become clearer with the following description of some of its embodiments, made by way of example and not limitation, with reference to the accompanying drawings, wherein:

- Figure 1 and Figure 2 show two axonometric views of the device deprived of the second rest plane and shown respectively in the closed position and in the extended position in which the first rest plane 18 is brought to a predetermined height;
- Figure 3 and Figure 4 are relative side views respectively in the extended (i.e. hence raised) and retracted position (i.e. the closed position) as per Figure 1 and 2;
- Figure 5 shows a further axonometric view of the device, always, deprived of the second rest plane and highlights the slot 60 obtained on the first rest plane 18;
- Figure 6 shows an axonometric view of the second rest plane 200 shown from the part comprising an attachment system 100 for connecting it to the first rest plane in a removable manner; Figure 6A is a sectional view showing a step of application of said second rest plane to the slot 60 of the first rest plane 18;
- Figure 7 and Figure 8 show that the second rest plane 200 can preferably be made in two parts that are separable from and recomposable to one another, for example for easier transportability and reduction of overall dimensions;
- Figure 9 shows the solution of the device on which the second rest plane is fixed, above the first rest plane;
- Figure 10 shows a further accessory 300 which is in the form of a sheet 300 bent like a V and which is applied to cover the slot obtained in the first rest plane; its function is to generate a stable rest plane for objects to be moved with the first rest plane;
- Figure 11 shows the only accessory 300 of Figure 10 to better highlight the conformation thereof;
- Figure 12 shows an example of lifting a bidet by using the accessory 300 of Figure 10 or 11 to highlight how the conformation of the base of the bidet is such as to be complementary to the accessory, thereby fitting into the seat formed by the accessory 300 and thus being stable against overturning; this greatly simplifies the structure as no side arms are necessary as described in the prior art;
- Figure 13 shows an example of lifting another type of bidet without using the accessory of Figure 10 or 11 and therefore using the normal first rest plane seen from the flat base of the object to be lifted;
- Figure 14 shows an example of lifting a chest of drawers with the aid of the second rest plane 200 mounted on the first rest plane;
- Figures 15 and 16 further show a bottom and top view of the second rest plane 200 when mounted on the first rest plane 18;

Description of some preferred embodiments

[0056] The invention concerns a lifter device for lifting and/or moving in general objects of different shapes and/or dimensions.

[0057] The movable objects are any and can for example include bathroom sanitary fixtures such as, for example, sinks, toilets, bidets. Further movable objects include all accessories and/or furniture in general that in a home must or can be fixed at a certain height from the floor, in particular bathroom accessories such as for example bathroom furniture like chests of drawers, mirrors with storage, etc.

[0058] The objects introduced above are only exemplary and not limiting.

[0059] The invention therefore relates to a device (1) for lifting and/or moving objects in general, preferably sanitary fixtures and/or bathroom furniture, comprising:

- A first rest plane 18;
- Means adapted to move said first rest plane so that it can be positioned at one or more different heights;
- A second rest plane 200 is also comprised, which therefore forms its own rest surface.
- This rest surface has an extension area larger than that formed by the first rest plane.
- Furthermore, said second rest plane is configured to be connected, in a removable manner (i.e. separable and reconnectable) to said first rest plane, resulting above the first rest plane.

[0060] In this way, when it is necessary to move objects of such an extension that they cannot be stably positioned on the first rest plane 18, the second rest plane 200 can be easily mounted, which is fixed stably to the first rest plane, thus allowing to move objects of much larger dimensions not compatible with the original first rest plane.

[0061] A further object of the invention is the use of a device, according to what has been indicated above, to move and allow the installation of objects in general, for example sanitary fixtures such as a toilet or a bidet and/or bathroom furniture in general, such as for example a chest of drawers.

[0062] A further object of the invention is a method for

installing an object in position, the method comprising the following steps:

- Arrangement of a device in accordance with one or more of the characteristics indicated above;
- Arrangement of the object to be moved on the rest plane of the device in such a way as to lift the object to the desired height;
- And wherein the rest plane is constituted by the original first rest plane 18 of the device or by the accessory 200 constituted by the second rest plane 200, which accessory can be removably fixed to the first rest plane, for example as a function of the overall dimension of the object to be moved.

[0063] The invention is now described in more detail with reference to the accompanying drawings.

[0064] Figure 1 shows in axonometric view the device 1, object of the invention, at the moment deprived of its second rest plane that will be described below.

[0065] Figure 1 shows a view in which the device is closed on itself, therefore in a compacted configuration.

[0066] Figure 2 shows the device in an extended position.

[0067] Figure 2 shows the first rest plane 18 which is the one destined, directly or indirectly, to lift the loads.

[0068] This original first rest plane 18 of the device has a certain area of extension and conformation that is more or less equivalent to the plan area of the entire device, for example of rectangular or even square shape (see also Figure 1).

[0069] The device is therefore de facto formed by a rest base 10 on which the first rest plane 18 is arranged.

[0070] Between the rest base 10 and the first rest plane 18, specific means are arranged that allow the first rest plane 18 to be moved in such a way that it can be raised with respect to the rest base or lowered with respect to said rest base 10.

[0071] More particularly, therefore, the first rest plane 18 is movable with respect to the rest base 10, so that it can move away from and/or approach the rest base 10.

[0072] In essence, therefore, the first rest plane 18 can be raised and lowered with respect to the rest base 10 thereby functioning exactly as a kind of "*car jack*" to lift cars, for example in tire change operations.

[0073] Therefore, in order to allow the movement of the first rest plane 18, which can be brought to one or more different height distances with respect to the base 10, specific means are provided.

[0074] These means are in the form of a lever mechanism well represented in Figures 2 to 5 and described here below.

[0075] In particular, as shown in Figure 2, the lever mechanism comprises two couples of rods (3a, 3b) and (4a, 4b) .

[0076] Each couple of rods (3a, 3b) and (4a, 4b) is therefore formed by two rods hinged to each other into an X, as better shown in Figure 3.

[0077] In particular, Figure 3 is a side view and therefore shows the two X-hinged rods 3a and 3b around the fulcrum point 5. As clearly evident from Figures 1 and 2, a couple of twin rods (4a, 4b) is arranged on the opposite flank in such a way that the rest plane 18 is well stable.

[0078] More particularly, one couple of X-shaped rods is arranged to connect the base 10 with the first rest plane 18 to each other through a flank of said planes (10, 18) while the other couple is connected on the opposite flank of the two planes overlapped on each other, i.e. the base 10 with the first rest plane 18.

[0079] The two couples of X-shaped rods are therefore placed in front of each other in a symmetrical manner.

[0080] The hinging point 5, as can be well seen from Figure 2, is preferably in the shape of a rod 5 that therefore joins the two X-hinged couples, thereby allowing them a free rotation around the fulcrum 5 itself but giving greater stiffness to the system.

[0081] Moving to Figure 3, it is therefore clear that the kinematic mechanism provides that each couple of X-hinged rods can rotate around the rotation point 5 thereby varying the conformation of the X between a position in which the two rods forming the X tend to be almost parallel to each other in an almost vertical position with respect to the plane 10 (position of maximum lifting of the first rest plane 18) and a position in which they stretch out totally or almost totally on the plane 10 thereby bringing the plane 18 substantially into contact with the base 10 (see Figure 4).

[0082] This simple kinematic mechanism therefore allows, as per double arrow direction of Figure 3 applied to the plane 18, to lift and/or lower the first rest plane 18 with respect to the base 10.

[0083] The two couples of X-shaped rods must obviously be able to be controlled by the user, in order to be able to move them in their various positions comprised between the position of maximum lifting of the plane 18 and the position in which the plane 18 is in contact and resting on the base 10.

[0084] To this end, as better clarified below, a worm system 41 is comprised that controls a translation of a control crossbar 40 connected, at each of the two ends thereof, to an end of a rod of the X-shaped couple.

[0085] The double direction of the arrow applied to the control crossbar 40 (see Figure 2) shows its movement along the plane 10 defining the base 10 and therefore it is evident that, since this bar 40 is connected to the ends of two rods of the X-shaped couples, it can control the extension / retraction motion of said X-shaped rods.

[0086] More in particular, the rod (3a) is hinged, as per Figure 2 or 3, at an end thereof to the first rest plane 18 through the rotating fulcrum 19 while the opposite end of the rod (3a) is slidable along the base 10 through a connection thereof to the bar 40 whose end of the bar 40 is constrained in a side guide obtained on the base 10.

[0087] The rod (3b) is instead hinged at an end thereof (19') to the base 10 and the opposite end is slidable along the first rest plane 18 through a connection thereof to a

guide obtained below the plane 10 (see for example Figure 15).

[0088] The above applies to both couples of rods, i.e. also to the other couple (4a, 4b) which in a specularly mirrored manner is connected in the same way.

[0089] An end of the rod (4a) is therefore rotatably connected to the plane 18 and the opposite end is connected to the bar 40 whose end of the bar 40 is slidably movable in a side guide of the plane 10. The other rod (4b) has an end hinged to the plane 10 and the other end sliding in the guide of the plane 18 (see Figure 15) .

[0090] For the rods (3b) and (4b), on the part opposite to the hinging (19'), the connection therefore provides for a movement along the two side guides formed in the plane 18 on the part opposite to the surface of the plane 18 intended to support the load (as shown in Figure 15).

[0091] The two X-hinged couples can be opened or closed like a pair of scissors thanks precisely to the ease of movement of the ends of the rod (3a) and (4a) that are slidably mounted in the guide of the base 10 through the crossbar 40 and, in the same manner, the ends of the rods 3b and 4b that are movable in the upper guides of the first plane 18.

[0092] Figure 3 clarifies de facto the kinematic mechanism showing the double arrow direction applied to the rod end (3a) at the base 10 and to the rod end (3b) at the first rest plane 18. The same happens for the rods (4a) (4b) placed in front of the previous ones and therefore not visible in side view because they overlap (3a), (3b).

[0093] An end-of-stroke can fix the maximum sliding range of the rods in the aforementioned guides, always guaranteeing good stability against overturning of said device described.

[0094] The forward or backward movement of the rod 40, as mentioned, is controlled within a range of excursion (for example limited by end-of-strokes as mentioned) through a system with threaded screw 41 that engages in a relative threaded hole of the rod 40.

[0095] The threaded screw 41 can be controlled in rotation by the operator through a specific knob 13', also shown in Figures 3 and 4. The screw is fixed, on the part of the knob 13', to the base 10 in such a way as to be able to rotate in an idle manner while remaining stationary in position (see for example Figure 4). The rotation of the threading, however, at this point cause the forward or backward movement along the plane defined by the base 10 of the bar 40 with consequent pulling of the two rod ends (3a, 4a) that connect to it. This results in a scissor-like opening or closing motion of the two couples of X-shaped rods around their hinging point 5.

[0096] It can be well seen in Figure 2 that the rod 40 has a sliding motion defined by two end-of-strokes that are the end of the base 10 on one part and a block on the opposite part, thus giving the X-shaped rods an opening/closing motion that is limited by these end-of-strokes.

[0097] In the first rest plane 18 it is also not necessary to structurally have an end-of-stroke, since this is de facto determined in itself by the end-of-stroke of the base 10. Furthermore, the control of the screw kinematic mechanism 13 is only present in the base 10 and can be implemented manually or with a specific mechanism.

[0098] In this way, de facto, the operator only has to drive the rotation of the knob 13', thereby causing a lifting or lowering motion of the plane 18 with respect to the base 1 depending on the direction of rotation of the knob.

[0099] Rotating the knob 13' therefore results in the rotation in one or the other direction of the threaded screw 41 which, by engaging in a threaded hole of the bar 40, causes a translation motion of the rod 40 in one or the other direction opposite to the previous one as a function of the direction of rotation of the threaded rod 41.

[0100] In the preferred solution, as shown in Figure 2, both ends of the rod 40 comprise a rolling body, for example a wheel, placed in the guide obtained in the base 10 (the same may apply to the plane 18 in which the wheel is directly connected to the end of the X-shaped rod). The ends of the rods 3a and 4a are fixed in abutment between the bar 40 and the rolling body. The rotation of the rolling body facilitates the sliding of the bar 40 and, consequently, facilitates the lifting and lowering movement of the first rest plane.

[0101] The same applies to the plane 18 where the wheel favours the sliding.

[0102] The base 10 can also be provided with wheels for its movement as well as with fixed rest points. The wheels are preferably rotatable about their point of fixing to the frame.

[0103] As well shown in Figure 5, in accordance with the invention, the first rest plane 18 now comprises a slot 60 in the form of a U-shaped notch, for example. The slot is therefore a removal of material that creates a sort of through opening, in the case of the example U-shaped.

[0104] This slot serves to allow a second rest plane 200 to be coupled, in a separable or removable manner, whatever it may be called.

[0105] The second rest plane 200 is well highlighted in various figures such as for example Figure 6 or Figures 7-9.

[0106] It is preferably made in two halves that are quickly separatable from and recomposable to one another. For this purpose, for example, Figure 8 and Figure 7 show two halves 201 and 202 separated from each other and provided with quick-connection means that allow to quickly couple the two halves 201 and 202 in order to obtain the final conformation as per Figure 6 or Figure 9.

[0107] Figure 7 shows the two halves on the part that in use is facing and hooks to the plane 18 while Figure 8 shows the part of the two halves that are intended to support the load and therefore on which the load rests.

[0108] The quick-connection means (203, 204) may simply provide, for example, one or more pins 203 emerging from one part (201, 202) and that fit into channels obtained on the other part. The pins can be one or more than one, for example in the form of rods welded or fixed

to one of the two parts and extending beyond the surface of the part itself, so that the exceeding part can penetrate a channel present in the other part and for example obtained through a specific hollow tubular piece fixed to the part in question (see for example Figure 7 and Figure 8).

[0109] In all the cases above, the advantage of realizing the second rest plane 200 in the form of at least two or more parts that are composable to one another, hence separable and reassemblable, is to greatly compact the overall dimensions and facilitate transport.

[0110] For example, the preferred solution may provide for the realization of the second rest plane 200 in two halves that join together for example through the quick-connection means (203, 204) preferably in the form of those of Figure 7.

[0111] In this way, at the end of use, the second rest plane can be disassembled by arranging the two halves (201, 202) stacked together on the plane 18 and therefore compacting the device for transport.

[0112] As can be seen from Figure 8, moreover the two or more parts constituting the second plane 200 can be provided with a through opening 205 that forms a handle that facilitates gripping and movement.

[0113] The second rest plane, i.e. its parts composing it, can be made, for example, of bent and/or welded sheet metal.

[0114] Figures 7 and 8, as mentioned, show very well the two separable parts by which the second rest plane can be constituted and with quick-connection means that allow it to be easily assembled.

[0115] For example, the solution of Figure 7 or 8 shows channels 204 (three in total) obtained in a part of the second rest plane adapted to receive pins or bars 203 (three in particular) coming out from one side relative to the other part. In this way, simply by bringing the two parts closer together, the pins (or bars) penetrate the channels, realizing a stable union.

[0116] In addition to the above, said second rest plane 200 further comprises suitable connection means that cooperate with the U-shaped slot 60 introduced before and for example visible in Figure 5, in order to allow to removably connect said second rest plane 200 with the original first rest plane 18.

[0117] In particular, the second rest plane is fixed above the first rest plane, as schematically shown in Figure 9.

[0118] This allows, as evident from Figure 9, to be able to expand the active rest area relatively to the plane 200 for lifting large objects, thereby being able to also move objects that are varied with respect to each other, with different overall dimensions and above all with considerably larger overall dimensions than the rest area provided by the plane 18.

[0119] As shown in Figure 6, the removable connection system may for example provide a plate 100 having two bent wings 101 and 102 respectively which engage slidingly below the U-shaped slot.

[0120] In fact, the U-shaped slot forms two flanks 61 that are thus positioned in an interposed manner (therefore comprised) in the space defined by the wings (101, 102) and the plane 200 realizing a sliding block.

[0121] Figure 6A in fact schematizes the plate 100 fixed to the second plane 200 to highlight the wings 101 and 102 that form the sliding channel within which an edge 61 of the slot fit into each one by sliding.

[0122] In a very simple way, therefore, it would be possible to couple the second rest plane 200 with the first rest plane 18 simply by taking care to slide the second rest plane on the first rest plane, thus bringing the wings 101 and 102 to slide under the flanks 61 of the slot in such a way as to constrain, with a certain degree of interference, the flanks 61 in the space comprised between the plane 200 and the wings.

[0123] The degree of sliding interference can be adjusted according to the needs of the expert in the field by carrying out the appropriate sizings.

[0124] In this way, a simple sliding movement in one direction or in the opposite direction can allow the connection or the separation of the second rest plane with the first rest plane.

[0125] As shown in Figure 7, also the plate 100 is made in two halves and one of which is connected, for example by welding, to one half of the second plane 200 and the other connected to the other half of the plane 200 and with shapes such that the coupling of the two halves completes totally the plane as per Figure 6.

[0126] In use, therefore, it is possible to lift objects at any desired height, obviously in a manner limited to the dimension of the device described herein and therefore to its maximum lifting possibility.

[0127] In the event that the object has a considerable overall dimension and the rest base provided by the first rest plane 18 is not sufficient to guarantee the stability of the same, then the accessory constituted by the second rest plane 200 can be fixed to the first rest plane.

[0128] The accessory is preferably made of two separable halves so that, once composed, it can be fixed above the first rest plane.

[0129] The fixing preferably takes place by simple sliding through the plate 100 that is constrained to the slot 60 but other removable locking systems, for example snap or other (even magnetic) nature systems would be possible.

[0130] The invention also includes a further second accessory shown separately in Figure 11 and in the form of a second plate 300 (or bent metal sheet 300) bent into a V. The metal sheet (or second plate whatever it may be called), with such a conformation, is configured to be able to be applied to partially cover the slot 60, as shown in Figure 10. In this way, the slot is not passing through but is closed by this metal sheet which, being V-shaped, forms a containment receptacle.

[0131] This is particularly useful and gives stability in the case of resting on the plane 18 a bidet or a sanitary fixture that has a rounded rest base and with a dimension such as to fit into the slot 60.

[0132] Figure 12 in fact shows this case in which it is well highlighted that the base of the bidet fits into the slot 60. The V-bent metal sheet 300 prevents the penetration of the base of the bidet into the slot from being excessive, thus preventing the bidet from accidentally touching the lifting/lowering lever mechanisms. However, the V-conformation makes sure that a part of the base of the bidet (or of the object in general) is below the plane 18 and surrounded by the edge of the sheet 300, thereby forming an accommodating niche that keeps the bidet in a stable position.

[0133] Figure 13 instead shows the case of an object, in this case a bidet, with a flat base which therefore rests entirely on the plane 18. In this case, the accessory 300 is not necessary.

[0134] Finally, Figure 14 shows the case of lifting an object of such a wide area that the removable application of the second rest plane 200 is necessary, which is fixed on the first rest plane.

[0135] At the end of use, the second rest plane can be removed and, if made in two parts, can be separated and easily transported also thanks to the handles 205.

Claims

1. A device (1) for lifting and/or moving objects in general, preferably sanitary fixtures, comprising:

   - A first rest plane (18) to be able to support one or more objects;
   - Means adapted to move said first rest plane so that it can be positioned at one or more different heights;
   - **Characterized in that** there is comprised a second rest plane (200) having a surface, on which in use one or more objects can be rested, the extension of which is larger than the extension of the first rest plane, said second rest plane being configured to be able to connect, in a removable manner, with said first rest plane and being positioned above said first rest plane.

2. The device (1) according to claim 1, wherein connection means (100) are comprised to allow to connect said second rest plane (200), in a removable manner, above said first rest plane (18).

3. The device (1) according to claim 2, wherein said connection means (100) comprise a sliding coupling system (100).

4. The device (1), according to one or more of the preceding claims, wherein said sliding coupling system (100) comprises a plate (100) fixed to a face of the second rest plane opposite to the face intended to receive in use the object to be moved, and wherein said plate forms two wings (101, 102) that are spaced from the face to which said plate is connected, so as to form two sliding corridors, in each sliding corridor respectively there being inserted a flank (61) of a slot (60) obtained in the first plane (18).

5. The device (1), according to one or more of the preceding claims, wherein said second rest plane (200) is formed by two or more parts that are decomposable from and recomposable to one another to form said second rest plane.

6. The device (1) according to claim 5, wherein quick-connection means (203, 204) are comprised which are adapted to allow said two or more parts forming said second rest plane (200) to connect to each other in a removable manner in such a way as to be able to compose or decompose said second rest plane.

7. The device (1) according to claim 1, wherein said means adapted to move said first rest plane comprise an articulated lever system.

8. The device (1), according to one or more of the preceding claims, wherein said first rest plane (18) forms a slot (60) and wherein it is further provided an accessory (300) in the form of a plate (300) insertable to at least partially close the slot and conformed to generate an accommodating niche, preferably the plate having a V-conformation.

9. The use of a device, according to one or more of the preceding claims, to move and allow the installation of objects in general, preferably such objects being sanitary fixtures such as toilets, bidets or furniture, for example bathroom furniture such as for example chests of drawers.

10. A method for installing an object in position, the method comprising the following steps:

    - Arrangement of a device according to one or more of the preceding claims;
    - Arrangement of the object to be moved on the rest plane (18, 200) of the device in such a way as to lift the object to the desired height;
    - And wherein the rest plane is constituted by the original first rest surface (18) of the device or by the accessory constituted by the second rest surface (200) which can be removably fixed on the first rest surface as a function of the overall dimension of the object to be moved.

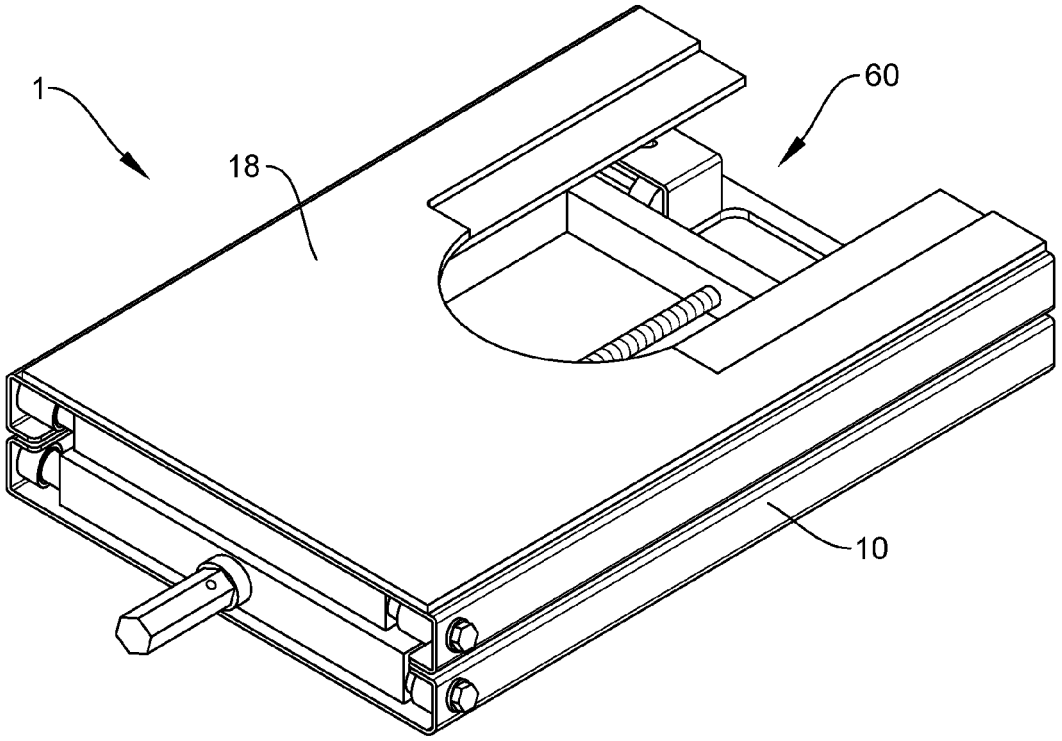
1
18
60
10

FIG. 1

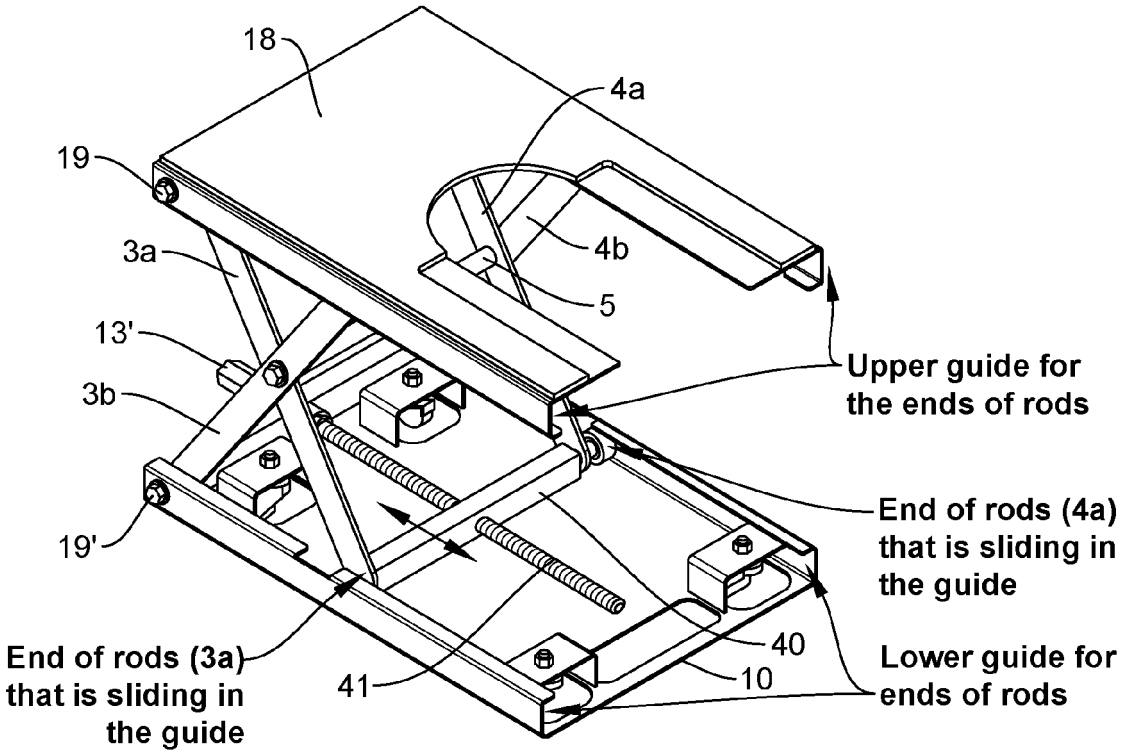
18
4a
19
4b
3a
5
13'
Upper guide for the ends of rods
3b
End of rods (4a) that is sliding in the guide
19'
40
Lower guide for ends of rods
End of rods (3a) that is sliding in the guide
41
10

FIG. 2

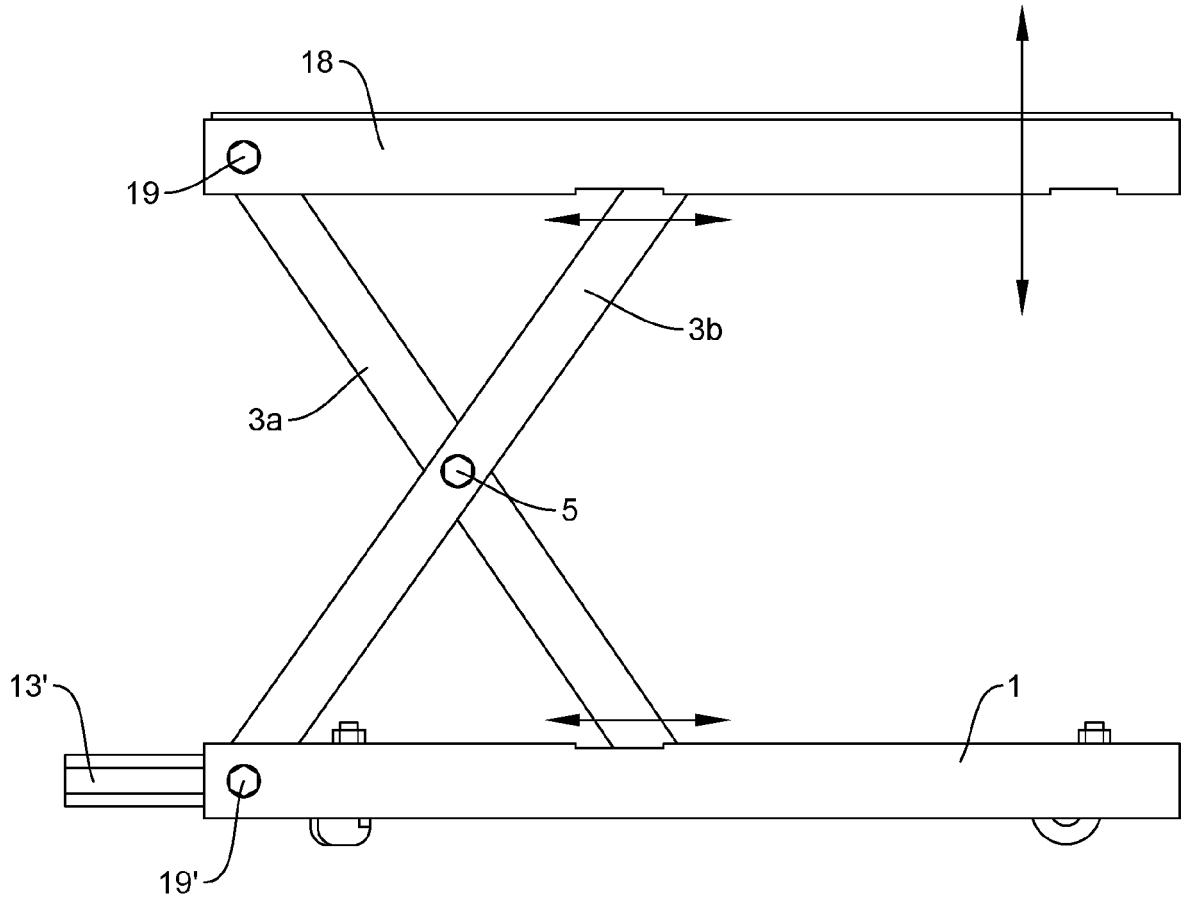

FIG. 3

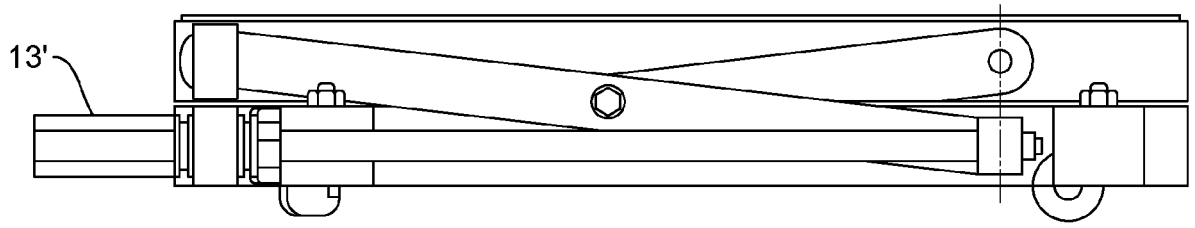

FIG. 4

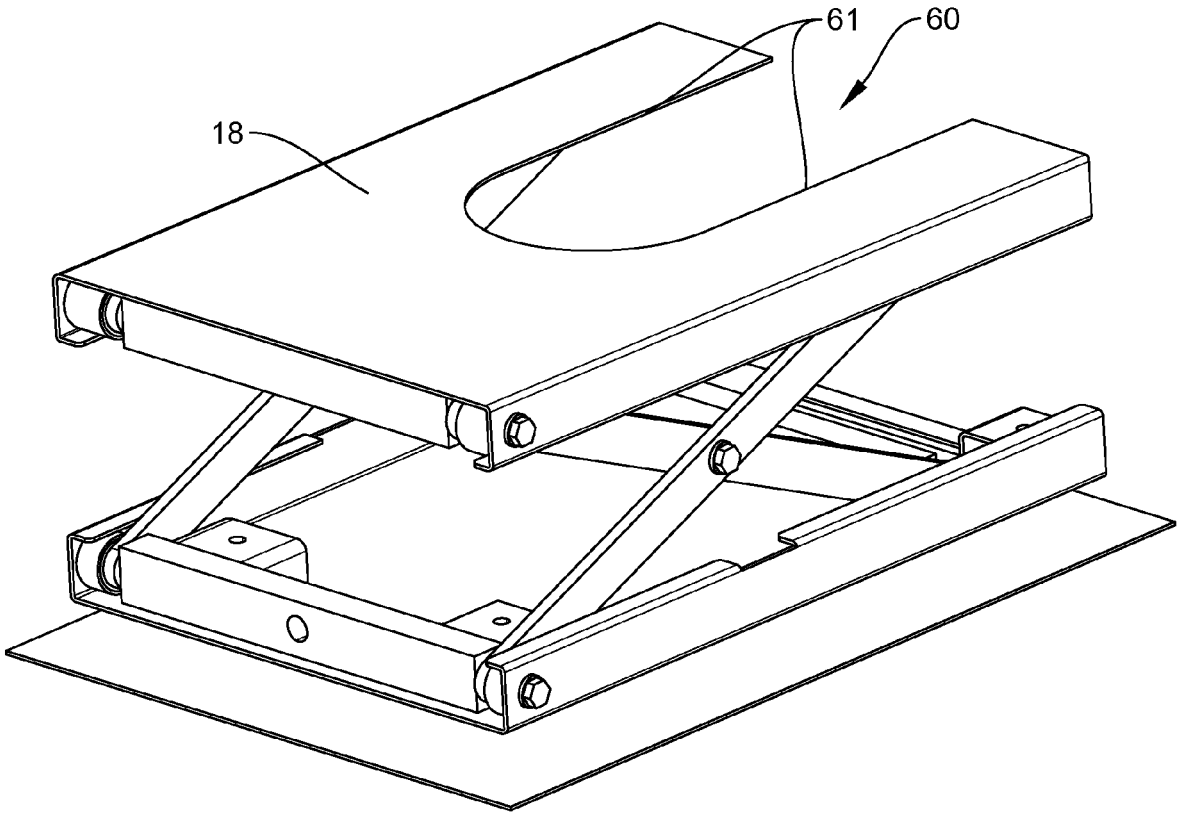

FIG. 5

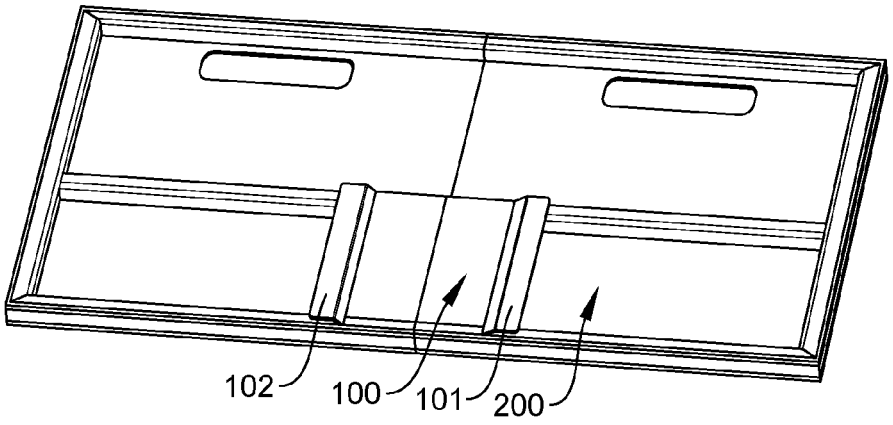

FIG. 6

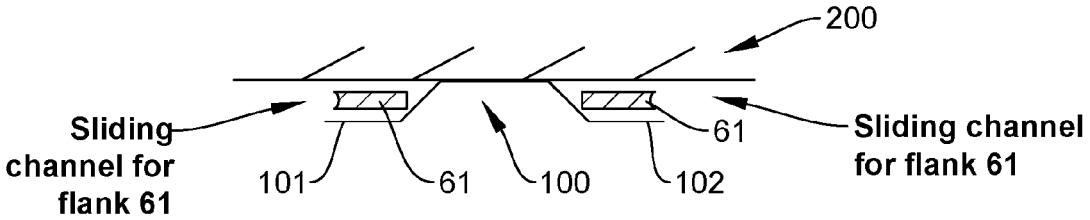

FIG. 6A

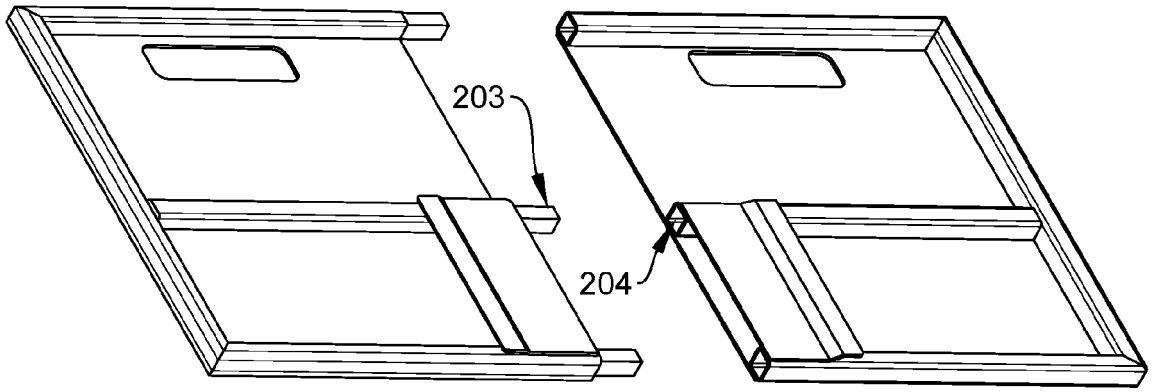

FIG. 7

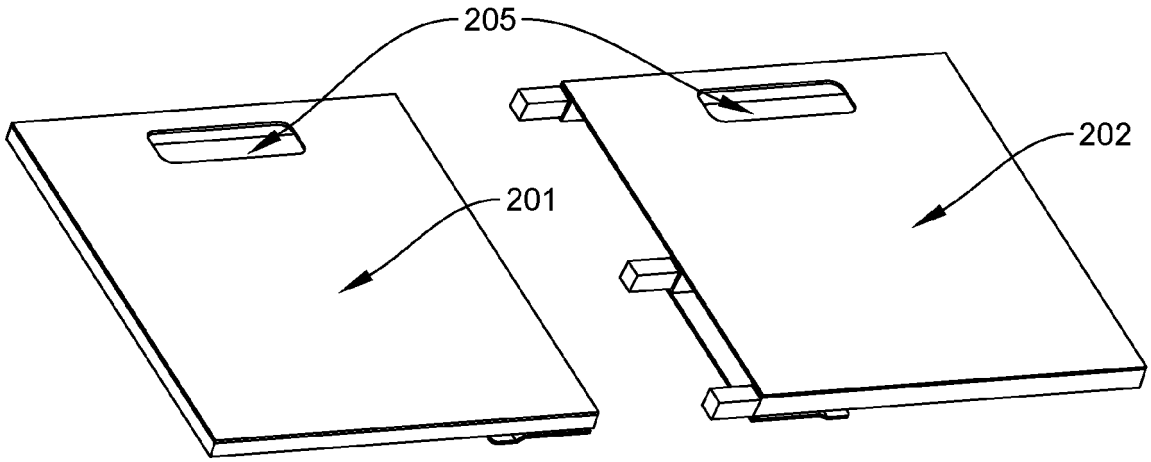

FIG. 8

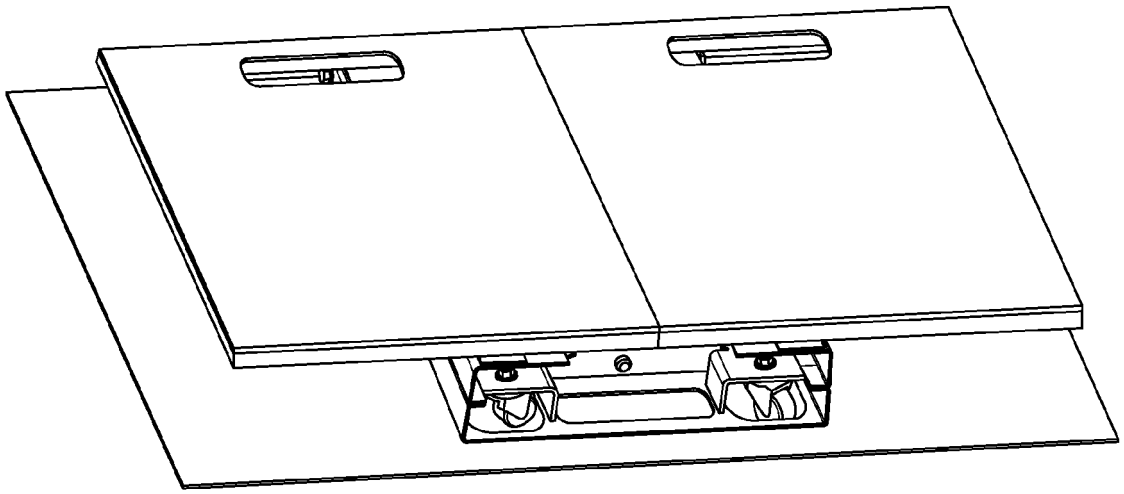

FIG. 9

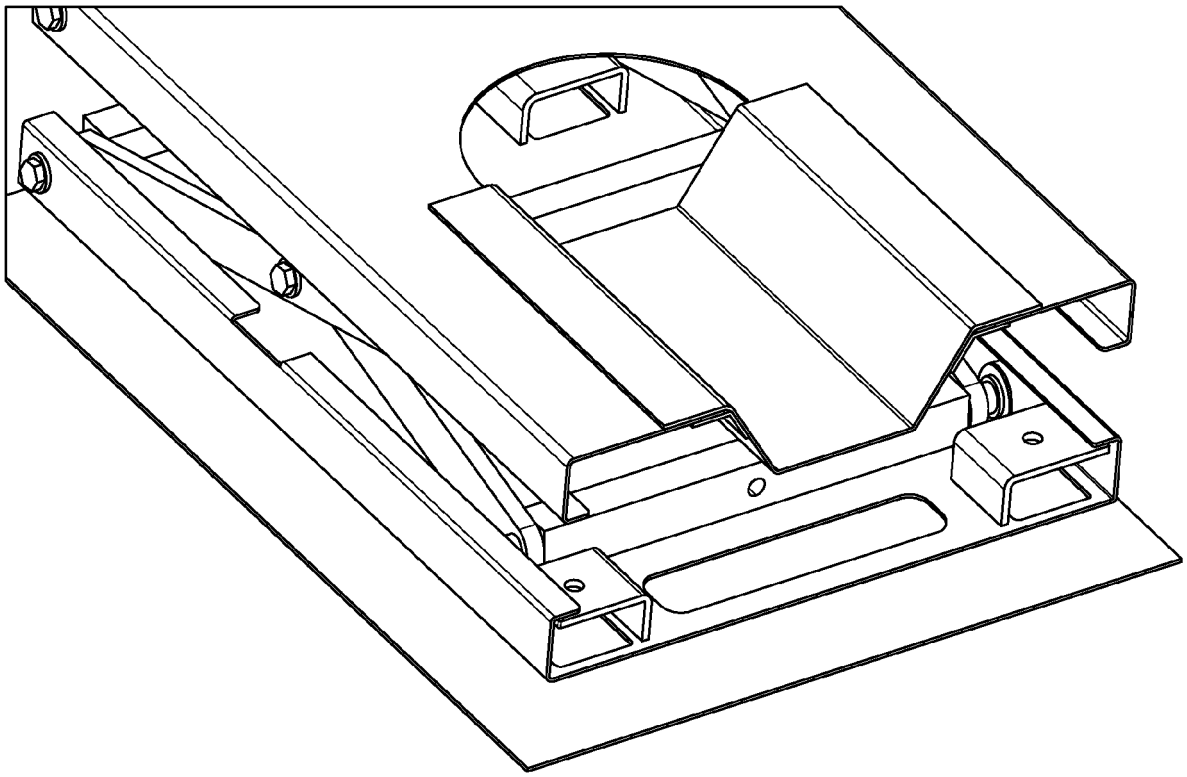

FIG. 10

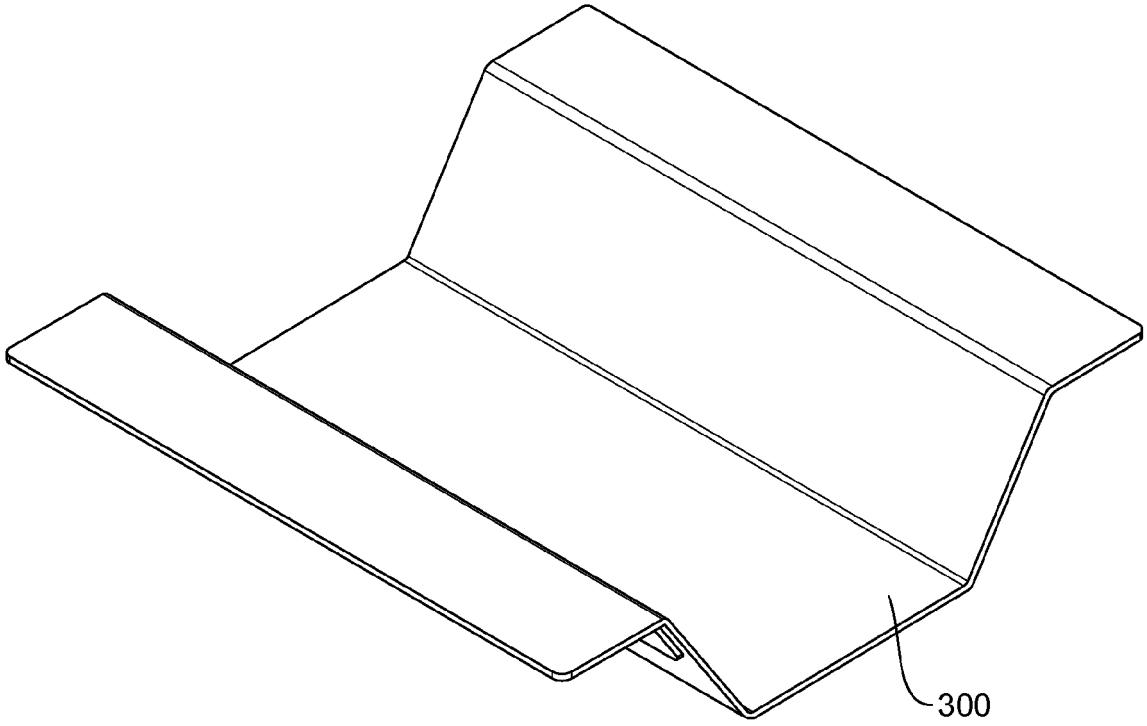

FIG. 11

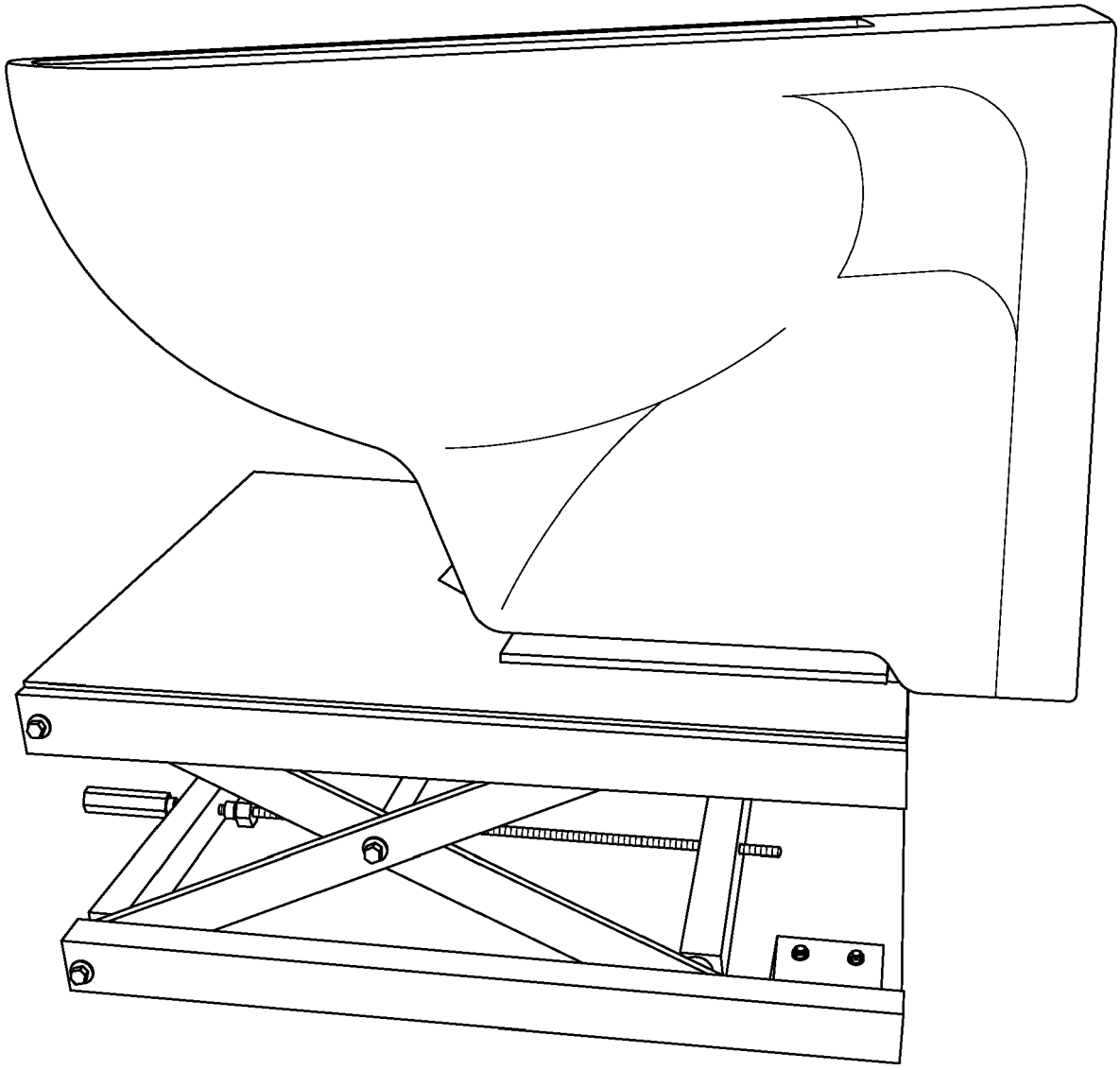

FIG. 12

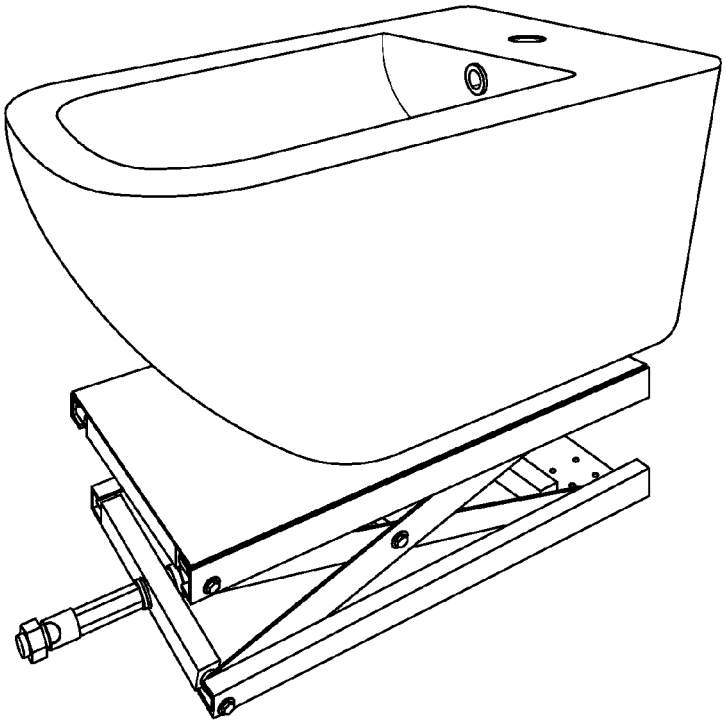

FIG. 13

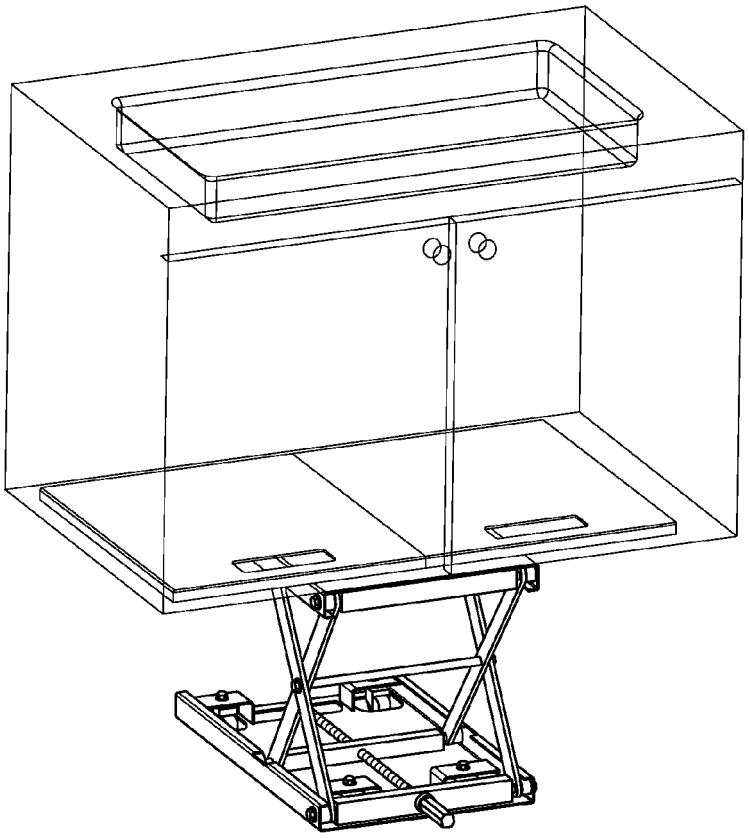

FIG. 14

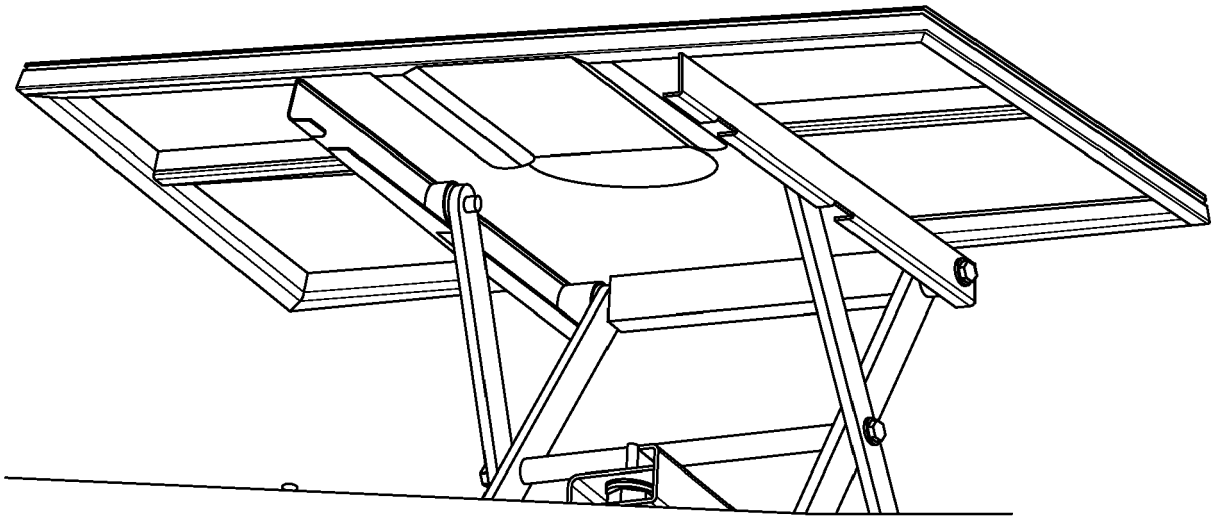

FIG. 15

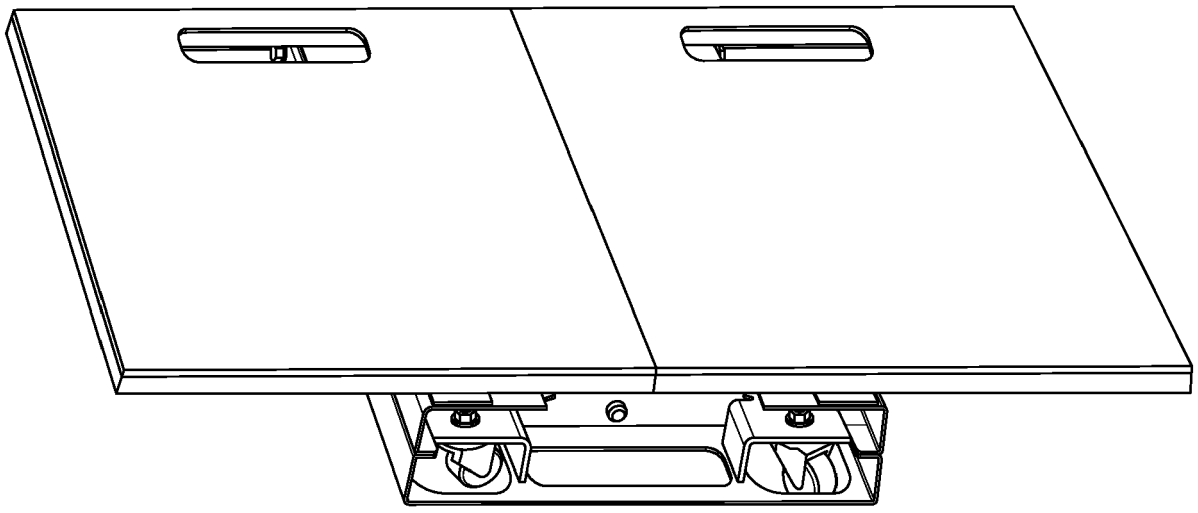

FIG. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 2788

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 106 744 496 A (SUZHOU HANNOVER LIFTING MACHINERY CO LTD) 31 May 2017 (2017-05-31)	1,2,7,9, 10	INV. B66F7/28
A	* the whole document *	3-6,8	
A	DE 10 2013 202985 B4 (PALLAUF HERBERT [DE]) 3 June 2015 (2015-06-03) * abstract *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 April 2024	Serôdio, Renato

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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27-04-2024

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CN 106744496 A	31-05-2017	NONE	
DE 102013202985 B4	03-06-2015	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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- DE 102013202985 **[0011] [0017]**