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(54) **GYMNASTIC APPARATUS FOR THE EXECUTION OF BODYWEIGHT EXERCISES**

(57) The invention relates to an apparatus for performing bodyweight exercises, such as dips and pull ups, comprising a straight guide (10) fixed vertically on a vertical wall (2), a first slider (20) sliding on the straight guide and lockable in different positions by means of a locking mechanism acting on the straight guide, an U-shaped equipment (30) comprising two substantially parallel arms joined together at one end with a connecting element; the equipment is mounted via the connecting element to the first slider. The U-shaped equipment (30) is rotatable relative to the first cursor (20) between a working position where the two arms are located on a horizontal plane and a resting position where the two arms are located on a vertical plane parallel to the vertical wall (2) and further the equipment stops in the two above-mentioned positions.

The object of the present invention is to provide a complete exerciser apparatus resealable, compact in size, not cumbersome and economic.

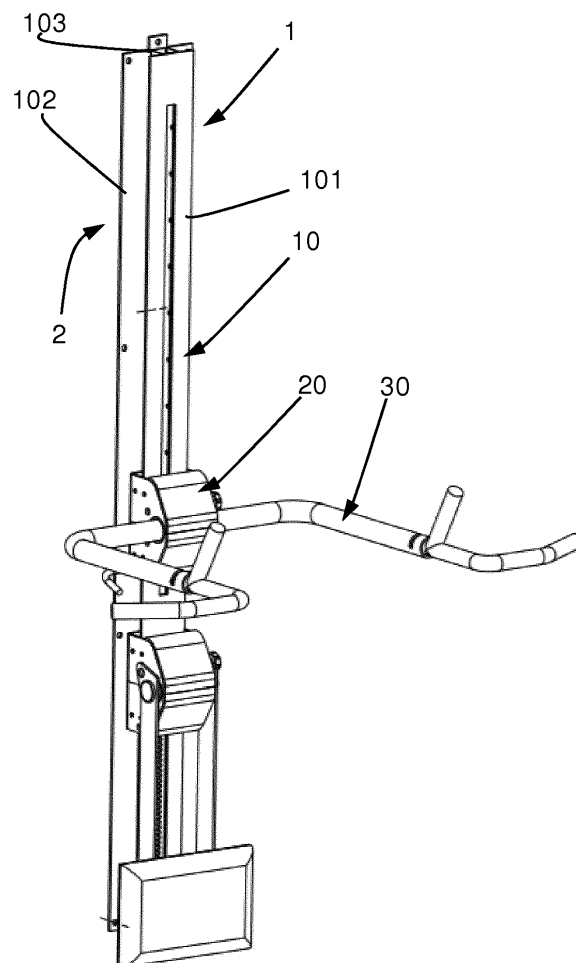


Fig. 1B

Description

Technical field

[0001] The present invention relates to the technical field of exercise equipment.

[0002] In particular, the invention relates to an apparatus for performing bodyweight exercises such as dips, pull ups, chin ups, in the variants close grip and wide grip and leg raises on dip bars and reverse crunch on dip bars.

State of the art

[0003] To perform a dip, the exerciser is positioned between two parallel bars holding them firmly with both hands. These bars are typically part of a structure called dip station, which includes a frame supported on the floor, on which are rigidly fixed parallel bars.

[0004] Pull-ups is a bodyweight exercise that consists of lifting his own body remaining fixed with the hands to a bar. Depending on the grip you choose (prone, reverse, wide, close, etc..), different muscles are stimulated. The bar can be a continuous rod fixed at its ends, or may be constituted by two separate handles fixed on a dedicated structure. The length of the bar, the distance and the inclination of the handles allow the execution of pull-ups with different grips to stimulate more or less different muscles. The bar or the handles for the pull ups may be mounted on a dedicated structure or as accessories of other equipment.

[0005] In the leg raises on dip bars and reverse crunch on the dip bars the exerciser stay suspended on the parallel bars with elbows and forearms resting on them. The hands grab directly the parallel bars or handles fixed at the end of the parallel bars.

[0006] It is known in the art apparatus which allow to adjust the positioning height of the parallel bars, moving them, individually or together with a connection element, along a column fitted with locking positions. With this solution it is possible to adapt the height of the parallel bars to the user and further, positioning them to an appropriate height, may also be used to perform some of pull-up exercises.

[0007] To facilitate the movement in the back lifting both in dips that in pull-ups are known devices, so-called easy power station, equipped with a platform whose thrust force is adjustable with counterweights. The easy power station allows a facilitated execution of the exercises, useful for beginners, women or overweight persons. Some easy power station impose execution upright, while others in the kneeling position. In this structure the platform is connected with a weight stack via a pulley or a lever.

[0008] It is then known complete apparatus that on the frame itself include both the parallel that the bar and/or the handles for pull-ups.

[0009] In the last few years they have catch on the so-called multi-station, which are modular structures com-

posed of more metal portals connected to each other and provided with numerous accessories and with the possibility of attaching different equipment. Along the columns of these portals it can be fixed, at different heights, U-shaped equipment for the execution of dips and pull-ups.

[0010] Document DE10041951A1 shows a multi station consisting of a frame comprising more columns on which different equipment are fixed. In particular, the U-bar 19 serves the execution of body lifting and is adjustable in height by means of a sleeve 18 slidably mounted on a column 32 and lockable in different positions. The bar 19 can also be rotated and locked in two different horizontal positions, one external to the frame in the using phase and one internal to the frame in the resting phase and/or during transport.

[0011] Document US2014/0031182A1 shows a training station consists of a column 3 fixed to a wall 1. On the column can slide and be fixed, at various heights, different equipment, among which a bar for the pull-ups 9 and a tool for the dips 6 on which are fixed the plates 15 and the backrest 5 for the execution of leg raises on dip bars and reverse crunch on dip bars.

[0012] American patent US6217483B1 shows an apparatus for performing dips and pull-ups exercises. The apparatus comprises a base 101 and a vertical column 10 connected to the base. A sliding element 110 surrounds the column and is slidable from a lower position to a top of the column and is lockable in different positions on the column. For the execution of the exercises are provided two handles 80, 82 fixed to a horizontal support bar 28, the latter connected to the element 110 sliding above. In an embodiment (figures 19 and 20) the column is fixed to the floor by a horizontal bar and to the wall by means of vertical plates.

[0013] Document FR2892638A1 shows an apparatus for the execution of dips, leg raises on dip bars and reverse crunch on dip bars, constituted by two articulated bars 5 and a backrest 2 fixed to a wall. The bars 5 can be individually pivoted downwards in a resting position.

[0014] The apparatus and equipment for the execution of bodyweight exercises such as dips, pull ups, chin ups, leg raises on dip bars and reverse crunch on dip bars, known in the state of the art, have the limits of being bulky, expensive, with complicate or absent adjustment, and/or to allow the execution of only a limited type of exercises.

Objects and summary of the invention

[0015] The object of the present invention is to provide a complete exerciser apparatus resealable, compact in size, not cumbersome and economic that allows the execution of bodyweight exercises such as dips, pull ups, chin ups, in the variants close grip and wide grip and leg raises on dip bars and reverse crunch on dip bars.

[0016] A further object of the present invention is to allow a simple and rapid adjustment of the said apparatus.

[0017] A further object of the present invention is to offer the possibility to perform pull-ups exercises with more grips, and to change the position of the grips in a quick and easy way.

[0018] A further object of the present invention is to enable an assisted execution of dips and pull-ups exercises.

[0019] These and other objects are obtained by the present apparatus according to claim 1.

[0020] The apparatus comprises:

- A straight guide fixed vertically on a vertical wall,
- A first slider sliding on the straight guide and lockable in different positions by means of a locking mechanism acting on the straight guide,
- An U-shaped equipment comprising two substantially parallel arms joined together at one end with a connecting element; said equipment being mounted via said connecting element to the first slider.

[0021] According to the invention, the U-shaped equipment is rotatable relative to the first cursor between a working position where the two arms are located on a horizontal plane and a resting position where the two arms are located on a vertical plane parallel to the vertical wall and further the equipment stops in the two above-mentioned positions.

[0022] In this way during the execution of the exercises the U-shaped equipment is placed on a horizontal plane, allowing the exerciser to be placed between the two arms and to perform dips, leg raises and reverse crunch or, by bringing the U-shaped equipment to an appropriate height and locking it via the locking mechanism, to perform the pull-ups by gripping one or both arms with both hands. When the apparatus is unused, the U-shaped equipment is rotated in the resting position, substantially parallel to the vertical wall, leaving a reduced residual encumbrance, slightly greater than that of the straight guide.

[0023] Advantageously, the first slider is constituted by two half-frames, symmetrical with respect to a horizontal plane, which, when mounted together, give origin into their internal to the support of the U-shaped equipment. This solution allows to keep the rotation and stopping mechanisms of the U-shaped equipment enclosed within the first cursor, avoiding possible injuries of the exerciser during the movement of the U-shaped equipment.

[0024] Advantageously, the locking mechanism of the first slider with respect to the straight guide is constituted by hook-shaped element that can be rotated by means of a handle and hooked to pegs distributed along the straight guide. In this way the locking of the slider, and consequently of the U-shaped equipment, is simple, fast and intuitive.

[0025] Advantageously, the parallel arms of U-shaped equipment each comprises a handle formed by several attachments. The handles are rotatable relative to the arms, placing the attachments in several positions, al-

lowing to perform various grips of pull-ups.

[0026] Advantageously, the U-shaped equipment arms comprise a semi-circumferential groove formed on their outer surface and the handles comprise an abutment sliding into the groove. In this way the rotation of the handle relative to the arm is guided in a simple way and the two extreme positions of the groove guarantee the correct positioning of the handles in order to be able to perform pull-ups with different grips.

[0027] Advantageously, an assisted lifting mechanism is slidably mounted on the straight guide and comprises a platform rotatable between a working position on a horizontal plane and a resting position substantially parallel to the vertical wall. The assisted lifting mechanism of the exerciser's body is vertically supported by an elastic element. With the assisted lifting mechanism, the exerciser can download part of its weight on the platform, reducing the load to be lifted and the needed effort. When the assisted lifting mechanism is unused the platform is rotated to the resting position parallel to the vertical wall, leaving a reduced residual encumbrance, slightly greater than that of the straight guide.

[0028] Advantageously, on each of the two arms are fixed two supports for the forearms of the exerciser and on the first slider is fixed a backrest. The exerciser can stay, with shoulders to the straight guide, leaned on the backrest with his back, and keeping suspended with the forearms on the supports of the arms, perform leg raises and reverse crunch.

Brief description of the drawings

[0029] Further characteristics and advantages of the present apparatus according to the invention, will be clearer with the following description of an embodiment thereof, exemplifying but not limitative, with reference to the accompanying drawings, in which:

- Figs. **1A**, **1B** and **1C** show the apparatus according to an embodiment of the present invention, with the U-shaped equipment in the resting position and in the working position at two different heights.
- Figs. **2A** and **2B** show the detail of the connection between the first slider and the straight guide according to the embodiment.
- Figs. **3A**, **3B** and **3C** show the detail of the first slider according to the embodiment.
- Figs. **4**, **5A-5B** and **6A-6B** show the detail of the connection between the U-shaped equipment and the first slider according to the embodiment.
- Figs. **7A-7B** and **8** show the detail of the block mechanism of the U-shaped equipment on the first slider.
- Figs. **9** and **10A-10B** show the detail of the locking mechanism of the first slider on the straight guide according to the embodiment.
- Figs. **11A-11B** and **12** show the detail of the handles and the handles adjustment mechanism according to the embodiment;

- Figs. **13A-13C** and **14A-14B** show the detail of the assisted lifting mechanism in accordance with the present invention.
- Fig. **15** shows the detail of the U-shaped equipment, provided with the supports for the execution of leg raises on dip bars and reverse crunch on dip bars according to the present invention.

Description of one embodiment

[0030] Figs. **1A**, **1B** and **1C** show the apparatus according to an embodiment of the present invention, with the U-shaped equipment in the resting position and in the working position at two different heights.

[0031] The apparatus (**1**) comprises a straight guide (**10**) that is vertically fastened on a vertical wall (**2**), which can be a wall or a column, preferably in masonry or metal. The vertical straight guide (**10**) has a H-shaped cross section with the flanges (**101a**) constituted by two rectangular sheets (**101**, **102**) connected in parallel to each other by a web (**103a**) consisting of a pair of plates or a section bar (**103**), preferably square or rectangular. The two rectangular sheets are one external (**101**), far from the vertical wall (**2**) and one internal (**102**), fixed to the vertical wall (**2**). Along the straight guide (**10**) slides a first slider (**20**), on which is mounted the U-shaped equipment (**30**).

[0032] Figs. **2A** and **2B** show the detail of the connection between the first slider and the straight guide in accordance with the invention. The first slider (**20**) has a C-shaped section (figs. **2C**, **2D**), in a horizontal plane when the first slider is mounted on the guide, with a side (**201s**) parallel to the vertical wall (**2**), the ends of which branch off in two sides (**202S**) parallel to each other, which terminate each with two ends (**203S**) that lie on a plane parallel to the vertical wall (**2**). Fig. **2E** shows the three-dimensional view of the connection between the first slider (**20**) and the straight guide (**10**). The side (**201s**) belongs to a plate (**201**) of the first slider (**20**) which is located on the opposite side of the vertical wall (**2**) relative to the outer rectangular sheet (**101**). The two parallel sides (**202S**) of the C-shaped section extend vertically in two sides (**202**), parallel among them and orthogonal to the vertical wall (**2**), which embrace externally the flanges (**101a**) of the outer rectangular sheet (**101**). The two ends (**203S**) extend vertically in two sides (**203**), which close towards the web (**103a**) of the straight guide (**10**). On the sides (**202**) and the ends (**203**) are mounted sliding elements (**202c**, **203c**) of the first vertical cursor (**20**) on the straight guide (**10**), which preferably are wheels or simple rolling bearings (figs. **2B**, **2D**, **2E**). On the sides (**202**) are mounted in pairs and counterposed, one on the inside and one on the outside of the two flanges (**101a**) of the external rectangular sheet (**111**), four pairs of sliding elements (**202c**), two pairs on the same horizontal plane and two pairs vertically shifted relative to the first two. On these sliding elements (**202c**) acts the torque around a horizontal axis parallel to the vertical wall, generated by

the exerciser's weight applied on the U-shaped equipment ends (**30**). Since the sliding elements (**202c**) of a single pair, are mounted counterposed, they also absorb the possible unbalancing torque around a vertical axis.

To take account also of the possible unbalancing torque around a horizontal axis orthogonal to the vertical wall (**2**), the sliding elements (**203c**), mounted on the sides (**203**), are arranged in pairs and counterposed along the web (**103a**) of the straight guide (**10**).

[0033] Figs. **3A**, **3B** and **3C** show the detail of the first slider in accordance with an embodiment. The first slider (**20**) is constituted by a frame (**21**) divided into two half-frames (**22**, **23**), one upper (**22**) and one lower (**23**), symmetrical relative to a horizontal plane (**221**), with reference to when it is mounted on the straight guide (**10**). Each of the two half-frames (**22**, **23**) comprises in its inside a pipe segment (**25**, **26**) sectioned in half by a plane passing through (**27**) to the axis of the pipe. The section plane (**27**) of the pipe segment lies on the plane of the connecting surface (**24**) between the two half-frames (**22**, **23**). Each of the two pipe segments (**25**, **26**) has a semi-cylindrical opening (**251**, **252**) formed on part of the side surface of the pipe segment (**25**, **26**). When the two half-frames (**22**, **23**) are assembled together, the two pipe segments (**25**, **26**) come together giving rise to a circular sleeve which acts as a support for the U-shaped equipment (**30**). The connection between the two half-frames (**22**, **23**) is obtained by the coupling between plates (**28**) fixed to each other with screws or bolts (not shown). The U-shaped equipment (**30**) comprises two arms (**31**), substantially parallel, joined together at one end with a connection element (**32**) by which the U-shaped equipment (**30**) is rotatable mounted on the first slider (**20**).

[0034] Fig. **4** shows the U-shaped equipment (**30**) according to an embodiment. In this embodiment, the arms (**31**) and the connecting element (**32**) of the U-shaped equipment (**30**) are constituted by three pipes (**311**, **321**). The two arms (**31**) are connected to the connecting element (**32**) by means of known procedures, such as welding, or are part of a single bent pipe. The pipe (**321**), which constitutes the connecting element (**32**), comprises a plate (**33**), rectangular or square, inserted and fixed into two diametrically opposite grooves (**322**) formed on the side surface of the pipe (**321**) in a central location equidistant from the two arms (**31**). The length of the plate (**33**) in the direction of the longitudinal axis of the pipe (**321**) is slightly less than the length of the semi-cylindrical opening (**251**, **252**) formed on part of the side surface of the pipe segment (**25**, **26**) of the two semi-frame (**22**, **23**). The plate (**33**) protrudes from the tube (**321**) to a defined distance.

[0035] Figs. **5A**, **5B**, **6A**, **6B**, show the detail of the connection between the U-shaped equipment (**30**) and the first slider (**20**) according to an embodiment. The connecting element (**32**) of the U-shaped equipment (**30**) is positioned in one of the two pipe segments (**25**, **26**) so that the plate (**33**) fits into the semi-cylindrical opening (**251**, **252**). When the two half-frames (**22**, **23**) are joined,

the U-shaped equipment (30) is positioned so that the arms (31) of the equipment are equidistant from the median axis of the straight guide (10). The U-shaped equipment (30) has the possibility to rotate around the axis of the sleeve, originated from the union of the two pipe segments (25, 26), between two positions imposed by the contact between the plate (33) and the semi-cylindrical openings (251, 252) of the sleeve. The two semi-cylindrical openings (251, 252) thus extend in the circumferential direction so as to stop the plate (33), and consequently the pipe (321) and the U-shaped equipment (30), in the two limit positions that are the working position, orthogonal to the vertical wall (2) and the resting position, substantially parallel to vertical wall (2). Furthermore, the U-shaped equipment (30) is constrained not to move sideways from the contact between the lateral surface (331) of the plate (33) and the lateral surface (253, 254) of the semi-cylindrical openings (251, 252) of the sleeve. Between sleeve, originated from the union of the two pipe segments (25, 26), and pipe (321) of the connecting element (32), is preferably interposed a bearing of friction material (28), divided into two parts and positioned at the ends of the sleeve, so as to generate a certain resistance to the rotation of the U-shaped equipment (30) and to slow down its descent.

[0036] In order to ensure the maintenance of the working and resting positions of the U-shaped equipment (30), on the pipe (321) of the connecting element (32) is mounted a block mechanism (34), shown in Fig. 7A, 7B and 8. The block mechanism (34) comprises a plate (341) radially fixed on the lateral surface of the pipe (321) and a mechanism comprising a pin (342), a spring (343) and a handwheel (344). The detail of the block mechanism (34) is shown in Fig. 8. The pin (342), sliding on a bush (345) fixed on the plate (341), is pushed by the spring (343) towards the lateral surface (202) of one of the two half-frames (22, 23) of the first slider (20). On the lateral surface is arranged a hole (205), in which is inserted the pin (342). In total there are two holes (205), one on each half-frames (22, 23) and positioned at 90° to each other, considering the vertex of the angle coinciding with the rotation axis of the U-shaped equipment (30). In this way, the pipe (321) of the connecting element (32), and consequently the U-shaped equipment (30), can be blocked relative to the first slider (20) in the two limit positions of working and resting (Fig. 7A and 7B). To unlock the U-shaped equipment (30) it is sufficient to pull the pin (342) out of the hole (205), using the handwheel (344).

[0037] Figs. 9, 10A and 10B show the detail of the locking mechanism (50) of an embodiment. To adjust the vertical position of the first slider (20), and consequently of the U-shaped equipment (30), along the straight guide (10), the first cursor (20) is slidable on the straight guide (10) and is lockable in different positions by means of a locking mechanism (50). The locking mechanism (50) comprises a hook-shaped element (51) rotatable fixed on the first slider (20) by a pin (52) and a rotation lever (53). The vertical straight guide (10) comprises a longi-

tudinal opening (103) on the side which faces the first slider (20) and which extends towards the inside of the vertical straight guide (10) by cutting the external rectangular sheet (101) and part of the section bar (12). A series of pegs (13), fixed on the side walls of the section bar (12), is distributed at regular distances along the opening (103). The hook-shaped element (51) is anchorable on the pegs (13) as a result of its rotation (Fig. 10A and 10B). In other solutions instead of the pegs distributed inside the section bar, the supports for the hook-shaped element can be obtained by practicing windows distributed along the guide, that open both the external rectangular sheet that the section bar, creating the supports for the hook-shaped element. In still other solutions, the locking system can be the classic pin that fits into a series of holes distributed on the surface of the straight guide and kept in position by an elastic element.

[0038] To slow down the descent of the first slider (20) and to facilitate its ascent, it is provided to connect it by means of a spring or, preferably an elastic band, to the straight guide (10). In Fig. 2C and 2E it is shown the solution in accordance with an embodiment. Inside the first slider (20), in correspondence with the plates (28) for the assembly of the two half-frames (22, 23), a plate (250) is mounted, that fits inside the longitudinal opening (105) of the straight guide (10). On the plate (250) is fixed to one end of an elastic band, while the other end is fixed to the inside of the bar section (103) in a position above the upper end of the longitudinal opening (105).

[0039] As described above, in the embodiment, the arms (31) and the connecting element (32) of the U-shaped equipment (30) are constituted by three pipes (311, 321). At the ends of the pipes (311) of the two arms (31) are inserted the handles (35), which are constituted by hollow or full circular tubes with a diameter equal to or slightly less than the inside diameter of the pipe (311) that composes the arm (31).

[0040] Figs. 11A and 11B show the detail of the handles (35). The handle (35) comprises a first tube (351), which is partially inserted at one end into the pipe (311) of the arm (31). The tubes (351) of the pair of handles are used to perform dips exercises on the bars. At the end of the first tube (351), opposite to that which is inserted in the pipe (311), is fixed a second tube (352) which forms an angle (•) of 90° with the first tube (351). On the end of the second tube (352) opposite to that is fixed on the first tube (351), is fixed a third tube (353) which forms with the second tube (351) an angle (•) laying between 100° and 150°. The first tube (351), the second tube (352) and the third tube (353) lie on the same plane and the angles (•, •) are in the direction such as to give the handle a form of "C". The two handles (35) can be positioned towards the outside, opposite one from the other, as shown in Fig. 11A, or, rotating them by 180°, towards the inside, facing each other, as shown in Fig. 11B. The second tube (352) and the third tube (353), when the handles are positioned outward, allow to perform pull-ups with wide grip. The handles positioned to-

wards the inside allow to perform pull-ups with close grip. If the angle between the first tube (351) and second tube (352) is greater than 90°, it is possible to perform pull-ups with prone close grip, when the exerciser is facing the vertical straight guide (10), and pull-ups with inverse close grip when the exerciser is directed back to the vertical straight guide (10).

[0041] As shown in Fig. 12, the relative fixing between the handles (35) and the pipes (311) of the arms (31) takes place by means of the coupling between a semi-circumferential groove (312) formed on the outer surface of the pipe (311) of each of the two arms (31) and an abutment (355) positioned on the first tube (351) of the handle (35). The trajectory of the groove (312) is located on a plane orthogonal to the longitudinal axis of the arm (31). The abutment (355) on the handle (35) can be for example the circular head of a screw or a dowel. The semi-circumferential groove (312) extends over 180° plus the size of the abutment (355) in such a way that the handle (35) can be rotated a total of 180° between two extreme positions, in which the two handles are located towards the outside (Fig. 11A) or towards the inside (Fig. 11B) and lying on an horizontal plane.

[0042] To facilitate the execution of lifting exercises, as dips, pull-ups or chin-ups, the apparatus (1) of the embodiment is provided with an assisted lifting mechanism (40) shown in figs. 13A-13C and 14A-14B. This mechanism comprises a platform (41) connected through an arm (42) to a second slider (43) sliding on the vertical straight guide (10) and mounted below the first slider (20). The arm (42) can rotate relative to the second slider (43) allowing the platform (41) to be placed in two positions, a working position (Fig. 13B) on a horizontal plane and a resting position (Fig. 13A) on a plane parallel to the vertical wall (2). The second slider (43) of the embodiment is identical to the first slider (20), but the sense of rotation of the platform (41) is opposite to that of the U-shaped equipment (30), so that the platform (41), in the resting position, does not interfere with the first slider (20). To ensure the maintenance of the working and the resting positions of the platform (41), on the end of the arm (42) which connects to the second slider (43), is mounted a block mechanism (44), analogous to the block mechanism (34) of the U-shaped equipment (30).

[0043] The platform (41) can slide vertically under the weight of the exerciser from a higher starting position (Fig. 13B) defined by an edge (45), to a lower position (Fig. 13C) defined by the equilibrium between the weight of the exerciser and the force exerted by an elastic element (46). In the assisted lifting mechanism (40) of the embodiment the elastic element (46) is a compression type spring and is inserted inside the section bar (12) of the vertical straight guide (10) and positioned below the second slider (43). To allow for the crushing of the spring (46), as a result of the sliding of the second slider (43), the straight guide (10) comprises a central opening (48) which extends for the whole stroke of the platform (41), that is from the upper end position defined by the edge

(45) to the lower position defined by the block of the spring (46). The second slider (43) comprises a plate (47) that fits inside the section bar (12) of the vertical straight guide (10) through the opening (48) and which crushes the spring (Fig. 14A, 14B). The stiffness of the spring (46) is chosen for example so as to allow a platform lowering of 40cm for a user weighing 60 kg. It can be used also springs with variable stiffness so that when the platform is used by hefty users, the spring with lower stiffness is crushed completely and then starts to work the spring with greater stiffness. Or it can be used coaxial springs of different lengths inserted one into the other, or even plate springs. In different embodiments, the spring is of the traction type and it is connected at one end to the plate of the second slider and at the other end to an inner wall of the section bar of the vertical straight guide, at a position higher than the plate. They may be helical traction springs or, preferably, elastic bands. It can also be used two or more elastic bands in parallel. The first elastic band is permanently attached to the plate of the second slider, while the second or subsequent are connected to the plate according to the assistance that is required and the weight of the performer.

[0044] Fig. 15 shows the whole apparatus (1) according to an embodiment, where the U-shaped equipment (30) is further provided with the supports for the execution of exercises of leg raises on dip bars and reverse crunch on dip bars. On each of the two arms (31) are fixed two support plates (361) for the forearms of the exerciser and on the first slider (20) is fixed a support plate (362) for the back of the exerciser. The two support plates (361) are inclined, with reference to when the U-shaped equipment (30) is positioned in the working position and relative to a horizontal plane, of an angle comprised between 0° and 45°, angle considered in a rotation direction that brings the two plates to look one another. The exerciser can settle back on the vertical straight guide (10), leaned with his back on the support plate (362) of the first slider (20) and staying suspended with the forearms on the supports (361) of the two arms (31), and perform exercises of leg raises on dip bars and reverse crunch on dip bars.

[0045] The hands of the exerciser grab directly the arms (31) or the first tube (351) of the handles (35) or two dedicated handles fixed to the arms (31) or on the first tube (351). In the embodiment shown in Fig. 15, two further tubes (354) are fixed on the first tube (351), which offer, when the handles (35) are positioned outwards, a grip for the hands vertical or slightly inclined.

[0046] The straight guide (10), the first slider (20), the second slider (43), the U-shape equipment (30), the platform (41) with its arm (42), are preferably made of a metallic material, steel or aluminium alloy.

[0047] The solution proposed by the present invention provides a complete apparatus for the execution of multiple bodyweight exercises that, when unused, occupies a very small space.

[0048] An apparatus such as that proposed by the

present invention can be used alone or combined with other apparatus, to be used by multiple users simultaneously, both on one's own and under the supervision of an instructor during a course.

[0049] Another possible use of the apparatus such as that proposed by the present invention is the domestic one, installing it for example on an unused wall of the house.

Claims

1. Gymnastic apparatus (1) for performing bodyweight exercises including:

- A straight guide (10) vertically fixed on a vertical wall (2),
- A first slider (20) sliding on the straight guide (10) and lockable in different vertical positions by means of a locking mechanism (50) acting on the straight guide (10),
- An U-shaped equipment (30) comprising two arms (31) substantially parallel joined together at one end with a connection element (32); said U-shaped equipment (30) being mounted via said connecting element (32) to the first slider (20);
- **Characterized in that**
- The U-shaped equipment (30) is rotatable relative to the first slider (20) between a working position where said two arms (31) lie on a horizontal plane and a resting position where said two arms (31) lie on a vertical plane parallel to the vertical wall (2) and **in that** the U-shaped equipment (30) stops in the two abovementioned positions.

2. Apparatus according to claim 1, wherein the straight guide (10) has a "H"-shape cross section, with the flanges (101a) constituted by two rectangular sheets, one external (101), far from the vertical wall (2) and one internal (102), fixed to the vertical wall (2), connected in parallel to each other by a web (103a) and wherein the first slider (20) has, in a horizontal plane, when the first slider (20) is mounted on the straight guide (10), a "C"-shaped section, externally embracing the flanges (101a) of the external rectangular sheet (101) of the straight guide (10), by means of two parallel sides (202S) and approaching the web (103a) of the straight guide (10), by means of two ends (203S).
3. Apparatus according to claim 2, wherein the two parallel sides (202S) of the "C"-shaped section extend vertically in two side walls (202), parallel between them and orthogonal to the vertical wall (2) and wherein

the two ends (203S) extend vertically in two side walls (203) .

4. Apparatus according to claim 3, wherein on the side walls (202) are mounted, in pairs and counterposed, one on the inside and one on the outside of the two flanges (101a) of the external rectangular sheet (101), four or more pairs of sliding elements (202c) of the first cursor (20) on the straight guide (10), two pairs on the same horizontal plane and two or more pairs shifted vertically relative to the first two pairs and wherein on the side walls (203) are mounted sliding elements (203c) arranged in pairs and counterposed and sliding along the web (103a) of the straight guide (10).
5. Apparatus according to claim 4, wherein the sliding elements (202c, 203c) are wheels or rolling bearings.
6. Apparatus according to one or more of the preceding claims, wherein the connecting element (32) of the U-shaped equipment (30) comprises a pipe (321) and wherein the first cursor (20) is constituted by a frame (21) divided into two half-frames (22, 23), one upper (22) and one lower (23), symmetrical relative to a horizontal plane (221), with reference to when the first slider (20) is mounted on the straight guide (10), and wherein each of the two half-frames (22, 23) comprises in its inside a pipe segment (25, 26), sectioned in half by a plane passing through (27) to the axis of the same pipe segment, wherein the section plane (27) of the tube segment lies on the plane of the connecting surface (24) between the two half-frames (22, 23), so that, when the two half-frames (22, 23) are assembled together, the two pipe segments (25, 26) come together giving rise to a circular sleeve which acts as a support for the pipe (321) of the connecting element (32) of the U-shaped equipment (30).
7. Apparatus according to claim 6, wherein each of the two pipe segments (25, 26) comprises a semi-cylindrical opening (251, 252) formed on part of the side surface of the pipe segment (25, 26) and wherein the pipe (321) of the connecting element (32) comprises a plate (33) inserted and fixed in two diametrically opposed grooves (322) formed on the side surface of the pipe (321), in a central position equidistant from the two arms (31) of the U-shaped equipment (30) and wherein the pipe (321) of the connecting element (32) is positioned in the circular sleeve in such a way that the plate (33) engages in the semi-cylindrical openings (251, 252) and wherein the semi-cylindrical open-

- ings (251, 252) extend in a circumferential direction so as to stop the plate (33), when the U-shaped equipment (30) is located in the two limit positions of working, orthogonal to the vertical wall (2), and resting, substantially parallel to the vertical wall (2).
8. Apparatus according to one or more of the preceding claim, wherein
the arms (31) of the U-shaped equipment (30) consist of pipes (311) and wherein
in each of the two ends of the pipes (311) of the two arms (31) are inserted two handles (35) comprising a first circular, hollow or solid, tube (351) of diameter equal to or slightly less than the inside diameter of pipes (311).
9. Apparatus according to claim 8, wherein
at the end of the first tube (351), opposite to the one that fits into the pipe (311) of the arm (31), is fixed a second tube (352), which forms an angle ($\bullet$) of 90° with the first tube (351), wherein
at the end of the second tube (352) opposite to the one which is fixed on the first tube (351), is fixed a third tube (353), which forms an angle ($\bullet$) that lies between 100° and 150° with the second tube (351) and wherein
the first tube (351), the second tube (352) and the third tube (353) lie on the same plane and the angles ($\bullet$, $\bullet$) are in the direction such as to give the handle a form of "C".
10. Apparatus according to claim 9, wherein
the pipe (311) of the arm (31) comprises a semi-circumferential groove (312) formed on the outer surface of the pipe (311) on the end where the handles are inserted (35) and wherein
the first tube (351) of the handle (35) comprises an abutment (355) and wherein
the first tube (351) is guided in its rotation relative to the pipe (311) by the stroke of said abutment (355) between two extreme positions of said semi-circumferential groove (312), which are such as to dispose the plane, where lie on the first tube (351), the second tube (352) and the third tube (353) of the handles (35) in a horizontal position.
11. Apparatus according to one or more of the preceding claims, wherein
the locking mechanism (50) comprises a hook-shaped element (51), rotatable fixed on the first slider (20), and a rotation lever (53), and wherein
the straight guide (10) comprises a series of pegs (13) distributed at regular distances along the straight guide (10) and wherein
the hook-shaped element (51) is anchorable to one of the pegs (13) as a result of its rotation by means of the rotation lever (53).
12. Apparatus according to one or more of the preceding claims, wherein
the apparatus (1) comprises a second slider (43) sliding on the straight guide (10) and positioned below the first slider (20), wherein
a platform (41) is rotatable fixed to said second slider (43) via an arm (42), wherein
said platform (43) can be rotated between a working position, in which it lies on a horizontal plane and a resting position in which it lies on a plane substantially parallel to the vertical wall (2), wherein
said platform (43) is lockable in the two above positions and wherein said second slider (43) is supported vertically by an elastic element (46).
13. Apparatus according to claim 12, wherein
the elastic element (46) is a compression helical spring placed below the second cursor (43), or
the elastic element (46) is an elastic band placed above the second cursor (43), or
the elastic element (46) is constituted by two or more elastic bands placed in parallel above the second slider (43) and wherein an elastic band is fastened in a fixed manner to the second cursor (43) and the other elastic bands are engageable or disengageable from the second slider (43).
14. Apparatus according to one of claims 12 or 13, wherein
the elastic element (46) is positioned inside the section bar (103) of the straight guide (10).
15. Apparatus according to one or more of the preceding claims, wherein
the two arms (31) of the U-shaped equipment (30) each comprises a plate (361) fixed on the outer surface of the arms (31) and inclined, with reference to when the U-shaped equipment (30) is located in the working position, relative to a horizontal plane of an angle comprised between 0° and 45° , angle considered in a rotation direction that brings the plates to look one to the other, and wherein
the first slider (20) comprises a plate (362) fixed on a substantially vertical outer surface of the first slider (20) and parallel to the vertical wall (2).

Fig. 1A

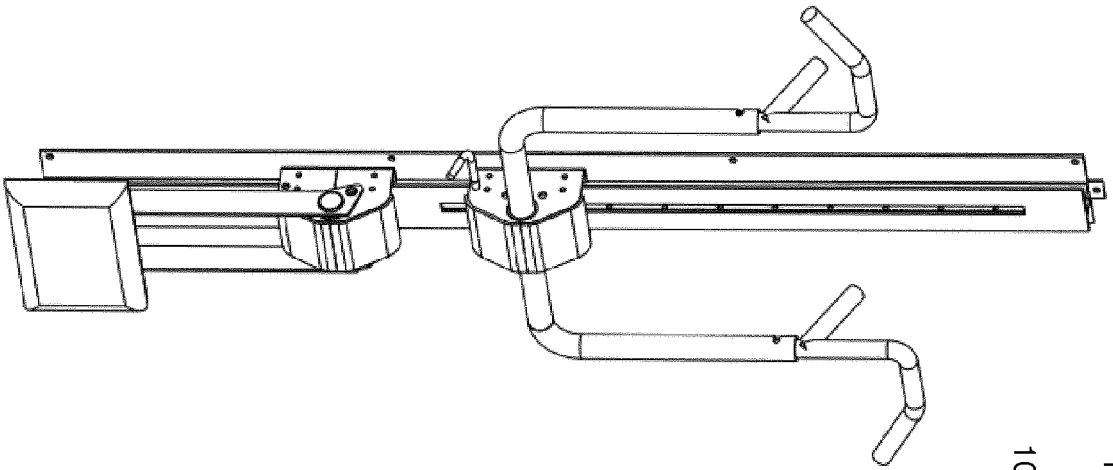


Fig. 1B

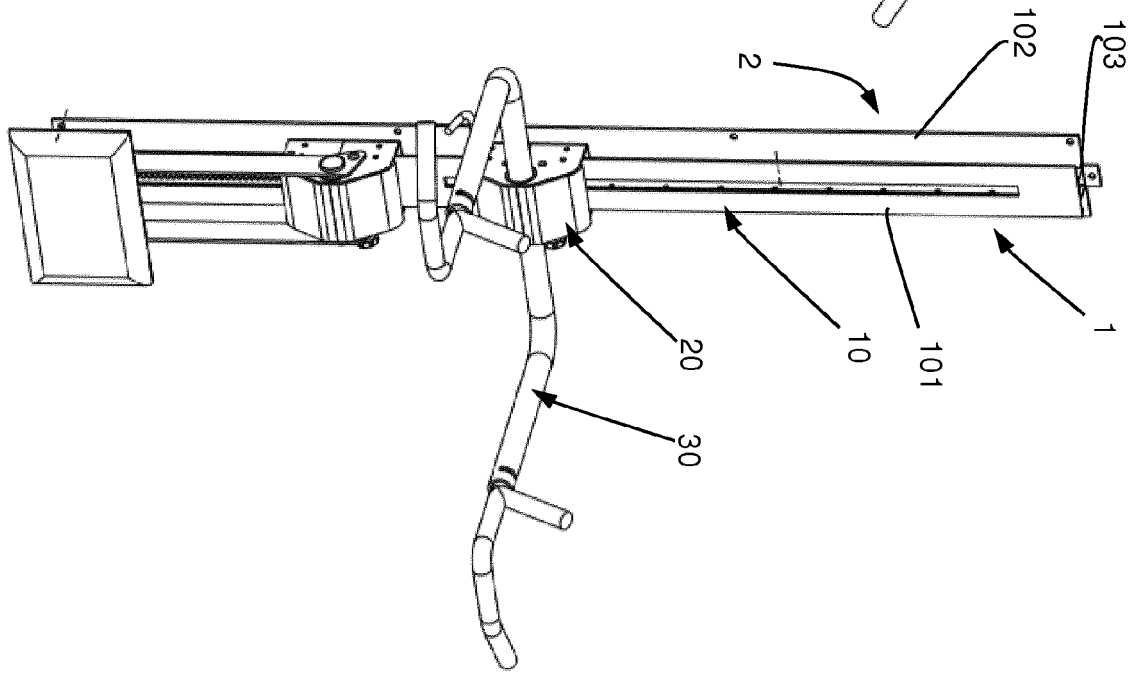
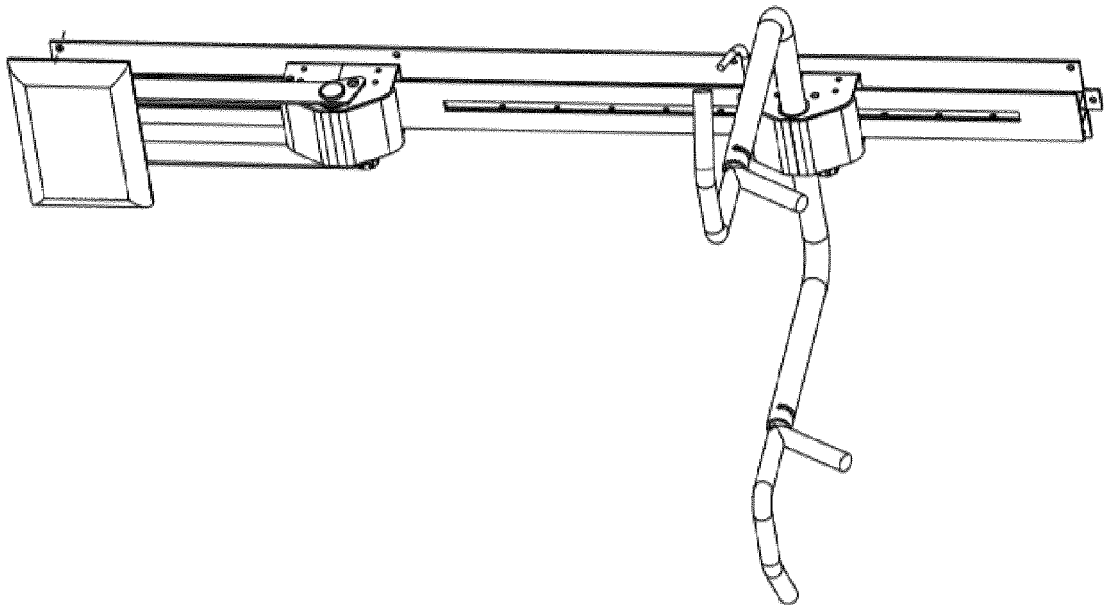


Fig. 1C



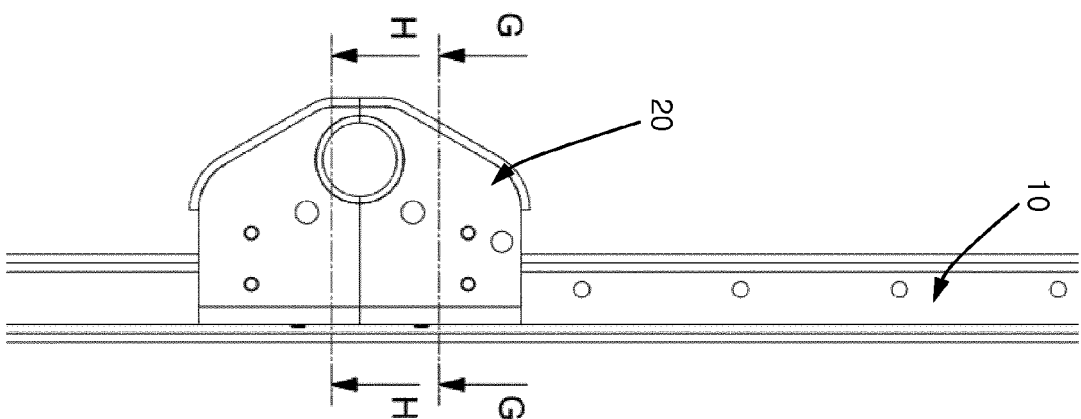


Fig. 2A

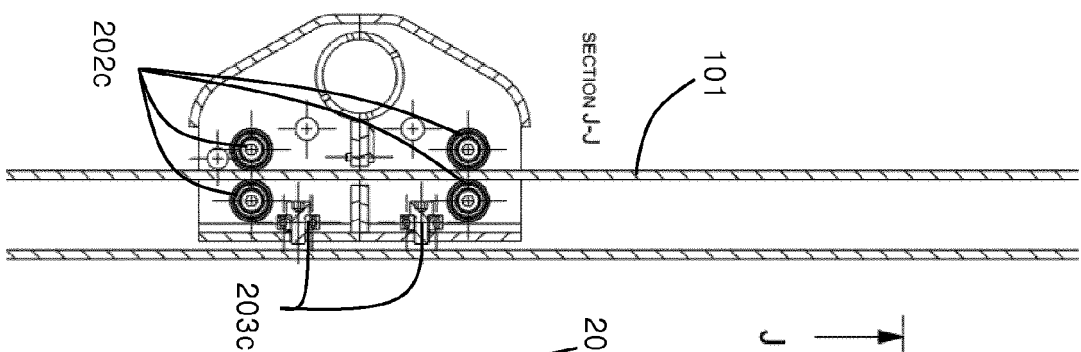


Fig. 2B

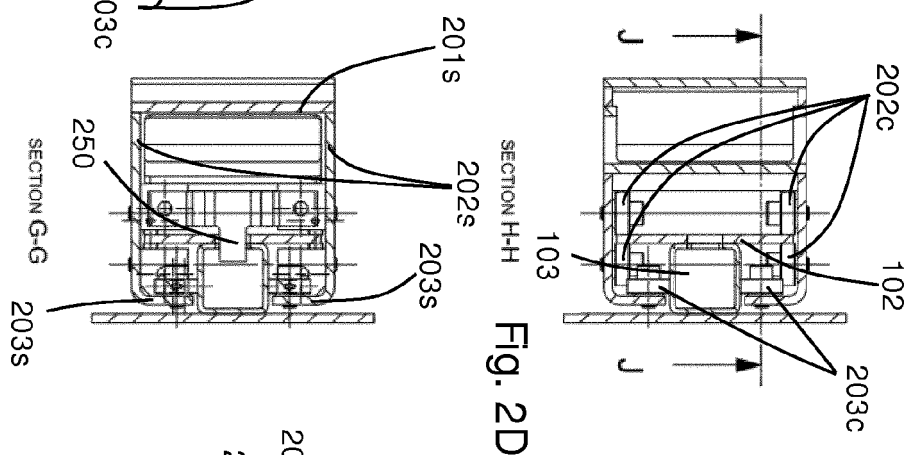


Fig. 2C

Fig. 2D

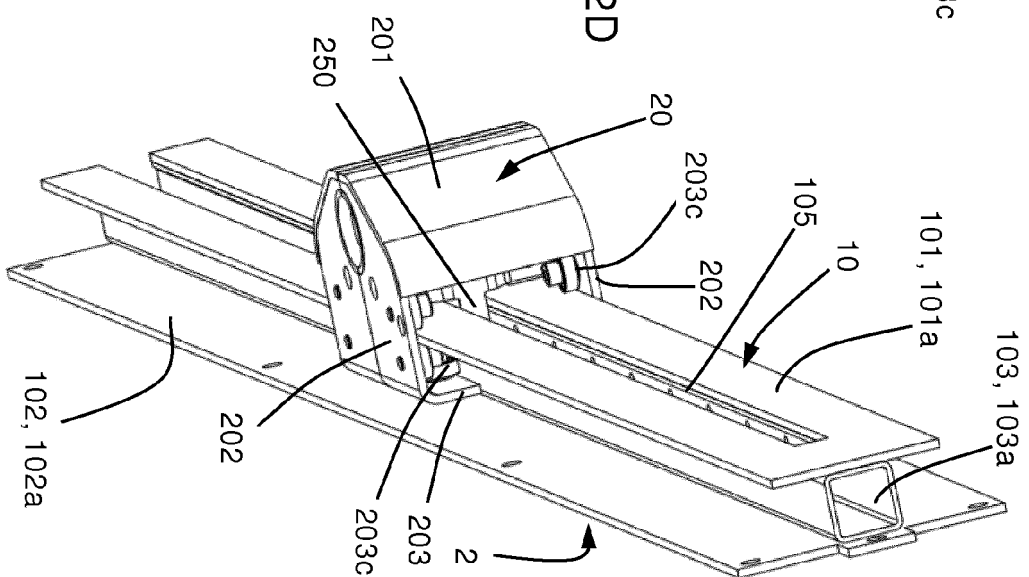


Fig. 2E

Fig. 3A

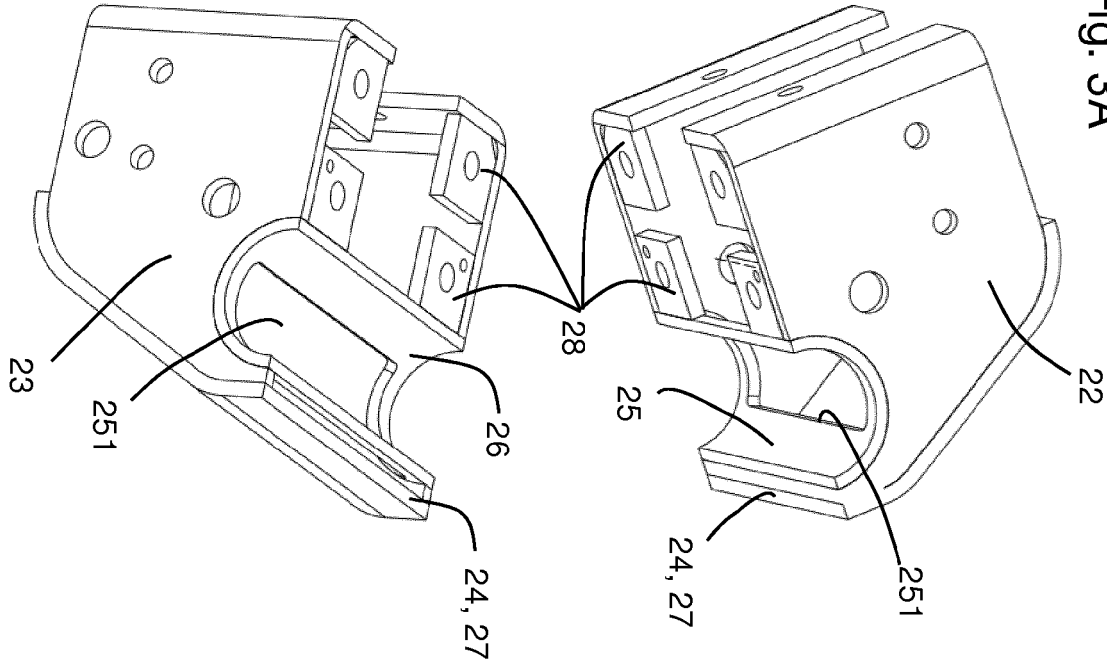


Fig. 3B

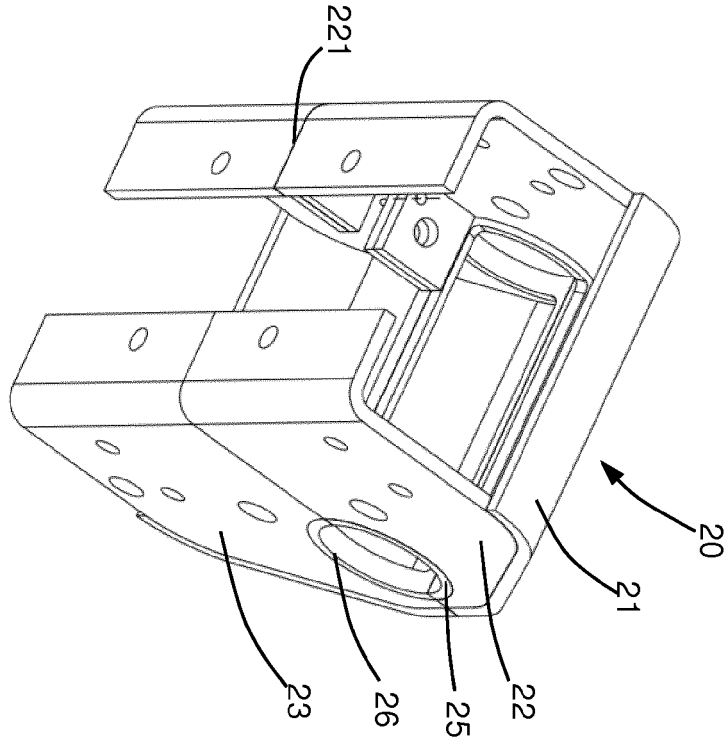
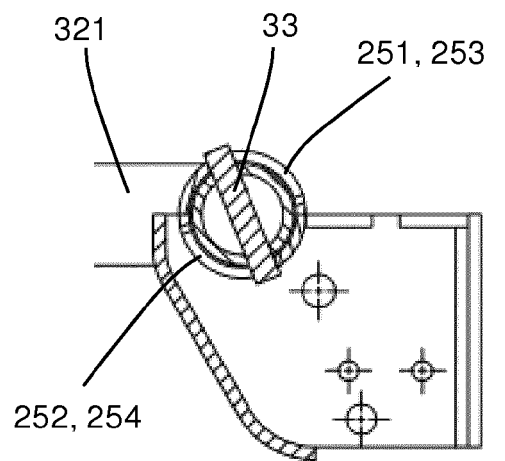
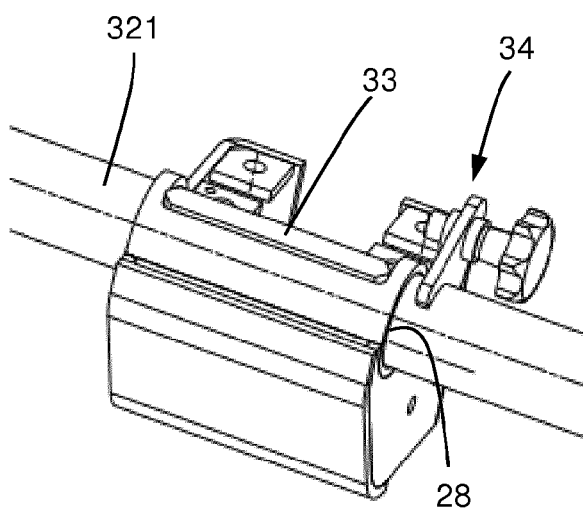
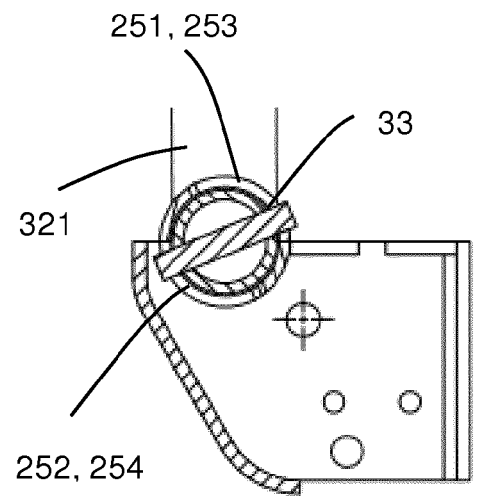
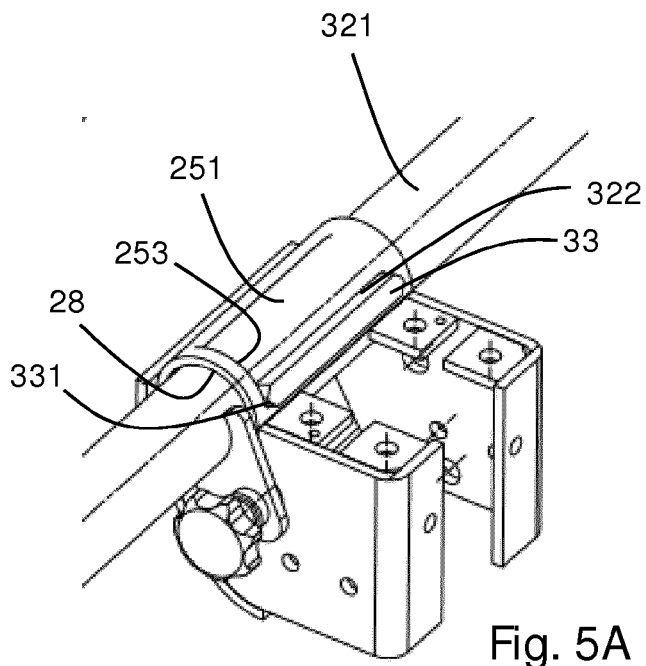
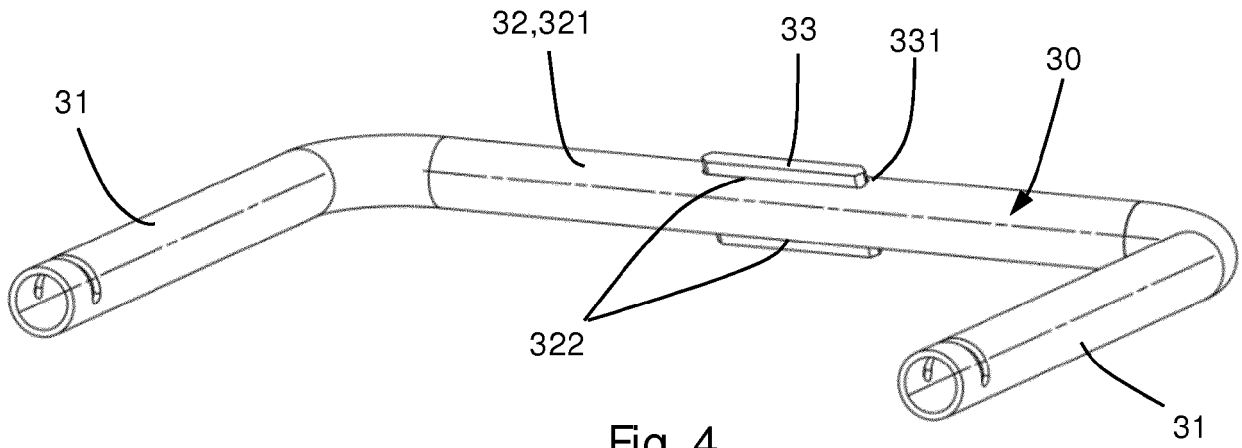


Fig. 3C



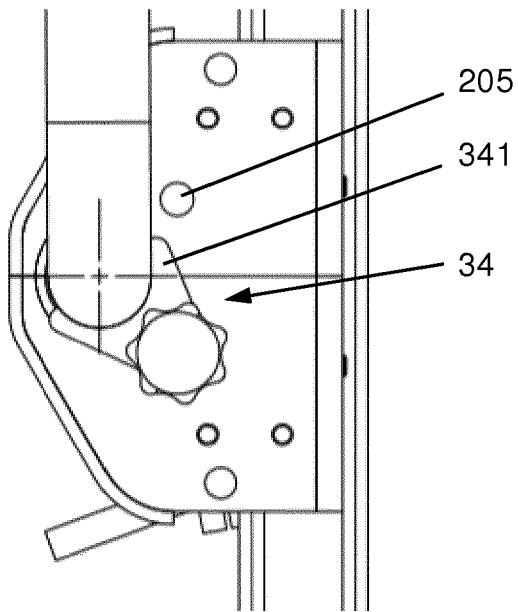


Fig. 7A

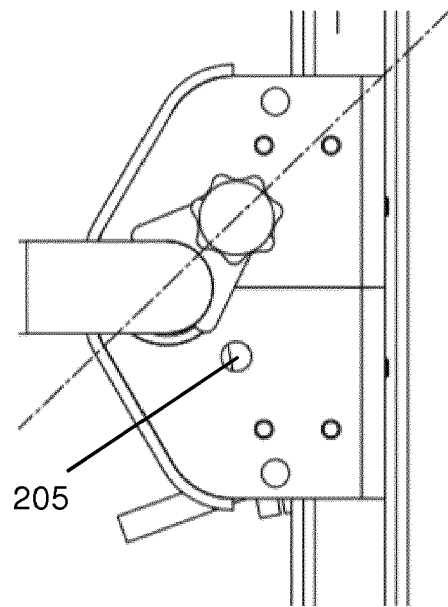


Fig. 7B

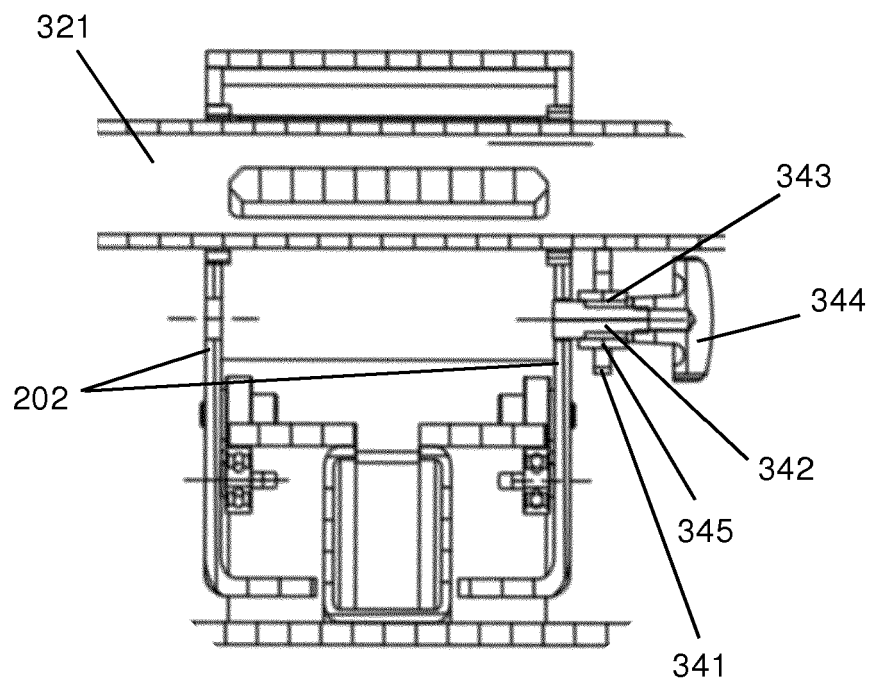


Fig. 8

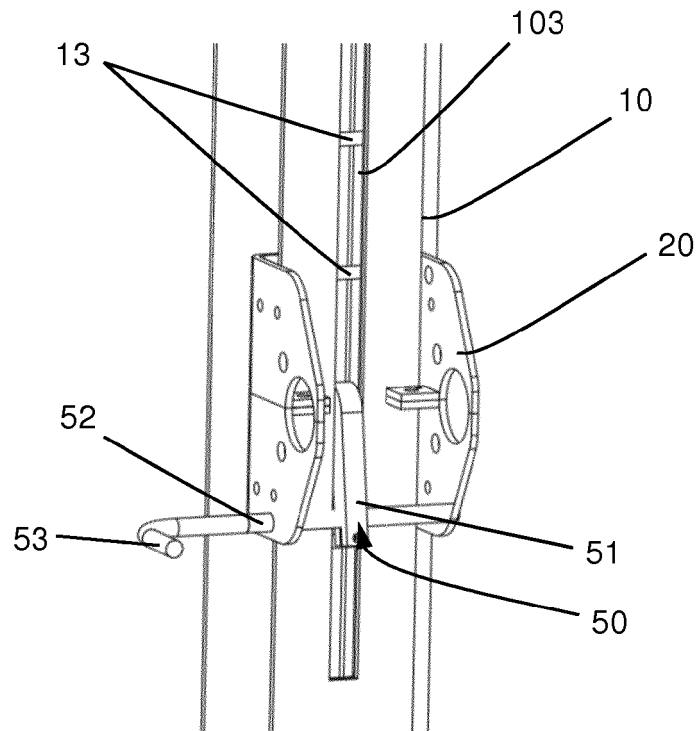


Fig. 9

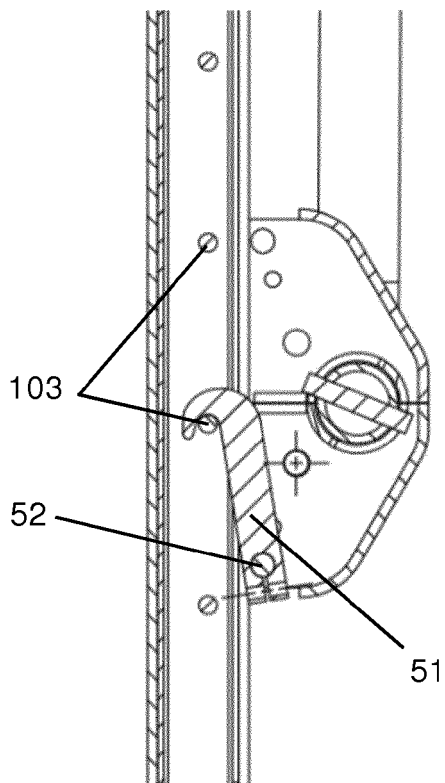


Fig. 10A

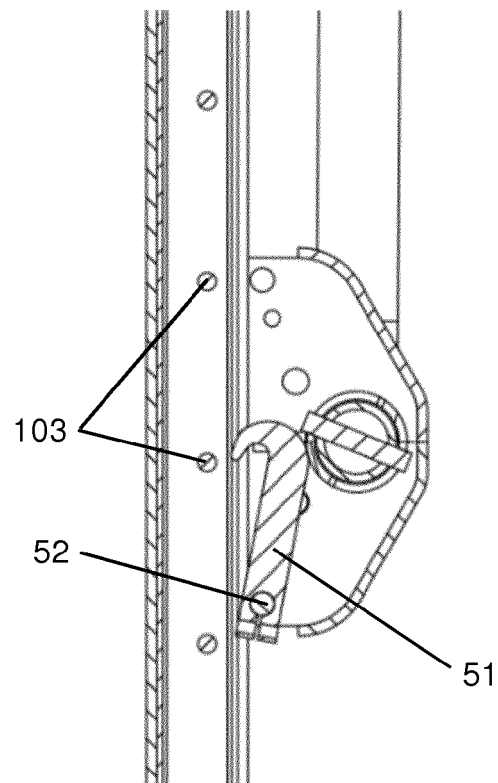


Fig. 10B

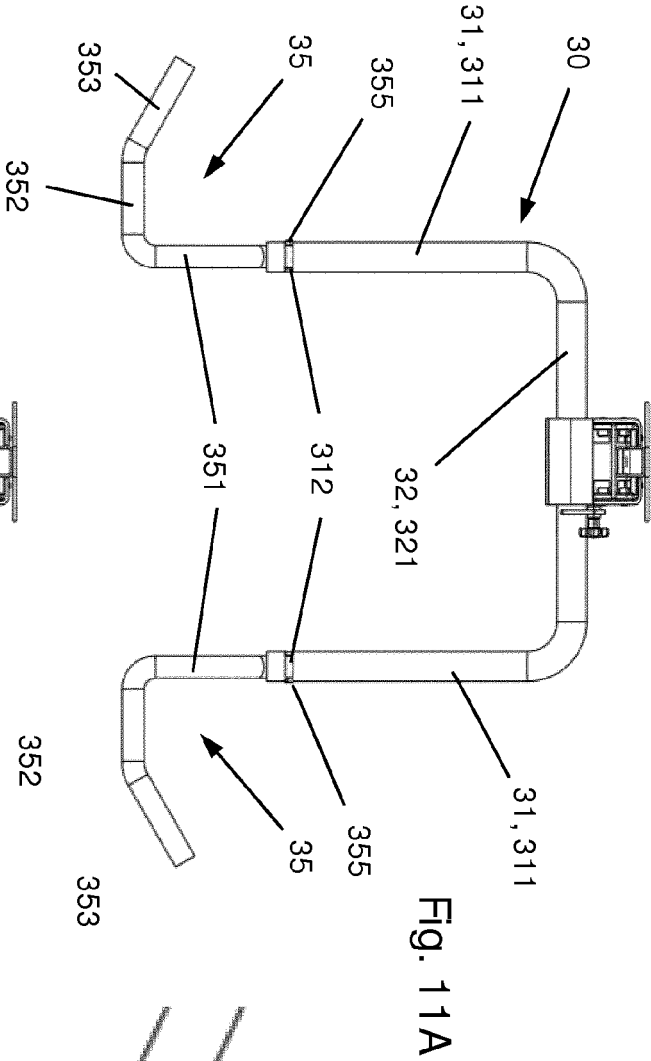


Fig. 11A

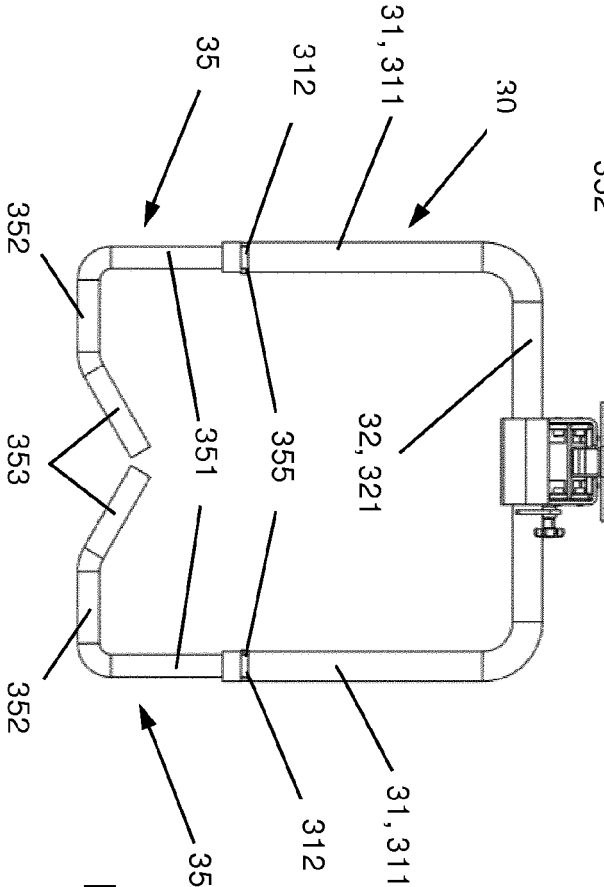


Fig. 11B

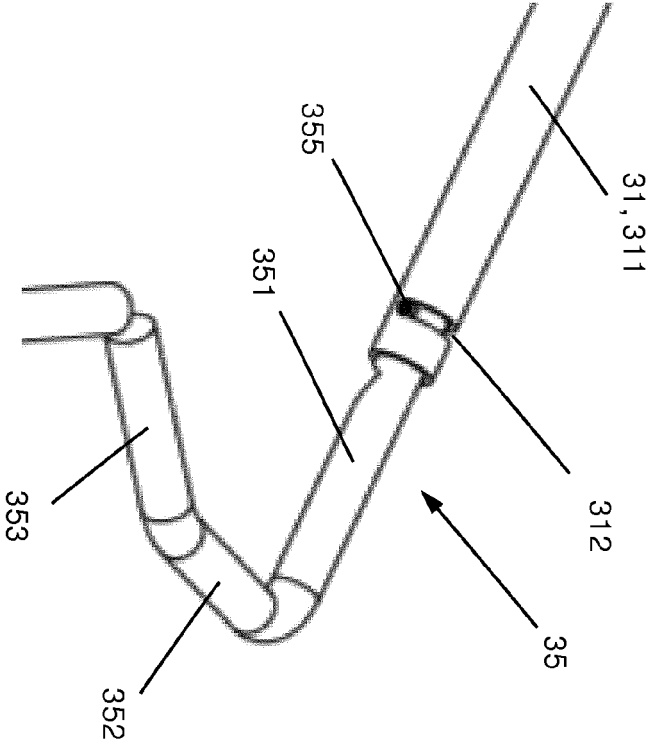


Fig. 12

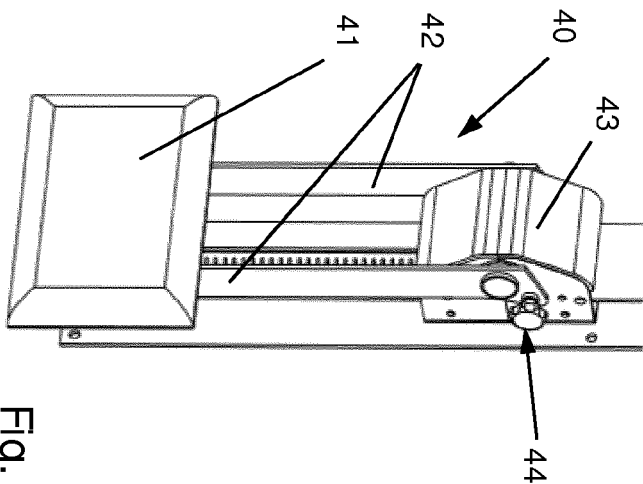


Fig. 13A

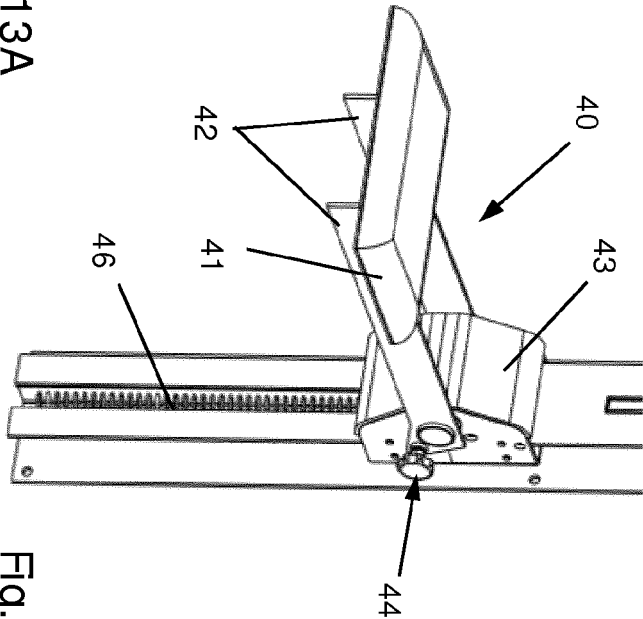


Fig. 13B

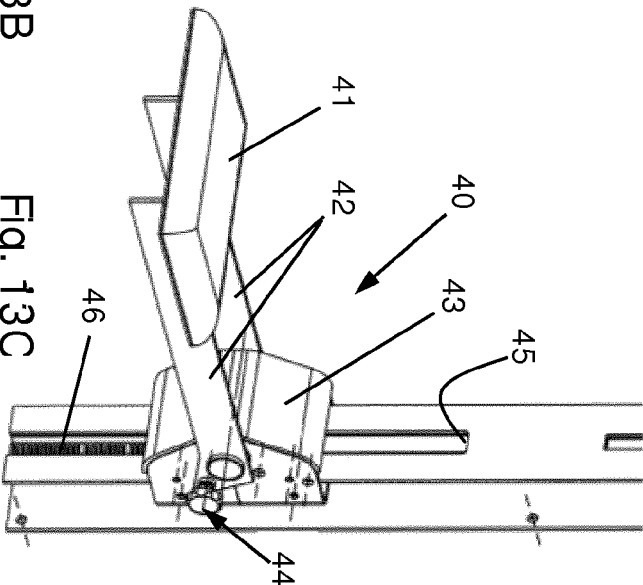


Fig. 13C

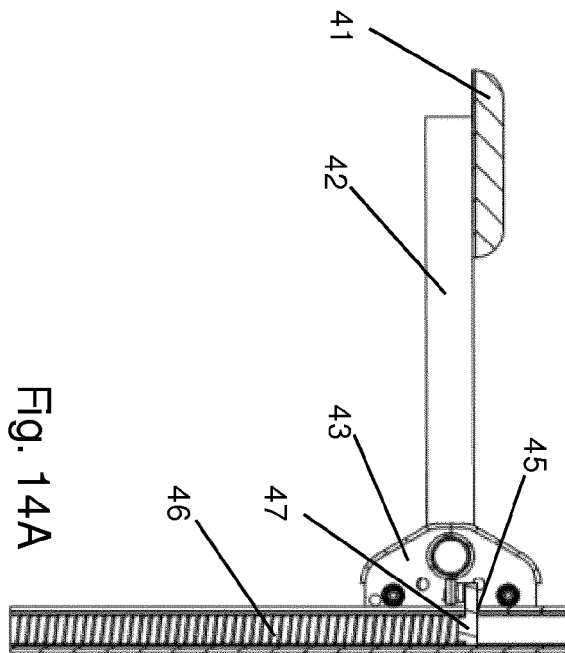


Fig. 14A

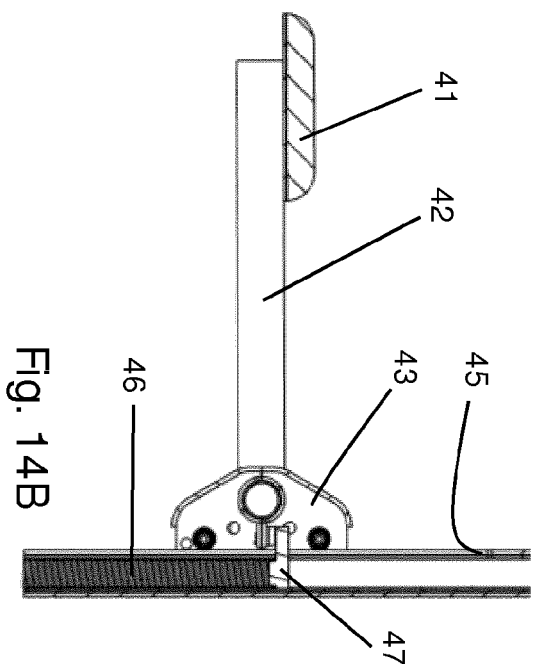


Fig. 14B

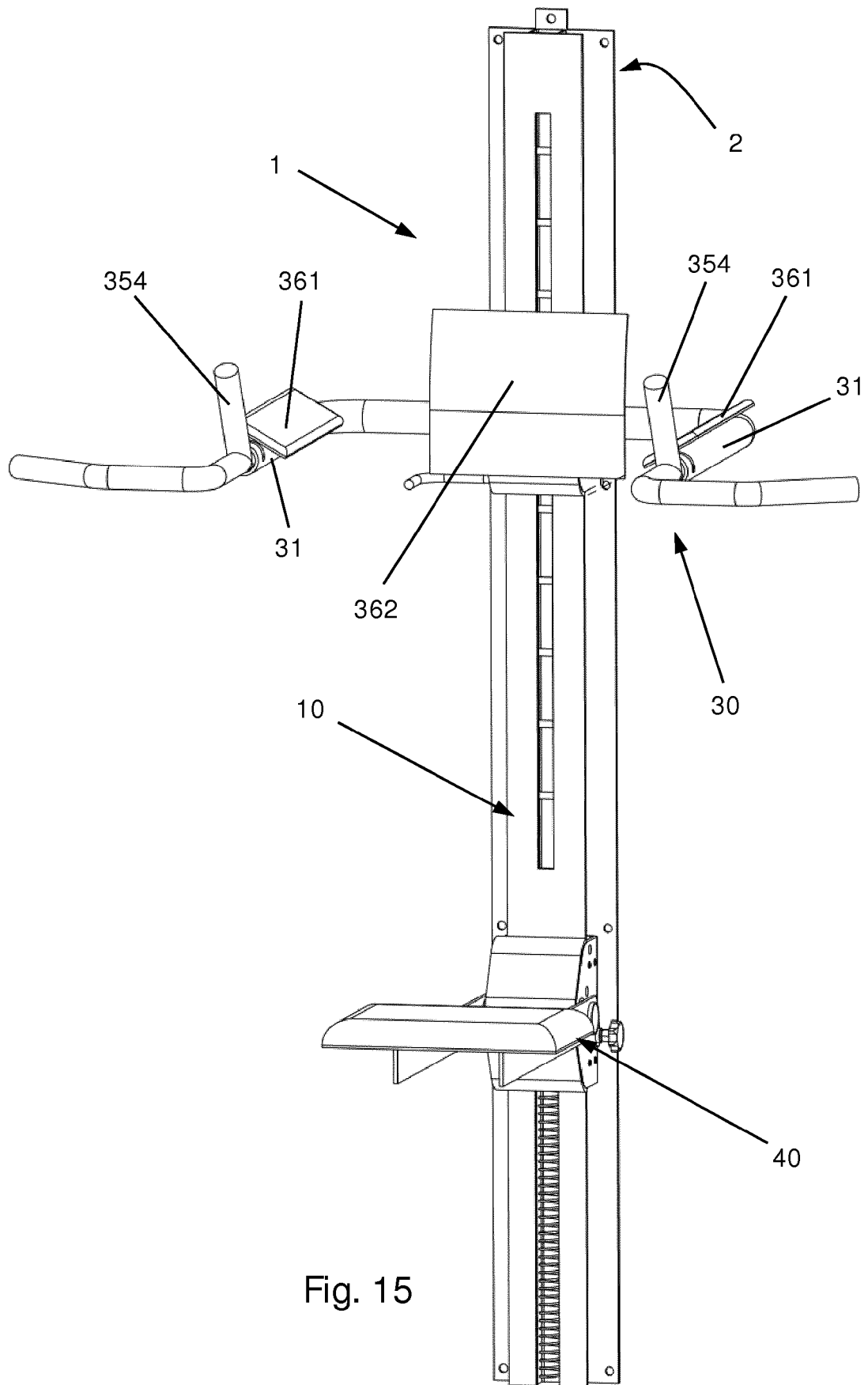


Fig. 15



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Application Number
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Y	* column 5 - column 10; figures * -----	13,14		
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X	US 2013/296146 A1 (STATEN KENNETH [US] ET AL) 7 November 2013 (2013-11-07) * paragraph [0049] - paragraph [0051]; figures 8-15 *	1		
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A	WO 2007/046078 A1 (QUINN ANTHONY [IE]) 26 April 2007 (2007-04-26) * abstract; figures *	1		TECHNICAL FIELDS SEARCHED (IPC)
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X,P	WO 2017/152275 A1 (9614206 CANADA INC [CA]) 14 September 2017 (2017-09-14) * paragraph [0046] - paragraph [0050]; figures *	1		
The present search report has been drawn up for all claims				
Place of search Munich		Date of completion of the search 18 January 2018	Examiner Borrás González, E	
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EPO FORM 1503 03.82 (P04C01)

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