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(54) **EXERCISE APPARATUS**

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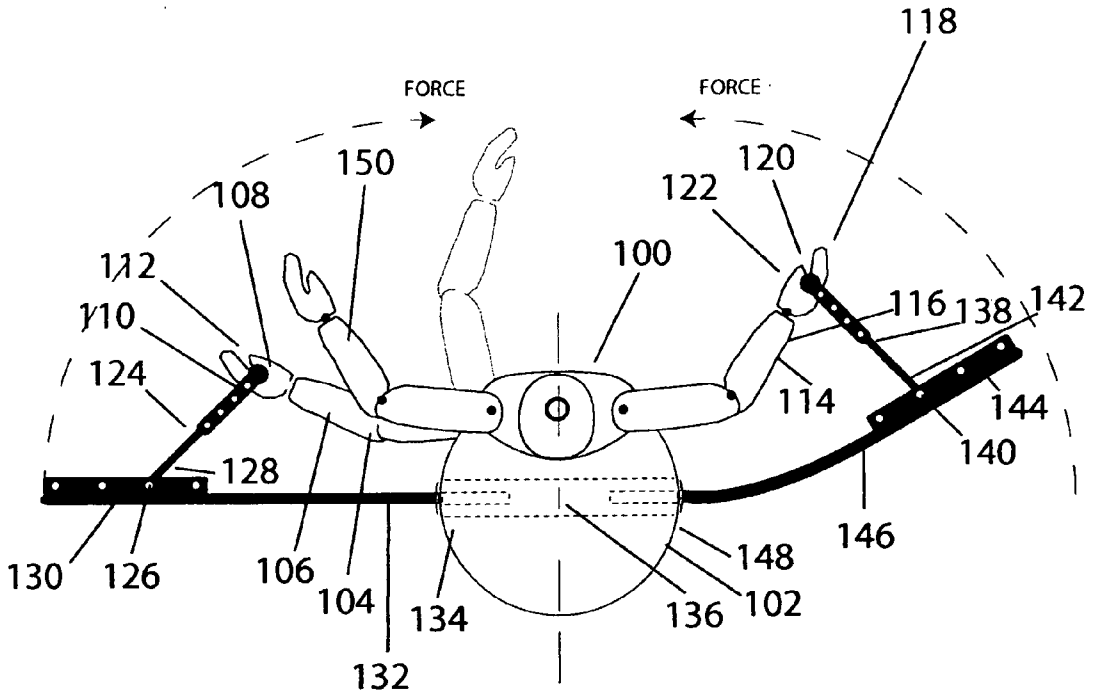
(57) **ABSTRACT**

In an exercise apparatus having full body anaerobic, flexibility and stability capabilities, an inner core is positioned within an aperture of an inflatable apparatus. One or more flexible rods are provided for insertion within a portion of the inner core. The flexible rod may include one or more rings to which may be coupled a handle for tensioning movement of the flexible rod. The tensioning movement of the flexible rod while supported on the inflatable apparatus generates a resistive force for the user and provides anaerobic, flexibility and stability exercise.



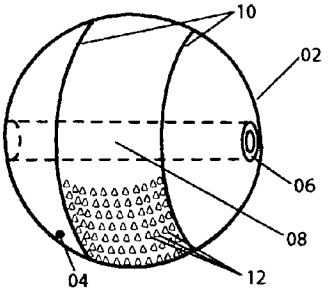


FIG.-1

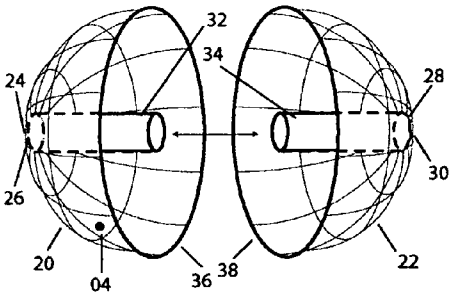


FIG.-2A

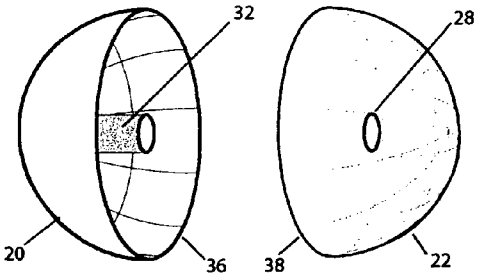


FIG.-2B

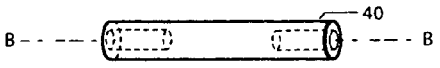
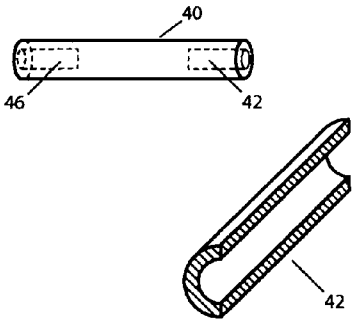


FIG.-3A



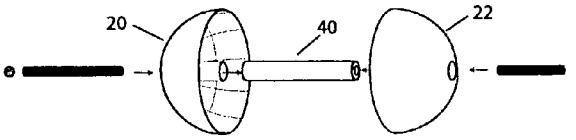


FIG.-3B

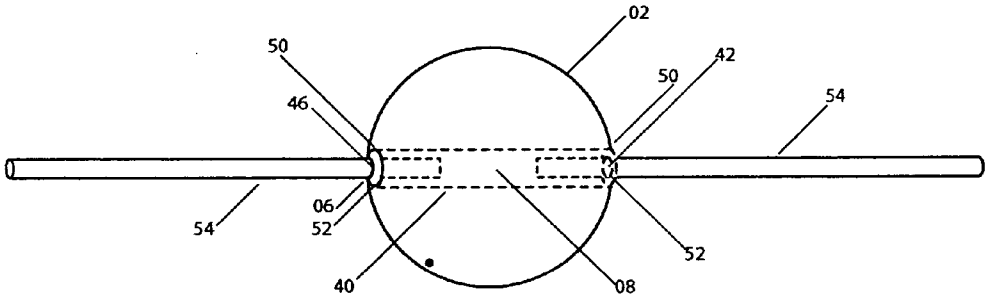


FIG.-4

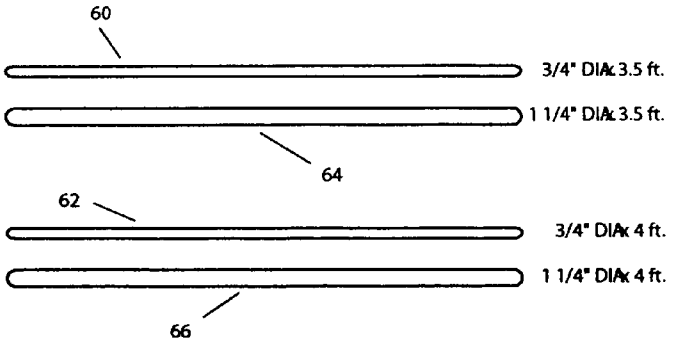
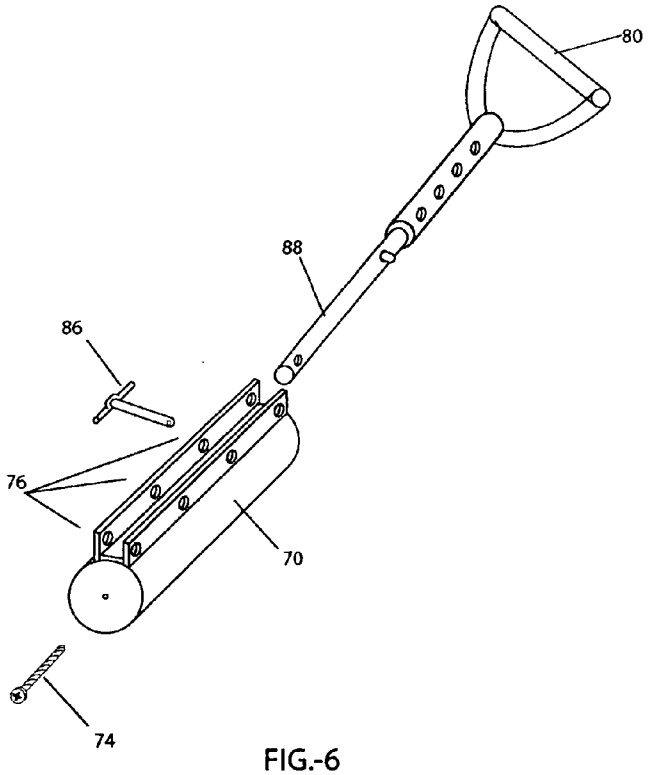


FIG.-5



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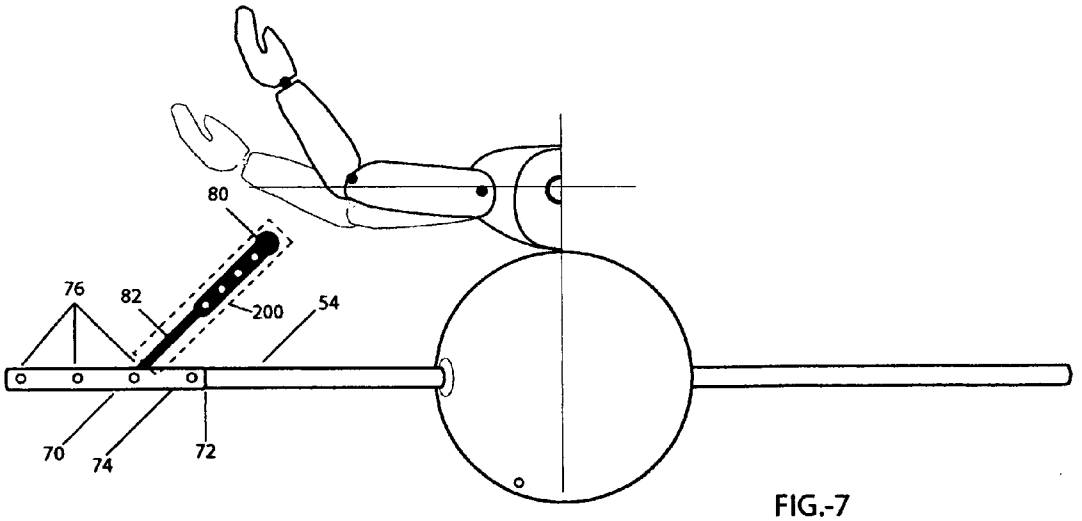

FIG.-7

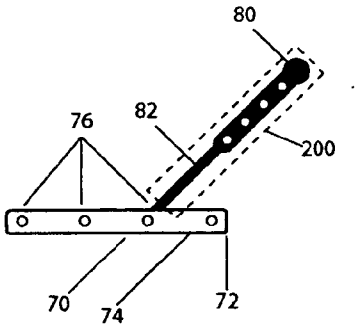

FIG.-8

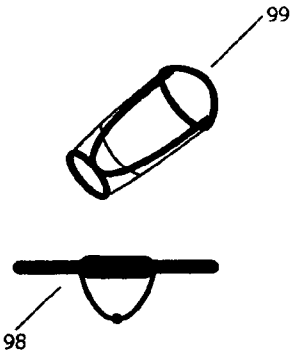

FIG.-9

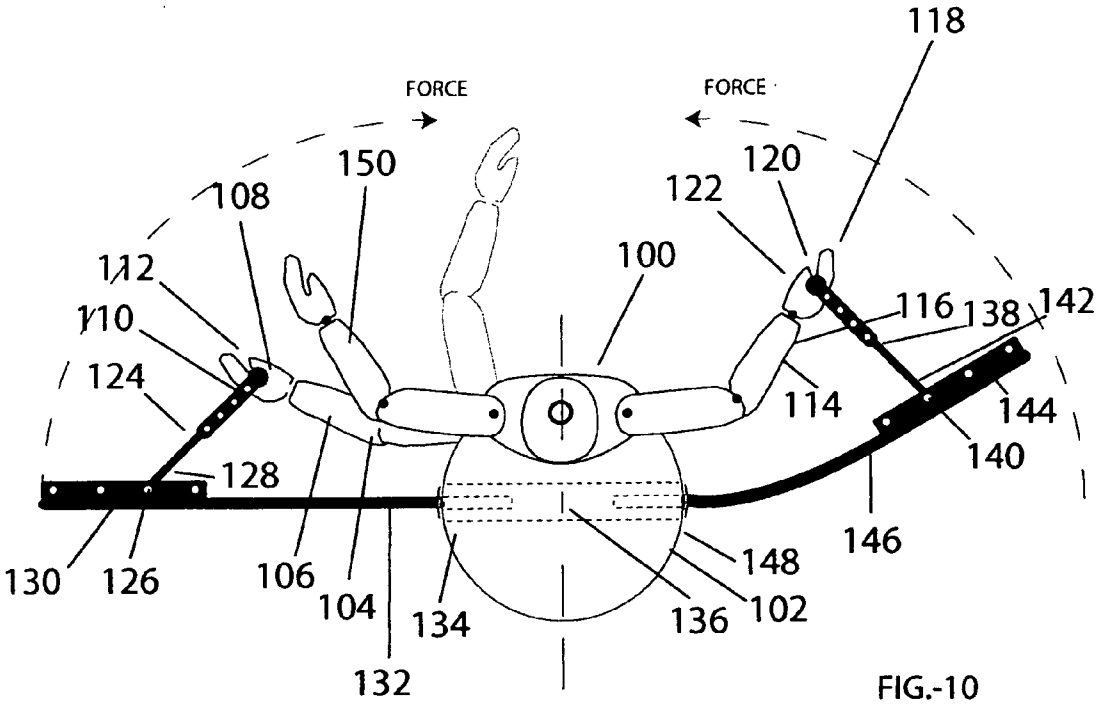
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FIG.-10

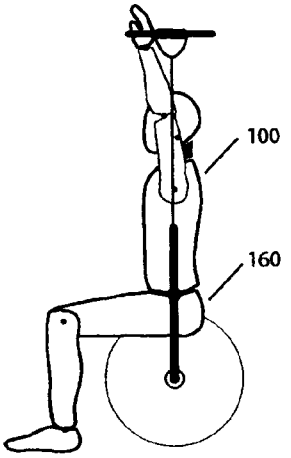
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FIG.-11

EXERCISE APPARATUS

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from U.S. patent application Ser. No. 60/476,560.

FIELD OF THE INVENTION

[0002] The present invention relates generally to an exercise apparatus for home, gym, travel, and therapeutic use, and more precisely to a light weight, mobile and storable exercise apparatus allowing anaerobic, stability and flexibility exercise in substantially any plane of motion.

BACKGROUND OF THE INVENTION

[0003] Recently, there has been considerable emphasis on marketing exercise equipment that allows for an integrated approach to fitness. Such integrated exercise equipment allows a user to exercise multiple muscle groups using the same piece of equipment, and may support toning and range-of-motion exercises, rather than traditional strengthening or muscle building.

[0004] In particular, a type of exercise based upon a combination of non free weight, resistance technology has become popular. This type of exercise focuses almost entirely on a user's muscle tone and range-of-motion, emphasizing circular movements of the body and limbs during exercise. A variety of specialized exercise equipment has been developed to support these types of circular, free-form exercise movements. U.S. Pat. Nos. 4,620,704 and 4,725,057, for example, disclose an exercise apparatus, i.e., Bow-flex, that has resistive poly-hexamethaline-adipamide rods, cables and pulleys as a primary component. These rods, cables and pullets provide resistance for movements in a variety of planes.

[0005] The Bow-flex apparatus of has been developed for home environments. In home gym settings, the Bow-flex apparatus includes a heavy bench and upright tower structure having a directional pulley system that allows the user to exert force against the resistive rods in the tower in downward planes of motion. The force exerted by the user against the resistive rods in the tower, by means of cables and pulleys allows for only direct linear resistance.

[0006] The need to provide such a large, heavy bench and tower in order to ensure structure and user stability has designated unquestionably that the Bow-flex is a non mobile, home only, static device, which has thus far been used and marketed only as a home specific non mobile exercise apparatus. While a large, heavy piece of equipment may be acceptable for stand alone home gym use, which typically focuses on anaerobic and range of motion use, such equipment is unacceptable for travel, mobility, flexibility, stability, or gym use.

[0007] Additionally, people are most inclined to engage in a particular type of exercise if a version of the necessary exercise equipment is available for home use. Typically, home use exercise equipment must be designed so that it is lightweight and storable, since the home user may not have a dedicated area for fitness, and may need to move the equipment and store it between exercise sessions. The size, weight, and cost of the Bow-flex or other known apparatus precludes the average user from owning one, because it is not at all portable and because it does not allow for stability or core work, due in part from it's dependence on a solid metal structure and the use of a cable pulley system of resistance.

SUMMARY OF THE INVENTION

[0008] The present invention is a lightweight, portable, and easily storable exercise apparatus. The exercise apparatus comprises an assembly that may be formed in any shape and which may, for example, be inflatable pressurized or coated with a soft or spongy material. Preferably the assembly is formed in a round, oval or cylindrical shape so as to provide for the additional benefit of core stability functionality. The assembly may be formed from plastic, vinyl, rubber, any other elastic or semi-elastic material or any combination of materials, including in combination with leather, or other soft or padded materials. Alternatively, the assembly may be formed from a harder semi-rigid or rigid material and may include a soft, cushioned, malleable or forgiving coating. The assembly may include ribs, nibs or other protrusions located along portions of its periphery, such as, for example, to provide additional lateral stability, or massage to the surface of the user in contact with the assembly. The assembly includes one or more apertures located in or running through a portion of the assembly. The apertures may be cylindrical or have an elliptical, triangular, square, rectangular or any other shaped cross-section.

[0009] The exercise apparatus also includes one or more flexible rods that may be inserted into the aperture. Each flexible rod has a cross-section matching that of the aperture and may be held in place by friction, grooves, pins or some sort of mounting or interlocking element or elements located along a portion of the flexible rod and/or located within the aperture, such as, for example, a screw mount, or a pin and groove assembly. Alternatively, the assembly may include a solid core structure that may be incorporated within the aperture or that may be inserted within the aperture prior to insertion of the one or more flexible rods.

[0010] The solid core structure may be constructed from a single rigid or semi-rigid element or multiple rigid or semi-rigid elements. For example, the solid core structure may be formed from a rigid plastic material shaped as a cylinder which is then glued within the aperture for permanent fixation therein or held within the aperture through friction. The solid core structure may have an aperture that goes extends its entire length or for only part or parts of the length of the solid core structure. For example, each side of the solid core structure may include an aperture that extends ⅓ of the way through its length leaving a solid middle portion that extends for ⅓ of the length of the solid core structure. The solid core structure may be secured in place, by any means, such as, for example, by securing flanges to one or both sides of the solid core structure after insertion within the assembly.

[0011] A pair of flexible rods may then be inserted within the solid core structure and held in place by any of a variety of method. For example, the flexible rods may be held in place using pin and groove elements contained on the flexible rods and/or within the solid core structure. Alternatively, or additionally, the flexible rods may be held in place using a tightening device for securing the flexible rods. For

example, the ends of the solid core structure may extend beyond the surface of the assembly and may include one or more slits or grooves running a portion of the length of the solid core structure. There may additionally be circumferential grooves along the exterior portion of the solid core structure for positioning a compression ring with corresponding internal grooves, such that the solid core element may be secured by turning of the ring which would tighten the solid core structure around the flexible rod.

[0012] Each of the flexible rods may include rings, hooks, apertures or other attachment elements for the attachment of one or more handles or other user interaction elements. Alternatively, a sleeve having one or more attachment elements may be coupled to the flexible rod. The sleeve may be coupled to the flexible rod using one or more pins, bolts, screws, or other securing device, or it may include grooves on an inside portion to correspond to grooves on the outside portion of the flexible rods for coupling by screwing the sleeve onto the flexible rod. The attachment elements may be located at different positions on the sleeve or flexible rod so as to provide for various resistance levels depending on where the user interaction elements are attached or where on the flexible rod the sleeve is located. For example, the closer in to the assembly that the sleeve is located or the user interaction elements are connected to the attachment elements on the sleeve or flexible rods, the greater the resistance for the user, and the further away from the assembly, the lower the resistance for the user. The user may utilize the user interaction elements for exercising the arms, legs, abdomen, back or most any other part of the user's body.

[0013] Because the assembly is able to support both the user and the flexible rods, there is no need for either a bench assembly or a resistance element/weight element support structure assembly. The assembly can be adjusted and positioned to support a user in a prone, supine, sitting, kneeling or other position so as to enable the user so positioned to access and interact with the user interaction elements attached to the sleeve or flexible rods. This user interaction may include pulling the user interaction elements toward the user, in arcular directions, parallel to the user's body or any other direction against the resistance provided by the flexible rods. The resistance generated and provided by the flexible rods in conjunction with the assembly allows the user to exercise while maintaining the stability of the flexible rods. The opposing force to the flexible rods generated by the inner core structure of the assembly provides stability to the flexible rods. The force generated by each of the flexible rods or by a first portion of the flexible rod that bends the inner core structure about the fulcrum/center point of the assembly is compensated for and brought into equilibrium by force generated by the other flexible rod or the other portion of the flexible rod on the same inner core structure in equal but opposite force and movement.

[0014] The exercise apparatus according to an embodiment of the present invention includes an assembly formed from an elastic, rubber-like material having an aperture running through a central axis. This aperture, which extends from one side of the outer surface of the assembly to the other along a central axis, has inserted therein a hardened inner core structure having two sides with an aperture on each side running toward the midpoint of the inner core structure along a central tubular axis. The apertures in the inner core structure each accommodates a flexible rod which may be inserted within each of the apertures.

[0015] Each of the flexible rods has attachment elements along its length which act as connection points for resistance load transmission through an interaction element that may be coupled to the flexible rod using the attachment elements. Alternatively, a collar or sleeve having attachment elements or an attachment track may be coupled to the flexible rods. The coupling of the flexible rods to the inner core structure acts as a load transmitting element from the flexible rods to the assembly. The exercise apparatus is also constructed and arranged to allow the assembly to act as an ergonomic bench pad or platform for the user.

[0016] Another aspect of the present invention is embodied in an exercise apparatus having the features described above and also provides for the full body anaerobic, flexibility, and stability capabilities of a standard "Swiss Ball" or "Exercise Ball", with the added benefit of use as, and to the maximum capacity for multiple exercises, flexibility and stability, not limited to any particular physical movements.

[0017] The full body anaerobic and stretch exercise ball fitness therapeutic apparatus can be inflated using a small air pump compressor, and used at gyms/therapy, at home and during travel. All muscle groups can be incorporated and exercised. Some of the many exercises which can be performed anaerobically with tension/resistance rods attached are chest press, incline/decline chest press, chest fly, incline/decline chest fly, back pull over wide/close, back rows wide/close, shoulder press, shoulder raises anterior/posterior, abdominal/upper/lower/oblique, lower back, thighs, butt, hips, triceps extension wide/close/reverse, triceps kick back, biceps curls wide/close/reverse, biceps preacher curl, leg extension, leg curl, leg press, calf raise, hip abduction/adduction, squat.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] **FIG. 1** shows an assembly of the exercise apparatus in an inflated view according to an embodiment of the present invention.

[0019] **FIG. 2** shows the assembly of **FIG. 1** in a ¾ cross-sectional view along a plane defined by ring A.

[0020] **FIGS. 3*a*** and **3*b*** show full and cross sectional views of an inner core, including along plane B-B, according to an embodiment of the present invention.

[0021] **FIG. 4** shows an assembled assembly and solid core structure, including flexible rods, according to an embodiment of the present invention.

[0022] **FIG. 5** shows various flexible rods of the exercise apparatus of **FIG. 4**.

[0023] **FIG. 6** shows the assembled exercise apparatus of **FIG. 4**, with a sleeve positioned on the flexible rod.

[0024] **FIG. 7** shows the exercise apparatus with a sleeve positioned on the flexible rod of **FIG. 6**, with an interaction element coupled to the sleeve.

[0025] **FIGS. 8*a*-8*d*** show an interaction element coupled to various positions on the sleeve of **FIG. 7**.

[0026] **FIG. 9** shows interaction elements according to other embodiments of the present invention.

[0027] **FIG. 10** shows an assembled exercise apparatus with a user situated in a supine position, according to a first embodiment of the present invention.

[0028] **FIG. 11** shows a side view of the assembled exercise apparatus of **FIG. 10** with a user situated in a seated position and with the flexible rods in a flexed position.

[0029] **FIGS. 12*a*-12*j*** show various exercises that may be performed according to the present invention.

DETAILED DESCRIPTION

[0030] The above and other objects, features and advantages of the present invention are further described in the detailed description which follows, with reference to the drawings, and by way of non-limiting exemplary embodiments of the present invention.

[0031] Referring to **FIG. 1**, there is shown an assembly of the exercise apparatus in an inflated view. The assembly **2** is inflatable and is comprised of an elastic material such as vinyl and is inflatable using valve **4** which may be connected to a pump for inflating and/or deflating. The valve **4** may be similar to a standard high quality "Swiss" or "Exercise" ball valve. The valve **4** of the assembly may be adaptable to a standard small, light weight electric air pump and/or a standard foot pump for inflation. The assembly **2** also includes an aperture **6** running through a central axis **8**. The assembly **2** may include ribs **10** and/or nibs **12** or other protrusions located along portions of its periphery.

[0032] The typical structure for the assembly **2** according to the present invention measures approximately 45 cm, 55 cm, 65 cm, 75 cm, and 85 cm diameters at proper inflation levels but can be over- or under-inflated at the user's discretion.

[0033] In **FIG. 2** there is shown the assembly of **FIG. 1** in a ¾ cross-sectional view along a plane defined by ring A. The assembly **2** may be molded from a first section **20** and an almost identical second section **22**, in this case, each section is in the shape of a half circle. The first section **20** has a first circular aperture **24** at its center point **26**. The second section **22** has an identical second circular aperture **28** at its center point **30**. The first section **20** also includes valve **4** for inflation of the assembly **2**. The first section **20** may be formed with a first cylindrical tube portion **32** extending from the first circular aperture **24** for a distance equal to the length of the radius of the assembly **2**. The second section **22** section may be formed with a second cylindrical tube portion **34** extending from the second circular aperture **28** for a distance equal to the length of the radius of the assembly **2**. The first cylindrical tube portion **32** and the second cylindrical tube portion **34** may be coupled using any known coupling method, such as, for example, welding, fusing, bonding or gluing.

[0034] Alternatively, the first section **20** may be formed with a first cylindrical tube portion **32** extending from the first circular aperture **24** for a distance equal to the length of the diameter of the assembly **2**, and the second section **22** would then be formed without any cylindrical tube portion, but instead, the first cylindrical tube portion **32** would be coupled to the second circular aperture **28** around its periphery by any known coupling method. For example, the first cylindrical tube portion **32** may be coupled to the second circular aperture **28** by welding, fusing, bonding or gluing.

[0035] The first periphery **36** of the first section **20** and the second periphery **38** of the second section **22** may then be coupled using one of the methods described above, thereby completing the assembly. The assembly will then have the structure as shown in **FIG. 1**.

[0036] Referring now to **FIG. 3*a***, there is shown a full view of an inner core according to an embodiment of the present invention. An inner core **40** is formed from a cylindrical piece of polyurethane or any other solid material, such as, for example, graphite, plastic, wood or metal.

[0037] As shown in **FIG. 3*b***, a cross-section of the inner core of **FIG. 3*a*** can be seen as viewed across points B-B as shown in **FIG. 3*a***. The inner core **40** includes the first center bore **42** extending lengthwise approximately ⅓ of its length, and a second center bore **46** extending lengthwise approximately ⅓ of its length. Each of the first center bore **42** and the second center bore **46** may include screw grooves, or some other securing element, for purposes of securing the flexible rods that are inserted into the bores, provided that the flexible rods include corresponding screw grooves, or other securing element.

[0038] Referring now to **FIG. 4**, there is shown an assembled assembly and solid core structure, including flexible rods, according to an embodiment of the present invention. The inner core **40** is positioned within the aperture **6** running through the central axis **8** of the assembly **2**. The inner core **40** may include flanges **50** that are inserted into the first center bore **42** and the second center bore **46** to secure the inner core **40** within the aperture **6**. One or more flexible rods **54** may be positioned within the first center bore **42** and/or the second center bore **46** of the inner core **40**. The interior circumference **52** of the flanges **50** may be rubberized to prevent slippage of flexible rods **54** after they are inserted into the inner core **40**. Alternatively, the flanges **50** may include snap fittings or grooves positioned along their interior circumference **52** to provide for the securing of the flexible rods **54** using corresponding features on the flexible rods **54**. In another embodiment the flexible rods **54** may be secured firmly on both sides of the air filled ball by means of the inner core **40**, which sits firmly inside of ball. The flexible rods **54** are held in place by both friction and angular friction pressure. The greater the flexion, the more pressure is placed on the inner attachment points of the rods. As the tension increases, the rods tighten inside the inner core fitting.

[0039] Alternatively, the inner core **40** may be stored separately from the assembly **2**. The inner core **40** may be positioned within the aperture **6** of the assembly **2** during inflation. At the point just prior to optimal inflation, the inner core **40** will fit semi firmly within the aperture **6**. When the inner core **40** is positioned within the aperture **6** the assembly **2** may then be brought to its optimal inflation level. As the assembly **2** fills with air, the increasing pressure from within the assembly **2** will force the walls of the aperture **6** against the inner core **40**, thereby securing it in place.

[0040] In **FIG. 5** there are shown various flexible rods of the exercise apparatus of **FIG. 4**. The flexible rods **54** may be provided in a variety of diameters and lengths, depending on the level of resistance required. For example, flexible rod **60** has a diameter of 0.75 inch and a length of 3.5 feet, flexible rod **62** has a diameter of 0.75 inch and a length of 4 feet, flexible rod **64** has a diameter of 1.25 inch and a

length of 3.5 feet, and flexible rod **66** has a diameter of 1.25 inch and a length of 4 feet. As can be seen in Table 1, each of flexible rods **60**, **62**, **64** and **66** has certain flex and tension characteristics that depend on both their diameter and length that determine the resistance provided. Thus, a desired resistance may be achieved by the proper selection of flexible rods. Moreover, the present invention is adaptable to changing requirements over time by simply changing the resistance rod that are used. The flexible rods **60**, **62**, **64** and **66** may be made from hexamethaline, i.e., extruded nylon rods, which offer variable resistance measured in terms of pounds per flexion during full range of motion. Range of motion is defined as flexing a straight flexible rod at given length to 90 degrees. At the point of 90 degree flexion, full weighted resistance is measured and achieved.

[**0041**] Referring now to **FIG. 6**, there is shown the assembled exercise apparatus of **FIG. 4**, with a sleeve positioned on the flexible rod. The sleeve **70** may be placed over a first end **72** of the flexible rod **54** and may be coupled thereto using screw **74** inserted into the first end **72** of the flexible rod **54**. Alternatively, some other fastening element or method may be used, such as, for example, bolts, pins, screws, glue, rubber grommets or gaskets. The sleeve **70** is formed from a cylindrically shaped resilient piece of composite material that either has two open ends or a single open end. For example, the sleeve **70** may be made from graphite, plastic, metal, wood or a composite material. The sleeve **70** may be coupled to the flexible rod **54** using a compression ring at either or both ends of the sleeve **70**. The sleeve **70** is approximately 16 inches in length, although it may be any length that does not substantially interfere with the flexing of the flexible rod **54**. The sleeve **70** includes a number of equally spaced attachment rings **76** integral to the sleeve **70**. The attachment rings **76** may be formed with the sleeve **70** and from the same material as the sleeve **70**. Alternatively, the attachment rings **76** may be formed from some other material and coupled to the sleeve **70**, or the sleeve may include a track in place of the attachment rings **76**. The location of each of the attachment rings **76** is designed by calibrating the tension or force generated based on the specific distance from the attachment ring to the meeting point between the flexible rod **54** and the opening of the inner core **40**, and the measured weight of resistance of the flexible rod **54** when pulled upon as the flexible rod **54** is flexed.

[**0042**] For example, using two flexible rods of different diameters, and using a sleeve with four attachment rings, eight possible resistance positions can be achieved. The handle can be used, unilaterally (with one hand, held in center) or bilaterally (with two hands, held on outside grip), held in over or under hand position.

[**0043**] In **FIG. 7** there is shown the exercise apparatus with a sleeve positioned on the flexible rod of **FIG. 6**, with an interaction element coupled to the sleeve. An interaction element in the form of a handle **80** having a cable **82** coupled thereto may be attached to a first attachment ring **84** of the sleeve **70** using a spring biased ring **86**. Alternatively, the cable **82** may be coupled to a track located on the sleeve **70**. The handle **80** may be replaced with another type of interaction element, such as, for example, a cord, a sling or a leg adapter. The cable **82** may include an anti coil tube **88**, which measures out the cable **82** and also prevents the cable **82** from being tangled near the point of exercise movement. Additionally, stoppers **85** may be included, which may be used to prevent the cable **82** from loosening, both at rest and during flexion of the flexible rod **54**, to prevent coiling of the cable **82**, and to maintain a constant tension upon the anti coil tube **88** and handle **80**. The spring biased ring **86** may be used to adjust the length of the cable **82** to compensate for the change in distance to the user when the spring biased ring **86** is moved to different attachment rings.

[**0044**] Referring now to **FIGS. 8***a* and-**8***b*, there are shown an interaction element coupled to various positions on the sleeve of **FIG. 7**. Looking first to **FIG. 8***a*, the handle **80** may be repositioned on the sleeve **70** by moving cable **82** to a second attachment ring **90**. This may be accomplished by pressing on the lever portion of the spring bias clip **86** and detaching from the first attachment ring **84**, followed by attachment to the second attachment ring **90** by pressing the lever portion downward against the second attachment ring **90**. As shown in **FIG. 8***b*, the same procedure may be followed to move the cable **82** to a third attachment ring **92** or to the other attachment ring **94**.

[**0045**] In **FIG. 9** there is shown attachment elements according to other embodiments of the present invention. The interaction element may be provided in the form of a three-in-one handle **98**. The three-in-one handle **98** may be used, unilaterally (with one hand, held in the center) or bilaterally (with two hands, held on the outside grip, or held in over or under hand positions). Alternatively or additionally, the interaction element may be provided in the of a foot attachment strap **99** for use in lower body exercise movements.

[**0046**] Referring now to **FIG. 10**, there is shown an assembled exercise apparatus with a user situated in a supine position, according to an embodiment of the present invention. A user **100** is shown in a supine position supported on assembly **102** which is inflatable, with the user's left arm **104** in an at rest position **106** and the user's left hand **108** gripping a first interaction element **110** in the form of a first handle **112**, and the user's right arm **114** in a first flexed position **116** and the user's right hand **118** gripping a second interaction element **120** in the form of a second handle **122**. The first handle **112** is coupled to a first cable **124** which in turn is coupled to a first attachment ring **126** via a first spring biased clip **128**. The first attachment ring **126** is located on a first sleeve **130** that is coupled to a first flexible rod **132**. The first flexible rod **132** is insertably coupled to a first side **134** of an inner core **136** of assembly **102**. The second handle **122** in turn is coupled to a second cable **138** which is coupled to a second attachment ring **140** via a second spring biased clip **142**. The second attachment ring **140** is located on a second sleeve **144** that is coupled to a second flexible rod **146**. The second flexible rod **146** is insertably coupled to a second side **148** of the inner core **136** of assembly **102**.

[**0047**] When the user's left arm **104** is in the at rest position **106**, the first flexible rod **132** remains unflexed and there is little or no tension being applied to the user's left arm **104**. This is in contrast to the user's right arm **114** which, when moved to a first flexed position **116**, generates some tension on the second flexible rod **146** and resistive force to the user's right arm **114**. When the user's left arm **104** is moved to a second flexed position **150**, there is a level of tension generated in the first flexible rod **132** and a

resistive force to the user's left arm greater than the tension generated in the second flexible rod **146** and the resistive force to the user's right arm when the second flexible rod **146** is located in the first flexed position **116**. The flexible rods provide a range of movement and flexibility throughout the full range of motion of user **100**.

[**0048**] The exercise apparatus according to this embodiment of the present invention may be used to perform a multitude of resistance, stability, and flexibility exercises and movements. During flexibility and stability movements, the invention is used in a manner similar to the way a standard "Swiss Ball" or Exercise Ball" is used, with the difference being that the present invention has an inner core running through its central axis, with flexible rods extending therefrom. The inner core acts as a pivot/leverage and containment structure during resistance exercise movements. The larger the diameter of the flexible rod, the greater the resistance to the user **100** as the flexible rod is flexed. The closer the cable is moved toward the end of the flexible rod furthest from the inner core of the ball, the lower the resistance generated during flexion. The resistance may be converted to a comparable weight measure that can be referred to as tension measured in pounds during flexion.

[**0049**] When the user **100** utilizes the exercise apparatus in the supine position as shown in **FIG. 10**, all of the upper body larger muscles, including Pectoralis Major and Minor, Latissimus Dorsi and Rectus abdominis, as well as Obliques, may be targeted.

[**0050**] Referring now to **FIG. 11**, there is shown a side view of the assembled exercise apparatus of **FIG. 10** with a user situated in a seated position and with the flexible rods in a flexed position. User **100** is shown in seated position **160** performing a shoulder press exercise. This seated position **160** and other similar secondary positions allow the user **100** to target smaller muscle groups, while performing upper body exercises, with the exception of leg exercises, which recruit larger muscle groups during such exercises. Muscles that are used during upper body exercises in such secondary positions include, (lower, medial, lateral, back), Trapezius, Deltoids, Biceps, Triceps, Extensors, Brachiradialis, Palmaris Longus, Abdominis, Obliques and Flexors. Muscles that are used during lower body exercises when in such secondary positions include Gluteus Medius and Maximus, Adductors and Abductors, Quadriceps, Sartorius, Tibalis, Soleus, Gastrocnemius, Semitendinosus, Bicep Femoris.

[**0051**] As shown in **FIGS. 12***a*-**12***j*, a variety of exercises may be performed using the exercise apparatus according to the present invention. Although only a selection of exercises are shown, many more and varied exercises may be performed using the exercise apparatus according to the present invention.

What is claimed is:

1. An exercise apparatus comprising:

a. an assembly having an aperture therethrough;

b. an inner core structure having at least one aperture therein, whereby the inner core structure may be positioned within the aperture of the assembly;

c. at least one flexible rod, whereby the at least one flexible rod may be positioned at least partly within the at least one aperture of the inner core structure;

2. The exercise apparatus according to claim 1, further comprising a handle, whereby the handle may be coupled to the flexible rod.

3. The exercise apparatus according to claim 1, wherein the aperture of the assembly does not provide for movement of a gas from the interior of the assembly to the exterior of the assembly.

4. The exercise apparatus according to claim 1, wherein the inner core structure has a circular cross section.

5. The exercise apparatus according to claim 1, wherein the inner core structure has an other than circular cross section.

6. The exercise apparatus according to claim 1, wherein the flexible rod has a circular cross section.

7. The exercise apparatus according to claim 1, wherein the flexible rod has an other than circular cross section.

8. The exercise apparatus according to claim 1, further comprising a ring coupled to the flexible rod.

9. The exercise apparatus according to claim 1, wherein the assembly is made of an elastic material.

10. The exercise apparatus according to claim 1, wherein the assembly is made of vinyl.

11. The exercise apparatus according to claim 1, wherein the assembly is made of a material other than vinyl.

12. The exercise apparatus according to claim 1, wherein the assembly is in the shape of a sphere.

13. The exercise apparatus according to claim 1, wherein the assembly is in the shape of an ovoid.

14. The exercise apparatus according to claim 1, wherein the assembly is in a shape other than a sphere or ovoid.

15. The exercise apparatus according to claim 1, wherein the assembly is inflatable.

16. The exercise apparatus according to claim 1, wherein the assembly is pressurized.

17. The exercise apparatus according to claim 1, wherein the assembly is formed from a non-elastic material.

18. The exercise apparatus according to claim 1, wherein the inner core structure has a first aperture and a second aperture and wherein there is a first flexible rod and a second flexible rod.

19. An exercise apparatus, comprising:

a. an assembly having a first aperture and a second aperture;

b. a first tube coupled to the first aperture and the second aperture;

c. a second tube, whereby the second tube may be positioned within the first tube;

d. at least one flexible rod, whereby the at least one flexible rod may be coupled to the second tube.

20. A method of exercising using an exercise apparatus including an assembly having an aperture therethrough, a tube, whereby the tube may be positioned within the aperture of the assembly, and at least one flexible rod, whereby the at least one flexible rod may be positioned at least partly within the tube, comprising the steps of:

a. positioning a user at least one of adjacent to and in contact with the assembly;

b. the user applying at least one of an abductive or adductive force to the at least one flexible rod.

21. An exercise apparatus, comprising:

a. an assembly having an aperture therethrough;

b. a tube having at least one aperture therein, whereby the tube may be positioned within the aperture of the assembly;

c. at least one flexible rod, whereby the at least one flexible rod may be positioned at least partly within the at least one aperture of the tube.

22. The exercise apparatus according to claim 21, wherein the tube has a circular cross section.

23. The exercise apparatus according to claim 21, wherein the tube has a non-circular cross section.

24. A package containing an exercise apparatus comprising an assembly having an aperture therethrough, a tube having at least one aperture therein, and at least one flexible rod, comprising:

a protective covering; and

instructions for assembling the exercise apparatus.

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