

INELASTIC EXERCISE DEVICE HAVING A LIMITED RANGE

TECHNICAL FIELD

[0001] The present invention generally relates to exercise devices, and in particular to an exercise device having an inelastic strap that can move within a limited range.

BACKGROUND ART

[0002] Resistance exercise devices allow a user to exercise by providing a resistance to the movement of a user's arms, legs, or torso. Thus, for example, such devices allow a user to exercise by working one muscle against another, or by working against the weight of the user, by providing a resistance to the movement of a user's arms, legs, or torso. Resistance exercise devices typically include either elastic bands or inelastic straps.

[0003] Resistance exercise devices having elastic bands typically restrict the motion of a user's arms and/or legs, or the motion between the user and a support structure. Elastic exercise devices typically have limited usefulness that result from their resistance characteristics, which depend on the length and elasticity of the elastic band. Due to differences in height, weight, or strength between different users, it may not be possible to use a device for a variety of exercises or for different users to use the device for the same exercise. Elastic resistance exercise devices typically provide resistance that is inconsistent and which increases with increasing displacement, and tend to snap back when released.

[0004] Resistance exercise devices having inelastic straps are typically attachable to a structure, such as, for example, a door. While devices having inelastic straps do not have many of the problems of those having elastic bands, they are generally usable for a limited number of exercises.

[0005] There is a need to provide a resistance exercise device that is capable of being used for a complete workout for any user, including adjustments that allow a wide range of stances and exercises, and that provides resistance to the user's motion in a form that is useful for exercising.

DISCLOSURE OF INVENTION

[0006] The present invention overcomes the disadvantages of prior art by providing an exercise device that permits a limited range of longitudinal motion. For example, certain embodiments described herein include an exercise device that interacts with an anchor to permit limited motion of the exercise device.

[0007] In certain embodiments, an exercise device including an inelastic elongated member supported by an anchor attachable to a structure is provided. The exercise device includes an inelastic elongated member having grips, an anchor attachable to the structure and having a support for the inelastic elongated member, and means for limiting the range of positions at which the anchor supports the elongated member.

[0008] In certain other embodiments, an exercise device attachable to a structure is provided. The exercise device includes an inelastic elongated member having grips, an anchor attachable to the structure and having a support for the inelastic elongated member, and a limiter including at least one loop connected to the elongated member.

[0009] In certain other embodiments, an exercise device attachable to a structure is provided. The exercise device includes an inelastic elongated member having grips, and an anchor attachable to the structure and having a frictional support for the inelastic elongated member. The inelastic elongated member includes a closed loop, and where the frictional support passes through the closed loop to limit the range of the inelastic elongated member on the support.

[0010] These features together with the various ancillary provisions and features which will become apparent to those skilled in the art from the following detailed description, are attained by the exercise device of the present invention, embodiments thereof being shown with reference to the accompanying drawings, by way of example only, wherein:

BRIEF DESCRIPTION OF DRAWINGS

[0011] FIG. 1 is a schematic front view of a first embodiment of an exercise device as anchored between a door and door jamb;

[0012] FIG. 2 is a partial schematic sectional view 2-2 of FIG. 1 showing the exercise device anchored between a door and door jamb;

[0013] FIG. 3 is illustrative of a user performing a high row exercise with the exercise embodiment of FIG. 1;

[0014] FIG. 4 is a perspective view of a second embodiment of an exercise device;

[0015] FIGS. 5A and 5B are views of a first embodiment of an anchor of the exercise device of FIG. 4, where FIG. 5A is a perspective view, and FIG. 5B is sectional view 5B-5B;

[0016] FIG. 6 is a schematic top view of the elongated member of the embodiment shown in FIG. 4 having two lengthening mechanisms and two hand grips;

[0017] FIG. 7 is a perspective view showing details of the grip and the lengthening mechanism of the embodiment of FIG. 4;

[0018] FIG. 8 is a sectional view 8-8 of FIG. 7 showing the hand grip;

[0019] FIG. 9A is a perspective view showing details of the slack sleeves of the embodiment of FIG. 4;

[0020] FIG. 9B is a sectional view 9B-9B of FIG. 9A showing details of the buckle and attachment of the slack sleeves to the buckle;

[0021] FIG. 10 is a schematic top view of an alternative elongated member embodiment having one lengthening mechanism and two finger grips;

[0022] FIG. 11 is schematic sectional view 11-11 of the finger grip embodiment of FIG. 10;

[0023] FIGS. 12A-12D are schematic drawings illustrating the use of the exercise device, where FIG. 12A is the initial configuration, FIG. 12B illustrates lengthening the elongated member, further illustrated in FIGS. 12B' and 12B'', FIG. 12C shows the application of force to the shorter leg of the elongated member, and FIG. 12D shows the application of force to the grips during an exercise;

[0024] FIGS. 13A-13C are schematic drawings illustrating the use of the exercise device having differing arm lengths, where FIG. 13A is the initial configuration, FIG. 13B shows the application of force to one of the pair of legs, and FIG. 13C shows the application of force to the grips during an exercise;

[0025] FIG. 14A is a second embodiment of an anchor that can be used for attaching the exercise device to a pole or railing, and FIG. 14B is a exercise device anchored to a pole using the alternative anchoring embodiment of FIG. 14A;

[0026] FIGS. 15A-15I illustrate poses of a user using an embodiment of an exercise device to perform exercises, where FIG. 15A is a reverse combination crunch, FIG. 15B is a single leg L-squat, FIG. 15C is a gymnast dip, FIG. 15D is a kneeling combination crunch, FIG. 15E is a lying leg curl, FIG. 15F is a hip lift, FIG. 15G is a front shoulder raise, FIG. 15H is a crunch, and FIG. 15I is a triceps extension;

[0027] FIGS. 16A and 16B illustrate an embodiment of the exercise device for doing one handed exercises, where FIG. 16A shows interlocking the handles for one handed exercises, and FIG. 16B illustrates the use of the exercise device in performing a one arm high row exercise;

[0028] FIGS. 17A and 17B show an embodiment of a foot grip accessory as attached to a grip of an exercise device, where FIG. 17A illustrates the foot grip accessory gripped by the user's toes, and FIG. 17B illustrates a pair of foot grip accessories with one accessory on each of the pair of grips of an exercise device and grasped by one of the user's heels;

[0029] FIGS. 18A, 18B, 18C and 18D show a first embodiment of the foot grip accessory of FIGS. 17A-B, where FIG. 18A is a perspective view of the foot grip accessory, FIG. 18B is a bottom view of the foot grip accessory, FIG. 18C is a side view of part of one of the grip attachment portions, and FIG. 18D is a top view of part of one of the grip accessory attachment portions;

[0030] FIGS. 19A, 19B, and 19C show an embodiment of a finger grip accessory as attached to a grip of an exercise device, where FIG. 19A illustrates the one finger placed through one of the loops, FIG. 19B illustrates one finger be placed through each of the two loops, and FIG. 19C shows two fingers placed through each of the two loops;

[0031] FIGS. 20A, 20B, and 20C show one embodiment of the finger grip accessory of FIGS. 19A-C, where FIG. 20A is a perspective view of the finger grip accessory, FIG. 20B is a top view 20B-20B of the finger grip accessory, and FIG. 20C is a sectional side view 20C-20C of the finger grip accessory;

[0032] FIGS. 21A, 21B, and 21C shown an embodiment of a grip accessory as attached to a grip of an exercise device, where FIG. 21A illustrates a hand gripping three cords, FIG. 21B illustrates the hand gripping two cords, and FIG. 21C illustrates the hand gripping one cord;

[0033] FIGS. 22A, 22B, 22C, and 22D show one embodiment of the grip accessory of FIGS. 21A-C, where FIG. 22A is a perspective view of the grip accessory, FIG. 22B is a top view of the grip accessory, FIG. 22C is a bottom view of the grip accessory, and FIG. 22D is sectional side view 22D-22D of FIG. 22C;

[0034] FIG. 23 shows a third embodiment of an anchor;

[0035] FIG. 24 illustrates the use of the anchor of FIG. 23 to anchor an exercise device to a tree;

[0036] FIGS. 25 and 26 shows an embodiment of a bracket for securing an exercise device by an enlarged first end of an anchor, where FIG. 25 is a perspective front view of a bracket for mounting an exercise device, and FIG. 26 illustrates the use of the bracket to anchor the exercise device;

[0037] FIG. 27 is a perspective view of a first embodiment combination grip;

[0038] FIG. 28 is a perspective view of a second embodiment combination grip;

[0039] FIG. 29 is a perspective view of an exercise device including a fourth embodiment of an anchor and a second embodiment of an elongated member;

[0040] FIG. 30 is a perspective view of an exercise device including a fifth embodiment of an anchor;

[0041] FIG. 31 is a perspective view of an exercise device including a sixth embodiment of an anchor;

[0042] FIGS 32A-32C are views of one embodiment of a support for the exercise device of FIG. 31, where FIG. 32A, is a perspective view showing the support connected to a ring, FIG. 32B is perspective view of the support unfolded, and FIG. 32C is an end view of the support ready to accept a ring;

[0043] FIG. 33 is a perspective view of an embodiment of a combination anchor;

[0044] FIGS. 34A and 34B are a side view and a top view respectively, of one embodiment of an anchor support;

[0045] FIG. 35 is a side view of one use of the anchor support of FIGS. 34A and 34B;

[0046] FIG. 36A is a perspective view of an exercise device having limited motion and including a fourth embodiment of an anchor and a third embodiment of an elongated member;

[0047] FIG. 36B is a sectional view 36B-36B of FIG. 36A showing a cross section of the motion limiting mechanism;

[0048] FIG. 36C is a sectional view 36B-36B of FIG. 36A showing a cross section of the motion limiting mechanism with the elongated member at an extreme position;

[0049] FIG. 37 is a perspective view of an exercise device having limited motion and including a combination anchor and a third embodiment of an elongated member;

[0050] FIG. 38 is a perspective view of a third embodiment combination grip; and

[0051] FIGS. 39A and 39B are perspective view of the combination grip of FIG. 38 with the hand grip in an upper and lower position, respectively.

[0052] Reference symbols are used in the Figures to indicate certain components, aspects or features shown therein, with reference symbols common to more than one Figure indicating like components, aspects or features shown therein.

MODE(S) FOR CARRYING OUT THE INVENTION

[0053] For purposes of contrasting various embodiments with the prior art, certain aspects and advantages of these embodiments are described where appropriate herein. Of course, it is to be understood that not necessarily all such aspects or advantages may be achieved in accordance with any particular embodiment. Modifications and variations can be made by one skilled in the art without departing from the spirit and scope of the invention including, but not limited to: the use of inelastic members, which are described herein as straps, that are round or have some other cross-sectional shape, and/or which are formed from two or more members joined together, as by stitching or with an adhesive; or the use of different mechanisms for adjusting the length of inelastic member that are known in the field including, but not limited to, buckles, hooks, or winding the inelastic member about a rigid element. Moreover, any one or more features of any embodiment may be combined with any one or more other features of any other embodiment, without departing from the scope of the invention.

[0054] Disclosed herein is an inelastic exercise device that is supported by, or that can be easily attached to, a supporting structure, and that allows a user to perform a large number of exercises by easily adjusting the length of the device and thereafter balancing the device as the user's weight is transferred to the device. Several of the features will now be illustrated with reference to FIGS. 1-3. FIG. 1 is a schematic front view of a first embodiment of exercise device **100** that is anchored at a point **A** between a door **D** and door jamb **J**. FIG. 2 is a partial sectional view **2-2** of FIG. 1 taken through door **D** and showing exercise device **100** in profile, and FIG. 3 is illustrative of a user **U** exercising with the exercise device of FIG. 1.

[0055] Exercise device **100** includes an anchor **110** and an elongated member **120** having a pair of arms **122**, indicated as a first arm **122a** and a second arm **122b**, on either side of the anchor, as

shown schematically in FIGS. 1 and 2. A pair of grips **123** is provided, with one positioned at each end **121** of each arm **122**, specifically first arm **122a** has a first grip **123a**, and second arm **122b** has a second grip **123b**. Elongated member **120** is substantially inelastic and flexible with a length **S** between the pair of grips **123**, and includes a strap or cord or other inelastic, flexible member, and a lengthening mechanism **135** that provides for increasing or decreasing the length **S**, as indicated by double arrows ΔS .

[0056] As used herein, the noun "grip" encompasses any device that is interlockable with part of the human body, that is it can be connected in such a way that a person can transfer a force to the grip, preferably a force equal to some or all of the person's weight, and the verb "grip," when used herein, refers to the action of interlocking the device and a body part. When used in an exercise device, a grip is attached to other elements that permit the force to be transferred to another object, including but not limited to a stationary support, a device that can store or release energy, such as an elastic cord or a spring, or another body part. Grips include devices that can be surrounded by a body part, for example flexible loop or a hook, or that a body part can surround, for example an elongated member that can fit within the grasp of the hand. In this context, a member that can be gripped, or is grippable, is one that can surround a body part or can be surrounded by a body part, and has a size and configuration that permits the transfer of forces from the user to the grip. A "hand grip" is grip that is sized for grasping by the hand, a "foot grip" is grip that is sized for grasping a foot, and a "finger grip" is grip that is sized for grasping by one or more fingers.

[0057] Anchor **110** provides a support for elongated member **120** that permits some amount of movement. Specifically, the interaction of anchor **110** and elongated member **120** allows the elongated member to be positioned along on the anchor, and may also provide resistance to the movement of the elongated member along the anchor. Preferably the resistance is sufficient so that, under some circumstances, the support prevents movement of elongated member **120** along anchor **110**, even where there is some mis-match of forces on the ends of the elongated member. In this way exercise device **100** may be used for a variety of exercises, by changing the length of elongated member **120**, for example, and also provide an exercise device that can provide support for the user while exercising.

[0058] One type of support is referred to herein, without limitation, as a "frictional support." Anchors that provide frictional support include, but are not limited to, an element or portion of an element that can support elongated member **120** during exercising, and over which the elongated member can slide. Resistance to the movement of elongated member **120** over anchor **110** may

be determined, in part, by the frictional resistance of the elongated member sliding over the anchor. In several embodiments of methods of using exercise device **100**, elongated member **120** slides along anchor **110** while a user positions herself. During exercising, a slight mis-match in the pulling forces on the grips is matched by static friction of the frictional support, and the grips do not move while exercising. That is, the static friction between elongated member **120** and anchor **110** generated by the frictional support is sufficient to permit exercises in which elongated member **120** does not slide through anchor **110** while exercising. Means that provide frictional support include elements or portions of elements that form part of or which are attached to an anchor and which can support an elongated member (that may, for example, include grips) and which can allow the elongated member to slide along the supporting anchor and provide frictional resistance to the motion of the elongated member during exercising.

[0059] Anchor **110** is used to provide a fixed anchor point for exercise device **100** and to support a user's weight as it is applied to arms **122** as indicated by an arrow **F** in FIG. 2 and as shown in FIG. 3. As shown in FIG. 2, anchor **110** is adapted for positioning exercise device **100** in a door and providing support to elongated member **120** by having an enlarged portion **111**, a portion **113** that can be strap or cord, and an approximately triangular shaped loop **115** for slidably supporting the elongated member. With enlarged portion **111** on the opposite side of door **D** from elongated member **120**, anchor **110** supports the weight of a user as grips **123** are pulled. In addition, anchor **110** provides for positioning the relative length of arms **122** as shown in FIG. 1 by double arrow **C**. Thus, the total length of elongated member **120** and distribution of that length between each of arms **122** can be easily adjusted through the lengthening mechanism **135** and by pulling the ends of the elongated member. FIG. 2 shows arms **122** each having a length **L**.

[0060] When supported by a structure, such as door **D** (as shown, for example, in FIGS. 1-3) or a railing, pole or other support member (as shown, for example, in FIGS. 14B and 26) the inventive exercise device provides a pair of grips for a user to exercise against her weight according the user's position relative to the device, and provides for easily adjusting the length of the device. As described below, the inventive device can be used to exercise in any one of a large number of orientations according the selected adjustable length and according to where and how the user stands relative to the exercise device. In general, a user sets the exercise device to a desired length, positions herself on the ground near the exercise device, supports a portion of her body weight from the exercise device by her hands or feet, and exercises by moving her body with her weight supported by the ground and the exercise device. Examples of support on the ground and exercise device include, but are not limited to, standing on one or both legs, lying on

the stomach or the back, kneeling, or by having the hands on the ground, and having the exercise device support ones weight by the hands or feet, as appropriate.

[0061] In an alternative embodiment (not shown), elongated member **120** does not include a lengthening mechanism **135**. In this embodiment, elongated member **120** is thus substantially inelastic and has a fixed length **S** between the pair of grips **123**.

[0062] With reference to FIG. 3, a user **U** is shown in one of the many exercise positions, in particular a high row exercise, gripping the pair of grips **123** with the user's hands and having the user's feet placed a horizontal distance **X** from anchor point **A**. When anchored to a door, it is preferred that anchor point **A** is on the inwards side of the door (that is, that the door open away from user **U**) so that jamb **J** can support the user's weight. The user **U** is shown leaning away from anchor point **A** and supporting a fraction of his or her weight through device **100**. It is apparent that user **U** can vary the amount of supported weight, and thus the resistance of exercise device **100**, by adjustment of his or her stance relative to anchor point **A** (distance **X**) and the length of arms **122** (length **L**). The user **U** of FIG. 3 performs a high row exercise by moving his body in a direction **E** towards and away from anchor point **A**. Note that other exercises are also possible with the user in this position by the user moving in other directions with the user's weight supported by the ground and exercise device **100**.

[0063] Several embodiments will now be described with reference to the drawings. These embodiments are meant to be illustrative and not limiting to the scope of the claims. FIGS. 4-9 are various views of a second embodiment of an exercise device **400**. Referring first to FIG. 4, a perspective view of exercise device **400** is shown as including a first embodiment of an anchor **410** and an elongated member **420**. Exercise device **400**, anchor **410**, and elongated member **420** are generally similar to exercise device **100**, anchor **110**, and elongated member **120**, respectively, except further detailed below. Where possible, similar elements are identified with identical reference numerals in Figures 1-9.

[0064] Anchor **410** includes an inelastic, flexible strap **413** having an enlarged first end **411** that is wider than the strap, and a second end that forms a loop **415**. Elongated member **420** passes through loop **415**, defining a pair of arms **422**, indicated as arm **422a** and **422b**. Each arm **422** has a respective end **421**, shown as end **421a** and **421b**, each forming a loop **425**, shown as loop **425a** and **425b**, to support one of a pair of grips **423**, shown as grip **423a** and **423b**. Elongated member **420** also includes a pair of lengthening devices or buckles **435**, shown as buckle **435a** and **435b**, at either end of a central strap **429**. Either one or both of buckles **435** provide for the adjustment of the length of elongated member **420**. Specifically, strap **429** has a pair of ends **431**,

indicated as **431a** and **431b**, that pass through buckle **435a** and **435b**, respectively. As described subsequently, elongated member **420** is substantially inelastic, with the length of the elongated member being adjustable through the action of one or both of the pair of buckles **435**.

[0065] FIGS. 4, 5A and 5B present several views of anchor **410**, where FIG. 5A is a perspective view of the anchor and FIG. 5B is a sectional view **5B-5B** of the anchor. As noted previously, anchor **410** includes an inelastic, flexible strap **413**. In one embodiment, the majority of lengths of anchor **410** and elongated member **420** are formed of materials that include, but are not limited, to straps of a webbing of a natural or synthetic material having strength sufficient to support the weight of a device user. Webbing materials include, but are not limited to, one or more of a nylon, polypropylene or other polymeric fibers. It is to be understood that a single length of flexible material can alternatively comprise two or more pieces that are stitched, glued, or otherwise attached to one another. In one embodiment, the length of strap **413** is from 6 to 18 inches. In another embodiment, the length of strap **413** is approximately 12 inches.

[0066] Strap **413** has an enlarged first end **411** that is wider than the strap, and a second end **417** that is attached to the strap so as to form loop **415**. As shown in FIG. 5B, strap **413** has an end **502** forming the core of first end **411**. Since one of the intended uses of anchor **410** is to anchor exercise device **400** between a door and jamb, it is preferable that the end **411** include materials that are soft enough to prevent damage to a wood door or door frame and sturdy enough to support the weight of a user. One embodiment that is soft and sturdy is shown in FIG. 5B. Specifically, strap end **502** is partially surrounded by a recessed enclosure **505** and a pillow **507** that covers the strap end and the enclosure. Strap end **502** can further be held within end **411** by gluing and stitching the strap end to enclosure **505** and pillow **507**, and by closing the pillow with one or more stitches **509**. Strap **413** passes into first end **411** through a slot **504** in enclosure **505** and through slot **501** in pillow **507**. In one embodiment, first end **411** is approximately 3.5" by 2.5" and is oriented approximately perpendicular to strap **413**. In another embodiment, enclosure **505** is formed of a high-density, closed cell foam, and that pillow **507** is formed from a felt, and includes stitches **503**. Alternatively, a second strap or piece of another material could be sewn, glued or otherwise attached to the end of strap **413** to form end **502**. In another alternative embodiment, enclosure **505** can include another rigid member, such as a metal or hard plastic plate, to increase the rigidity of strap end **411**.

[0067] Elongated member **420** is shown in greater detail in FIGS. 6-9, where FIG. 6 is a schematic top view of the elongated member, FIG. 7 is a perspective view of one of the pair of grips **421** and the corresponding one of the pair of buckles **435**, FIG. 8 is a sectional view **8-8** of

one of the pair of grips **421**, and FIG. 9A is a perspective view showing details of one of the pair of buckles and the adjoining strap **429**. As shown in FIG. 6, the elongated member **420** has length **S**, and includes two inelastic strap portions **427**, indicated as **427a** and **427b**, strap **429** and the pair of buckles **435** for adjusting the length **S**. The portion of elongated member **420** from each end to the nearest buckle has a fixed length - that is, each of the two portions from one of the pair of ends **421** to the corresponding one of the pair of buckles **435** has a fixed length. In one embodiment, the length **S** is adjustable over a length that allows for a wide range of exercises. Thus, for example and without limitation, length **S** can be varied in length from approximately 6 feet to 12 feet. In another embodiment, elongated member **420** has a width of approximately 1.5". When used for exercising, strap **429** and loop **415** can slide the elongated member **420** along anchor **410**, while providing enough friction so that there can be some mis-match in forces on the two ends **421** without the elongated member sliding through the anchor while a user is exercising.

[0068] The details of one of the pair of ends **421**, including strap **429** to grip **423**, and including buckle **435** are shown in FIGS. 7, 9A and 9B. Buckle **435** is a cam buckle, the design and use of which are well known in the art. Buckle **435** is attached to strap **427**, and thus the length of each of end **421** is not adjustable. Buckle **435** is also slidably accepts and grips strap **429**, allowing for adjustment of the length **S**.

[0069] Buckle **435** has a frame **709**, a first strap bar **705**, a second strap bar **707**, and a user movable cam **711**. First strap bar **705** supports a loop of strap **427** that is preferably secured by stitches **703**. Alternatively, strap **427** can be secured to bar **705** through a second member, such as another looped strap or a plastic or metal piece that loops about bar **705** and provides a location to attach strap **427**. Strap **427** has an opposite end that is bound with stitches **701** to form loop **425** to secure grip **423**, as described subsequently. Second strap bar **707** and cam **711** supports strap **429**. It is to be understood that the use of stitches as described herein to fasten strap portions can also be accomplished through the use of other methods of fastening, such as glue or by melting strap portions together.

[0070] Cam **711** is spring loaded such that it normally restrains a strap **429**, and that under the action of a user, such as by pushing or pulling the cam, the cam is moved to allow the strap to move. The distance between cam **711** and bar **707** is adjusted by the user and a spring within buckle **435** by pushing on cam **711**, allowing strap **429** to slide between cam **711** and bar **707**. Thus, the length **S** can be adjusted by the user actuating cam **711** of buckle **435**.

[0071] Grip **423** is shown in greater detail in the sectional view of FIG. 8. Grip **423** has a generally tubular shape, with an outer cover **801** and an inner cylindrical tubular portion **803**. Cover **801** has a length and outer diameter to allow a hand to easily grab grip **423**, and is formed from a material that permits a user to hold it while exercising. In one embodiment, the material for cover **801** is a high-density foam. Portion **803** provides the strength of grip **423** and can be formed from a length and diameter of plastic or other rigid material to match the size of cover **801** and to provide space for a loop **425** to pass through the center of portion **803**. In one embodiment, portion **803** is formed from a rigid and light material, such as PVC tubing.

[0072] One of the pair of free ends **431** is shown in greater detail in FIG. 9A. Each end **431** is preferably folded back, and is held in place, for example by a stitch **901**, to form an easily manipulated end. Elongated member **420** also includes several sleeves, shown as sleeves **903**, **905a** and **905b** that twice surrounds strap **429** to prevent ends **431** from moving about. Specifically, sleeves **903** and **905** are placed between buckles **435**, ends **431** and strap **429**. Thus sleeves **903** and **905** restrain the portion of strap **429** from a buckle **435** to the corresponding end **431** from moving about as exercise device **420** is moved. As shown in FIG. 9A, sleeve **903** is affixed near end **431**, while sleeves **905** can be slid along the length of strap **429**. FIG. 9B is a sectional view **9B-9B** of FIG. 9A showing details of the cam buckle and attachment of sleeve **905b**. In particular, FIG. 9B shows a bar **907** that spans buckle **435** and a strap **909** that is attached both the bar and to sleeve **905b**. Strap **909** keeps sleeve **905b** from sliding too far down strap **429** during adjustment of the length of the exercise device. It is preferred that sleeves **905b** are elastic so that they can easily move and hold together the portions of strap **429**.

ALTERNATIVE ANCHOR EMBODIMENTS

[0073] Several anchor embodiments are shown in FIGS. 14A, 14B, 23 through 26, and 29 through 32A-32C. Except where explicitly stated, any of the anchors may be used to support any of the elongated members of the exercise device. In the following discussion, the anchor embodiments are meant to be illustrative and not to be limiting. Thus, for example and without limitation, embodiments of an exercise device can be anchored in a door, about a pole, railing or stanchion, from a hook installed in a wall, or can be permanently affixed to a wall or exercise structure, for example.

[0074] FIG. 14A is a second embodiment of an anchor **1410** that can be used for attaching the exercise device to a pole or railing, and FIG. 14B is an embodiment of an exercise device anchored to a pole using the alternative anchoring embodiment of FIG. 14A.

[0075] FIG. 14A shows alternative embodiment anchor **1410** which includes an adjustable loop **1419** and an anchor loop **1415**. As described subsequently, anchor **1410** is an alternative anchor, and can, for example, present an anchor loop **1415** for accepting elongate member **420** to form an exercise **1400**. Alternatively, anchor **1410** can support elongate member **120** or any of the other elongate members described herein. Adjustable loop **1419** is formed from a flexible strap **1411** and a cam buckle **1412** as follows. Cam buckle **1412** can be, for example, cam buckle **435** shown in detail in FIG. 9B. Flexible strap **1411** has a free, first end **1414** that is threaded through the cam portion of cam buckle **1412**, for example by threading the strap between the second strap bar **707** and movable cam **711** of cam buckle **435**. Flexible strap also has a second end **1418** that is attached to cam buckle **1412**, for example, by looping the second end about first strap bar **705** of cam buckle **435** and providing a stitching **1416** through a double thickness of strap **1411**. Strap **1411** thus threaded through buckle **1412** has forms an adjustable loop **1419** that can be increased or decreased in size by actuating cam buckle **1412** to release strap **1411**, moving the strap through the cam buckle, and releasing the cam. End **1414** is held against strap **1411** by a slack sleeve **1413**. An anchor loop **1415** is attached to strap **1411** by a stitching **1417**.

[0076] It is preferred that the majority of lengths of anchor **1410** are formed of materials that include, but are not limited, to straps of a webbing of a natural or synthetic material having a strength sufficient to support the weight of a device user. Webbing include, but are not limited to, webbings made of one or more of nylon, polypropylene or other polymeric fibers. It is understood that alternative embodiments of a single length of flexible material include, but are not limited to, two or more pieces that are stitched, glued, or otherwise attached to one another.

[0077] FIG. 14B shows exercise device **1400** formed from anchor **1410** and elongated member **420**. Adjustable loop **1413** of anchor **1410** is tightened about a pole **P**, for example, by placing the adjustable loop over the top of the pole and tightened using cam buckle **1412**. Alternatively, strap **1411** can unthreaded from cam buckle **1412**, wrapped about pole **P**, and then threaded through the cam buckle and tightened. In either case, end **1414** is the pulled through cam buckle **1412** and adjustable loop **1419** is tightened about pole **P** with sufficient force to allow exercise device **1400** to support a user's weight.

[0078] In addition to being attached to a pole, anchor **1410** can be tensioned to support exercise device **1400** about a railing, post, or other member. Alternately, the anchor can be attached to a carabiner that is fixed to a wall or other structure.

[0079] FIG. 23 shows a third embodiment of an anchor **2300** including a flexible strap **2301** with a first end **2305** having a loop **2307** held in place with stitching **2311** and a second end **2303**

having a ring **2304** held within a loop created by stitching **2309**, and FIG. 24 illustrates the use of anchor **2300** to anchor the elongated member **420**, which could also be elongated member **120**, to a tree. In one embodiment, ring **2304** is a gated ring, such as a carabineer. In another embodiment, ring **2304** is a snap ring. It is preferred that the majority of lengths of strap **2301** are formed of materials that include, but are not limited to, straps of a webbing of a natural or synthetic material having a strength sufficient to support the weight of a device user. Preferred webbings include, but are not limited to, webbings made of nylon, polypropylene or other polymeric fibers. FIG. 24 shows an exercise device **2400** formed from anchor **2300** and elongated member **420**. Strap **2103** is be wrapped about a tree with ring **2304** accepting the strap. Loop **2307** accepts strap **429**, allowing the user to exercise against a tree or other object small enough for strap **2103** to be wrapped about.

[0080] FIGS. 25 and 26 shows a bracket **2500** for securing an anchor, such as the first end **411** of anchor **410**, where FIG. 25 is a perspective front view of the bracket, and FIG. 26 illustrates the use of the bracket to anchor the exercise device. Bracket **2500** has a first flange **2503** with a mounting hole **2509** and a second flange **2505** with a mounting hole **2511** and a face **2507** that extends from the first flange to the second flange and includes a slot **2515** that extends into the face a face edge **2513** and includes a central slot **2517**. In a preferred embodiment, bracket **2500** is formed from a single sheet **2501** of sheet metal, for example that has crease **2518** in flange **2503**, crease **2523** in flange **2505**, and creases **2519** and **2521** between face **2507** and flanges **2503** and **2505**, respectively. In one embodiment, the thickness of sheet **2501** is from 0.05 to 0.10 inches, or more preferably approximately 0.0625 inches, and creases **2518**, **2519**, **2521**, and **2523** are placed to such that face **2507** is parallel to and separated from flanges **2503** and **2505** by a distance **D** of from approximately 1 to 2 inches, or in another embodiment, approximately 1.5 inches. Mounting holes **2509** and **2511** are, in one embodiment, between approximately 1/4 inch and approximately 1/2 inch in diameter, and in another embodiment approximately 3/8 inch in diameter.

[0081] FIG. 26 illustrates the use of bracket **2500**. Bracket **2500** is mounted to a wall **W**, and held in place by a pair of screws **2601** through mounting holes **2509** and **2511**. A portion of anchor **410** is shown in phantom on the right side of FIG. 26, specifically enlarged portion **411** and flexible strap **413**. Anchor **410** is placed in bracket **2500** as indicated by the arrow. Specifically, strap **413** is slid through the slot **2515** in face edge **2513**, with enlarged portion between bracket **2500** and wall **W** and into central slot **2517**. Slot **2515** is sized to be large enough to allow strap **413** to slide through the slot but not so large as to allow enlarged portion **411** to pass through the slot. The use of bracket **2500** allows for exercise device **400**, which was

previously shown as being mountable in a door jamb, to be mounted against any wall to which the bracket can be mounted.

[0082] Several embodiments provide an anchor for an exercise device formed of components that are removably attached. Thus, for example, embodiments include an anchor having a portion to attach to a structure that is removably attached to a portion to support an elongated member. Thus for example, and without limitation, any one of anchors **110**, **410**, or **2300** may include interlinking or interlocking components. This may permit the replacement or interchanging of anchor components or the addition of additional components, such as straps to lengthen the anchor.

[0083] FIG. 29 is a perspective view of an exercise device **2900** including a fourth embodiment of an anchor **2910** and a second embodiment of an elongated member **2920**. Exercise device **2900**, anchor **2910**, and elongated member **2920** are generally similar to exercise devices **100** or **400**, anchors **110**, **410**, or **2300** and elongated members **120** or **420**, respectively, except further detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0084] Anchor **2910** includes a ring **2911** that passes through loop **415** to form an extension of anchor **410**. Ring **2911** is a closed or closable loop of material capable of supporting a user when exercising. The material of ring **2911** may be a metal or plastic having sufficient strength to support an exercising user. An alternative embodiment of ring **2911** is any loop capable of supporting elongated member **2920**, and includes, but is not limited to, an open loop, a hook, a ring that deforms (as in a snap ring) or has a movable portion (as in a gated ring) to permit the ring to open or close. FIG. 29 illustrates, without limitation, one embodiment, where ring **2911** is a ring **2913** having a spring loaded gate **2915**. In another alternative embodiment, anchor **410**, which does not necessarily include loop **415**, includes one or more holes, which are preferably reinforced with metal, through which ring **2911** may pass.

[0085] Elongated member **2920** includes a pair of buckles **2935**, shown as buckle **2935a** and **2935b**. As shown in detail with respect to buckle **2935a**, buckle **2935** includes a first ring **2931** and a second ring **2933** having a center bar **2932** and a tab **2936**. Strap **427** is attached to both ring **2931** and **2933**, and strap **429** passes through ring **2931**, around bar **2932**, and back through ring **2931**. Buckle **2935a** illustrates the buckle restraining straps **429** and **427**. When tab **2932** is pulled to separate rings **2931** and **2933**, as shown for buckle **2935b**, the length of elongated member **2920** may be changed.

[0086] When configured for exercising, anchor **410** may pass through a door jamb, as described above, and strap **429** of elongated member **2920** passes through ring **2911** of anchor **2910**.

[0087] FIG. 30 is a perspective view of an exercise device **3000** including a fifth embodiment of an anchor **3010** and elongated member **2920**. Exercise device **3000** is generally similar to exercise devices **100**, **400**, or **2900**, and anchor **3010** is generally similar to anchor **2910**, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0088] Anchor **3010** includes anchor **2300** and ring **2911**, where the ring passes through loop **2307**. Anchor **3010** may be used to secure exercise device **3000** to one of a variety of supports with ring **2911** supporting elongated member **2920**. In one embodiment, ring **2304** may be attached to a ring affixed to a structure. In another embodiment, strap **2301** may be looped about a structure. Thus, for example, FIG. 30 shows ring **2304** positioned to arrange strap **2301** in a loop **3001**. Loop **3001** may, for example, be placed about a pole to support exercise device **3000**.

[0089] FIG. 31 is a perspective view of an exercise device **3100** including a sixth embodiment of an anchor **3110** and elongated member **2920**. Anchor **3110** includes anchor **2910** and a support **3112**. Exercise device **3100** is generally similar to exercise devices **2900** or **3000**, and anchor **3110** is generally similar to anchors **2910** or **3010**, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0090] Support **3112** has a first portion **3111** for interacting with elongated member **2920** and a second portion **3113** for connecting to ring **2911** of anchor **2910**. Anchor **2910** is described above with regard to the embodiment of FIG. 29. In one embodiment, the material of support **3112** may include, but is not limited, to a webbing of a natural or synthetic material having strength sufficient to support the weight of a device user. Webbing materials include, but are not limited to, one or more of a nylon, polypropylene or other polymeric fibers. It is to be understood that a single length of flexible material can alternatively comprise two or more pieces that are stitched, glued, or otherwise attached to one another. In another embodiment, the material of elongated support **3112** includes or is formed entirely of a metal or a plastic. When configured for exercising, anchor **410** may pass through a door jamb, as described above, and strap **429** of elongated member **2920** passes through first portion **3111** of support **3112**.

[0091] FIGS 32A, 32B, and 32C are views of one embodiment of support **3112**, or a portion thereof, where FIG. 32A, is a perspective view of support **3112** and ring **2911**, FIG. 32B is perspective view of the support unfolded, and FIG. 32C is an end view of the support ready to

accept a ring. Support **3112** of FIGS. 32A, 32B and 32C is generally similar to the support of FIG. 31, except further detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0092] As shown in FIG. 32A, support **3112** includes a strap **3205** that forms first portion **3111** and second portion **3113**. Second portion **3113** includes a first loop **3201** and a second loop **3203** that are formed or attached to strap **3205**. As shown in FIG. 32B, loops **3201** and **3203** are on opposite ends of strap **3205** and are offset so that loops **3201** and **3203** align when strap **3205** is folded to form second portion **3113** as shown in FIG. 32C.

[0093] When assembled for exercising, strap **3205** is folded to align loops **3201** and **3203**, and ring **2911** is placed through the aligned loops. Ring **2911** is also attached to anchor **410**, which may be placed through a door jamb. Elongated member **2920** is placed through second portion **3111**, and a user may exercise as described herein.

[0094] While exercise device **100**, and more specifically exercise devices **400**, **2900**, **3000**, and **3100** have been described with respect to a particular embodiment, there are many alternative embodiments. Thus, for example, there are many embodiments that provide for an adjustable length, substantially inelastic, strap-like member that has an easily adjustable length and balance of the two sides of the strap-like member about the anchor.

[0095] FIG. 33 is a perspective view of an embodiment of a combination anchor **3300**. Combination anchor **3300** may be generally similar to any of the previous anchors, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0096] Combination anchor **3300** includes ring **2911**, enlarged first end **411**, and ring **2304**, that are connected with a flexible material **3310**. End **411** or ring **2304** may be attached to a structure, and ring **2911** may support an elongated member, including but not limited to elongated member **120** or another exercise device to be supported by a structure. Flexible material **3301** may be, for example and without limitation, one or more webbings as described above with reference to the material of elongated member **420** and may include joints, such as may be formed by stitching the material to itself (to form loops, for example) or to adjacent portions.

[0097] In the embodiment of FIG. 33, flexible material includes a first strap **3301** and a second strap **3303**. Strap **3301** includes end and a loop **3307** that can support ring **2911**. Strap **3303**

includes a loop **3305** that supports ring **2304** and one or more stitches **3305** that attached the strap to strap **3301**.

[0098] Combination anchor **3300** is shown having an optional ring support **3320**, which is shown in greater detail in FIGS. 34A and 34B, which are a side view and a top view respectively, of one embodiment of the ring support. Support **3302** includes a strap **3401** that is held in place on strap **3303** by stitches **3309**. The portions between stitches **3309** are sewn with stitches **3403**, forming a series of ring loops **3405** (shown as loops **3405a**, **3405b**, and **3405c**).

[0099] FIG. 35 is a side view of one use of the anchor support of FIGS. 34A and 34B. Strap **3303** is wrapped about a pole **P**, with ring **2304** placed through loop **3305** and ring loop **3405b**. With combination anchor **3300** in this configuration, an elongated member, including but not limited to elongated member **120** can be attached to ring **2911**. Alternatively, ring **2304** may be attached directly to a structure, such as to an eye bolt attached to a wall (not shown).

EXERCISE DEVICES WITH LIMITED RANGE

[0100] Certain embodiments of exercise device **100** include means for limiting the range of positions at which elongated member **120** can be supported along anchor **110**. For such devices anchor **110** provides a frictional support for elongate member **120** as long as grips **121** are not pulled too far in one direction or another. When a maximum position is reached, elongated member **120** and anchor **110** interact to prevent further movement of the grips and by transferring the force from the grips directly to the anchor – that is, if the user pulls a grip too far, the grip can move no further and the user's weight is transferred entirely to the anchor. An exercise device having limited the range of motion may have one or more benefits. Thus, for example, a limited range of motion may be useful as a safety feature by catching a user who has accidentally released a grip. It may also be useful as a training feature since it limits how far a user may move while exercising. It can also be used to exercise without motion of the grips – that is, but exercising with the grips a fixed distance from the anchor.

[0101] As an example of such means, elongated member **120** may include one or more devices (“limiters”) that are affixed or which may be attached to anchor **110** or the elongated member and which movement of the elongated member within a certain range. Limiters include, but are not limited to: a tether attached to elongated member **120** and to anchor **110** (where the tether can be sewn or knotted to the elongated member and anchor); protrusions from the elongated member at two positions (including, for example pieces of fabric or a ball), where either protrusion can catch on the anchor to prevent sliding beyond the protrusion's position; and a sleeve or strap

affixed to the elongated member and adapted to accept the anchor, such that the sleeve or strap limits the motion of the elongated member along the strap.

[0102] FIG. 36A is a perspective view of an exercise device **3600** having one embodiment of a means for limiting motion. Exercise device **3600** includes a third embodiment of an elongated member **3620**. Exercise device **3600** may be generally similar to exercise device **100**, or any of the other exercise devices described herein, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0103] Elongated member **3620** includes a motion limiting mechanism **3261**. Mechanism **3261** permits a limited range of longitudinal motion of elongated member **3620** relative to the anchor, which may be, for example anchor **110**. In one embodiment, limiter **3621** includes a pair of interlocking loops or rings, where one of the pair is connected to the anchor and the other is connected to the elongated member. With the loops or rings interlocking, the range of motion is limited by the circumference of the ring or the diameter of the ring. In one embodiment, mechanism **3261** permits ends **121** (indicated as end **121a** and **121b**) to move within a range of several inches along anchor **110**.

[0104] FIG. 36B is a sectional view 36B-36B of FIG. 36A showing a cross section of an embodiment of a limiter **3621**. Limiter **3621** includes a loop **3622** formed by stitching the loop material at stitching **3602** and affixing the loop to strap **429** at a pair of stitchings **3601**. Ring **2911** passes through loop **3622**. When anchor **2910** is supported by a door and door jamb, the interaction of ring **2911** and loop **3622** permits ends **121a** and **121b** only limited back and forth motion. The range of motion of ring **2911** along strap **429** is indicated in FIG. 36B as the length **X**. With ring **2911** positioned between stitches **3601**, the user's weight is transferred from both of ends **121** to anchor **2910**.

[0105] As an example of the FIG. 36C is a sectional view 36B-36B of FIG. 36A showing a cross section of the motion limiting mechanism with the elongated member at an extreme position. In this Figure, end **121a** is pulled, as indicated by the arrow, with ring **2911** against a side **3603** of loop **3622**. Limiter **3621** in this configuration, the user is not able to pull end **121a** any further from anchor **2911**. The limited range of longitudinal motion permits a user to perform the exercises described herein, and provides support to the user that might have trouble balancing the device.

[0106] In one embodiment, loop **3622** is formed from webbing material described above with reference to elongated member **420**. Loop **3622** may, for example and without limitation, be

formed from 1.5 inch tubular webbing approximately 8 inches to 10 inches long, and affixed with stitches **3601** that are separated by approximately 3 inches longitudinally along strap **429**, resulting in a distance **X** of approximately 3.5 inches.

[0107] FIG. 37 is a perspective view of an exercise device **3700** having limited motion and including combination anchor **3300**, support **3112**, and elongated member **3620**. Exercise device **3700** may be generally similar to exercise device **100**, or any of the other exercise devices described herein, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0108] Combination anchor **3300** permits the anchoring of exercise device **3700** to a door, pole, eye bolt, or a variety of other supports. Support **3112** provides a flexible material-to-flexible material friction between the anchor and elongated member **3620**. Limiter **3621** permits elongated member **3620** to move over a limited range of longitudinal motion, as described above.

ALTERNATIVE GRIP EMBODIMENTS

[0109] The use of exercise device **100** is determined by the grips available to a user. Grips allow the user to grip, such as by squeezing with sufficient force to support her weight, and include devices that can hold the user within a loop or hook as the user pulls on the exercise device. In this context, a "grippable" portion refers to the ability to either wrap a body part around and squeeze that portion of the grip, or place a portion of the body through a loop or hook of the grip so that the user can pull against the exercise device and keep the body part within the grip.

[0110] Grips are usable for applying forces to various part of the body, including the neck, all or part of the hand, arms, legs, toes, or the heel. Several embodiments of grips are described herein as grips that may be used, for example and without limitation, by the hand, foot, or fingers. The grips described herein may be integral to device **100** or, alternatively, may be attached to, or attachable to, one of the pair of grips that are part of an exercise device, including but not limited to grips **123**. The term "accessory" grip is used herein to denote a grip that may be attached to an existing grip on exercise device **100**. It is to be understood that the scope of the present invention extends to the integral information of the accessory grips into exercise device **100**.

[0111] The user may choose to exercise with the pair of grips having the same or different accessories, or without a grip accessory. In addition, several embodiments of the exercise device include a grip attachment portion to removably attach the grip of an exercise device, such as exercise device **100** or any exercise device having two grips, and a portion that is grippable by the hand, foot, fingers, or other parts of the body. The use of grip accessories allow a user to

build additional strength in the hand or fingers by providing for different types of hand or finger gripping, and allows for additional exercises to be performed, as with the foot grip accessory. In addition, the pair of grips can be coupled, as discussed in reference to FIGS. 16A and 16B, allowing a user to exercises using one grip accessory.

[0112] One alternative embodiment is shown in FIGS. 10 and 11, where FIG. 10 is a schematic top view of an alternative elongated member **1020** having one cam buckle **435** as a lengthening device, and two finger grips **4001**, and FIG. 11 is a sectional view **11-11** of alternative finger grips. The use of one buckle **435** provides a lighter exercise device **400**, but results in a smaller useful range of lengths for elongated member **1020**. Finger grips **4001** include four holes **4101** for the user's fingers, and allows for exercise of one or more finger muscles.

[0113] One example of a grip accessory is foot grip accessory **1700**, which is illustrated in FIGS. 17A-17B as being attached to grips **123** of exercise device **100**. Specifically, FIG. 17A illustrates foot grip accessory **1700** attached to exercise device **100** and gripped by toes **T**, and FIG. 17B illustrates a pair of foot grip accessories, one on each of the pair of grips **123**, and each grasped by one of the user's heel **H1** and **H2**. Each foot grip accessory **1700** has a flexible loop **1710** and a grip attachment portion **1720**. It is preferred that the portion of loop **1710** that extends from grip **123** is approximately 12 inches long to provide enough room for either a user's heel or toe fit through the loop. With foot grip accessory **1700** so secured, the toes (FIG. 17A) or heel (FIG. 17B) can be placed through loop **1710**, and a force can be exerted by the foot against exercise device **100**.

[0114] It is preferred that the majority of foot grip accessory **1700** is formed of materials that include, but are not limited, to straps of a webbing of a natural or synthetic material having a strength sufficient to support the weight of a device user. Preferred webbings include, but are not limited to, polymeric fiber webbings made of, for example, nylon or polypropylene or some other polymeric fiber. It is understood that a single length of flexible material can alternatively comprise two or more pieces that are stitched, glued, or otherwise attached to one another.

[0115] In a first embodiment foot grip accessory **1700**, flexible loop **1710** is removably attachable, as discussed subsequently, to one of the pair of grips **123**. A specific embodiment of foot grip accessory **1700** is illustrated in FIGS. 18A-D, where FIG. 18A is a perspective view of the foot grip accessory, FIG. 18B is a bottom view of the foot grip accessory, FIG. 18C is a side view of part of one of the grip attachment portions, and FIG. 18D is a top view of part of one of the grip accessory attachment portions. As shown in FIGS. 18A and 18B, foot grip **1700** is formed from three straps: a loop strap **1801** and two attachment straps **1803**. With the three straps

attached, as described subsequently, loop strap **1801** forms loop **1710** and the two attachment straps **1803** forms the grip attachment portion **1720**.

[0116] Loop strap **1801** is formed from a length of strapping having ends that are joined to form a loop. Loop strap **1801** is preferably polymeric fiber webbing 20 inches long and 1.5 inches wide. In the preferred embodiment, the loop includes two triangular shaped double stitched portions **1815**, one of which joins the two ends of loop strap **1801**. Each of the two grip attachment straps **1803** is formed from a length of strapping having a first end **1807** with a first fastening surface **1809** and a second end **1811** with a second fastening surface **1813**. Attachment straps **1803** are preferably polymeric fiber webbing. In one embodiment straps **1803** have a length of 7.5 inches and a width of 1.5 inches. Fastening surfaces **1809** and **1811** are, in one embodiment, attached to loop strap **1801** by double stitching **1817**, and grip attachment straps **1803** are preferably joined midway between ends **1807** and **1811** to the loop strap by double stitching **1805**.

[0117] Each attachment strap **1803** includes fastening surfaces **1809** and **1813** are on opposite sides of the strap. In one embodiment, fastening surfaces **1809** and **1813** are matching surfaces, such as matching hook and loop surfaces of a hook and loop fastening system, such as VELCRO® brand hook and loop fasteners. In one embodiment, fastening surfaces **1809** and **1813** are each approximately 2 inches by 1.25 inches.

[0118] Foot grip accessory **1700** is removably attachable and is used as follows. Grip attachment portion **1720** of foot grip accessory **1700** is removably attachable to one of the pair of grips **123**, by wrapping the length of each strap **1703** about grip **123a** and contacting fastening surfaces **1809** and **1813** on each strap **1803**. Stitching **1815** allows loop **1710** to open without twisting and provides a secure strap for securing the foot.

[0119] Another example of a grip accessory is finger grip accessory **1900**, which is illustrated in FIGS. 19A-19C with three different exercises when attached to grips **123** of exercise device **100**. Finger grip assembly **1900** has loops **1910** adapted for receiving and being gripped by the thumb and one or more fingers and a grip attachment portion **1920** for attaching the accessory to the grip of an exercise device. Grip attachment portion **1920** is removably attachable to one of the pair of grips **123**. In one embodiment, there are two loops **1910**: a first loop **1910a**, and a second loop **1910b**. With finger grip accessory **1900** so secured, a finger **F1** can be placed through one of the loops, for example first loop **1910a** as shown in FIG. 19A, a finger **F1** can be placed through the first loop and a finger **F2** can be placed through second loop **1910b** as shown in FIG.

19B, or two fingers, **F1** and **F2** can be placed through the first loop and a finger **F3** and a finger **F4** can be placed through the second loop, as shown in FIG. 19C.

[0120] In one embodiment, each of the pair of grips **123** is provided with one finger grip accessory **1900**. With the finger or fingers so placed through at least one of loops **1910**, a force can be exerted by the pulling against exercise device **100**. Finger grip accessory **1900** has similar functionality as finger grips **4001**.

[0121] A specific embodiment of finger grip accessory **1900** is illustrated in FIGS. 20A-C, where FIG. 20A is a perspective view of the finger grip accessory, FIG. 20B is a top view 20B-20B of the finger grip accessory, and FIG. 20C is a sectional side view 20C-20C of the finger grip accessory. Finger grip accessory **1900** includes two loops **1910**, first loop **1910a** and second loop **1910b**, and grip attachment portion **1920** includes three portions **1920a**, **1920b**, and **1920c**. More specifically, finger grip accessory **1900** is formed from five straps: a loop strap **2001**, three attachment straps **1803**, and a backing strap **2003**. With the five straps attached, as described subsequently, loop strap **2001** forms first loop **1910a** and finger loop **1910b**, that can each receive one or more fingers, and each of the three attachment straps **1803** forms one of grip attachment portion **1920a**, **1920b**, and **1920c**. It is preferred that the majority of finger grip **1900** is formed of the same materials as hand grip **1700**.

[0122] In one embodiment, loop strap **2001** is constructed from a polymeric fiber webbing having a length of 21.5 inches long and a width of 1 inch, and backing strip **2003** is a polymeric fiber webbing having a length of 2 inches and a width of 1 inch. Finger grip accessory **1900** is assembled by three stitches **2007** that each pass through one of the three attachment straps **1803** and through loop strap **2001** and backing strap **2003**. In the preferred embodiment, stitching **2007** is double stitched portions. As is shown in FIGS. 20A and 20C, a portion of loop strap **2001** protrudes between each of the three attachment straps **1803** to form loops **1910a** and **1910b**. It is preferred that loops **1910a** and **1910b** are formed from lengths of loop strap **1901** that are approximately 8 inches. Loop strap **2001** preferably extends the length of backing strap **2003**, with two loops **1910a** and **1910b** between adjacent attachment straps **1803**.

[0123] Finger grip accessory **1900** is removably attachable and is used as follows. Grip attachment portion **1920** of finger grip accessory **1900** is removably attachable to one of the pair of grips **123** by the contact of fastening surfaces **1809** and **1813** on each strap **1803**. With finger grip accessory **1900** so secured, a finger may be placed through one of the loops, for example loop **1910a** as shown in FIG. 20A, one finger can be placed through each of loop **1910a** and **1910b** as shown in FIG. 20B, or two fingers can be placed through each of loop **1910a** and

1910b as shown in FIG. 20C. With the finger or fingers so placed through at least one of loops **1910**, a force can be exerted by the user against exercise device **100**.

[0124] A third example of a grip accessory is grip accessory **2100**, which is illustrated in FIGS. 21A-21C as being attached to grips **123** of exercise device **100**. Grip accessory **2100** has several cords **2110** that can be gripped in different combinations, as explained subsequently, and a grip attachment portion **2120**. In general, the number of cords **2110** can be from one to five, or more, with four being the number in one embodiment, and with each cord having the same diameter and length. In one embodiment cords **2110** have a grippable length large enough for a human hand, for example a length from 4 inches to 6 inches, and that there is enough additional length to allow the user to pass her hand between cords, as illustrated in FIGS. 21A-21C. In one embodiment, grip accessory **2100** has four cords, denoted as a first cord **2110a**, a second cord **2110b**, a third cord **2110c**, and a fourth cord **2110d**. The cords can be gripped in almost any combination so that a user can grip any number of cords, from one cord to all 4 cords. FIG. 21A illustrates hand **H** gripping three cords, for example the first cord **2110a**, second cord **2110b**, and third cord **2110c**, FIG. 21B illustrates the hand gripping two cords, for example the first and second cords, and FIG. 21C illustrates the hand gripping one cord, for example the first cord.

[0125] Grip attachment portion **2120** is removably attachable, as discussed subsequently, to one of the pair of grips **123**. With grip accessory **2100** so secured, between one and all of cords **2110** can be gripped, and a force can be exerted by pulling against exercise device **100**. In one embodiment, each of the pair of grips **123** is provided with one grip accessory **2100**.

[0126] One embodiment of grip accessory **2100** is illustrated in FIGS. 22A-D, where FIG. 22A is a perspective view of the grip accessory, FIG. 22B is a top view of the grip accessory, FIG. 22C is a bottom view of the grip accessory, and FIG. 22D is sectional side view **22D-22D** of FIG. 22C. Grip accessory **2100** is formed from four straps, specifically a backing strap **2205**, a front strap **2207**, and two attachment straps **1803**, and two cords **2201** and **2203**. Cords **2110** are formed from two longer cords **2201** and **2203**, and grip attachment portion **2120** is formed from straps **2205**, **2207**, and **1803**.

[0127] The two straps **1803** forming grip attachment portion **2120** are attached at their respective central portions between the ends of backing strap **2205** and front strap **2207**. The four cords **2110a-d** are formed from the longer cords **2201** and **2203**. Specifically, as shown in FIG. 22B, cords **2201** and **2203** are side-by-side and folded in half. Each cord forms a loop **2213** near the middle of cords **2201** and **2203**, with both cords lashed together by whipping **2211** and to form a loop **2213** and with the four ends of cords **2201** and **2203** lashed by whipping **2209**. In the

sectional view of FIG. 22D, cord **2203** is shown with a first end **2213** and second end **2217** lashed together by whipping **2209**, and a central portion **2215** forming loop **2213** about strap **2207**. Each cord **2201** and **2203** is folded in half, and thus each cord forms two cords between whippings **2209** and **2211**. Specifically, cord **2201** forms cords **2210a** and **2210b**, and cord **2203** forms cords **2210c** and **2210d**.

[0128] In one embodiment, straps **2205** and **2207** are polymeric fiber webbings, backing strap **2205** has a length of 5 inches and a width of 1 inch, and front strap **2207** preferably has a length of 6 inches and a width of 1 inch. Cords **2201** and **2203** are, in one embodiment, cotton cord having a length of from approximately 20 inches to approximately 30 inches, and, in another embodiment, have a length of from approximately 22 inches to approximately 26 inches. In yet another embodiment, the length is approximately 24 inches. In one embodiment, cords **2201** and **2203** have a diameter that is preferably from 1/2 inch to 1 inch, or, in another embodiment, approximately 3/4 inches. The joints between straps **2205** and **2207** and attachment straps **1803** are preferably double stitched. The resulting grip attachment **2100** has four cords with approximately 10 inches of grippable length, allowing enough room for a human hand to pass between and grip cords **2110**.

[0129] Grip accessory **2100** is removably attachable and is used as follows. Grip attachment portion **2120** is removably attachable to one of the pair of grips **123** by the contact of fastening surfaces **1809** and **1813** on each strap **1803**. With finger grip accessory **2100** so secured, one, two, three, or all four of cords **2110a-d** may be gripped by the hand. For example, FIG. 22A illustrates cords **2110a**, **2110b**, and **2110c** gripped by a user, FIG. 22B illustrates cords **2110a** and **2110b** gripped by a user, and FIG. 22C illustrates cord **2110a** gripped by a user. With cords **2110** so gripped, a force can be exerted by the user against exercise device **100**.

[0130] FIG. 27 is a perspective view of a grip which may be used as either a hand grip or a foot grip, and which is referred to herein without limitation as a "combination" grip **2700**. Grip **2700** may be generally similar to the grips or accessory grips of exercise device **100**, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0131] In general, combination grip **2700** includes two elements which may be used as grips, which may be at one end or at both ends of the exercise devices described herein including, but not limited to, exercise device **100** or **400**. Thus, for example, combination grip **2700** may be at both of ends **121**, on both of ends **421**, or on one of ends **421a** or **421b**. In the embodiment of FIG. 27, grip **2700** includes a hand grip **423a** supported by loop **425a** from strap **427a**.

Specifically, the material of strap **427a** continues through loop **425a** and is affixed to the strap by stitching **2711**. Grip **2700** further includes a loop **2710** supported at end **421a**.

[0132] In one embodiment, loop **2710** is a strap formed from one or more inelastic pieces that are attached together to form a continuous loop through portion **803**, and the loop is thus integrally attached to hand grip **423**. Thus, for example, hand grip **423a** has a first end **423a-1** and **423a-2** that correspond to a first end **802-1** and a second end **803-2**, respectively, of inner cylindrical tubular portion **803**. In one embodiment, loop **2710** is formed from one or more pieces of webbing with ends sewed together form a single loop through portion **803**, resulting in a portion of the loop hanging below the hand grip.

[0133] FIG. 28 is a perspective view of a second embodiment of a combination grip **2800** which may be generally similar to grip **2700**, except as explicitly detailed below. Where possible, similar elements are identified with identical reference numerals in the Figures.

[0134] Combination grip **2800** includes a flexible loop **2810** that includes a strap **2811** having an end **2812**, and a length adjustment mechanism **2813**. Strap **2811** passes through tubular portion **803** and length adjustment mechanism **2813** permits the size of loop **2810** to be adjusted by moving end **2812** through the mechanism. Mechanism **2813**, which may be, for example, a cam buckle, as illustrated, or a **VELCRO®** brand hook and loop fastener, permits the user to adjust the length of loop **2810** to the user's body size. Strap **2811** may either be removable from hand grip **423a**, or may have ends that are too large to permit removal of the grip, and thus is not removable from the hand grip. In an alternative embodiment (not shown), strap **2811** and end **2812** have matching fasteners, such as a **VELCRO®** brand hook and loop fastener, to prevent dangling of the strap end.

[0135] In one embodiment, grip **423** is 5 inches long, and loop **2710** is approximately 20 inches long. In another embodiment, a portion of loop **2710** that is not within portion **803** is padded with 1/8 inch of a soft material, including but not limited to a rubber based on polychloroprene, such as neoprene. In another embodiment, and loop **2810** is adjustable from approximately 12 inches long to approximately 23 inches long.

[0136] In yet another embodiment, loop **2711** or **2811** does not form a loop through portion **803**, but is attached at or near the ends **803-1**, **803-2**.

[0137] FIGS. 38, 39A and 39B are three perspective views of a third embodiment combination grip **3800**, having a movable rigid grip **423**, where FIG. 38 is a perspective view of the grip and

FIGS. 39A and 39B are perspective view of the combination grip of FIG. 38 having the rigid grip in an upper and lower position, respectively. Combination grip **3800** may be generally similar to grips **2700** or **2800**, except as further detailed below. Where possible, similar elements are identified with identical reference numerals in the depiction of the embodiments of Figures 4, 7, 17, 18, 27, 28, 38, 39A, and 39B.

[0138] Combination grip **3800** includes a portion **3801** that is attached to, or is an extension of, strap **427**. Combination grip **3800** includes an upper loop **3802**, grip **423**, and a lower loop **3804**. Portion **3801** passes through cylindrical tubular portion **803** and forms upper loop **3802** and lower loop **3804**. Portion **3801** may be, for example and without limitation a length of webbing, or joined portions of webbing, as described with respect to elongated member **420**. As described subsequently, grip **423** may move along material **3801** and thus adjust the size of loops **3802** and **3804**.

[0139] A part of portion **3801** that forms lower loop **3804** has a padding **3811**. Padding **3811** is attached to loop **3810** by sewing, adhesives, or any other appropriate bonding technique.

[0140] The structure and function of combination grip **3800** is shown in greater detail in FIGS. 39 A and 39B, with hand grip **423** shown in phantom. As shown in these figures, portion **3801** passes through the cylindrical tubular portion **803** of grip **423** to form loops **3802** and **3804**. Specifically, portion **3801** traces a “figure 8” through cylindrical tubular portion **803** of grip **423**. Grip **423** can be moved to form a large lower loop **3804** (as in FIG. 39A) or a small lower loop (as in FIG. 39B). The size of loop **3810** may thus be adjusted by moving hand grip **423**. In one embodiment there is sufficient friction between the material of portion **3801** and the inner surface of tubular portion **803** to prevent loop **3804** from changing size when loop **3802** is pulled away from grip **423**. Thus, for example, when loop **3804** is pulled from grip **423**, as for example when used as a foot grip as in FIG. 17A, the friction between the material of portion **3801** and portion **803** prevents grip **423** from moving, and the size of loop **3804** does not change. In another embodiment, padding **3811** cannot easily pass through portion **803** and it defines the smallest loop **3804**.

[0141] Combination grip **3800** can be provided on any of the exercise devices described herein. Thus, for example and without limitation, combination grip **3800** is provided at end **121** of elongated member **120**, **420**, or **3620**.

METHODS OF EXERCISING

[0142] The use exercise device **120** is illustrated in FIGS. 12A-12D, where FIG. 12A is an initial configuration, FIG. 12B illustrates lengthening the elongated member **420**, further illustrated in FIGS. 12B' and 12B'', FIG. 12C shows the application of force to the shorter leg of the elongated member, and FIG. 12D shows the application of force to the grips during an exercise. FIGS. 12A-12D are illustrative, and in general apply to the exercise devices of the present invention.

[0143] For illustrative purposes, FIG. 12A is assumed to be an initial configuration of an anchored device, and it is assumed that the user wishes to increase the length **S** while keeping the pair of arms **422** the same length (approximately one half of **S**). First, the user actuates one or both buckles **435**. FIG. 12B schematically shows the result of actuating buckle **435a** and elongating leg **422a** as indicated by the arrows on that figure. FIG. 12B' shows the user **U** pushing cam **711** and grabbing end **431**, and FIG. 12B'' shows the user pulling end **431** away from the cam, as indicated by the arrow, to shorten the device.

[0144] The user then preferentially pulls on the shorter leg **422b** as indicated by force vector **F1** of FIG. 12C. With both of the pair of legs **422** having approximately the same, longer length the user can then exercise, as indicated in FIG. 12D, by applying equal forces **F2** to each handle grip. In practice, it is not necessary for the two forces of FIG. 12D to be equal, as the application of force to legs **422** away from anchor **410** increases the friction between elongated member **420** and the anchor, allowing the lengths to not change, even under some mis-match of applied forces. Alternatively, exercise device can be adjusted to provide shorter legs **422** by pulling on end **431** to shorten the length **S**.

[0145] In addition to being equally balanced between the two arms, it is possible to use the inventive device to provide differing arm lengths for exercising. FIGS. 13A-13C illustrate the use of an exercise device having differing lengths of arms **422**, where FIG. 13A is an initial configuration, FIG. 13B shows the application of force to one of the pair of arms **422**, and FIG. 13C shows the application of force to the grips during an exercise. For illustrate purposes, FIG. 13A is assumed to be an initial configuration of an anchored device, and it assumed that the user wishes to adjust the length of arms **422** to different lengths. First, the user preferentially pulls on the shorter leg **422b** as indicated by force vector **F1** of FIG. 13B. The user can then exercise, as indicated by the equal forces **F2** of FIG. 13C. In practice, it is not necessary for the two forces of FIG. 13C to be equal, since as illustrated in FIG. 12, as the application of force to legs **422** away from anchor **410** increases the friction between elongated member **420** and the anchor also increases. This limits the possibility that the arm lengths will change, even under some mis-

match of applied forces. The adjustment of arms **422** to different lengths can be combined with the lengthening or shortening of the length **S** by actuating one or both of buckles **435**.

[0146] The inventive exercise device allows for a wide range of exercises. Examples of the many exercises that are possible are presented in TABLE 1 for the inventive device placed over the top of a door. FIGS. 3 and 15 illustrate three of the many exercise positions. In each of these positions the user has selected a length for exercise device **100** or **400**, adjusted as explained with reference to FIGS. 12 or 13, has positioned himself on the ground a desired horizontal distance **X** from anchor point **A** with a portion of his weight being supported by the exercise device. With his weight so supported, as shown in FIGS. 3 and 15, he moves his body in directions appropriate to the type of exercise to be performed, for example by moving his body toward or away from the wall or ground, by bending his arms or legs while supporting his weight by the exercise device, or performing other movements that exercise his muscles.

[0147] Specifically illustrated in FIGS. 3 and 15 are single poses of a user **U** performing a variety of exercises including a high row exercise (FIG. 3), a reverse combination crunch (FIG. 15A), a single leg L-squat (FIG. 15B), a gymnast dip (FIG. 15C), a kneeling combination crunch (FIG. 15D), a lying leg curl (FIG. 15E), a hip lift (FIG. 15F), a front shoulder raise (FIG. 15G), a crunch (FIG. 15H), and a triceps extension (FIG. 15I). It is apparent from FIGS. 3 and 15 that many different types of exercises are possible with the inventive exercise device according to the length of the device, the positioning of the body, and how the handles are gripped. In addition, the inventive device can be used to perform one handed exercises as illustrated in FIGS. 16A and 16B. Specifically, FIG. 16A shows an exercise device **400'** having interlocking the ends **421a** and **421b** for one handed exercises, and FIG. 16B illustrates the use of the exercise device **400'** in performing a one arm high row exercise.

[0148] Although the invention(s) presented herein have been disclosed in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that the invention(s) extend beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the invention(s) and obvious modifications and equivalents thereof. In addition, the invention(s) may include all of the different combinations embodied herein. Thus, it is intended that the scope of the invention(s) herein disclosed should not be limited by the particular embodiments described above, but should be determined only by a fair reading of the claims that follow.

Basic Exercises	Intermediate	Advanced
<u>Pull functions</u>	<u>Pull functions</u>	<u>Pull/lateral functions</u>
Low row	One-arm low row	Lateral raise
High row	One-arm high row	Front shoulder raise
Pull-up	One-arm pull-up	Reverse-grip curl
High curl	One-arm high curl	Combination row/kickback
Low curl	One-arm low curl	Internal rotator cuff
Back fly	Lower chest/lat crunch	External rotator cuff
Wrist curl	Reverse-grip wrist curl	2-Way forearm flexors
<u>Core Strength</u>	<u>Core Strength</u>	<u>Core Strength</u>
Crunch	Kneeling combination crunch	Standing combination crunch
Reverse single leg raise	Reverse leg raise	Reverse leg raise w/ hip lift
Oblique crunch	V-sit-up	Reverse oblique raise
Reverse crunch	Hip lift	V-balance
Bicycle	Reverse bicycle	Reverse combination crunch
Back Bridge		
<u>Legs</u>	<u>Legs</u>	<u>Legs</u>
Squat	Lying hamstring pedal	Lying hamstring curl
Hip hinge	Tip-toe squat	Single-leg hip hinge
Squat lunge	Step-back lunge	Single leg L-squat
Sumo squat	Single leg squat	Diagonal Step-back lunge
Side-to-side lunge	Single calf raise	Crossover off-balance squat
Calf raise	Jumping Ski PT	
<u>Push functions</u>	<u>Push functions</u>	<u>Push functions</u>
Standard press	One-arm incline press	Triceps kickback
Chest fly	Low chest press (outside grip)	One-arm concentration fly
Shoulder press	Reverse Push-up	Reverse crunch/push-up
Overhead triceps extension	One-arm triceps extension	combo
Lat-Pullovers		One-arm shoulder press
		Gymnast dip

TABLE 1: Several Basic, Intermediate, and Advanced Over the Door Anchor Exercises.

[0149] Throughout this specification, the term "comprising" shall be synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. "Comprising" is a term of art which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the statement.

CLAIMS

What is claimed is:

1. An exercise device attachable to a structure, said exercise device comprising:
an inelastic elongated member having grips;
an anchor attachable to the structure and having a support for said inelastic elongated member; and
means for limiting the range of positions at which said anchor supports said elongated member.
2. The exercise device of Claim 1, where said means includes a loop formed by a length of material connected to said elongated member, and where said anchor passes through said loop.
3. The exercise device of Claim 2, where said length of material is connected to said elongated member at one or more lateral positions.
4. The exercise device of Claim 2, where said length of material includes a flexible material.
5. The exercise device of Claim 1, where said means limits said position to within approximately 1 inch and approximately 12 inches.
6. The exercise device of Claim 1, where said anchor provides a frictional support for said inelastic member.
7. The exercise device of Claim 1, where said support is a frictional support, and where said anchor further includes:
a first portion attachable to the structure;
a second portion including said frictional support; and
means for removing said first portion from said second portion with said first portion attached to the structure.
8. The exercise device of Claim 1, where said means is a tether between said elongated member and said anchor.
9. An exercise device attachable to a structure, said exercise device comprising:
an inelastic elongated member having grips;
an anchor attachable to the structure and having a support for said inelastic elongated member; and
a limiter including at least one loop connected to said elongated member.
10. The exercise device of Claim 9, where said at least one loop is a closed loop including a portion of said inelastic member and an element attached to said inelastic member, and where said support passes through said closed loop.

11. The exercise device of Claim 9, where said at least one loop includes a length of a flexible material.
12. The exercise device of Claim 9, where said limiter limits the position of said anchor from between approximately 1 inch and approximately 12 inches.
13. The exercise device of Claim 9, where said limiter limits the position of said anchor from between approximately 2 inches and approximately 4 inches.
14. The exercise device of Claim 9, where said support is a frictional support.
15. The exercise device of Claim 9, where said anchor further includes:
 - a first portion attachable to the structure; and
 - a second portion including said support,
 - where said support is a frictional support, and
 - where, with said first portion attached to the structure, said second portion is removably connectable to said first portion.
16. The exercise device of Claim 15, where said anchor includes a loop, and where said loop removably connects said first portion and said second portion.
17. The exercise device of Claim 16, where said loop includes a substantially rigid material.
18. The exercise device of Claim 16, where said loop is a first loop, and where said support includes a second loop of a flexible material.
19. The exercise device of Claim 18, where said flexible material includes a webbing.
20. The exercise device of Claim 18, where said flexible material includes at least two apertures separated by a length of flexible material, where said first loop removably passes through said at least two apertures, and where said second loop includes said length of flexible material.
21. The exercise device of Claim 15, where said first portion is attachable to a door jamb.
22. An exercise device attachable to a structure, said exercise device comprising:
 - an inelastic elongated member having grips; and
 - an anchor attachable to the structure and having a frictional support for said inelastic elongated member; and
 - where said inelastic elongated member includes a closed loop, and where said frictional support passes through said closed loop to limit the range of said inelastic elongated member on said support.
23. The exercise device of Claim 22, where said closed loop limits the position of said anchor from between approximately 1 inch and approximately 12 inches.

24. The exercise device of Claim 22, where said anchor further includes:
a first portion attachable to the structure; and
a second portion including said frictional support,
where said support provides a frictional force to inhibit lateral motion of said inelastic member relative to said anchor, and
where, with said first portion attached to the structure, said second portion is removably connectable to said first portion.
25. The exercise device of Claim 24, where said anchor includes a first loop, and where said first loop removably connects said first portion and said second portion, and where said support includes a second loop of a flexible material.
26. A device substantially as shown and described.