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(54) **Inflatable exercise device**

(57) An inflatable unitary construction hemispherical or dome-shaped flat-bottomed exercise device analo-

gous to an exercise ball having a flat and relatively stable surface to improve its usefulness to people who cannot control fully round prior art exercise balls.

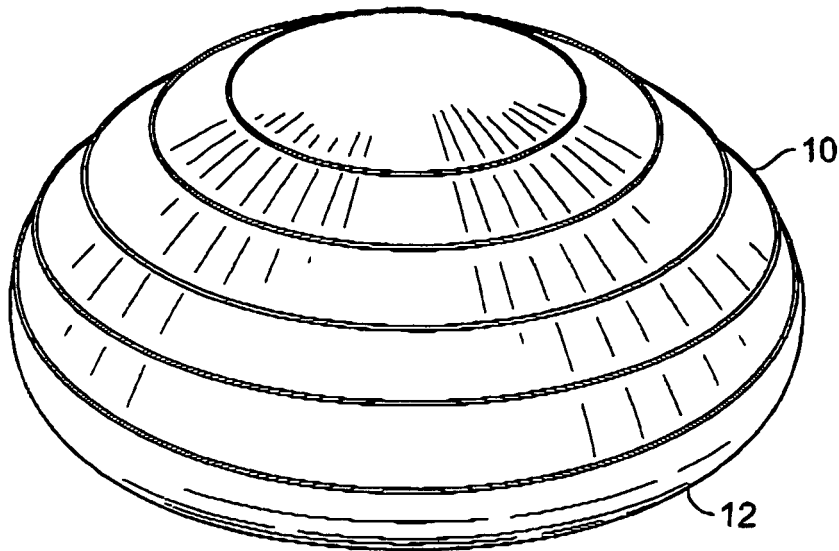


FIG. 1

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DescriptionField of the Invention

[0001] This invention relates to exercise equipment. More particularly, this invention relates to air-filled exercise devices that are used to work various muscle groups and to promote core stability.

Background of the Invention

[0002] Prior exercise balls are relatively large-diameter (12-42 inches) air-filled balls that are sufficiently strong to support a person's body weight while retaining a generally spherical shape.

[0003] Exercise balls are useful to target specific muscle groups. Sit-ups and other abdominal exercises can be much more effective when they're done using an exercise ball. Limited research in the scientific literature suggests that exercise training on an unstable surface results in increased muscle activity, as a means to provide stability to the system (human body) during an exercise.

[0004] A problem with prior art exercise balls is that they tend to roll and wobble during exercise. Indeed, the prior art exercise ball's tendency to pitch and roll makes exercises that are performed with an exercise ball more challenging because the ball's tendency to pitch and roll requires the person using the ball to provide more muscle control (to control the ball's movement as well as the exercise being performed) than would be required to perform the same exercise on a flat surface. For people who need or who want the more focused muscle work provided by an exercise ball, but who are unable to control the pitching and rolling of a prior art exercise ball, there exists a need to provide an exercise device that reduces or eliminates roll.

[0005] Prior dome-shaped inflatable balance trainers, such as the BOSU® balance trainer, have hard plastic bases and tend to be large and heavy, weighing upward of 14 lbs. These devices are not designed to fit comfortably between the user and the floor when the user is in a substantially supine position.

Summary of the Invention

[0006] There is provided an air-filled, hemi-spherically shaped exercise device that reduces or eliminates pitching and rolling of prior art round exercise balls. Because the device is hemispherical, the flat surface of the device that is placed on the floor, reduces or even eliminates excessive pitching and rolling that some prior art devices cause. In addition, the unitary construction of the present invention provide the limited additional instability of a distended base under load, while maintaining a low profile for ease of use and storage.

Brief Description of the Drawings

[0007] For the sake of brevity, like elements are denoted by the same reference numerals throughout the disclosure.

[0008] FIG. 1 is a general perspective view of the preferred embodiment of an exercise apparatus according to the present invention;

[0009] FIG. 2 is a bottom view of the device shown in FIG. 1;

[0010] FIG. 3 is a side view;

[0011] FIG. 4 is a side view of the device showing its deformation under load by a person using the device for exercise and the resultant partial deformation of the flat surface;

[0012] FIG. 5 is a perspective view of an exercise apparatus according to the present invention with a user shown in a first exercise position;

[0013] FIG. 6 is a view of the preferred embodiment of an exercise apparatus according to the present invention with a user shown in a second exercise position;

[0014] FIG. 7 is a view of the preferred embodiment of an exercise apparatus according to the present invention with a user shown in a third exercise position; and

[0015] FIG. 8 is a view of the preferred embodiment of an exercise apparatus according to the present invention with a user shown in a fourth exercise position.

Detailed Description of the Preferred Embodiment

[0016] FIG. 1 shows an exercise device 10 made from a flexible bladder, which takes the shape of a hemisphere when filled with air or other gas. As is well known, a hemisphere is a half sphere, thus, the exercise device 10 shown in FIG. 1 includes a substantially planar or flat bottom 12 surface that is placed against a floor, table, mat or other flat surface on which exercises can be performed using the device 10 but the flat surface 12 prevents the device 10 from rolling or pitching as prior art round exercise balls are known to do.

[0017] As shown in FIG. 2, the flat bottom 12 of the exercise device 10 includes an air inflation port or valve 14 through which well-known prior art "needles" can be inserted so as to allow the bladder to be inflated. Because the device is made from a relatively pliable material, those of ordinary skill in the art will appreciate that the firmness of the device 10 will be directly related to the amount of gas or air pumped into the device 10.

[0018] In one embodiment, the flexible bladder is made from a flexible polymer or vulcanized rubber. In another embodiment, the flexible bladder is made from a relatively thin poly vinyl chloride or "PVC." A preferred embodiment uses PVC, the thickness of which is approximately 2- 3 mm.

[0019] By using thin, lightweight flexible materials, the exercise device's weight can be kept to less than approximately 1200 g. (1.2 Kg.) thereby allowing the device to be easily moved and stored.

[0020] In a preferred embodiment, the hemisphere-shaped exercise device 10 shown in FIG. 1 should be sized to allow the device 10 to comfortably support a person relatively close to the floor or other supporting surface under the small of the user's back, buttocks or feet as he or she performs various exercises using the device 10 in a substantially supine position. In the preferred embodiment, the device has an interior radius of approximately five inches and a flat bottom diameter of approximately fifteen inches. As used herein the term "interior radius" is considered to be the distance from the geometric center of the flat bottom 12, extending away from the center of the bottom 12 to the inner surface of the bladder when the device 10 is both fully inflated and not supporting a load.

[0021] Referring now to FIG. 3 there is shown a side view of the device 10 and the flat bottom 12 having a diameter "D" as shown. Also shown in FIG. 3 is a body part 16 of a user, just above the device 10.

[0022] In FIG. 4, the device 10 is shown to be under a load presented as the body weight of a person using the device 10. When a user's body weight is impressed on the device 10 by the body part 16 being placed directly atop the hemisphere-shaped bladder thereby, the person's body weight causes the device to deform, i.e., become non-hemispherical.

[0023] As shown in FIG. 4, when a load is impressed on the top of device 10, the resulting increased internal pressure causes the flexible base of the device to distend. The circumferential edge 18 of the bottom 12 rolls or curls upwardly, thereby reducing the device's stability. Stated alternatively, the exercise device 10 becomes mildly unstable when it is supporting a load, slightly increasing the difficulty for exercises performed using the device 10.

[0024] FIGS. 5 and 6 depict the device 10 being used to perform abdominal "crunch" exercises. As those of ordinary skill in the art will appreciate, placement of the exercise device 10 beneath the spine reduces the likelihood of injury. By reducing the air pressure in the device 10, its deformation for exercises like abdominal crunch can be increased thereby improving its comfort level.

[0025] FIG. 7 and 8 depict the device 10 being used to support the lower back during "crunches." By positioning the device in small of the lower back, the user can more effectively exercise abdominal muscle groups.

[0026] A goal of muscle strengthening is to move freely through a full range of motion, and the present invention allows for a greater range of motion at the trunk, with subsequent greater muscle activity during a repetition. Use of this device resulted in an exercise that required greater trunk range of motion and greater muscle activity in the rectus abdominus (upper portion) and external oblique muscle. Several factors appear to contribute to the greater muscle activity measured with this device compared with a traditional floor exercise.

[0027] The device allows a user to work through a greater range of motion. Thus, the muscles of the motion are required to work over a greater range of muscle ac-

tion. Because of this greater range of motion, the muscles of the anterior trunk are engaged with the trunk in an extended position (beginning of crunch exercise) as well as a flexed position (end of crunch exercise; i.e., the curled-up position). The extended position is performed with the center of mass of the upper body at a greater distance from the axis of rotation (the pelvis); hence the external effort arm is greater during the early phase of the crunch exercise. As the crunch motion continues, the center of mass of the upper body moves closer to the axis of rotation (pelvis), resulting in a decrease in the external effort arm. The device positions the trunk in a more extended position, lengthening the overall external moment arm more so than the traditional floor exercise.

[0028] It will be apparent to those of ordinary skill in the art that various modifications can be made to the device 10 described above without departing from the spirit of the present invention. The scope of the invention is as recited in the appended claims.

Claims

1. An exercise device comprised of:

a flexible bladder, sized, shaped and arranged to take the form of a hemisphere when the flexible bladder is at least partially filled with air, the substantially hemispheric bladder having a substantially flat surface for placement onto a floor or other flat surface.

2. The device of claim 1, wherein the flexible bladder is further comprised of at least one inflation valve for filling the bladder with air or other gas.

3. The device of claim 1, wherein the flexible bladder is made of a polymeric substance or a vulcanized rubber material.

4. The device of claim 1, wherein the flexible bladder is poly vinyl chloride (PVC).

5. The device of claim 4, wherein the PVC is approximately 2 mm thick.

6. The device of claim 1, wherein the device weighs less than 1200 g.

7. The device of claim 1, wherein the interior radius of the inflated and unloaded hemisphere is less than 6 inches.

8. The device of claim 1, wherein the diameter of the flat surface of the device is less than 17 inches.

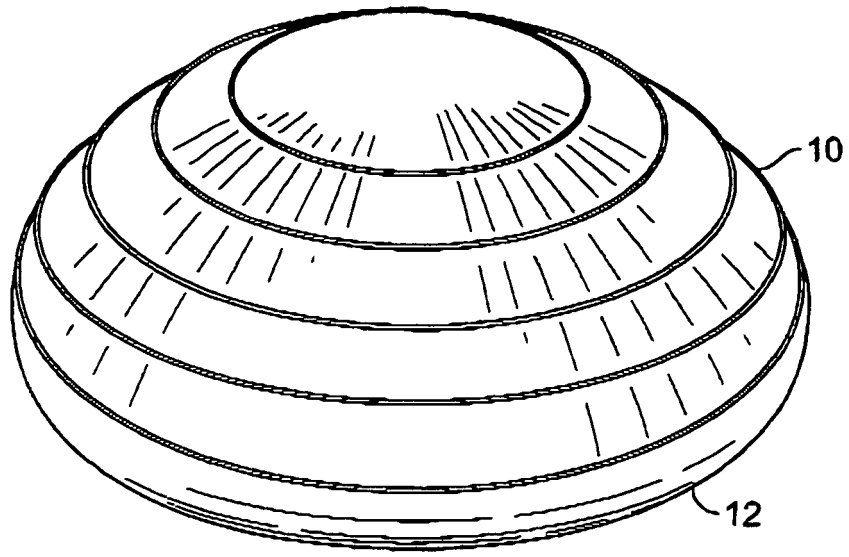


FIG. 1

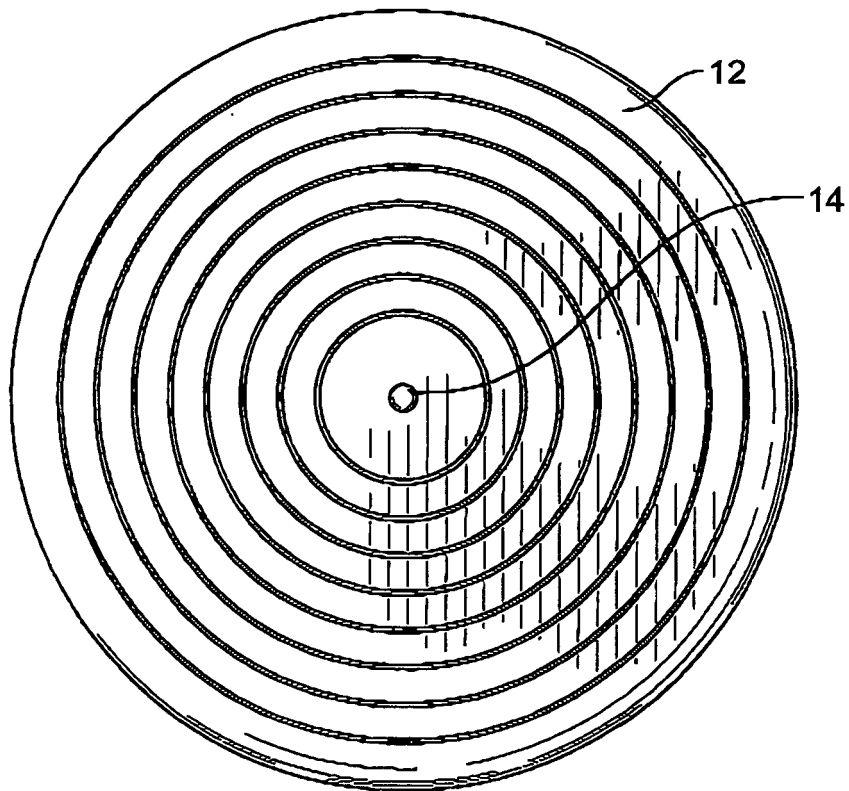


FIG. 2

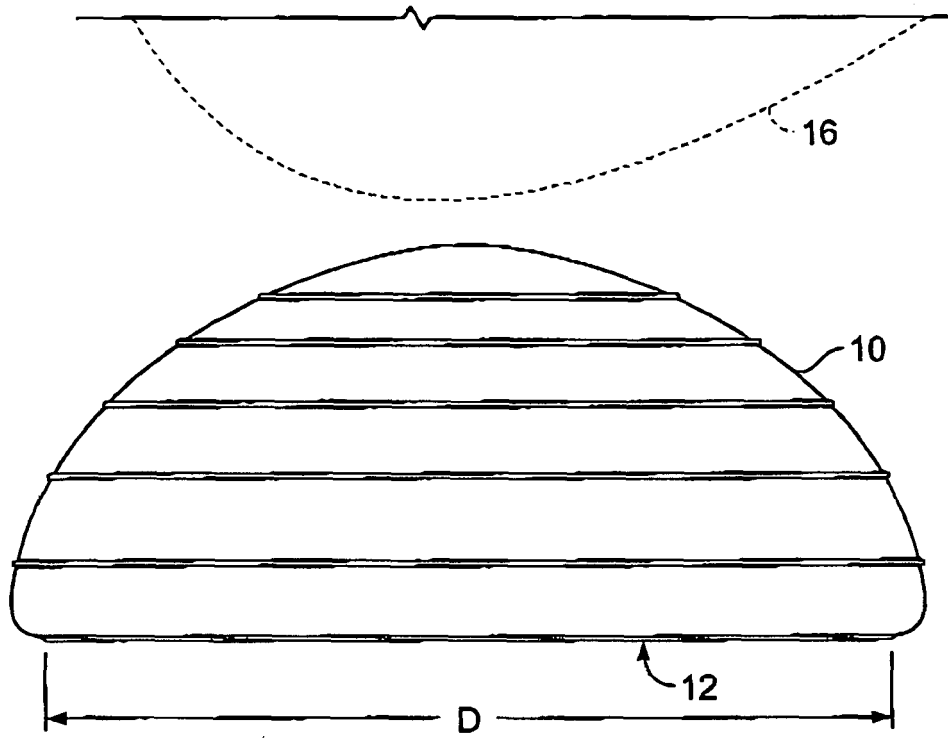


FIG. 3

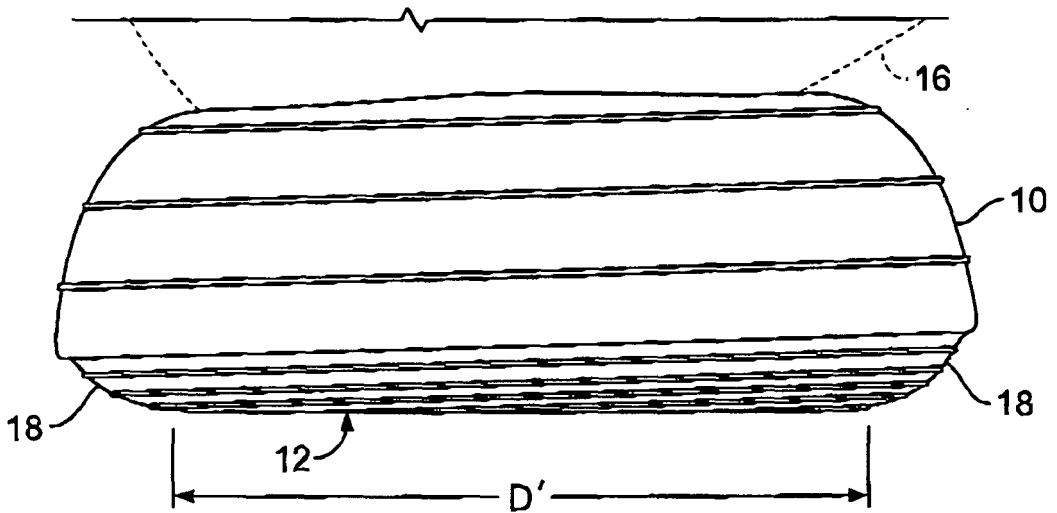


FIG. 4

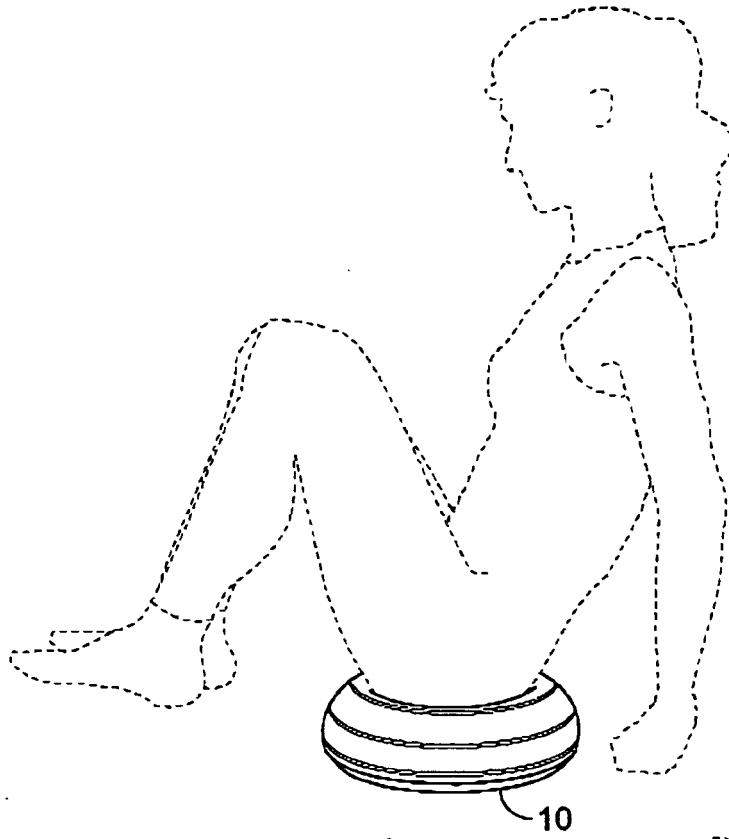


FIG. 5

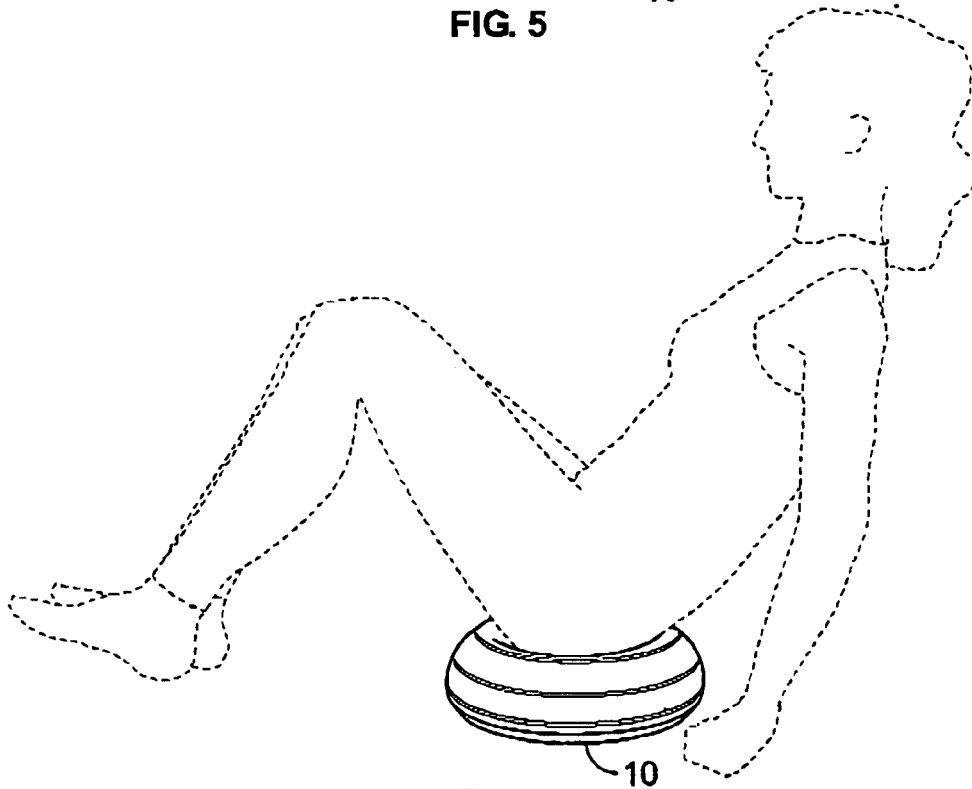


FIG. 6

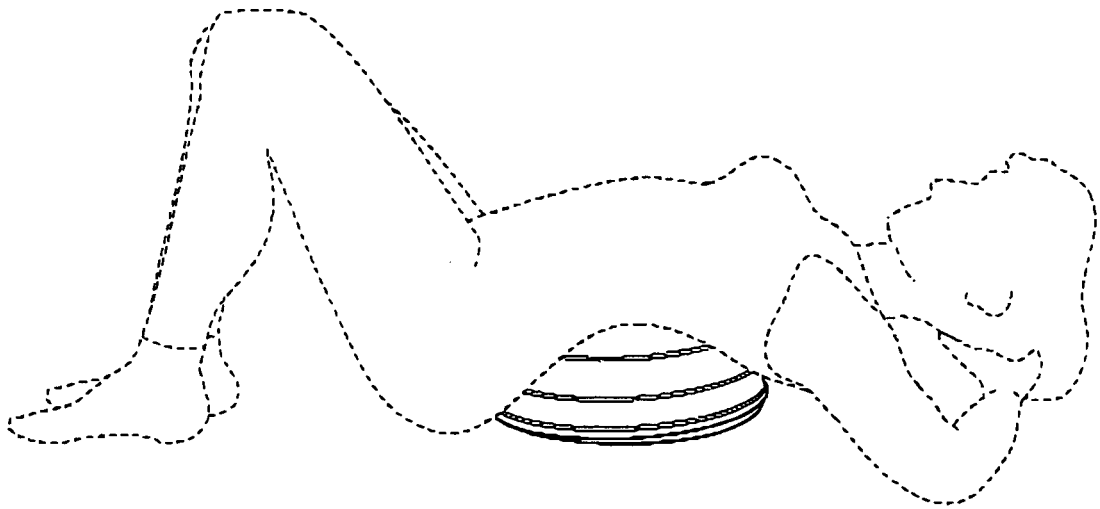


FIG. 7

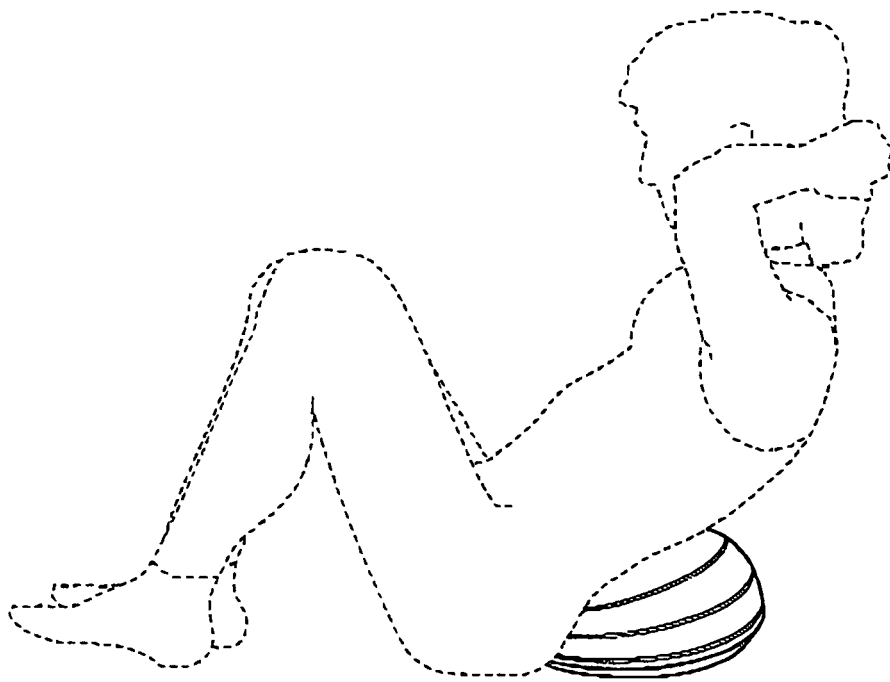


FIG. 8



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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 01/24887 A (WECK DAVID S [US]; COTTER JAMES E [US]) 12 April 2001 (2001-04-12)	1-3,8	INV. A63B22/18
Y	* page 8, line 3 - page 11, line 20; figures 7,8 *	4,7	
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X	----- US 2004/220029 A1 (CHEN WEN-HSING [TW]) 4 November 2004 (2004-11-04) * paragraph [0020] - paragraph [0023]; figures 1,2 *	1-3	
X	----- US 2005/009677 A1 (YANG LIEN CHUAN [TW]) 13 January 2005 (2005-01-13) * paragraph [0017] - paragraph [0020]; figures 1-3 *	1-3	
X	----- US 6 719 676 B1 (HSU CHENG-HSIUNG [TW]) 13 April 2004 (2004-04-13) * column 1, line 20 - column 3, line 13; figures 3-7 *	1,2	TECHNICAL FIELDS SEARCHED (IPC) A63B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 March 2007	Examiner Jekabsons, Armands
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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