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(54) **EXERCISE DEVICE**

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(57) **ABSTRACT**

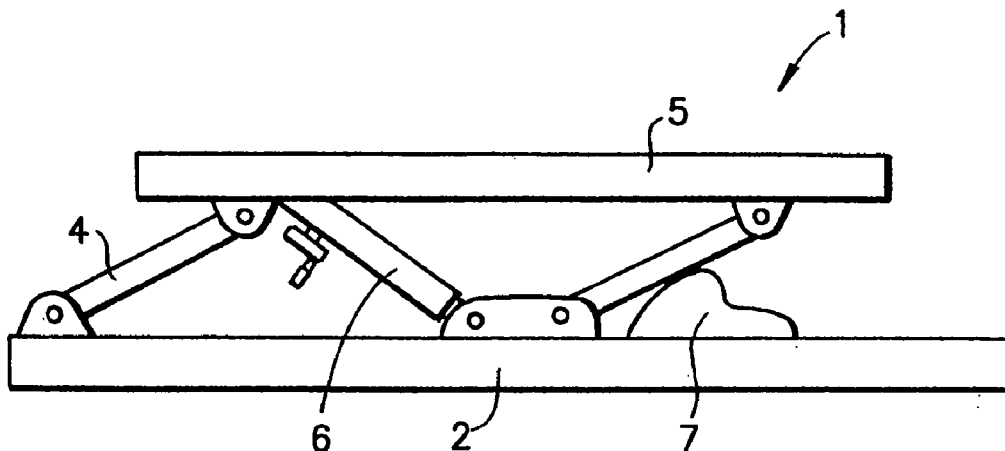
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Related U.S. Application Data

(60) Provisional application No. 60/566,853, filed on Apr. 30, 2004.

An exercise apparatus having a base, a support member, at least two legs, each of the legs having a first end pivotably attached to the base and a second end pivotably attached to the support member, and a longitudinally adjustable member connected between the base and the support member for infinitely adjusting and securing a vertical position of the support member between two end positions.



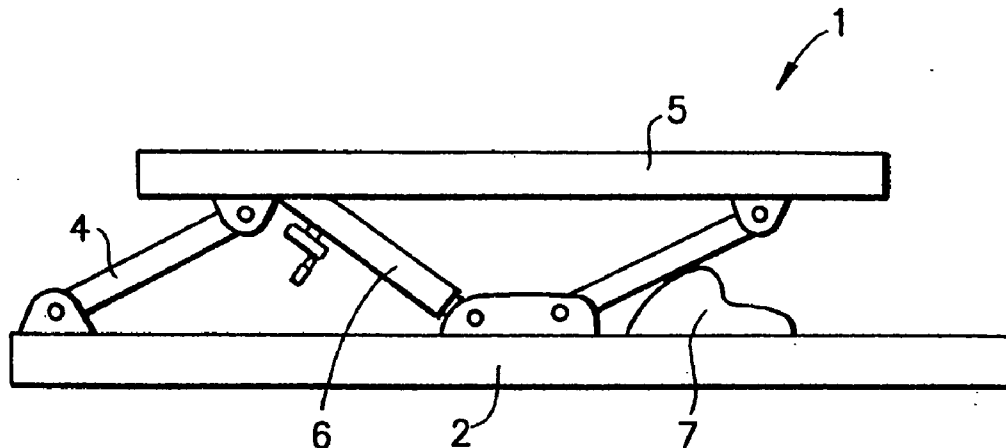


FIG. 1

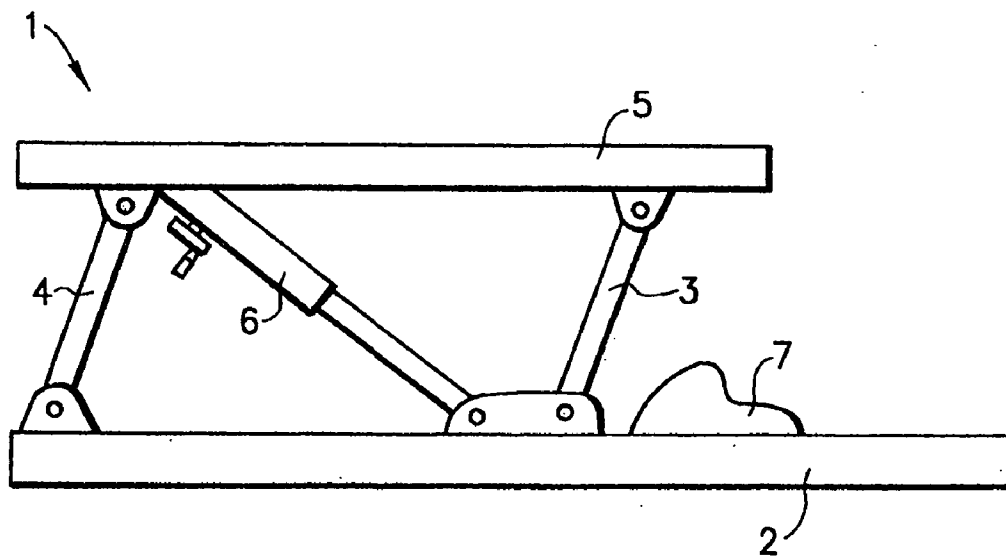


FIG. 2

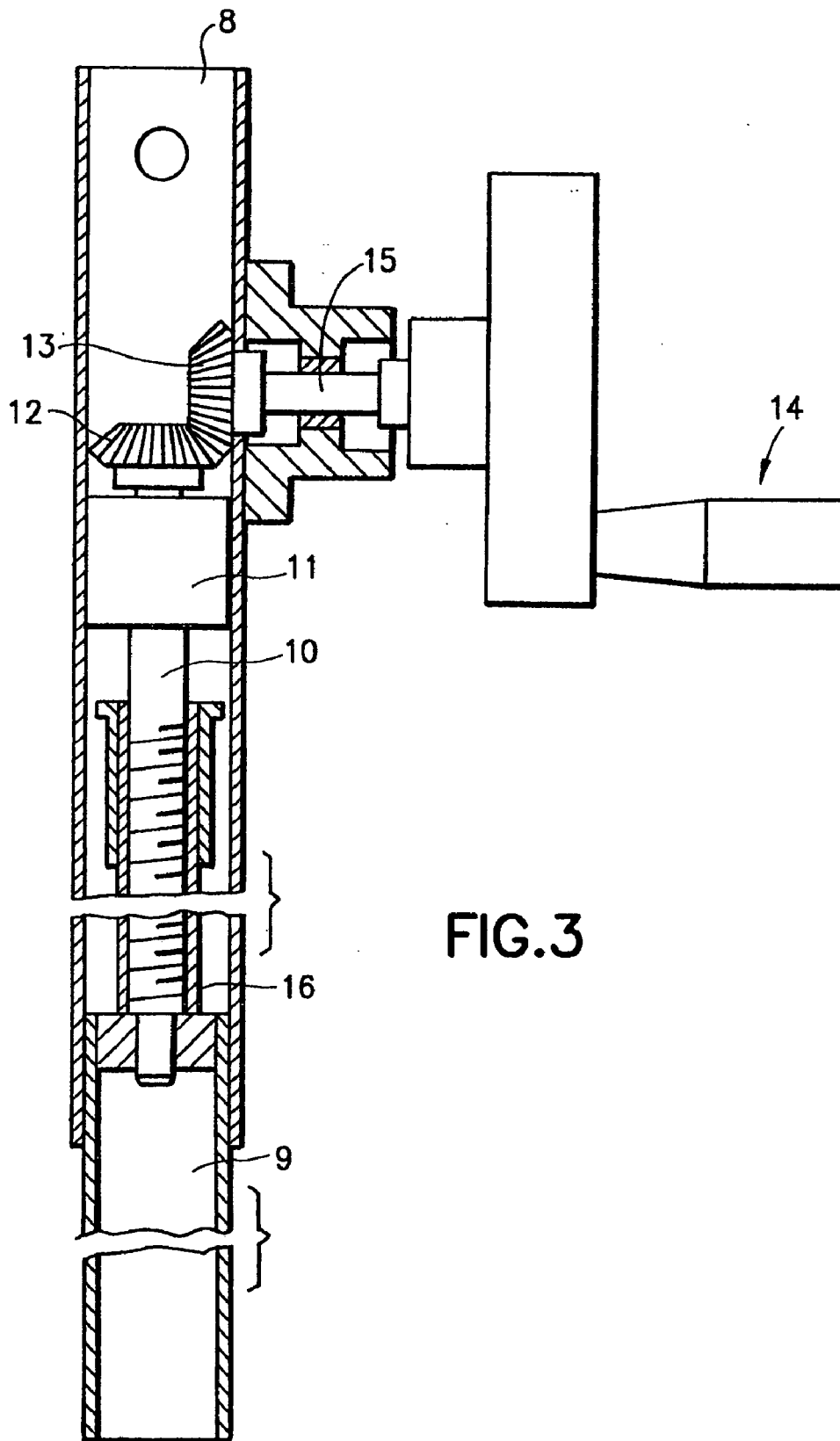


FIG. 3

EXERCISE DEVICE

PRIORITY CLAIM

[0001] This application claims priority to U.S. Provisional Application Ser. No. 60/566,853, filed Apr. 30, 2004.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to an exercise apparatus, and more particularly to an exercise bench whose vertical position can be adjusted infinitely between two end points.

[0003] Exercise devices of many types are known, including exercise devices which have a so-called bench which is used in combination with various other types of exercise components for exercising different parts of the body. Examples of such benches are those sold under the Universal® and Nautilus® trademarks. The problem with such conventional benches is that they are either fixed as to either their height off the ground or, if they are adjustable, the adjustment is only possible in fixed increments. This presents a drawback to these prior art benches since a user must settle for either a fixed height of the bench or one of the preselected heights when using the exercise equipment. This "settling" compromises the efficiency, safety, and benefits to the user when using the exercise equipment since it is not optimally adjusted or adjustable to his or her stature.

SUMMARY OF THE INVENTION

[0004] Accordingly, it is an object of the present invention to provide an exercise bench construction that is infinitely adjustable between two end positions.

[0005] Pursuant to this object, and others which will become apparent hereafter, one aspect of the present invention resides in an exercise apparatus having a base, a support platform and at least two legs pivotally attached to the base and the support platform. A longitudinally adjustable member is connected between the base and the support member for infinitely adjusting and securing a vertical position of the support platform above the base between two end positions.

[0006] In another embodiment of the invention, the adjustable member includes a first hollow tube having a second end pivotally attached to the support platform and a first open end. A second hollow tube has a first end pivotally attached to the base and a second end arranged within the first tube via the first end of the first tube. A mechanism is also provided for moving the tubes relative to one another.

[0007] The moving mechanism, in one embodiment, includes a threaded first shaft rotatably mounted in one of the tubes and a threaded sleeve fixed in the other of the tubes. A threaded shaft is arranged to pass through the sleeve so that rotation of the shaft causes the sleeve to move along the shaft.

[0008] In still another embodiment, the first shaft is mounted in the first tube and the threaded sleeve is fixed in the second tube. In yet another embodiment, the moving mechanism further includes a gear mechanism for rotating the threaded shaft from outside the first tube. The gear mechanism includes a second shaft arranged substantially perpendicular to the first shaft and extending through a wall of the first tube. The second shaft has a first end outside the

first tube and a second end inside the first tube. A first gear is mounted on the second end of the second shaft and is in engagement with a second gear mounted on the first shaft.

[0009] In still another embodiment, the first and second gears are bevel gears. Furthermore, a crank can be mounted on the first end of the second shaft to facilitate rotation of the second shaft.

[0010] Another embodiment provides a stop mounted on the base so that one of the legs rests against the stop in one of the end positions.

[0011] In yet another embodiment, the second end of the first tube is mounted to the support member in a region in which a first one of the legs is attached to the support member and the first end of the second tube is mounted to the base in a region in which a second one of the legs is attached to the base.

[0012] Other features and advantages of the present invention will become apparent from the following description of the invention which refers to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is a side view of the inventive exercise apparatus in a first end position;

[0014] FIG. 2 is a side view of the inventive apparatus in a second position; and

[0015] FIG. 3 is a cross-section showing the crank mechanism;

DETAILED DESCRIPTION OF THE INVENTION

[0016] Referring to the drawings, FIG. 1 shows the inventive exercise apparatus having a bench 1 with a base 2 on which legs 3, 4 are pivotally mounted at one end. A platform 5 is pivotally mounted at the other end of the legs 3, 4.

[0017] A longitudinally adjustable member 6 is connected between the base 2 and the support member 5. A stop member 7 is mounted on the base 2 so that the leg 3 rests against the stop 7 in the lower-most position of the support member 5, as shown in FIG. 1.

[0018] The adjustable member 6 extends between a point in a region of the end of the leg 3 attached to the base 2, to a region of the support member 5 where the legs 4 are attached. The adjustable member 6 has an adjustable length so that as the length increases from the position shown in FIG. 1 the support member 5 is raised vertically to a second end position. The height of the support 5 can be maintained at any desired position between the lower-most and upper-most positions.

[0019] The adjustable member 6 is made up of a first tubular member 8 and a second tubular member 9 arranged to slide within the first tubular member 8 in a telescoping manner. One end of the second tubular member 9 is attached to the base 2 and one end of the first tubular member 8 is attached to the bottom side of the support member 5. The tubular members 8, 9 are connected together by a screw-drive mechanism arranged within the tubes. The screw-drive mechanism includes a threaded shaft 10 is rotatably held within the first tubular member 8 by a bearing 11. A proximal end of the shaft 10 is fitted with a first beveled gear 12. A

second beveled gear 13 engages the first beveled gear 12 and is driven by a crank 14 via a shaft 15 that extends through a side wall of the first tubular member 8.

[0020] A threaded sleeve 16 is fixed within the free end of the second tubular member 9 that is arranged in the first tubular member 8. The threaded shaft 10 is threaded into the sleeve 16 so that rotation of the threaded shaft 10 causes the sleeve 16 to ride up or down the threads of the shaft 10, depending upon the direction of rotation of the shaft 10, so as to move the second tubular member relative to the first tubular member and thereby change the length of the adjustable member 6 and in turn raise or lower the support member 5. This rotation of the shaft 10 is carried out by turning the crank or handle 14. By stopping the turning of the handle 14 the support can be held at any desired height between the two end positions.

[0021] It will be understood by those skilled in the art that other types of rotation transmission mechanisms can be used in place of the beveled gears.

[0022] It is also understood that although the illustrated embodiment has three legs supporting the support member 5 on the base 2, this support can also be provided by, if desired, two legs or more than three legs.

[0023] Additionally, the stop member 7 is not essential for practicing the invention, but is desirable for providing additional stability in the lower-most position of the support 5.

[0024] Although the present invention has been described in relation to particular embodiments thereof, many other variations and modifications and other uses will become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein, but only by the appended claims.

What is claimed is:

- 1. An exercise apparatus, comprising:
 - a base;
 - a support member;
 - at least two legs, each of the legs having a first and pivotably attached to the base and a second end pivotably attached to the support member; and
 - a longitudinally adjustable member connected between the base and the support member for infinitely adjusting and securing a vertical position of the support member between two end positions.
- 2. An exercise apparatus as in claim 1, wherein the adjustable member includes a first hollow tube having a second end pivotably attached to the support member, and an open first end, a second hollow tube having first end

pivotably attached to the base and a second end arranged within the first tube via the first end of the first tube so that the tubes are movable relative to one another in a telescoping manner, and a mechanism for moving the tubes relative to one another.

3. An exercise apparatus as in claim 2, wherein the moving mechanism includes a threaded first shaft rotatably mounted in one of the tubes, and a threaded sleeve fixed in the other of the tubes, the threaded shaft being arranged to pass through the sleeve so that rotation of the shaft causes the sleeve to move along the shaft.

4. An exercise apparatus as in claim 3, wherein the first shaft is mounted in the first tube and the threaded sleeve is fixed in the second tube.

5. An exercise apparatus as in claim 4, wherein the moving mechanism further includes a gear mechanism for rotating the threaded shaft from outside the first tube.

6. An exercise apparatus as in claim 5, wherein the gear mechanism includes a second shaft arranged substantially perpendicular to the first shaft and extending through a wall of the first tube, the second shaft having a first end outside the first tube and a second end inside the first tube, the second end having a first gear mounted thereon that is in engagement with a second gear mounted on the first shaft.

7. An exercise apparatus as in claim 6, wherein the first and second gears are bevel gears.

8. An exercise apparatus as in claim 6, and further comprising a crank mounted on the first end of the second shaft to facilitate rotation of the second shaft.

9. An exercise apparatus as in claim 1, wherein the legs are parallel.

10. An exercise apparatus as in claim 1, wherein the support member is parallel to the base.

11. An exercise apparatus as in claim 10, wherein the base is longer than the support member.

12. An exercise apparatus as in claim 1, wherein two legs are provided at one end of the support member and one leg is provided at another end of the support member.

13. An exercise apparatus as in claim 1, and further comprising a stop mounted on the base so that one of the legs rests against the stop in one of the end positions.

14. An exercise apparatus as in claim 2, wherein the second end of the first tube is mounted to the support member in a region in which a first one of the legs is attached to the support member.

15. An exercise apparatus as in claim 14, wherein the first end of the second tube is mounted to the base in a region in which a second one of the legs is attached to the base.

16. An exercise apparatus as in claim 1, and further comprising exercise equipment at one end of the support member.

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