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(54) Title: SLIDING EXERCISE BOARD

(57) Abstract: A sliding exercise device comprising of a base board on which is mounted a sliding platform movable from one end of the board to the other in a controlled fashion and a resistance mechanism to provide resistance to the movement of the platform with respect to the board. The base board is sufficiently thick to hold a sliding board and wide enough to fit a large foot. The sliding exercise device has a non-slip surface on the underside.

SLIDING EXERCISE BOARD

BACKGROUND OF THE INVENTION

FIELD OF INVENTION

Reference: US60/749,438 Provisional application DEC/13/2005

- 5 This invention relates to a portable exercise device with a sliding platform moving on a base board, that can provide passive, active and resisted movement in weight or non weight bearing exercises for the upper and lower extremities. This invention relates particularly to a sliding foot/hand plate moving on a base board where the device can be used for weight and non
- 10 weight bearing active, passive, and resisted exercise to be performed for upper and lower extremities.

The device can be used to allow active range of motion exercises for the ankle, knee, hip and lower trunk in addition to the elbow, shoulder and upper

15 trunk in either weight or non weight bearing situations. Passive exercises can be performed to the knee, hip, elbow and shoulder. Resisted exercises for the ankle, knee, hip and lower trunk in addition to the wrist, elbow, shoulder and upper trunk in either weight or non weight bearing situations.

- 20 There are many conditions of the musculo-skeletal system that require passive, active, and/or resisted exercises as part of their rehabilitation. The exercises can be either performed in weight bearing or non-weight bearing. Exercises that are performed non-weight bearing where there is no fixation of the distal end of the limb are defined as 'open chain'. Sitting on the edge of
- 25 the treatment table with a weight on the ankle and straightening the knee is an example of an 'open chain' exercise, as is performing a biceps curl in the upper arm. When the exercise is performed weight bearing, with the distal end of the limb being stabilized, it is defined as being closed chain. Performing a squat or deep knee band is an example of a lower extremity
- 30 closed chain exercise as a 'press up' is an upper extremity example. Closed chain exercises promote different muscle actions of the limbs and are more

appropriate in some rehabilitation situations than 'open chain exercises. The device can be used for both. The device is portable and can be used in the home, gym or rehabilitation clinic. The device can be adapted to the needs of the patient. Passive movement is applied by loading the sliding foot/hand
5 plate so when a limb is placed on the plate, the loaded plate will passively move the limb to the extent of the resistance bands. Closed chain exercise are performed by standing with one foot on the foot/hand plate for the lower extremity or the hand on the foot/hand plate while placing weight on the limb down the arm for example in a kneeling position of all fours. The larger
10 version uses the patients other foot to fixate the board by placing the weight on the lid. The smaller version uses an anti skid friction surface on the under side.

15 DESCRIPTION OF PRIOR ART

Various kinds of muscle training apparatus and other exercising devices are well known. One of the known apparatus is US 4,911,430 issued to Jean Marie Flament on March 27, 1990 comprising of an apparatus allowing the user to exercise particularly his lower limbs as for training in sliding sports
20 such as snow or water skiing, includes a base adapted to be anchored on a reference surface, the base having a accurate shaped track formed of two concentric paths, each path having a curved concentric rail, and a pair of movable carriages, each having grooved wheels for bearing on the concentric rails. Each carriage has a shoe connected to its upper part for articulation, the
25 shoe being adapted to receive the foot of the user and to rotate about an axis parallel to a simulated direction of a ski. Each shoe includes a brake for blocking movement of the carriage over the track so as to a simulate an edge taking skiing technique by placing the user in a position corresponding to that actually taken during skiing.

30

Another known lower muscle training device is US2005/0272563 A1 published on December 8, 2005 comprising a training device includes a base, and a foot support having an intermediate portion pivotally coupled to the base with a pivot shaft and having one or more foot pedals for supporting users. The foot
5 pedals and the foot support may be rotatable relative to the base about the pivot shaft by the users, to train and exercise lower muscle groups of the users. The base includes a front pad and a rear stop to cushion the foot support. The stop may be used to adjust an inclination or tilting angle of the foot support relative to the base. A resistive device may be coupled between
10 the foot support and the base, to apply a resistive force against the foot support and to the users.

Another known lower muscle training device is US2006/0058719 A1 published on March 16, 2006 comprising an apparatus for anterior and posterior
15 mobilization of the human talocrural joints for rehabilitation and/or therapeutic utilization. A patient's foot is secured in an apparatus and an Ankle Mortise Strap is looped around the mortise of an ankle of the foot A force strap is attached to the ends of the Ankle Mortise Strap. Anterior mobilization is achieved by moving the force strap ventrally from the foot so
20 that the foot including the talus remains stationary while the tibia and fibula glide anteriorly. Posterior mobilizations are achieved by securing the foot, and looping an Ankle Mortise Strap around the front of the ankle. A force strap is attached to the ends of the Ankle Mortise Strap. Posterior mobilization is achieved by moving the force strap dorsally from the foot so that the foot
25 including the talus remains stationary while the tibia and fibula glide posteriorly.

Another of the known apparatus is US 6,616,583 B1 by Louis Stack dated September 9, 2003 comprising of an exercise board for accommodating the
30 foot or feet of a balancing user during exercise movement has an elongated flat platform with opposite, typically upturned ends, similar to a skateboard.

The board defines an upper facing side dimensioned to receive the foot or feet of the balancing user and a lower facing side. Resilient rocker-mounting ends are mounted to the lower facing side at either end of the elongated flat platform. Each resilient rocker-mounting end includes a rigid floor contacting
5 rocker section and an elastic column. The floor contacting rocker section has a rounded floor-contacting surface. The elastic column is mounted to the elongated flat platform at the upper end, mounted to the floor contacting rocker at the lower end, and bendable both longitudinally and in torque responsive to shifting weight of a balancing user on the upper facing side of
10 the elongate platform.

None of the known muscle training or exercising devices are suitable to effectively allow weight and non weight bearing active, passive, and resisted exercise to be performed for upper and lower extremities at home,
15 gymnasium or rehabilitation clinic that are required in many conditions of musculo-skeletal system, as part of their rehabilitation.

OBJECTS OF THE INVENTION

20 The main object and purpose of the invention is to provide an exercising device that allows to perform passive, active, and/or resisted exercises required in many conditions of musculo-skeletal systems as part of the patients rehabilitation.

25 Another object of the invention is to provide portable exercise device for passive, active, and/or resisted exercises to be performed at home, gymnasium or rehabilitation clinic.

Another object of the present invention is to provide an exercise device which
30 is suitable for both weight bearing/close chain or non weight bearing/open chain exercises to be performed for upper and lower extremities.

A further object of the present invention is to provide an exercise device for passive, active, and/or resisted exercises of the upper and lower extremities having a resistance mechanism installed which is easily adjustable according to the degree of resistance needed.

5

SUMMARY OF THE INVENTION

According to the present invention, there is provided a sliding exercise device comprising of a base board on which is mounted a sliding platform movable
10 fro one end of the board to the other in a controlled fashion and a resistance mechanism to provide resistance to the movement of the platform with respect to the board. The base board is sufficiently thick to hold a sliding board and wide enough to fit a large foot. It can have a non-slip surface on the underside. This base board is the foundation of the device.

15

The platform is further guided by a slide runner or groves or rails or any other such system that ensure its movement from one end of the base board to the other in a controlled fashion. The platform is made of aluminum or any other material that is strong enough to cope with the weight that will be applied.

20

The sliding platform can consist a hand/foot plate mounted on wheel frame having wheels for movement along the base board. The said plate is bent at at least one end to allow the plate to be pulled or pushed and thus providing a grip.

25

The plate can be further provided with a covering made of plastic or rubber or any other soft material to make it easier to handle and also provide more grip while using the device.

30 The resistance mechanism provided in the exercise device comprises of springs or any other elastic material or a combination of different materials

to provide the resistance and also consists of a knob or any other system to alter the degree of resistance.

Stop ends are provided to limit the movement of the movable platform as per
5 the exercise to be performed.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features and advantages of the invention appear from
the following description of the exemplary embodiments which are
10 diagrammatically illustrated on the attached drawings, wherein:

- Figure I: Shows the top view of the exercise device in accordance with an embodiment of the present invention.
- Figure II: Shows the side view of the device showing the sliding platform of the device in the start position.
- 15 Figure III: Shows the side view of the device showing the sliding platform of the device pushed out from the start position.
- Figure IV: Shows the side view of the of the sliding platform of the device.
- Figure V: Shows the end view of the sliding platform of the device.
- Figure VI: Shows the top view of the base board of the device.
- 20 Figure VII: Shows the side view of the base board of the device.
- Figure VIII: Shows the bottom view of the sliding platform attached to the resistance mechanism of the device.
- Figure IX: Shows the close-up of the side view showing the arrangement of the resistance mechanism of the device.
- 25 Figure X: Shows the top view of the exercise device in accordance with another embodiment of the present invention.
- Figure XI: Shows the side view of the device shown in Figure X ,with it's lid in lifted up position.
- Figure XII: Shows the top view of the device shown in Figure X, with it's lid
30 removed.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Although following examples shows the operation of specific embodiments, many modifications and variations will readily occur to those skilled in the art, accordingly it is not intended to limit the scope of the invention.

5

Accordingly with reference to the diagrams and initially to Figure I to IX, an exercising device with sliding platform in accordance with the preferred embodiment of this invention that can be used in weight bearing/close chain or non weight bearing/open chain exercise situation to allow active, passive, and resisted exercises comprises of a base board (1) having end stops (2, 6) one at each end of it to limit the slide. The end stop (6) being deeper than the end stop (2) to accommodate the foot or hand of the user and is called as master stop. Each stop is preferably provided with a handle (3, 7) on the top. A sliding platform consists of a foot/hand plate (5) provided with a slide runner (4) fixed to the base board (1) and underside of the plate (5). The foot/hand plate (5) guided by the slide runner (4) moves from one end of the base board (1) to the other end in a controlled manner. The plate (5) is supported a wheel frame (11) having at least one wheel (10). A resistance mechanism is installed under the plate (5) which consists of resistance end plates (12) with holes (15) for allowing resistance bands (17) to pass through. The base board has a non-slip surface on the underside.

With reference to figure I the movable foot/hand plate (5) runs on a thick plastic base board (1). At each end of the base board (1) are the end stops (2, 6) The depth of the end stop (6) can be increased to allow a foot to be placed on it. On the top of each end stops is a handle (3, 7). The foot/hand plate (5) is guided by the slide runner (4) which is screwed to the base board (1) and the under side of the foot/hand plate (5). The slide runner (4) made of any metal or any other hard material, ensures the foot/hand plate (5) moves from one end of the base board to the other in a controlled fashion. Attached to the end stop (6) is the resistance mechanism's slotted end stop

housing (9).

With reference to figure II the side view of the assembled device with the end stops (2, 6) with handles (3, 7) and foot/hand plate (5) using the runner (4)
5 as a guide. The foot/hand plate (5) is in the start position.

With reference to figure III the side view shows the foot/hand plate (5) in a position where it has been pushed out from the start position and the resistance is supplied from rubber bands (17) or springs or any other elastic
10 material.

With reference to figure IV shows the side view of the foot/hand plate (5). The foot/hand plate (5) has the end bent up to allow a foot or hand to push or pull the plate. This provides a better grip. Each end of the foot plate or the
15 complete surface of it is provided/covered with a plastic (14) or rubber or any other soft material to increase the grip of the hand or foot when using the device and to make the aluminum end of the foot/hand plate (5) safer. The foot/hand plate (5) is supported by the wheel frame (11) and runs on wheels
(10).

20 With reference to figure V the foot/hand plate is supported by a wheel frame (11) on which are mounted the wheels (10). Under the foot/hand plate (5) is the resistance mechanism. There is a resistance end plate (12) screwed to each end of the foot/hand plate (5). The resistance end plate (12) has a t
25 least one hole/opening (15) in it to allow the resistance rubber band or springs or any other elastic material to pass through. There is a center support (13) which is screwed to the foot/hand plate on the upper surface and about which the resistance end plates (12) are attached. The center support is screwed to the runner (4) on the under surface. The runner (4)
30 and the center support (13) is the link between the base board (1) and the foot/hand plate (5).

With reference to figure VI the top view of the base board of the device (1) shows the end stops (2, 6) at the end and the handles on each (3, 7) end stop. The runner (4) is the track in which the foot/hand plate slides. This is sufficiently long to give the correct range of motion. The resistance bands (17) are slotted/installed into the end stop housing (9) on the master end stop (6).

With reference to figure VII the side view of the base board of the device (1) shows the end stops (2, 6) and the handles (3, 7) on each end stop. The resistance bands (17) are slotted/installed into the end stop housing (9) on the master end stop (6).

With reference to figure VIII the bottom view of the foot/hand plate (5) with the resistance mechanism attached. The resistance bands (17) are made of rubber tubing but can be metallic springs or other resistance/elastic material and can be of various tensions or strengths. The number of resistance bands (17) shown are four. There can be any number of resistance bands and any combination of these of any resistance/elasticity as long as these fit within the space provided. The resistance bands (17) are prevented from being pulled through the holes (15) in the end plates (12) by a washer (18) and pull knob mechanism (8). The mid line stay (16) is attached to the foot/hand plate (5) above and the runner (4) below.

With reference to figure IX The close up side view of the resistance mechanism is shown where the slotted housing (9) has the resistance band (17) in place. The knob (8) is used for ease of gripping when there is a need to alter the degree of resistance of the device. The pull knob (8) is held in place by a washer (8). The handle (7) is on the master end stopper (6). The resistance band (17) is clamped on the shaft of the pull knob (8) by a clip (19) made of plastic or any other hard material.

Now referring to figure X to XII showing another embodiment of the present invention figure X shows a base board (22) is longer than the base board (1). The longer device is designed a person can stand on the lid (27). The foot
5 plate (21) is moved by pushing out using the other foot placed on the plate (21). The end stop (23,20) are not provided with any handles. The handle (25) is on the side of the foot board (21) and is in the center of the balance of the device. The runner (4) is longer, giving a greater range of motion than the previous embodiment.

10

With reference to figure XI diagram shows the side view of the embodiment shown in figure X where the stops (23, 20) are at the end of the board. The lid (27) is shown in the lifted up position where the resistance band knobs may be accessed. The foot plate (21) is bent up one end only.

15

With reference to figure XII the diagram shows the top view of the exercise device where the lid (27) is has been removed. This exposes the resistance knobs (8) and the lid hinges (26). The weight of the body on the lid (27) is supported by the sides (24).

SLIDING EXERCISE BOARD

I CLAIM:

1. An exercise device with a sliding platform for performing weight
5 bearing and non weight bearing active, passive and resisted exercises
for lower and upper extremities comprising of:
a base board,
a sliding platform mounted on the base board movable from one end
of the base board to the other end in a controlled fashion,
10 a resistance mechanism installed in exercise device connected between
the base board and the sliding platform to provide resistance to the
movement of the platform on the base board.
2. The exercise device according to the Claim 1 in which the sliding
platform is guided by a slide runner, made of metal or any other hard
15 material, that connects the platform with the base board to ensure its
movement from one end of the board to the other in a controlled
fashion.
3. The exercise device according to the Claim 1 in which the sliding
platform consists of a foot/hand plate mounted on a wheel frame
20 having at least one wheel to enable the platform to slide on the base
board.
4. The exercise device according to the Claim 3 in which the foot/hand
plate is bent at at least one end to provide more grip while performing
the exercise.
- 25 5. The exercise device according to the Claim 4 in which the foot/hand
plate is provided with a soft covering to make it safe to handle and
also provide more grip.
6. The exercise device according to the Claim 1 in which the resistance
mechanism consists of end plates provided with at least one hole, at
30 least one resistance band passing through the said hole, attached to at
least one knob at one end to provide for easier alteration of the degree

of resistance.

7. The exercise device according to the Claim 6 in which the resistance band is clamped to the knob by a clip made of plastic or any other hard material.
- 5 8. The exercise device according to the Claim 6 in which the resistance band is provided with a washer to prevent it from being pulled out of the holes.
9. The exercise device according to the Claim 6 in which the resistance band is made from a rubber or metallic spring or any other elastic material of any elasticity as desired.
- 10 10. The exercise device according to the Claim 9 in which the resistance band can be any number of bands of same or different materials of same or different elasticity.
11. The exercise device according to the Claim 1 in which the mid line stay is provided and is attached to the foot/hand plate.
- 15 12. The exercise device according to the Claim 3 in which a center support is provided and is attached to the foot/hand plate and to the runner forming a link between the base board and the foot/hand plate.
13. The exercise device according to the Claim 1 in which the base board is provided with end stops at each end, one end stop deeper than the other, and handles provided at the top of the end stops.
- 20 14. The exercise device according to the Claim 1 in which the runner is sufficiently long to allow the foot/hand plate to slide according to the desired range and the resistance bands are slotted into the end stop housing.
- 25 15. The exercise device according to the Claim 1 with a sufficiently long base board with a handle provided at the side of foot/hand plate, a lid provided at one end of the base board to enable the person to place one foot on it and pushing the foot/hand plate by placing other foot on it.
- 30 16. The exercise device according to the Claim 15 in which the lid is hinged

at one end, and side supports are provided to support the weight of the lid.

- 5 17. The exercise device according to the Claim 13 in which the base board is made of plastic or any other hard material, is sufficiently thick to hold the sliding platform sufficiently wide to fit a large foot on it.
18. The exercise device according to the Claim 13 in which the end stops are made of plastic or any other hard material with at least one end stop sufficiently deep to have room for a handle and also resistance housing to be installed in it.
- 10 19. The exercise device according to the Claim 1 with a non slip surface on the underside.

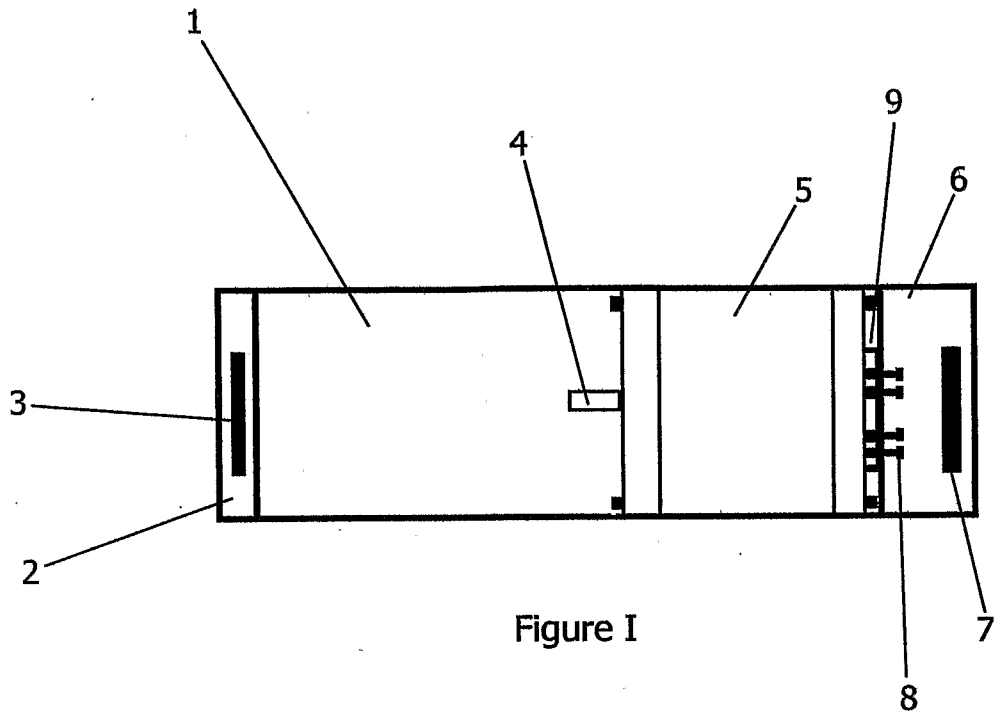


Figure I

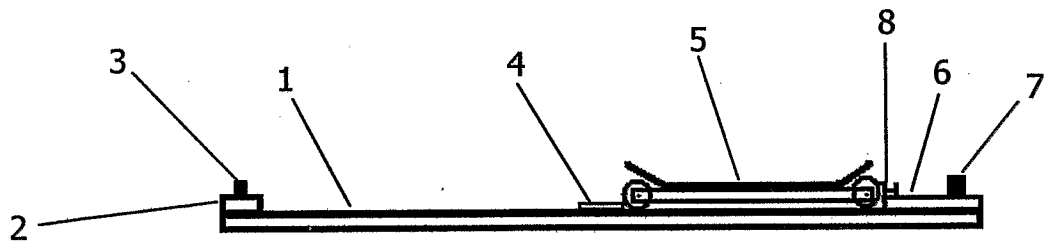


Figure II

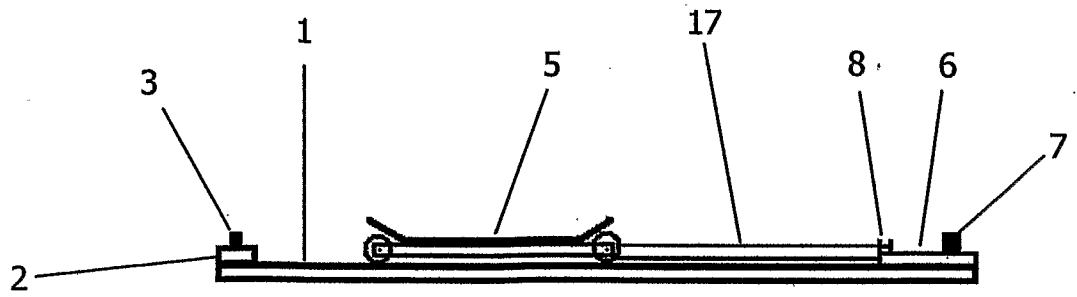


Figure III

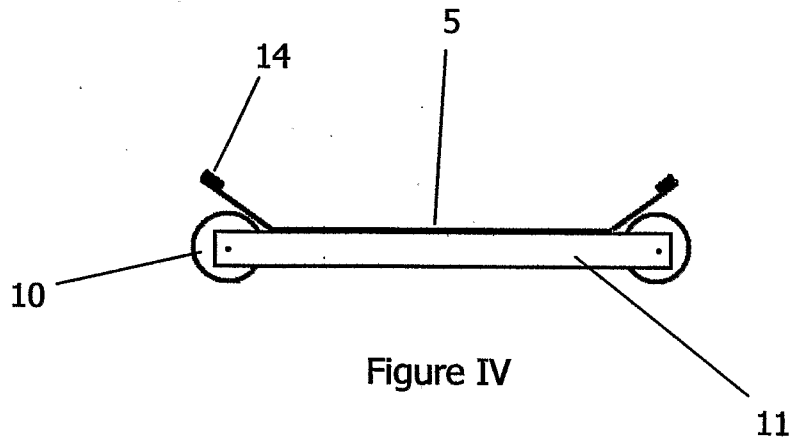


Figure IV

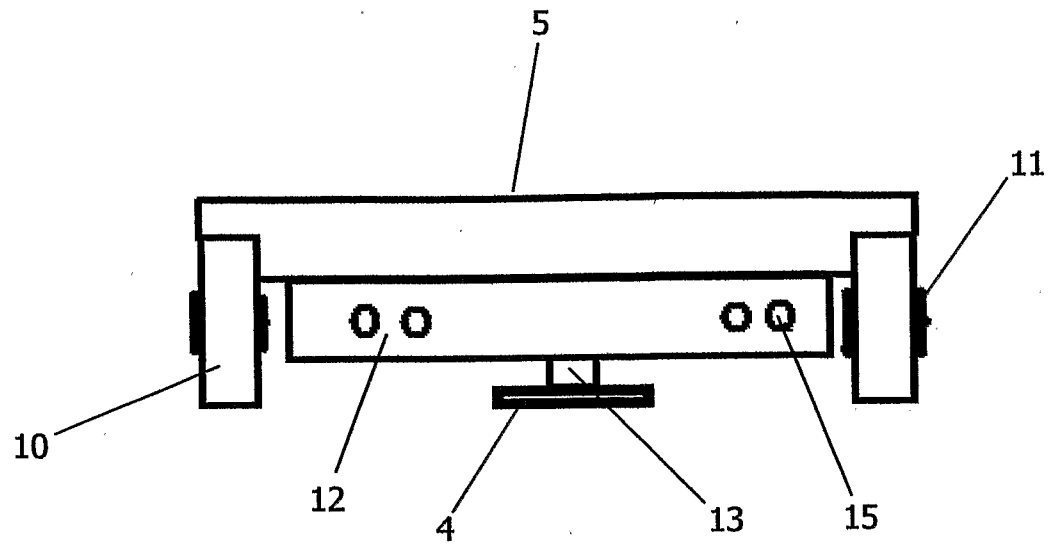


Figure V

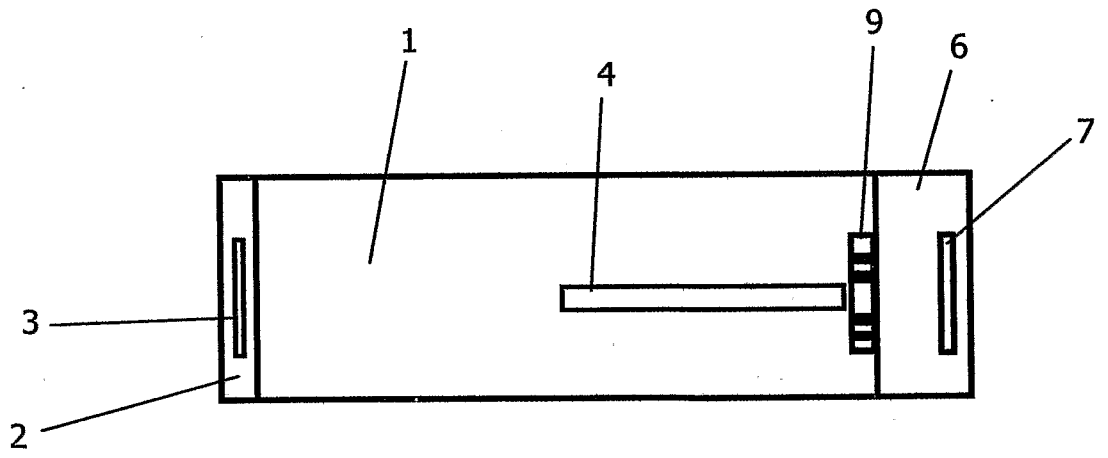


Figure VI

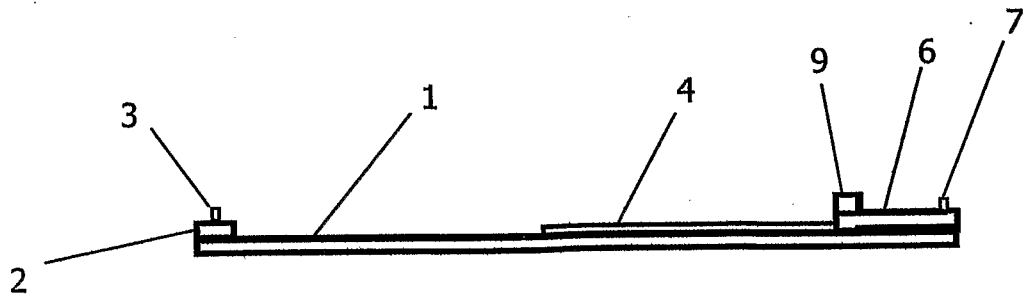


Figure VII

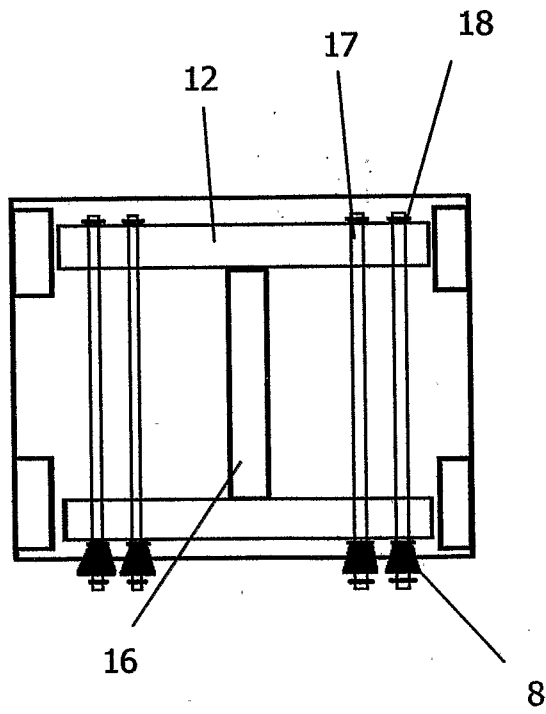


Figure VIII

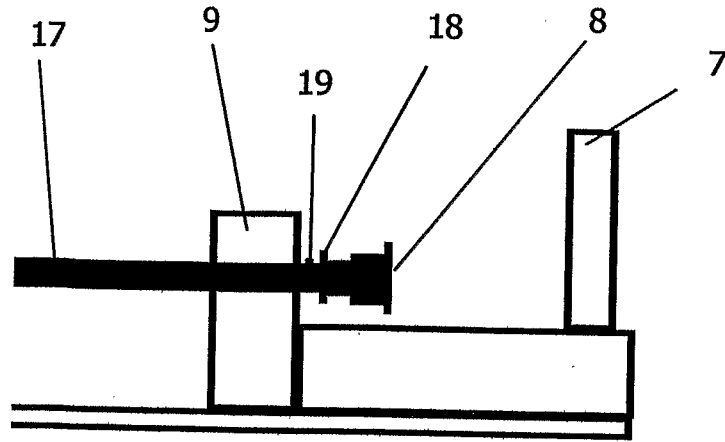


Figure IX

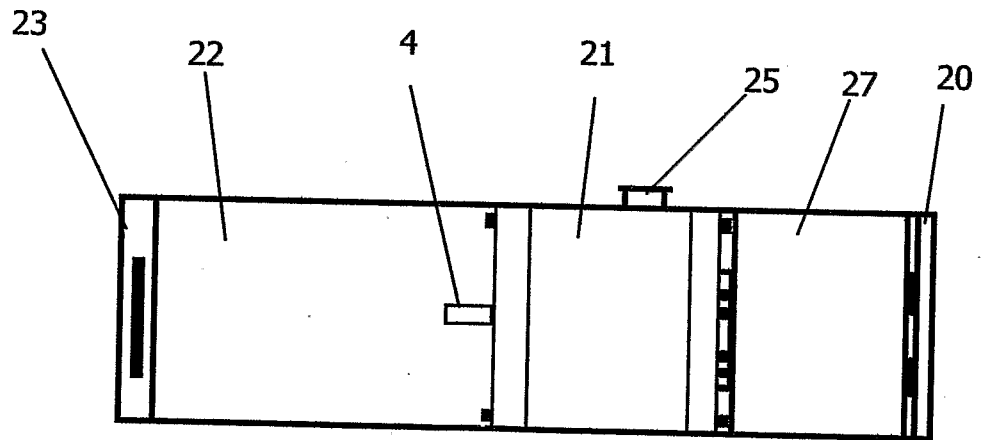


Figure X

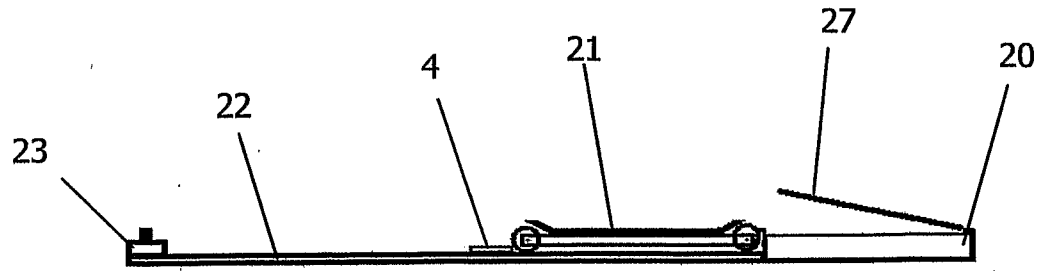


Figure XI

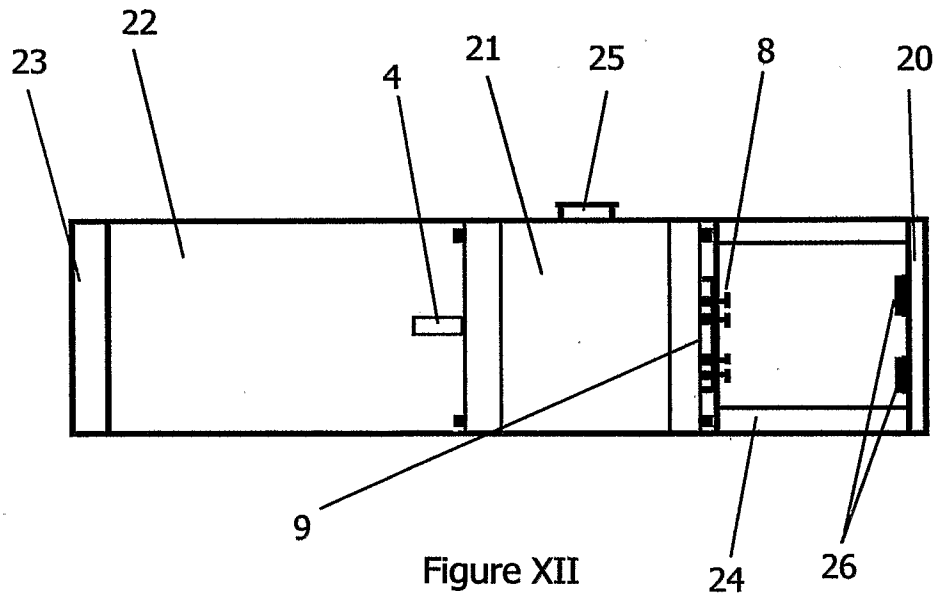


Figure XII