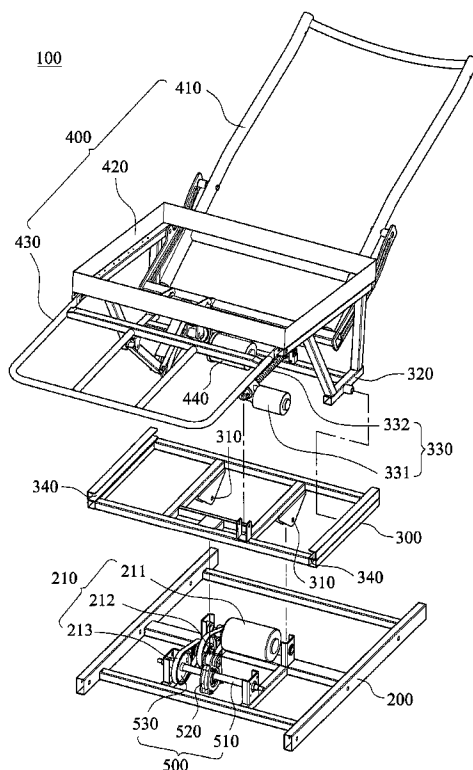




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(72) Inventeur/Inventor:
HSIEH, WEN-HSU, TW
(73) Propriétaire/Owner:
KUANG YU METAL WORKING CO., LTD., TW
(74) Agent: GOWLING WLG (CANADA) LLP

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(57) Abrégé/Abstract:

An exercising device includes a base, a rail, a swinging chair, and a swinging unit. The rail is pivotally disposed at the base by at least one pivoting point. The swinging chair is movably disposed on the rail. The swinging unit is disposed between the rail and the base. The swinging unit is for changing an angle between the rail and the base.

EXERCISING DEVICE AND OPERATING METHOD THEREOF

Abstract:

An exercising device includes a base, a rail, a swinging chair, and a swinging unit. The rail is pivotally disposed at the base by at least one pivoting point. The swinging chair is movably disposed on the rail. The swinging unit is disposed between the rail and the base. The swinging unit is for changing an angle between the rail and the base.

EXERCISING DEVICE AND OPERATING METHOD THEREOF

TECHNICAL FIELD

5 The present disclosure relates to an exercising device. More particularly, the present disclosure relates to an exercising device with swinging function and the operating method thereof.

DESCRIPTION OF RELATED ART

Because of the popularization of health, exercise becomes more and more
10 important for modern people. Besides the outdoor exercise, like running, riding bike, and playing ball, people would like to go to the gym to do the muscle training so as to improve the blood circulating, the metabolism, and the body health. However, the acceptant exercising strength is different from each person and the health status of each person is also different. Therefore, the
15 usage of the exercising device is limited. Some people develop a simple swinging device to decrease the difficulty of exercise and thus everyone can use the device easily.

The conventional swinging device includes a platform and at least one swinging unit for swinging the platform. When people stand on the platform, the human
20 body can swing along with the platform and the muscle in body will be vibrated because of the swinging motion. Thus the exercise effect is achieved. Because there is no complicated step to use the swinging device and the only thing has to do before using is standing on the platform, the swinging device is very popular for old men and children.

25 But there is still a limitation of the swinging device. Physically challenged persons, or people who are unable to stand and have to lie on the bed cannot stand on the platform to use the swinging device. They can only do some simple stretching exercising by others' assistance so that the body will become weaker and weaker.

30 Besides, some old people or patients having vertigo cannot have their necks

shake for a long time and become another group that cannot stand on the platform to use the swinging device.

To solve the aforementioned problem, inventor invents an exercising device and the operating method thereof. The mode of the exercising device can be
5 changed corresponding to a human body, and the swinging amplitude of the exercising device can be changed corresponding to the linear position of the exercising device. Thus the advantages of exercise strength adjusting and easy usage are achieved.

DISCLOSURE OF INVENTION

10 The purpose of the present disclosure is to propose an exercising device and an operating method thereof. The exercising device may give various swinging amplitudes according to the requirements of different parts of the human body.

According to one aspect of the present disclosure, an operating method of an exercising device includes a linear moving step and a swinging step. The linear
15 moving step includes providing a rail pivotally disposed at a base by at least one pivoting point and moving a swinging bed or a swinging chair movably disposed on the rail for a linear movement. The swinging step changes an angle between the rail and the base to make the rail moving along a swinging path reciprocatedly.

20 Accordingly, a position of the swinging bed or the swinging chair of the exercising device on a horizontal line will change relatively to the base. Since a position of the pivoting point of the rail pivotally disposed at the base is fixed, a force arm between the pivoting point and each parts of the swinging bed or the swinging chair is also changed during the movement. When the rail is driven by the
25 swinging unit to swing, the swinging amplitude of a part varies at different positions, and hence a function of controlling adjustment of swinging amplitude of different parts can be achieved.

Based on the operating method of the exercising device, the linear moving step provides the linear movement via a horizontal driving unit, the swinging step then

vibrates the rail, and the swinging bed or the swinging chair is linked with the rail. In addition, the operating method further includes an open-close step, wherein the open-close step is for changing a mode of the swinging bed or the swinging chair corresponding to a human body, and the open-close step is acted with the linear moving step simultaneously. By the steps above, the user may firstly adjust the position or lying (or sitting) angle of the swinging bed or the swinging chair according to the body condition or preferences thereof and then perform a swinging movement, such that the flexibility of using the swinging bed or the swinging chair can be promoted. On the other hand, the lying or sitting angle can be simultaneously changed during adjusting the position of the swinging bed or swinging chair to achieve a simpler and faster operation.

According to another aspect of the present disclosure, an exercising device includes a base, a rail, a swinging chair, and a swinging unit. The rail is pivotally disposed at the base by at least one pivoting point. The swinging chair is movably disposed on the rail. The swinging unit is disposed between the rail and the base. The swinging unit is for changing an angle between the rail and the base.

Accordingly, a position of the swinging chair of the exercising device on a horizontal line will change relatively to the base. Since a force arm between the pivoting point of the rail pivotally disposed at the base and each parts of the swinging chair changes in response to different positions of the swinging chair, when the rail is driven by the swinging unit to swing, the swinging amplitude of a part varies at different positions, and hence a function of adjusting of swinging amplitude can be achieved.

The aforementioned exercising device further includes a moving unit and a horizontal driving unit. The moving unit connects the swinging chair to the rail, and the horizontal driving unit moves the moving unit in the rail, thus the swinging chair can be linked with the moving unit and moved along the rail. The horizontal driving unit includes a motor and a screw arbor, wherein the motor is for driving the screw arbor. The moving unit includes a screw hole coordinated

with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail. The swinging unit includes a roller, an eccentric block, and a wheel. The roller is rotatably disposed at the base. The eccentric block is sleeved on the roller and pushing the rail. The wheel is sleeved on the roller.

5 The aforementioned exercising device further includes a swing driving unit disposed at the base and for driving the swinging unit to rotate. The swinging unit may include a motor, a pulley, and a belt. The pulley is driven by the motor. The belt connects the pulley to the wheel, wherein the motor drives the pulley, the belt, the wheel, the roller and the eccentric block to rotate simultaneously.

10 By the horizontal driving unit, the swinging chair may generate horizontal displacement, and the swinging unit driven by the swing driving unit pushes the rail to result in a swinging movement of the swinging chair. The interactions between these mechanical components can achieve the objective of the present disclosure.

15 Based on the aforementioned exercise device, the swinging chair includes a seat portion, a back portion, a leg portion, and an open-close driving unit. The back portion is pivotally connected to the seat portion. The leg portion is pivotally connected to the seat portion, wherein a mode of the swinging chair is changed by driving the seat portion, the back portion and the leg portion. The open-close

20 driving unit drives the back portion and the leg portion to change an angle between the back portion and the seat portion or an angle between the leg portion and the seat portion to switch from one mode to another mode. By the open-close driving unit and the structure of the swinging chair, the mode of the swinging chair may change in response to the demands of the user, such as

25 changing from a seated posture to a lying posture, and hence people being inconvenient to move may perform the swinging movement while sitting or lying.

According to further another aspect of the present disclosure, an exercising device for a human to lie includes a base, a rail, a swinging bed, and a swinging unit. The rail is pivotally disposed at the base by at least one pivoting point.

30 The swinging bed is movably disposed on the rail. The swinging unit is

disposed between the rail and the base. The swinging unit is for changing an angle between the rail and the base.

Accordingly, a position of the swinging bed on the horizontal line will change relative to the base. Since a force arm between the pivoting point of the rail
5 pivotally disposed at the base and each parts of the swinging bed changes in response to different positions of the swinging bed, when the rail is driven by the swinging unit to swing, the swinging amplitude of a part varies at different positions, and hence a function of adjusting of swinging amplitude can be achieved. The user may select a part to swing stronger based on requirements
10 during the process of lying and swinging.

The aforementioned exercising device further includes a moving unit and a horizontal driving unit. The moving unit connects the swinging bed to the rail. The horizontal driving unit moves the moving unit in the rail, thus the swinging bed can be linked with the moving unit and moved along the rail. The horizontal
15 driving unit includes a motor and a screw arbor, wherein the motor is for driving the screw arbor. The moving unit includes a screw hole coordinated with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail. By the horizontal driving unit, the swinging bed may generate horizontal displacement, and the swinging unit driven by the swing driving unit
20 pushes the rail to result in a swinging movement of the swinging bed. The interactions between these mechanical components can achieve the objective of the present disclosure.

According to yet another aspect of the present disclosure, an exercising device includes a base, a rail, a swinging bed or a swinging chair, a supporting stick,
25 and a swinging unit. The rail is pivotally disposed at the base by at least one pivoting point. The swinging bed or the swinging chair is movably disposed on the rail. One end of the supporting stick is connected to the swinging bed or the swinging chair and the other end of the supporting stick is connected to the base. The swinging unit is disposed between the rail and the base. The swinging unit
30 is for changing an angle between the rail and the base.

Accordingly, a position of the swinging bed or the swinging chair on the horizontal line will change relatively to the base. An angle between the supporting stick and the swinging bed or the swinging chair or an angle between the supporting stick and the base changes as well. Since a force arm between the pivoting point of the rail pivotally disposed at the base and each parts of the swinging bed or the swinging chair changes in response to different positions of the swinging bed or the swinging chair, when the rail is driven by the swinging unit to swing, the swinging amplitude of a part varies at different positions, and hence a function of adjusting of swinging amplitude can be achieved. By the way of disposing multiple pivoting points, the swinging amplitudes corresponding to each parts of the swinging bed or swinging chair have more variations, and the swinging pattern variations can be increased. Therefore, during the process of the user lying (or sitting) and swinging, the user may select various swinging movements, and other aspects or implementations of the above also have the same functions and performances.

The aforementioned exercise device may further include a moving unit and a horizontal driving unit. The moving unit connects the swinging bed or the swinging chair to the rail. The horizontal driving unit moves the moving unit in the rail, thus the swinging bed or the swinging chair can be linked with the moving unit and moved along the rail. The horizontal driving unit includes a motor and a screw arbor, wherein the motor is for driving the screw arbor. The moving unit includes a screw hole coordinated with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail. The swinging bed or the swinging chair is pivotally connected to the moving unit, such that an angle of the swinging bed or the swinging chair relative to the rail changes. The rail includes two grooves and two pad portions, the moving unit is movably disposed in the grooves, and each pad portion is positioned in each groove. In addition, the exercise device further includes a plurality of base pads, wherein the base pads are disposed under the base. By the horizontal driving unit, the swinging bed or the swinging chair may generate horizontal displacement, and the swinging unit driven by the swing driving unit pushes the

rail to result in a swinging movement of the swinging bed or the swinging chair. By using the pad portions, the noise of the swinging bed or swinging chair during displacing can be reduced, and an assembling tolerance can be adjusted to achieve an objective of moving smoothly. By the way of disposing more
5 pivoting points, the swinging amplitude may have more variations.

According to yet another aspect of the present disclosure, an exercising device includes a base, a rail, a swinging chair, a swinging unit and an elastic unit. The rail is pivotally disposed at the base by at least one pivoting point. The swinging chair is movably disposed on the rail. The swinging unit is disposed between
10 the rail and the base. The swinging unit is for changing an angle between the rail and the base. The elastic unit is disposed between the base and the rail, and the elastic is deformed by the reaction of the rail so as to reduce an impulse caused by the swinging unit.

The aforementioned exercising device further includes a moving unit and a
15 horizontal driving unit. The moving unit connects the swinging chair to the rail. The horizontal driving unit moves the moving unit in the rail, thus the swinging chair can be linked with the moving unit and moved along the rail. The swinging unit includes a roller, an eccentric block, and a wheel. The roller is rotatably disposed at the base. The eccentric block is sleeved on the roller and pushing
20 the rail. The wheel is sleeved on the roller. The elastic unit is a cylinder structure.

Based on the aforementioned exercising device, the swinging chair includes a seat portion, a back portion, and a leg portion. The back portion is pivotally connected to the seat portion. The leg portion is pivotally connected to the seat
25 portion, wherein a mode of the swinging chair is changed by driving the seat portion, the back portion and the leg portion. The swinging chair further includes an open-close driving unit for driving the back portion and the leg portion to change an angle between the back portion and the seat portion or an angle between the leg portion and the seat portion. In addition, the aforementioned

exercising device further includes a plurality of base pads, wherein the base pads are disposed under the base.

Compared with the conventional technologies, the exercising device of the present disclosure has advantages of giving various swinging amplitudes according to the requirements of different parts of the human body.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view of an exercising device according to one embodiment of the present disclosure;

Fig. 2 is an exploded view of the exercising device as illustrated in Fig. 1;

Fig. 3 is an exploded view of a swing driving unit and a swinging unit of the exercising device as illustrated in Fig. 2;

Fig. 4 is a cross-sectional view of one using state of a rail and a base as illustrated in Fig. 1;

Fig. 5 is a cross-sectional view of another using state of the rail and the base as illustrated in Fig. 1;

Fig. 6 is a schematic view of one using state of the rail as illustrated in Fig. 1;

Fig. 7 is a schematic view of another using state of the rail as illustrated in Fig. 1;

Fig. 8 is a side view of one mode of the exercising device as illustrated in Fig. 1;

Fig. 9 is a side view of another mode of the exercising device as illustrated in Fig. 1;

Fig. 10 is a side view of an exercising device according to another embodiment of the present disclosure;

Fig. 11 is a side view of an exercising device according to yet another embodiment of the present disclosure;

Fig. 12 is an exploded view of a rail as illustrated in Fig. 11;

Fig. 13 is a side view of one mode of the exercising device as illustrated in Fig. 11;

Fig. 14 is an exploded view of an exercising device according to yet another embodiment of the present disclosure;

Fig. 15A is a cross-sectional view of one using state of a rail, a base and an elastic unit as illustrated in Fig. 14;

5 Fig. 15B is a cross-sectional view of another using state of the rail, the base and the elastic unit as illustrated in Fig. 14;

Fig. 16 is a schematic view of an exercising device according to yet another embodiment of the present disclosure;

Fig. 17 is a side view showing one using status of an exercising device according
10 to yet another embodiment of the present disclosure; and

Fig. 18 is a flow diagram of an operating method of the exercising device as illustrated in Fig. 1 according to yet another embodiment of the present disclosure.

DETAILED DESCRIPTION

15 Fig. 1 is a schematic view of an exercising device 100 according to one embodiment of the present disclosure. Fig. 2 is an exploded view of the exercising device 100 as illustrated in Fig. 1. As shown in Figs. 1 and 2, the exercising device 100 includes a base 200, a rail 300, a swinging chair 400, and a swinging unit 500. The rail 300 is pivotally disposed at the base 200 by at
20 least one pivoting point 310, wherein a number of the pivoting point 310 is two in the embodiment of Fig. 1. The swinging chair 400 is movably disposed on the rail 300, wherein the swinging chair 400 is moved along the rail 300 linearly. The swinging unit 500 is disposed between the rail 300 and the base 200. The swinging unit 500 is for changing an angle between the rail 300 and the base
25 200, precisely, the angle is determined between an extension line I1 of the rail 300 and an extension line I2 of the base 200 (see Figs. 4 and 5). Thus, the position of the swinging chair 400 relative to the position of the base 200 along a horizontal line can be changed. When the swinging chair 400 is at different position, a force arm between the pivoting point 310 and a part of the swinging

chair 400 is also changed. Therefore, a vibrating amplitude of the part of the swinging chair 400 is changed correspondingly and a swinging strength can be changed too.

Fig. 3 is an exploded view of a swing driving unit 210 and the swinging unit 500 of the exercising device 100 as illustrated in Fig. 2. In Figs. 2 and 3, the exercising device 100 further includes the swing driving unit 210 disposed at the base 200 for driving the swinging unit 500 to rotate, hence, the rail 300 is linked with the swinging unit 500, and the angle between the rail 300 and the base 200 is changed. In detail, the swinging unit 500 includes a roller 510, an eccentric block 520 and a wheel 530. The eccentric block 520 pushes the rail 300. The roller 510 is rotatably disposed on the base 200. The wheel 530 and the eccentric block 520 are sleeved on the roller 510 and have no relative rotating motion with respect to the roller 510. In other words, the wheel 530 and the eccentric block 520 are fixed on the roller 510 and rotate with the roller 510 simultaneously.

The swing driving unit 210 includes a motor 211, a belt 213, a pulley 212, a motor wheel 215 and a motor belt 214. The motor wheel 215 is disposed at a shaft of the motor 211, the motor belt 214 is for connecting the motor wheel 215 to the pulley 212, and the belt 213 is for connecting the pulley 212 to the wheel 530. The motor 211 drives the motor wheel 215 and the motor belt 214 to rotate, thus the pulley 212 will be rotated simultaneously, i.e., the pulley 212 is driven by the motor 211 indirectly. When the pulley 212 is driven to rotate, the belt 213, the wheel 530, the roller 510, and the eccentric block 520 will rotate simultaneously, and the rail 300 will be pushed by the eccentric block 520. Of course, the pulley 212 can be directly disposed at the shaft of the motor 211, and the motor wheel 215 and the motor belt 214 can be omitted in other embodiment. The present disclosure will not be limited to the embodiment of Fig. 3.

Fig. 4 is a cross-sectional view of one using state of the rail 300 and the base 200 as illustrated in Fig. 1. Fig. 5 is a cross-sectional view of another using state of the rail 300 and the base 200 as illustrated in Fig. 1. In Figs. 4 and 5,

the angle α is changed because of the eccentric rotating motion of the eccentric block 520. Because the eccentric block 520 has different radial distances, a vertical distance between the rail 300 and the roller 510 is changed.

In other embodiment, the swing driving unit 210 can only include a motor 211, and the swinging unit 500 can include a roller 510 and an eccentric block 520. The motor 211 directly drives the roller 510 to rotate the eccentric block 520. Similarly, the swing driving unit 210 can include a motor 211 and a first gear (not shown) disposed on the shaft of the motor 211. The swinging unit 500 includes a roller 510, a second gear (not shown) engaged with the first gear, and an eccentric block 520. The first gear driven by the motor 211 is meshed with the second gear so as to rotate the roller 510 and the eccentric block 520. The structures are easily to be changed by a person skilled in the art, so that there is no need to describe the details and the present disclosure should not be limited to this.

Fig. 6 is a schematic view of one using state of the rail 300 as illustrated in Fig. 1. Fig. 7 is a schematic view of another using state of the rail 300 as illustrated in Fig. 1. As shown in Figs. 6, 7 and 2, the exercising device 100 further includes a moving unit 320 and a horizontal driving unit 330, and the rail 300 further includes two grooves 340 which are parallel to each other. The moving unit 320 includes a body 321, two sliders 322, and a screw hole 323. The sliders 322 are connected to the body 321, and the screw hole 323 is disposed at the body 321. Each of the sliders 322 is disposed in each of the grooves 340. The horizontal driving unit 330 includes a motor 331 and a screw arbor 332. The motor 331 is disposed at the rail 300. One end of the screw arbor 332 is threadly disposed in the screw hole 323 and the other end of the screw arbor 332 is disposed at the rail 300. When the screw arbor 332 is driven by the motor 331 to rotate, the position of the screw hole 323 relative to the position of the screw arbor 332 will be changed simultaneously so as to make the moving unit 320 moving horizontally in the rail 300.

Fig. 8 is a side view of one mode of the exercising device 100 as illustrated in

Fig. 1. Fig. 9 is a side view of another mode of the exercising device 100 as illustrated in Fig. 8. As shown in Fig. 8 and Fig. 9, the swinging chair 400 is connected to the moving unit 320, and includes a seat portion 420, a back portion 410, a leg portion 430, and an open-close driving unit 440. The back portion 410 is pivotally disposed at the seat portion 420 by two pivoting points 411, and the leg portion 430 is pivotally disposed at the seat portion 420 by two pivoting points 412. The open-close driving unit 440 includes a motor 441, an actuator 442, and a linking rod assembly 443. One end of the actuator is pivotally disposed at the seat portion 420 and the other end of the actuator 442 is pivotally disposed at the back portion 410. Therefore, when the motor 441 drives the actuator 442 to expand or shrink, the seat portion 420, the linking rod assembly 443, and the leg portion 430 will be acted simultaneously to change an angle b between the back portion 410 and the seat portion 420 or an angle c between the seat portion 420 and the leg portion 430 so as to change the mode of the swinging chair 400. When the mode of the swinging chair 400 is changed, a posture of a human can be changed from a lying posture to a sitting posture or from a sitting posture to a lying posture. The structure of the open-close driving unit 440 mentioned before is a sampling example and other driving structures can be adapted in other embodiments.

Fig. 10 is a side view of an exercising device 110 according to another embodiment of the present disclosure. As shown in Fig. 10, the exercising device 110 includes a base 200, a rail 300, a swinging bed 700, a swinging unit 500 and a swing driving unit 210 for swinging the rail 300. The rail 300 is pivotally disposed at the base 200. The exercising device 110 further includes a moving unit 320 and a horizontal driving unit 330. The moving unit 320 is connected to the swinging bed 700, and is driven by the horizontal driving unit 330 to move horizontally in the rail 300. Therefore, the horizontal distance between the moving unit 320 and the pivoting point 310 will be changed. The mode of the swinging bed 700 can be changed corresponding to a human body (not shown). The structures and relationships of the swinging unit 500, the swing driving unit 210, the rail 300, the horizontal driving unit 330, and the

moving unit 320 are similar to aforementioned structures of Fig.1 to Fig. 9.

Fig. 11 is a side view of an exercising device 120 according to yet another embodiment of the present disclosure. Fig. 12 is an exploded view of the rail 300 as illustrated in Fig. 11. Fig. 13 is a side view of one mode of the exercising device 120 as illustrated in Fig. 11. As shown in Figs. 11 to 13, the exercising device 120 includes a base 200, a swinging chair 400, two supporting sticks 800, a swinging unit 500, a swing driving unit 210 for swinging the rail 300, and a moving unit 360. The rail 300 is pivotally disposed at the base 200 by the pivoting point 310, and includes two grooves 350 and two pad portions 351. Each groove 350 has an opening facing toward the swinging chair 400. Each pad portion 351 formed a plank shape is disposed at each groove 350, and is abutted against each wall of each groove 350. The moving unit 360 includes a body 361 and two sliders 362. The sliders 362 are pivotally connected to the swinging chair 400. Each slider 362 is disposed in each groove 350 and can be moved linearly along each groove 350. The rail 300 further includes two fixing boards 353 and four fixing blocks 352 which are higher than a depth of the groove 350. Two of the fixing blocks 352 are disposed in two end of one groove 350, and the other two of the fixing blocks 352 are disposed in two end of the other groove 350. The fixing board 353 is connected to the groove 350 via the fixing blocks 352 so that the slider 362 is limitedly positioned between the groove 350 and the fixing board 353. The slider 362 is driven by the horizontal driving unit 330 to move along the groove 350, and a moving distance of the slider 362 is limited by the two fixing blocks 352. The fixing board 353 is used to prevent the slider 362 separating from the groove 350 during the exercising process. The pad portion 351 is used to decrease the noise from the slider 362 during the sliding motion and thus an unwell feeling of a human can be prevented. Preferably, the pad portions 351 are sound absorbing cottons. The exercising device 120 further includes a plurality of base pads 220. The base pads 220 are disposed under the base 200 for decreasing the vibration effect between the base 200 and a surface where the exercising device 120 is positioned.

The swinging chair 400 is driven by the horizontal driving unit 330 to move

horizontally in the rail 300 so as to change a horizontal distance between the moving unit 360 and the pivoting point 310. The mode of the swinging chair 400 can be changed corresponding to a human body via the open-close driving unit 440. Therefore, an angle d between the swinging chair 400 and the rail 300, an angle e between the swinging chair 400 and the supporting stick 800, and/or an angle f between the supporting stick 800 and the base 200 will be changed to make the mode of the swinging chair 400 changing more smoothly. By controlling the open-close driving unit 440 to change each of the angles, the variation of the swinging amplitude for different human part at different position will increase. The structures of the swinging unit 500, the swing driving unit 210, the open-close driving unit 440, the swinging chair 400 and the horizontal driving unit 330 are similar to the aforementioned structures of Fig.1 to Fig. 9, and there is no need to describe the details.

Fig. 14 is an exploded view of an exercising device 150 according to yet another embodiment of the present disclosure. As shown in Fig 14, exercising device 150 includes a base 200b, a rail 300b, a swinging chair 400, a swinging unit 500, an elastic unit 930, a swing driving unit 210 and a plurality of base pads. The structures of the swinging chair 400, the swinging unit 500 and the swing driving unit 210 are similar to the structures of the embodiment shown in Figs 1 to 9, the structure of the base pad 220 is similar to the embodiment shown in Figs 11 to 13, and there is no need to describe in detail. The elastic unit 930 is disposed between the base 200b and the rail 300b, and can be deformed to reduce an impulse caused by the rail 300b.

Fig. 15A is a cross-sectional view of one using state of the rail 300b, the base 200b and the elastic unit 930 as illustrated in Fig. 14, and Fig. 15B is a cross-sectional view of another using state of the rail 300b, the base 200b and the elastic unit 930 as illustrated in Fig. 14. Specially, a swinging motion of rail 300b is caused by the swinging unit 500, and a distance between the rail 300b and the base 200b is changed accordingly. As shown in Figs 15A and 15B, the elastic unit 930 is deformed by the swinging motion of the rail 300b. When the rail 300b swings from the highest point toward the lowest point, the gravity and

the inertia force of the eccentric block result in producing an impetuous impulse toward a ground where the exercising device 150 (see Fig. 15) is disposed. Thus the rail 300b and the swinging chair 400 cannot swing smoothly because of the impulse, and a user will feel unwell. Through disposing the elastic unit 930
5 between the rail 300b and the base 200b, the impulse can be absorb by the elastic unit 930, and a user will feel more comfortable when using the exercising device 150.

The elastic unit 930 is comprised by the rail 300b in Fig. 15A while extended by the rail 300b in Fig. 15B. In other embodiment, the elastic unit 930 can only be
10 comprised but not be extended, and keeps an original height while the rail 300b is at the highest position.

Fig. 16 is a schematic view of an exercising device 130 according to yet another embodiment of the present disclosure. As shown in Fig. 16, the exercising device 130 further includes two armrests 910 and a chair cover 920. By the
15 assistance of the armrests 910 and the chair cover 920, the user will feel more comfortable when using the exercising device 130. In Fig. 11 to Fig. 16, each of the exercising device 120, the exercising device 130, and the exercising device 150 includes the swinging chair 400, and the swinging chair 400 can be replaced by a swinging bed in other embodiments.

20 The swinging speed of the swing driving unit will affect the swinging status of the exercising device. As the aforementioned description, the swinging unit swings eccentrically to drive the exercising device swinging simultaneously. When the swinging speed of the swinging unit becomes higher, the exercising device will swing faster and the user will feel the body shaking up and down with small
25 amplitude and higher speed. On the other way, when the swinging speed of the swinging unit becomes lower, the exercising device will swing slower and the user will feel the body swinging forward and backward. The swinging motion is smooth and the body swings in a circle. Further with the function of linear motion, the exercising device can be at different position and can have different
30 swing speed so as to bring different feeling to users. Thus the user can choose

a love way to swing.

Fig. 17 is a side view showing one using status of an exercising device 140 according to yet another embodiment of the present disclosure. As shown in Fig. 17, the inside structure of the exercising device 140 cannot be seen because
5 of the chair cover, and the basic structures are similar to the aforementioned structures of Fig. 1 to Fig. 9. The swinging chair 400a includes a back portion 410a, a seat portion 420a, a leg portion 430a, and a pillow 460a. The swinging chair 400a is in a mode for a human to lying. The pillow 460a disposed on the back portion 410a is for a user P to lean his or her head on. The pillow 460a is
10 disposed to confirm the ergonomic effect and increases the comfortable feeling of user P. Moreover, the pillow 460a can help to fix the position of the head of user p and prevent the head shaking too much during the swinging process. Preferably, the pillow 460 has shock absorbing function. Besides, the swinging chair 400a further includes two armrests 910a disposed at two sides of the seat
15 portion 420a, respectively.

When the user P is lying, his or her hands will be put on the armrest 910a, and the hands and the legs will be at a higher position than his or her heart. Because the blood is concentrated on the hands and the legs for a seating posture and a standing posture, the blood hardly returns to the heart.
20 Therefore, the positions of the hands and the legs are designed to be higher than the position of the heart, and the blood returns to the heart from the hands and the legs to increase the blood circulating by the assistance of the swinging function of the exercising device 140.

Besides, the back portion 410a can includes a plurality of airbags (not shown) and a plurality of massagers (not shown). Through the inflation and deflation
25 motion of the airbags, and the swinging and moving motion of the massagers, a massage effect on back can be achieved. Similarly, the seat portion 420a can also includes a plurality of airbags so as users can enjoy the massage effect for leg and hip. The inflation and deflation motion of the aforementioned airbags
30 can be acted simultaneously or non-simultaneously and thus the massage effect

becomes diversifying.

Fig. 18 is a flow diagram of an operating method of the exercising device 100 as illustrated in Fig. 1 according to yet another embodiment of the present disclosure. The operating method 600 of the exercising device 100 includes a linear moving step 610 and a swinging step 630. The linear moving step 610 includes providing a rail 300 pivotally disposed at a base 200 by two pivoting points 310, moving the swinging bed 700 or the swinging chair 400 movably positioned on the rail 300, and providing a horizontal driving unit 330 to drive the swinging bed 700 or the swinging chair 400 moving in the rail 300 linearly. The swinging step 630 includes providing a swing driving unit 210 for driving a swinging unit 500 to change an angle α between the rail 300 and the base 200 so that the rail 300 moves along a swinging path reciprocatedly. In the embodiment of Fig. 18, the linear moving step 610 provides the linear movement of the swinging bed 700 or the swinging chair 400 first, and then the swinging step 630 vibrates the rail 300 to swing the swinging bed 700 or the swinging chair 400. Besides, the operating method can further include an open-close step 620. The open-close step 620 provides an open-close driving unit 440 to change a mode of the exercising device 100 corresponding to a human. In the embodiment of Fig. 18, the linear moving step 610 is the first step, the open-close step 620 is the second step, and the swinging step 630 is the final step. In other embodiment, the sequence of the linear moving step 610 and the open-close step 620 can be changed. For example, the open-close step 620 becomes the first step, the linear moving step 610 becomes the second step, and the swinging step 630 is remained to be the final step. In yet another embodiment, the open-close step 620 and the linear moving step 610 can be acted simultaneously and the swing step can be acted soon after. Of course, all the steps can be acted simultaneously.

According to the aforementioned embodiments, the present disclosure has the following advantages.

1. Through the operating method of the exercising device, the

horizontal position of the swinging chair or the swinging bed can be changed according to the demand of the user. The mode of the exercising device can be changed corresponding to a human body so that the user can choose different exercising posture, like sitting posture or lying posture. Moreover, the swinging amplitude and swinging strength for different part of the human body can be changed according to the horizontal position of the exercising device.

2. Through the linear motion structures of the exercising device, the horizontal position of the swinging bed or the swinging chair can be changed, and the force arm between the pivoting point and the part of the human body will be changed together. When a person is sitting on the swinging chair to swing, the horizontal distance between the vertical line of the head and the pivoting point becomes short and thus the force arm becomes short too. Therefore, the swinging amplitude of the head is small and an unwell feeling from head shaking can be reduced. The swinging amplitude of other part of the human body is proportional to the force arm, and an exercising effect of other part of the human body can also be achieved. Specially, the changing of the horizontal position of the swinging bed or the swinging chair will result in changing the corresponding vibrating part of the human body. Choices of a user will increase.

3. Besides, when the distance between the pivoting point and the moving unit becomes closer, the swinging amplitude of the rail becomes smaller, too. On the other way, when the distance between the pivoting point and the moving unit becomes farer, the swinging amplitude of the rail becomes larger so that the swinging amplitude of the swinging bed or the swinging chair will also becomes larger. Therefore, the exercising strength of the exercising device can be changed.

4. If the swinging chair is pivotally connected to the rail, or the exercising device further includes a supporting stick for pivotally connecting to the rail and the swinging chair, the angle between the rail and the swinging chair, the angle between the supporting stick and the swinging chair, and/or the angle between the supporting stick and the base can be driven to changed. The

swinging amplitude corresponding to the different part of the swinging chair becomes more diversified with the structure of multi-pivoting points, and the types of different swinging motion will be increased. For example, the swinging motion can be an up-and-down motion or a circular swinging motion. The smoothness of the open-close operation or the linearly moving operation can be increased with the structure and thus the comfortable feelings of users will also be improved.

5 5. When the swinging bed or the swinging chair further includes the supporting stick, the open-closed operation for changing the mode or the swinging bed or swinging chair becomes smoother. The structure is stronger during the swinging process with the supporting of the supporting stick. The angles of the seat portion can also be changed so that the swinging motion becomes more diversified.

10 6. The sound making by the horizontal linear moving motion of the exercising device can be decrease via the pad portion which is disposed in the groove of the rail, and thus an operating noise can be prevented. Besides, a dimensional tolerance of the groove and the slider can be made larger if the pad portion is disposed in the groove. Therefore, a manufacturing cost as well as difficulties of manufacturing process can be reduced.

15 7. The mode of the exercising chair can be changed via the open-close structure of the exercising device and the operating convenience can be improved.

20 8. The different of the swinging speed of the swinging unit makes the user feeling different swinging motion. When the swinging speed is high, the swinging amplitude of human body is small, and the user will feel swing up and down with whole body shaking. When the swinging speed is small, the swinging amplitude of the human body is large, and the user will feel swing backward and forward with the body swinging circularly. Therefore, the exercising device can provides different exercising effect.

25 It will be apparent to those skilled in the art that various modifications and
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variations can be made to the structure of the present disclosure without departing from the scope or spirit of the disclosure. In view of the foregoing, it is intended that the present disclosure cover modifications and variations of this disclosure provided they fall within the scope of the following claims.

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CLAIMS:

1. An operating method of an exercising device, comprising:

a linear moving step, comprising:

providing a rail pivotally disposed at a base by at least one pivoting point; and

moving a swinging bed or a swinging chair along the rail for a linear movement relative to the base, wherein a force arm between the pivoting point and a gravity center of the swinging bed or the swinging chair is changed such that a vibrating amplitude of the swinging bed or the swinging chair is changed correspondingly; and

a swinging step for vibrating the rail, wherein the swinging step changes an angle between the rail and the base to make the rail move along a swinging path reciprocatedly.

2. The operating method of claim 1, wherein the linear moving step provides the linear movement via a horizontal driving unit, the swinging step then vibrates the rail, and the swinging bed or the swinging chair is linked with the rail.

3. The operating method of claim 1, further comprising:

an open-close step, wherein the open-close step is for changing a mode of the swinging bed or the swinging chair corresponding to a human body.

4. The operating method of claim 3, wherein the open-close step is

acted with the linear moving step simultaneously.

5. An exercising device, comprising:

a base;

a rail pivotally disposed at the base by at least one pivoting point;

a swinging chair movable along the rail for a linear movement relative to the base; and

a swinging unit disposed between the rail and the base to vibrate the rail;

wherein when the swinging chair is moved, a position of the swinging chair relative to a position of the base along a horizontal line is changed such that a force arm between the pivoting point and a gravity center of the swinging chair is changed and a vibrating amplitude of the swinging chair is changed correspondingly.

6. The exercising device of claim 5, further comprising a moving unit for connecting the swinging chair to the rail and a horizontal driving unit for moving the moving unit in the rail, thus the swinging chair being linked with the moving unit and moved along the rail.

7. The exercising device of claim 6, wherein the horizontal driving unit comprises a motor and a screw arbor, wherein the motor is for driving the screw arbor, and the moving unit comprises a screw hole coordinated with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail.

8. The exercising device of claim 5, wherein the swinging unit comprises:

- a roller rotatably disposed at the base;
- an eccentric block sleeved on the roller and pushing the rail; and
- a wheel sleeved on the roller.

9. The exercising device of claim 8, further comprising a swing driving unit disposed at the base and for driving the swinging unit to rotate.

10. The exercising device of claim 9, wherein the swing driving unit comprises:

- a motor;
- a pulley driven by the motor; and
- a belt connecting the pulley to the wheel,

wherein the motor drives the pulley, the belt, the wheel, the roller and the eccentric block to rotate simultaneously.

11. The exercising device of claim 5, wherein the swinging chair comprises a seat portion, a back portion pivotally connected to the seat portion, and a leg portion pivotally connected to the seat portion, wherein a mode of the swinging chair is changed by driving the seat portion, the back portion and the leg portion.

12. The exercising device of claim 11, wherein the swinging chair further comprises an open-close driving unit for driving the back portion and the leg portion to change an angle between the back portion and the seat

portion or an angle between the leg portion and the seat portion.

13. An exercising device for a human to lie, comprising:

a base;

a rail pivotally disposed at the base by at least one pivoting point;

a swinging bed movable along the rail for a linear movement relative to the base; and

a swinging unit disposed between the rail and the base to vibrate the rail;

wherein when the swinging bed is moved, a position of the swinging bed relative to a position of the base along a horizontal line is changed such that a force arm between the pivoting point and a gravity center of the swinging bed is changed and a vibrating amplitude of the swinging bed is changed correspondingly.

14. The exercising device of claim 13, further comprises a moving unit for connecting the swinging bed to the rail and a horizontal driving unit for moving the moving unit in the rail, thus the swinging bed being linked with the moving unit and moved along the rail.

15. The exercising device of claim 14, wherein the horizontal driving unit comprises a motor and a screw arbor, wherein the motor is for driving the screw arbor; and the moving unit comprises a screw hole coordinated with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail.

16. An exercising device, comprising:

a base;

a rail pivotally disposed at the base by at least one pivoting point;

a swinging bed or a swinging chair movable along the rail for a linear movement relative to the base, swinging bed or the swinging chair being pivotally disposed at the rail;

a supporting stick, wherein one end of the supporting stick is pivotally connected to the swinging bed or the swinging chair, and the other end of the supporting stick is pivotally connected to the base; and

a swinging unit disposed between the rail and the base to vibrate the rail, wherein the swinging unit is for changing an angle between the rail and the base;

when the swinging bed or the swinging chair is moved, a position of the swinging bed or the swinging chair relative to a position of the base along a horizontal line is changed such that a force arm between the pivoting point and a gravity center of the swinging bed or the swinging chair is changed and a vibrating amplitude of the swinging bed or the swinging chair is changed correspondingly.

17. The exercising device of claim 16, further comprising a moving unit for connecting the swinging bed or the swinging chair to the rail and a horizontal driving unit for moving the moving unit in the rail, thus the swinging bed or the swinging chair being linked with the moving unit and moved along the rail.

18. The exercising device of claim 17, wherein the horizontal driving

unit comprises a motor and a screw arbor, wherein the motor is for driving the screw arbor, and the moving unit comprises a screw hole coordinated with the screw arbor, wherein the motor drives the screw arbor, thus the moving unit is moved in the rail.

19. The exercising device of claim 18, wherein the swinging bed or the swinging chair is pivotally connected to the moving unit.

20. The exercising device of claim 19, wherein the rail comprises two grooves and two pad portions, the moving unit is movably disposed in the grooves, and each pad portion is positioned in each groove.

21. The exercising device of claim 20, further comprising:

a plurality of base pads, wherein the plurality of base pads are disposed under the base.

22. An exercising device, comprising:

a base;

a rail pivotally disposed at the base by at least one pivoting point;

a swinging chair movable along the rail for a linear movement relative to the base;

a swinging unit disposed between the rail and the base to vibrate the rail; and

an elastic unit disposed between the base and the rail, wherein the elastic unit is deformed by the reaction of the rail so as to reduce an impulse caused by the swinging unit;

wherein when the swinging chair is moved, a position of the swinging chair relative to a position of the base along a horizontal line is changed such that a force arm between the pivoting point and a gravity center of the swinging chair is changed and a vibrating amplitude of the swinging chair is changed correspondingly.

23. The exercising device of claim 22, wherein the elastic unit is a cylinder structure.

24. The exercising device of claim 23, further comprising a moving unit for connecting the swinging chair to the rail, and a horizontal driving unit for moving the moving unit in the rail, thus the swinging chair being linked with the moving unit and moved along the rail.

25. The exercising device of claim 24, wherein the swinging unit comprises:

a roller rotatably disposed at the base;

an eccentric block sleeved on the roller and pushing the rail; and

a wheel sleeved on the roller.

26. The exercising device of claim 22, wherein the swinging chair comprises a seat portion, a back portion pivotally connected to the seat portion, and a leg portion pivotally connected to the seat portion, wherein a mode of the swinging chair is changed by driving the seat portion, the back portion and the leg portion.

27. The exercising device of claim 26, wherein the swinging chair further comprises an open-close driving unit for driving the back portion and the leg portion to change an angle between the back portion and the seat portion or an angle between the leg portion and the seat portion.

28. The exercising device of claim 22, further comprising a plurality of base pads, wherein the plurality of base pads are disposed under the base.

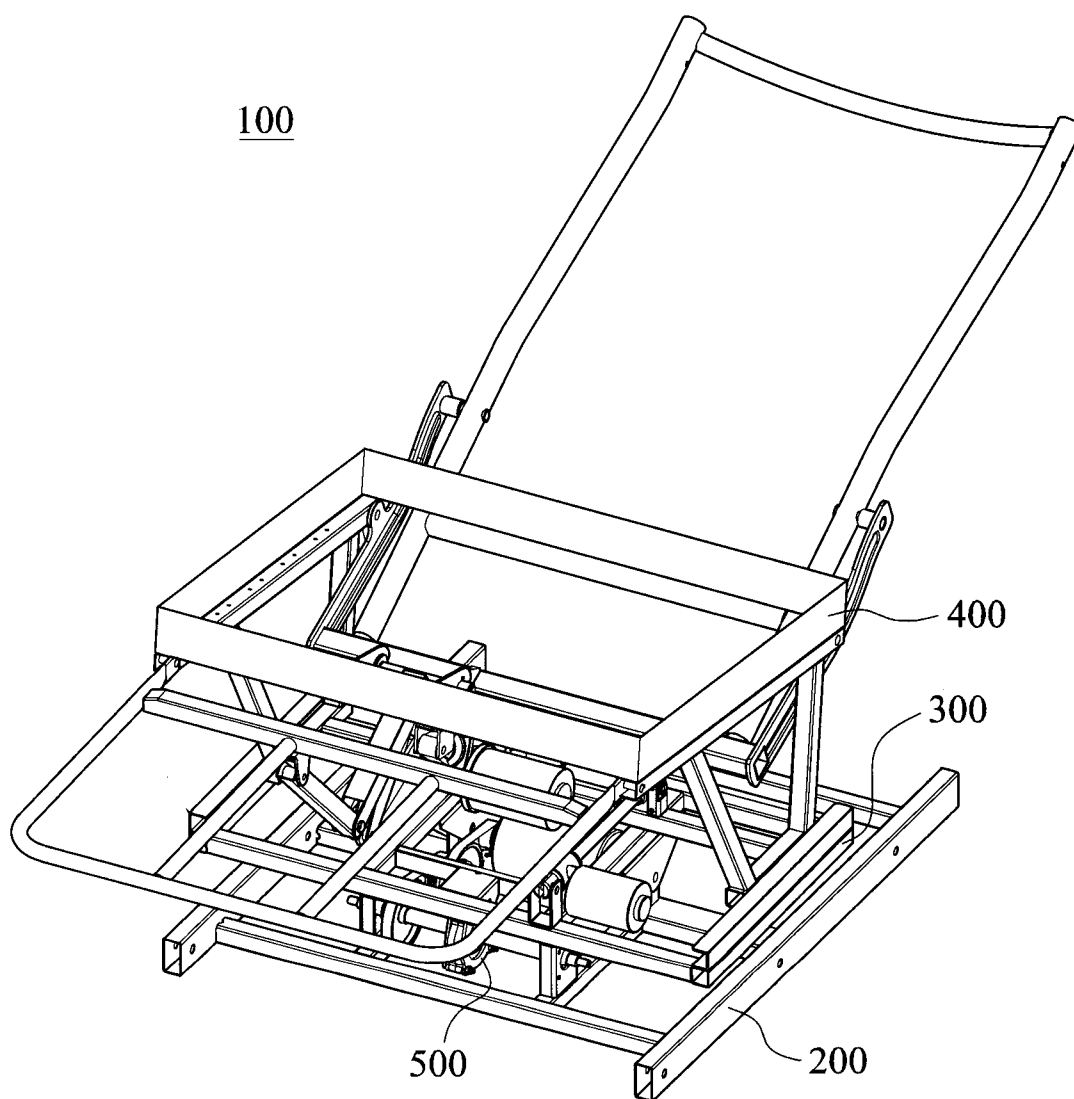
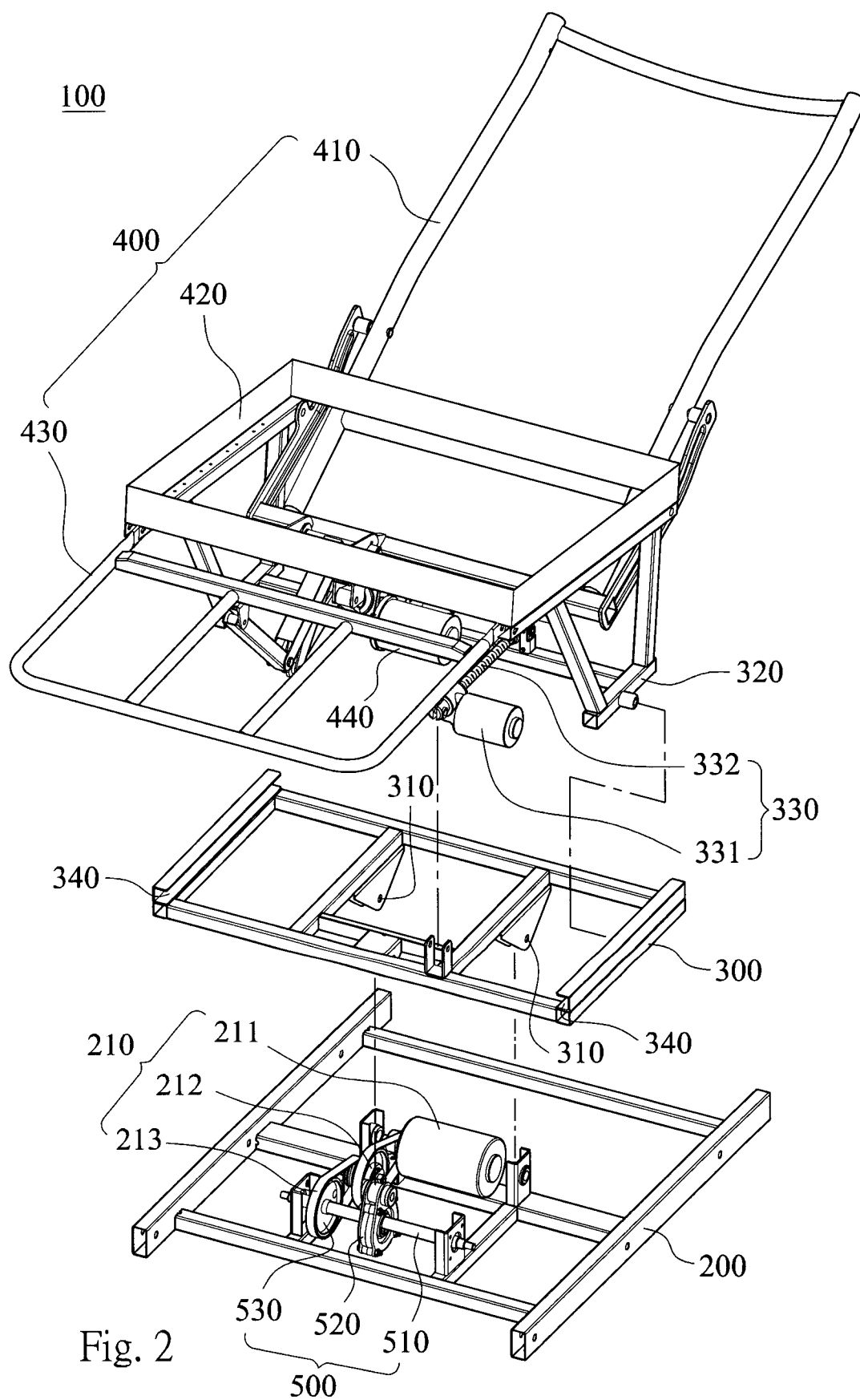


Fig. 1



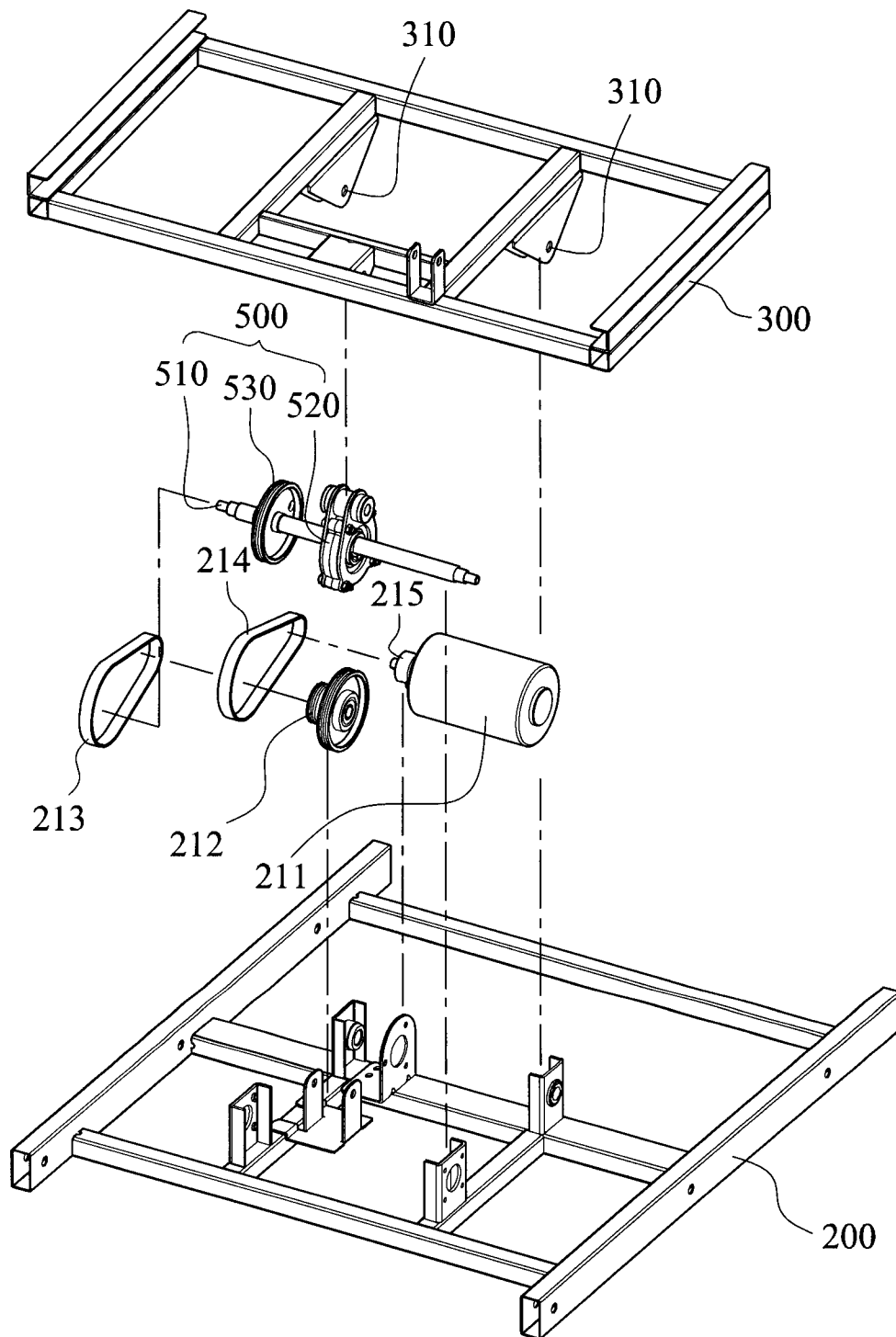


Fig. 3

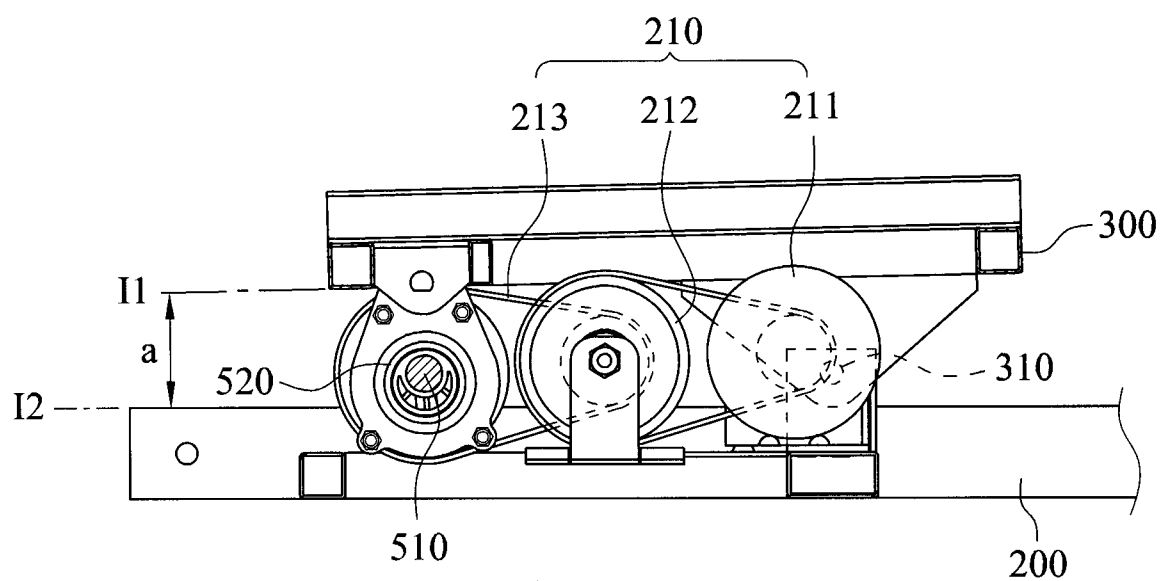


Fig. 4

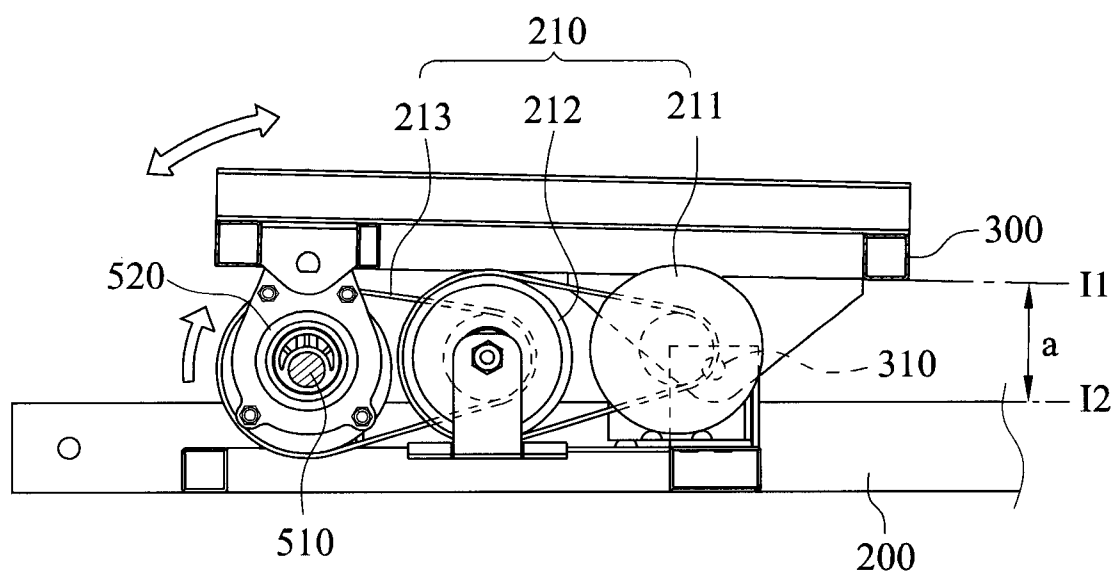


Fig. 5

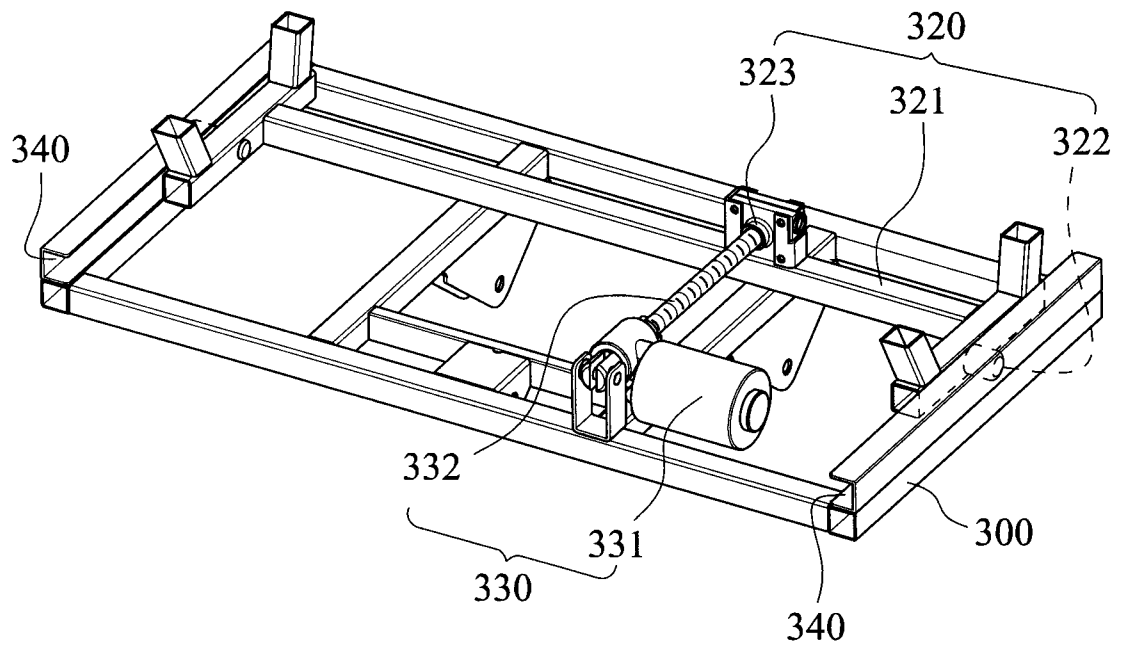


Fig. 6

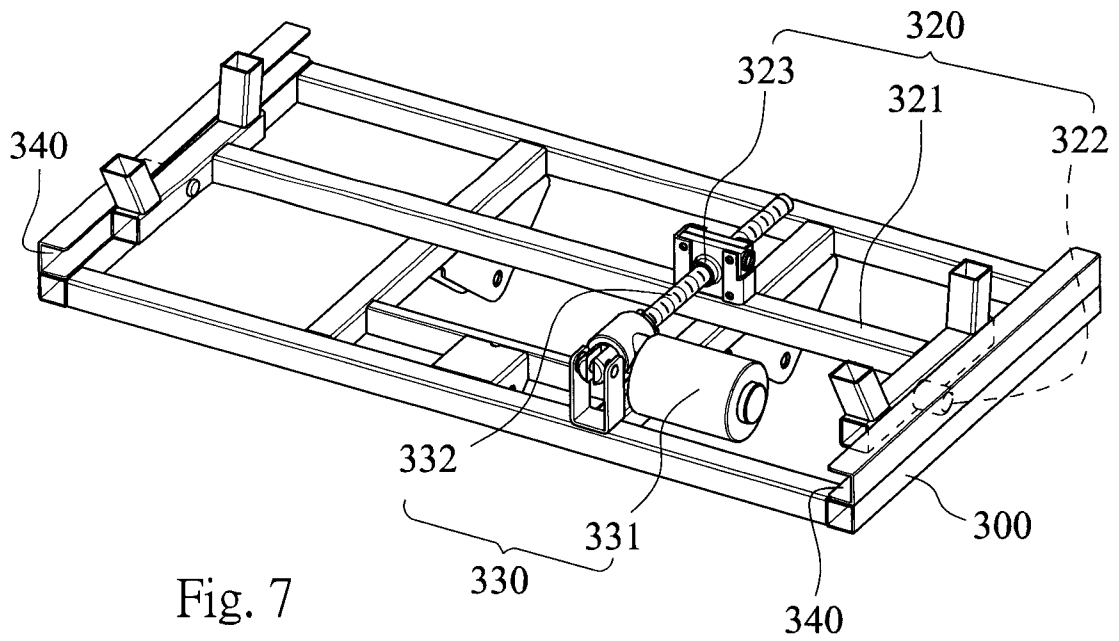
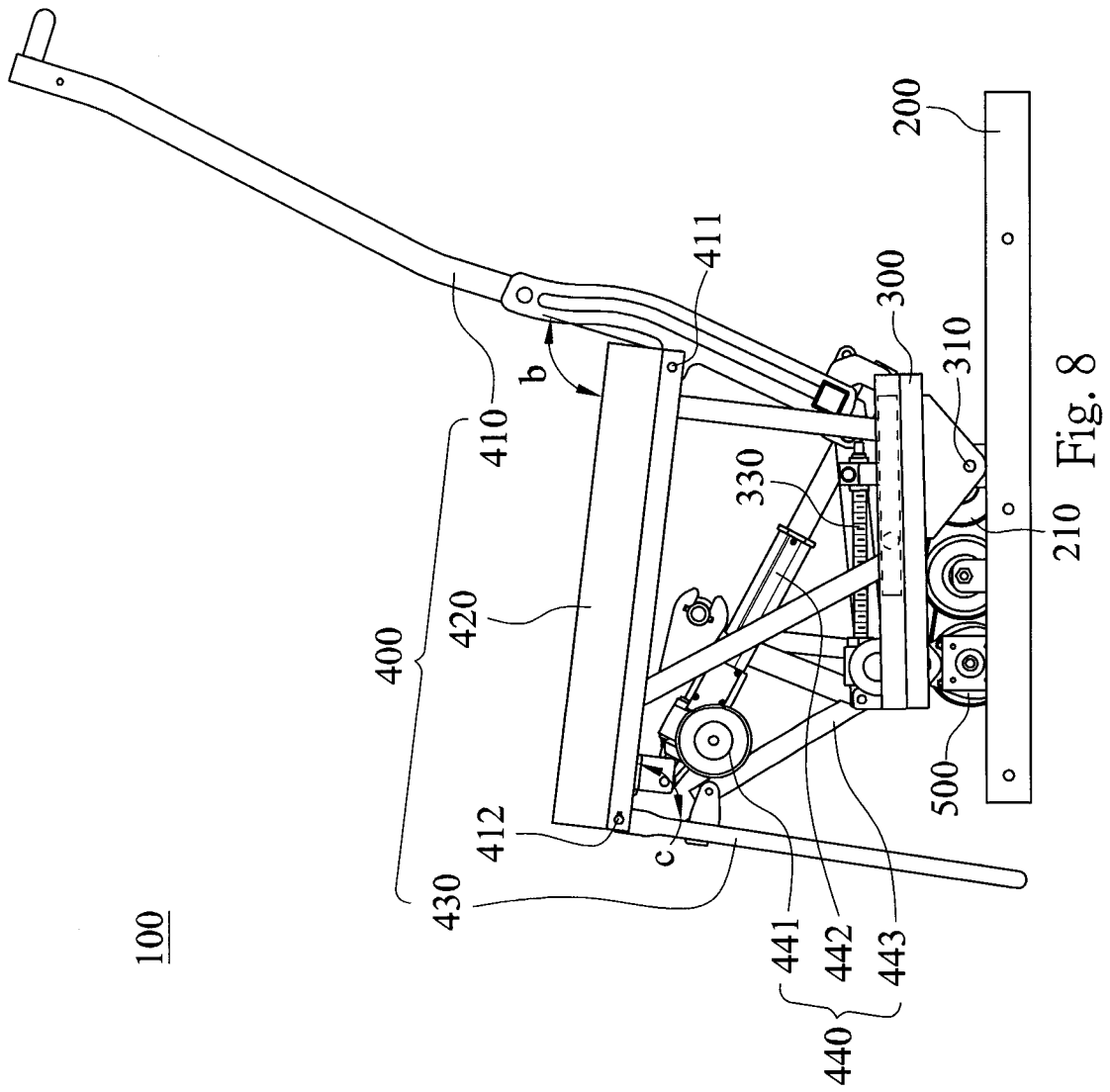


Fig. 7



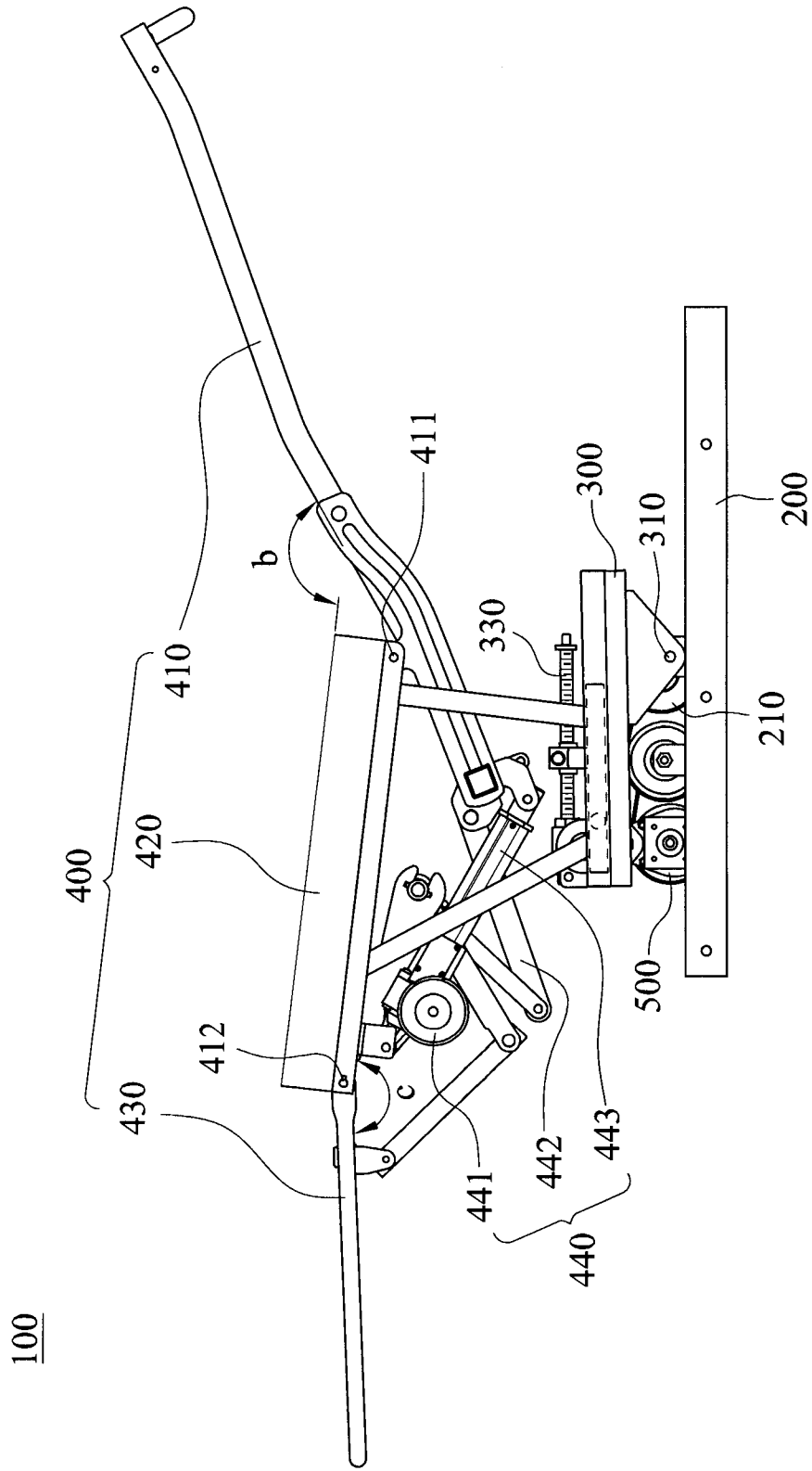


Fig. 9

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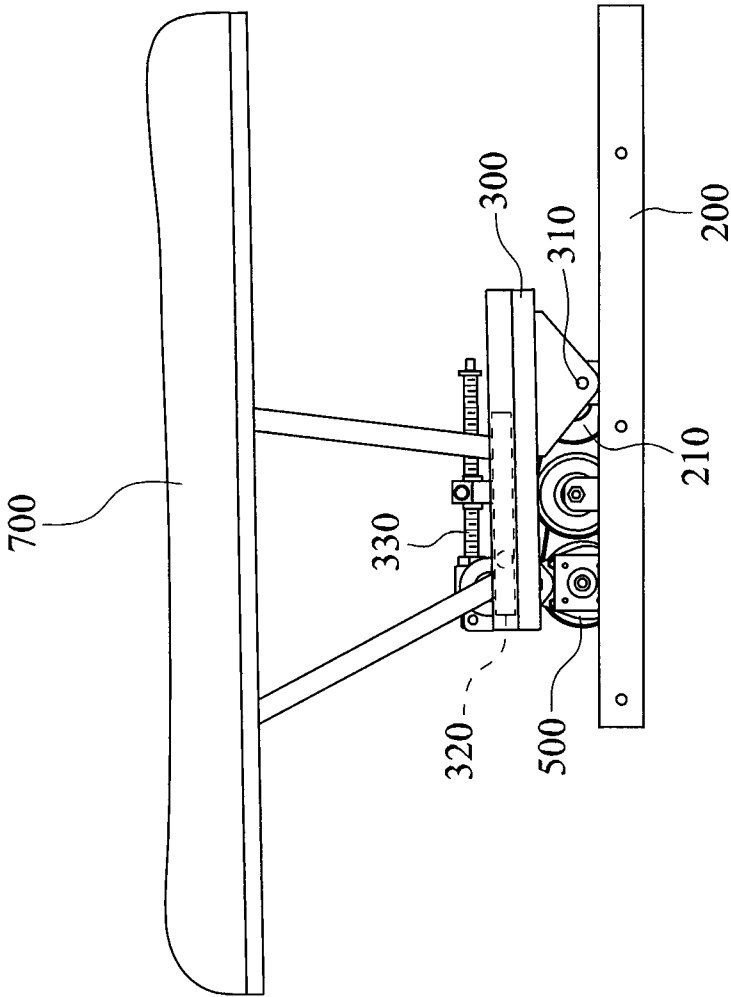


Fig. 10

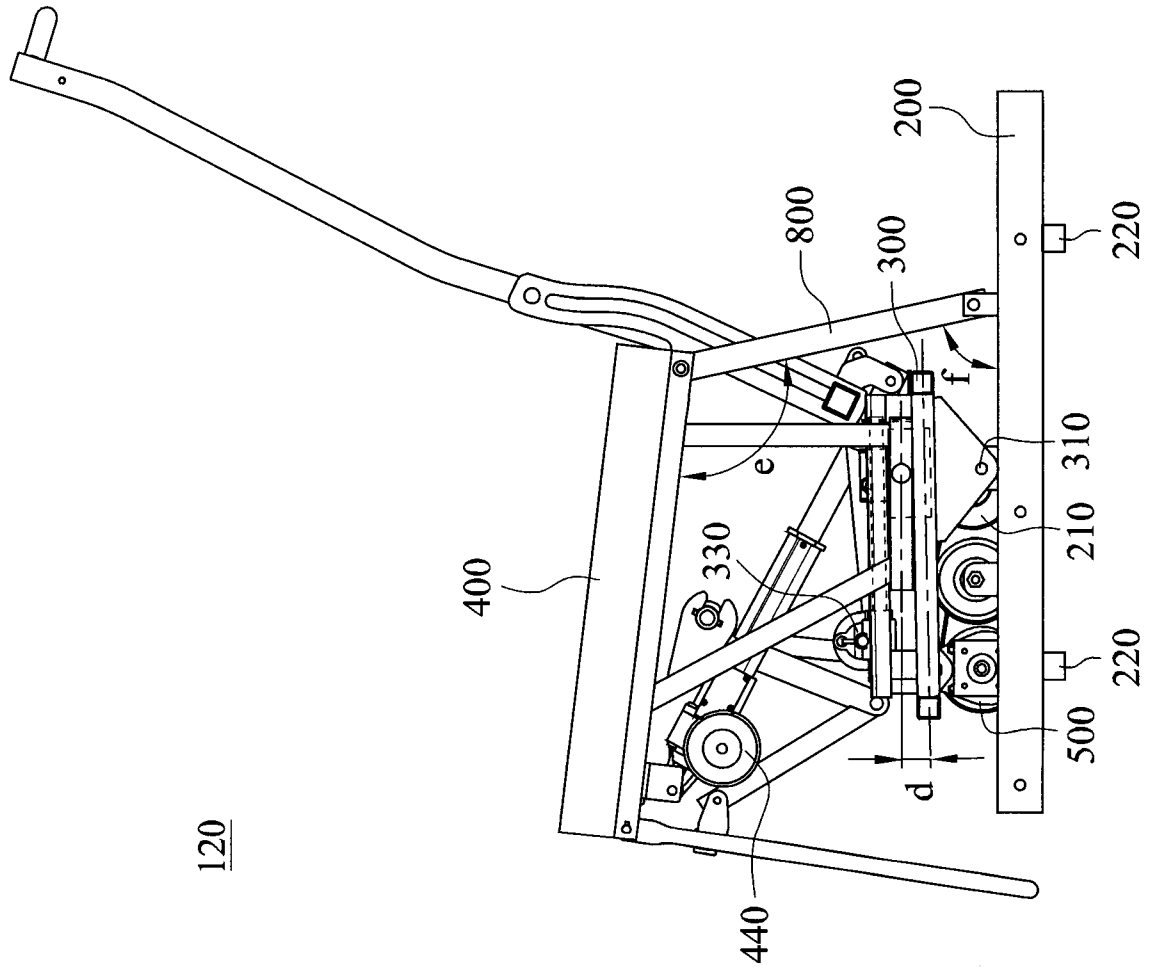


Fig. 11

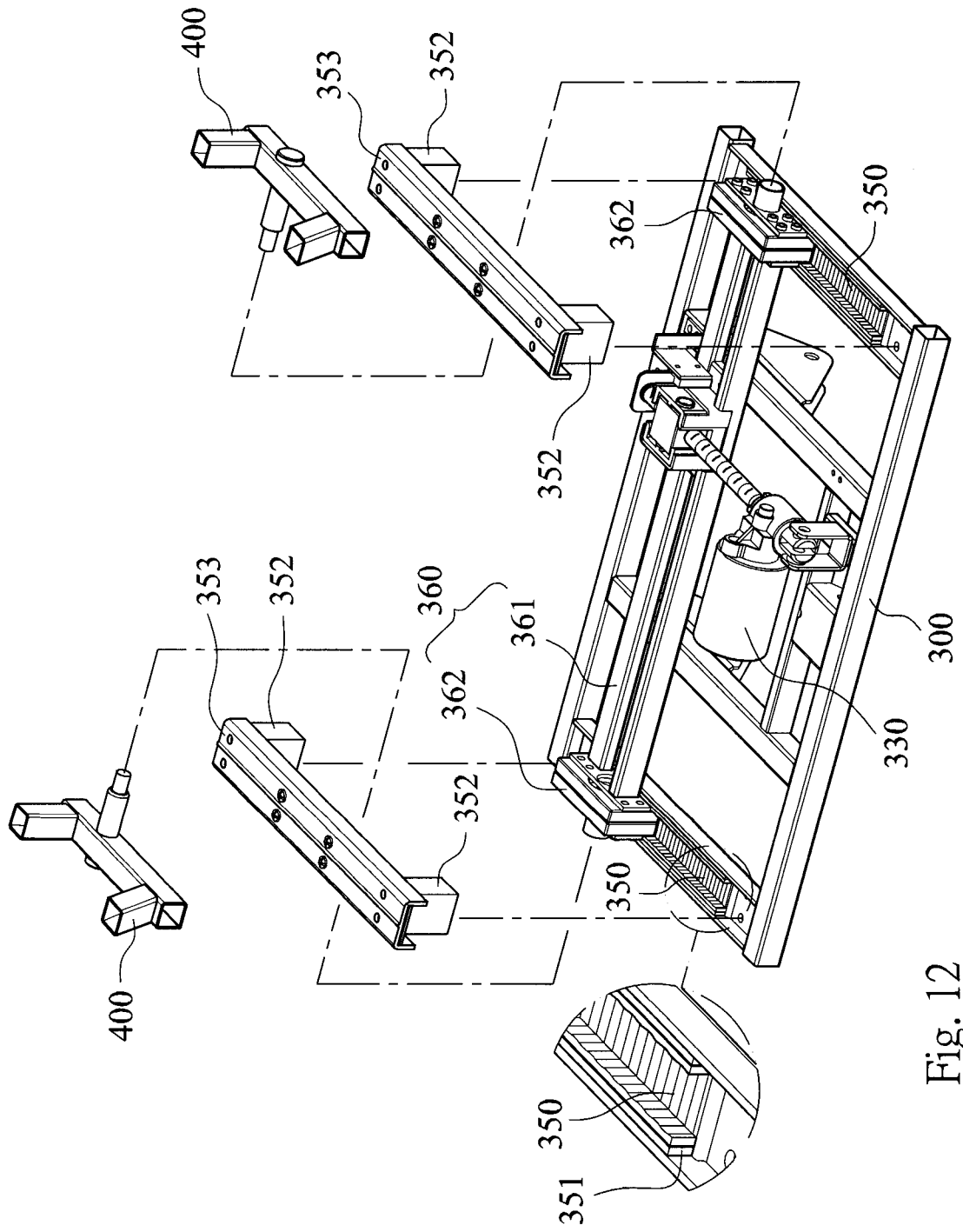


Fig. 12

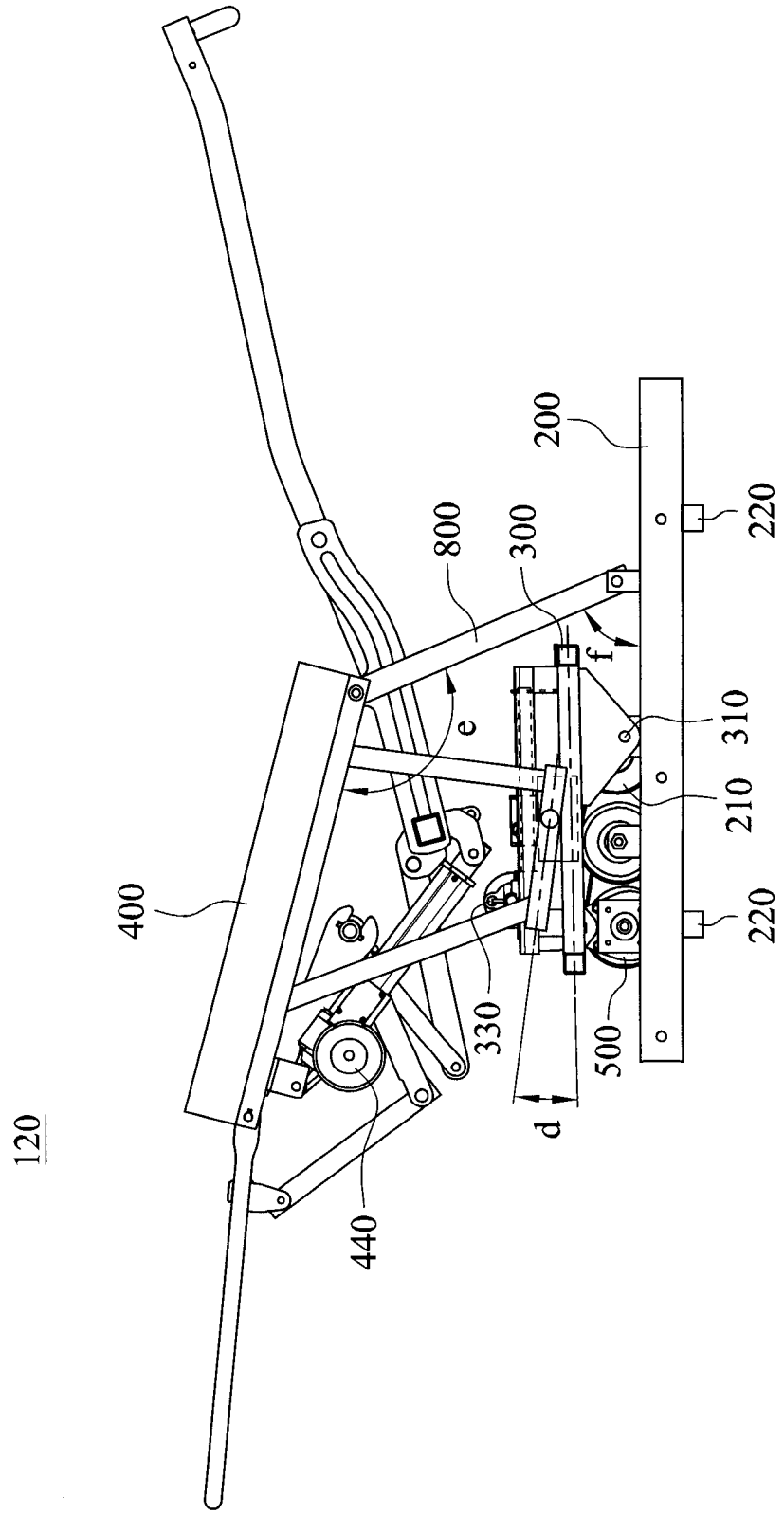


Fig. 13

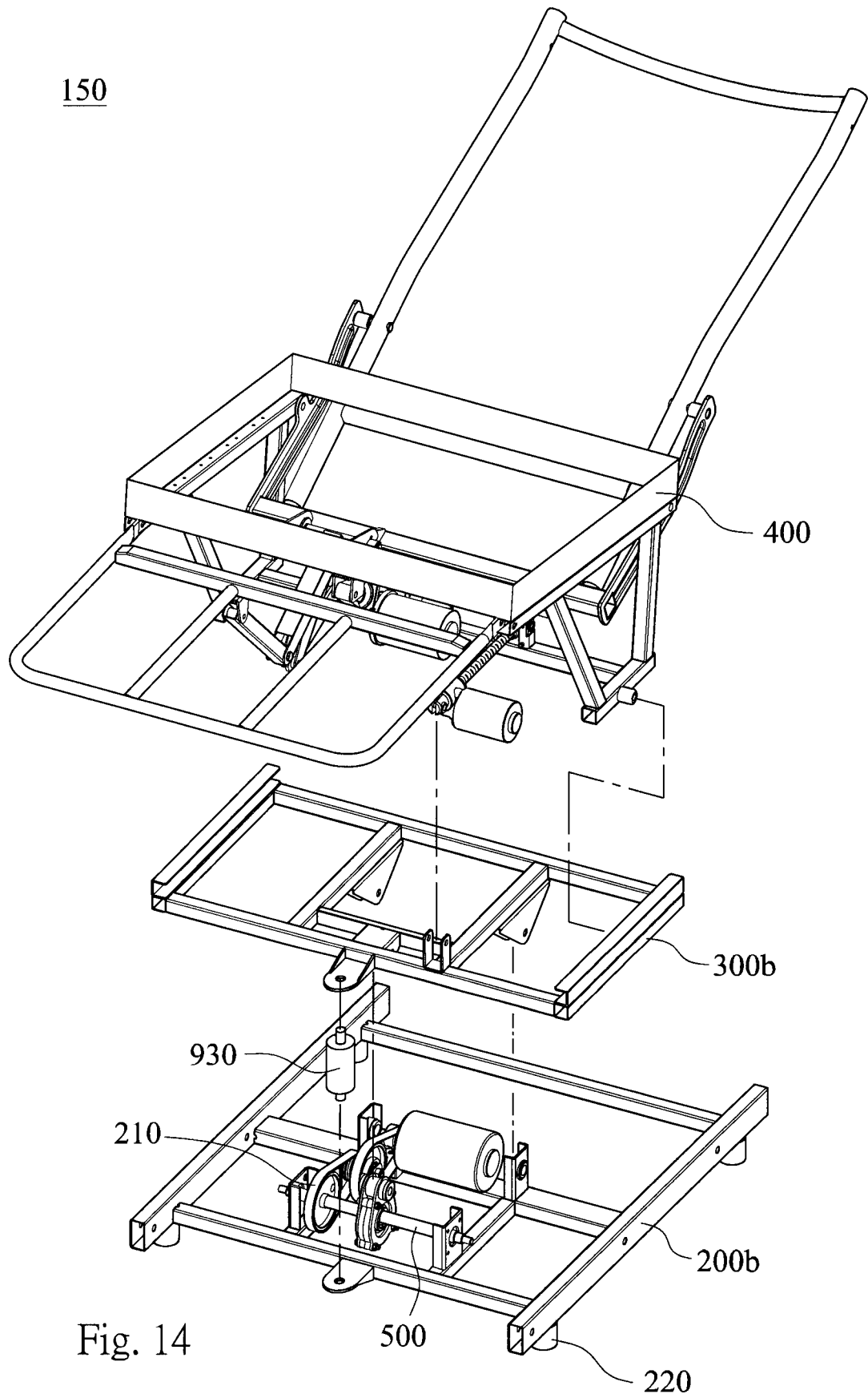


Fig. 14

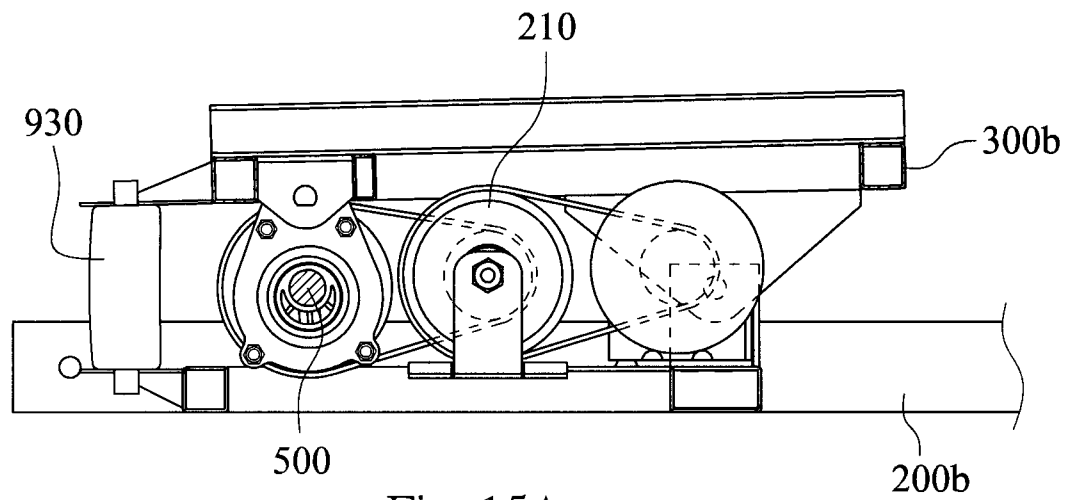


Fig. 15A

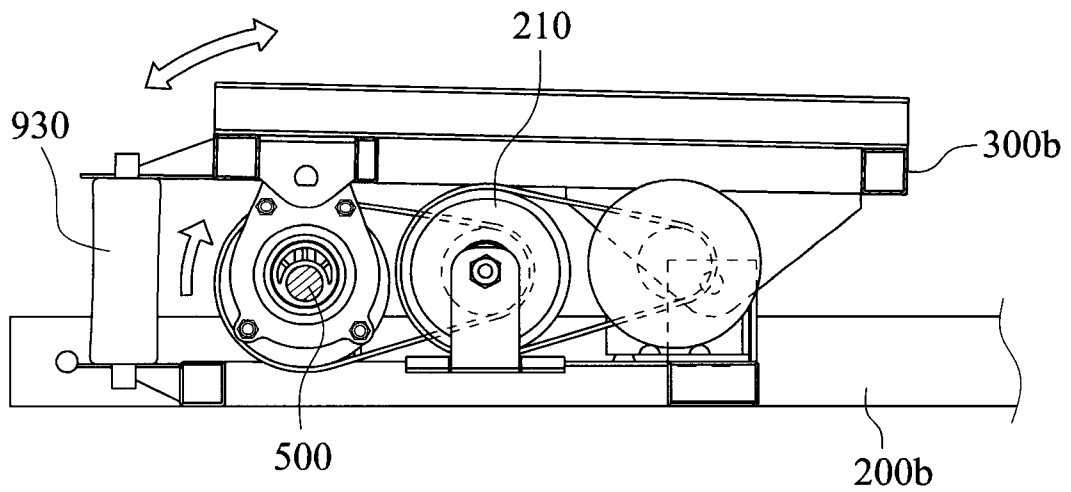
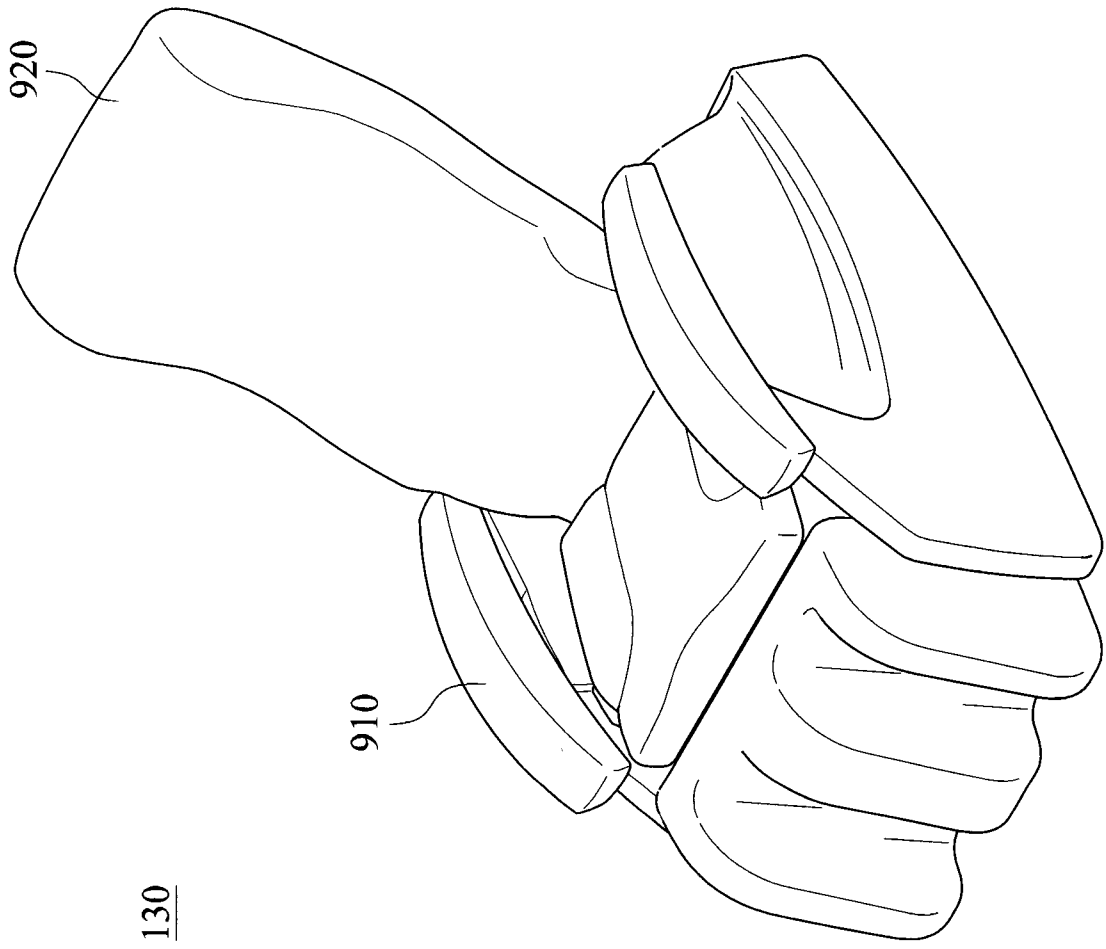


Fig. 15B



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Fig. 16

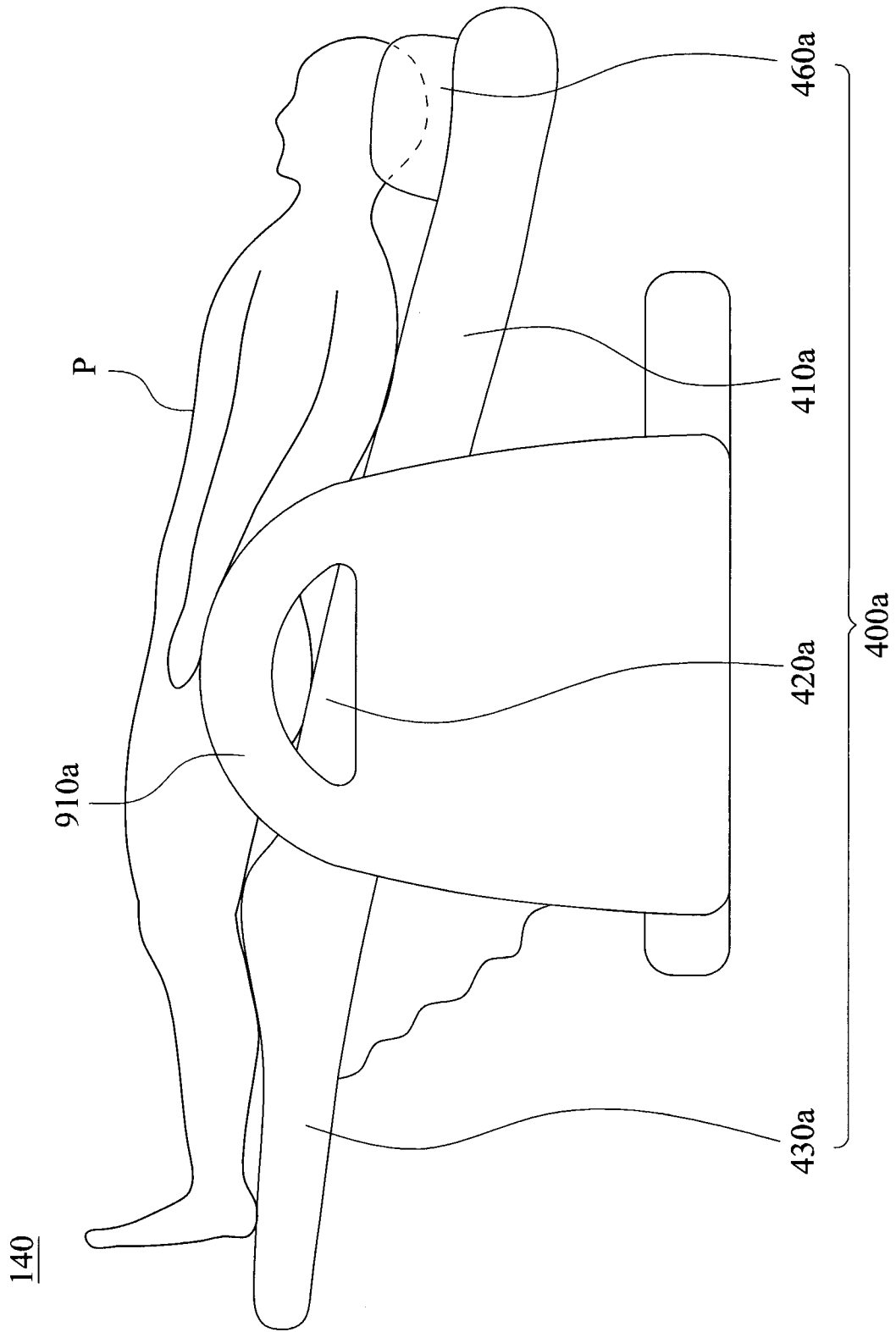


Fig. 17

600

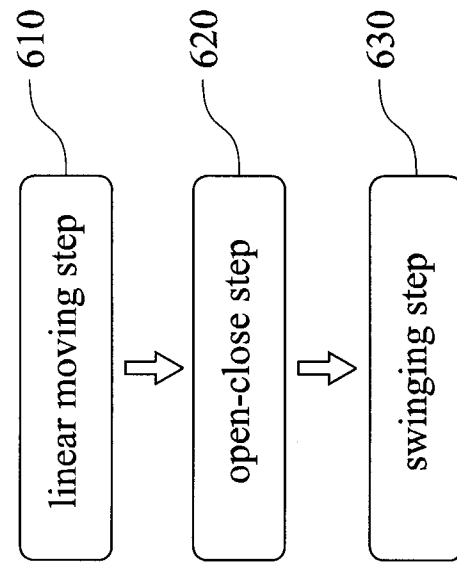


Fig. 18

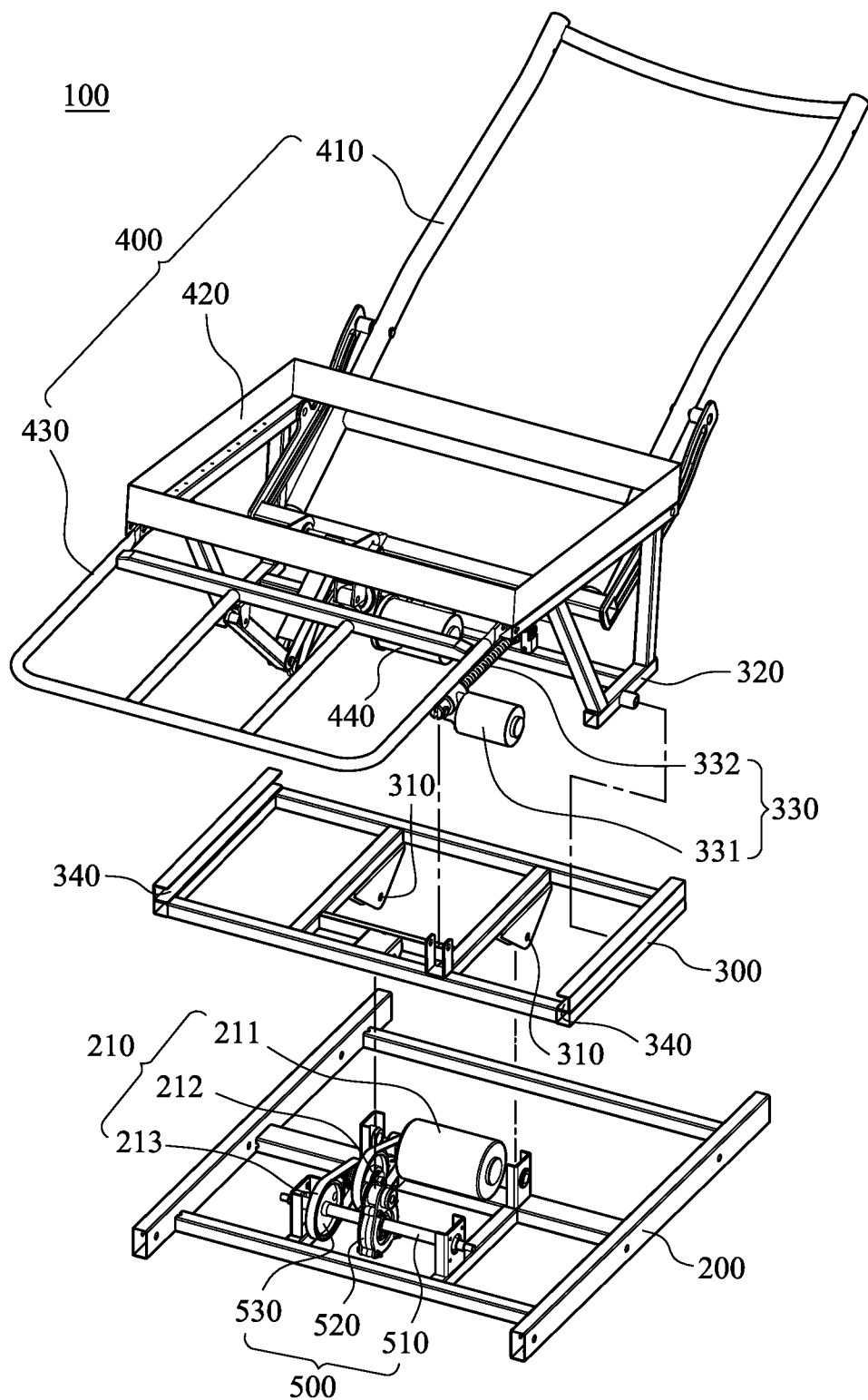


图2