



(19) **United States**

(12) **Patent Application Publication**  
**Carreras**

(10) **Pub. No.: US 2022/0080247 A1**

(43) **Pub. Date: Mar. 17, 2022**

(54) **WEARABLE EXERCISE APPARATUS**

(57) **ABSTRACT**

(71) Applicant: **Noel Carreras**, Rochester, MA (US)

(72) Inventor: **Noel Carreras**, Rochester, MA (US)

(21) Appl. No.: **17/023,337**

(22) Filed: **Sep. 16, 2020**

**Publication Classification**

(51) **Int. Cl.**

*A63B 21/04* (2006.01)

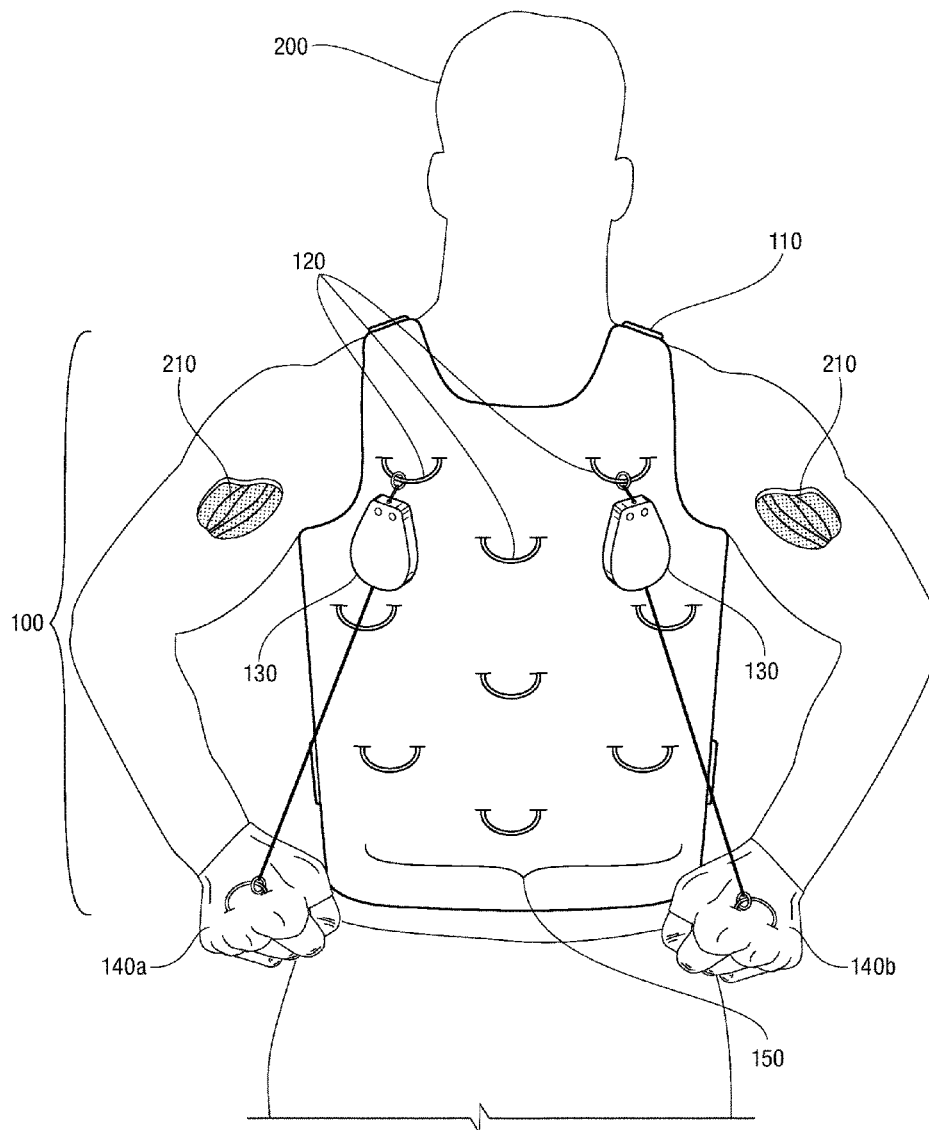
*A63B 21/00* (2006.01)

*A63B 21/065* (2006.01)

(52) **U.S. Cl.**

CPC ..... *A63B 21/0442* (2013.01); *A63B 21/4001*  
(2015.10); *A63B 21/065* (2013.01); *A63B*  
*21/4043* (2015.10)

Apparatus is provided for use by people exercising or conducting physical training, including but not limited to physical therapy. The apparatus presented comprises a garment or harness with multiple attachment points, spring-force resistance components which may be adjustable and reversibly attached to the garment or harness, and handles that may be reversibly attached to one or more of the spring-force resistance components. A person may use the apparatus to exercise with full range of motion and with adjustable resistance while training in free motion or while stationary, from any position or location. The apparatus allows to exercise any of a range of muscle groups, with a full or recovering range of motion, while seated, lying down, standing, or running, in any location or setting, providing a better exercise experience than prior art training devices. The present invention solves problems with the currently available means and apparatuses of exercise.



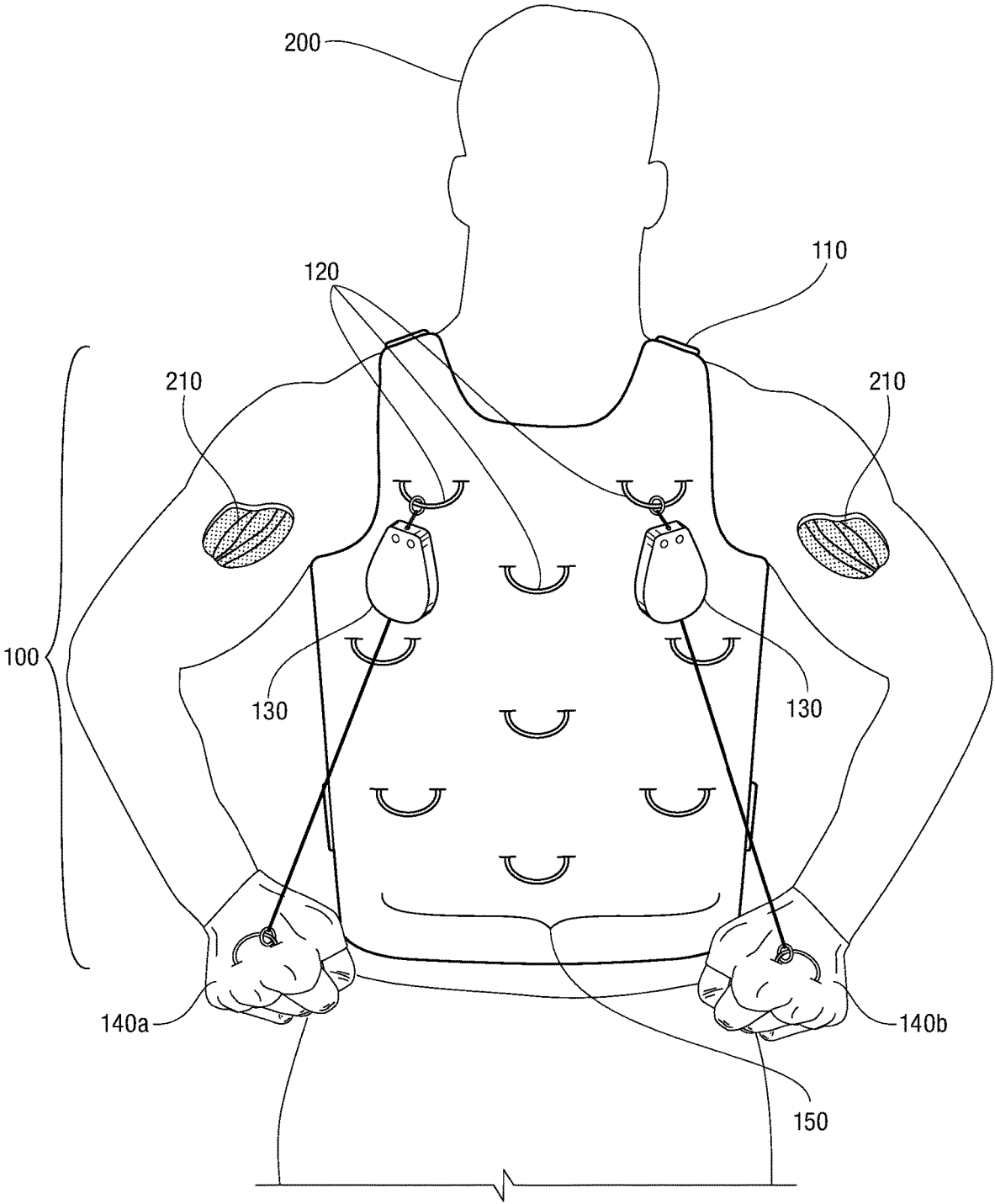


FIG. 1

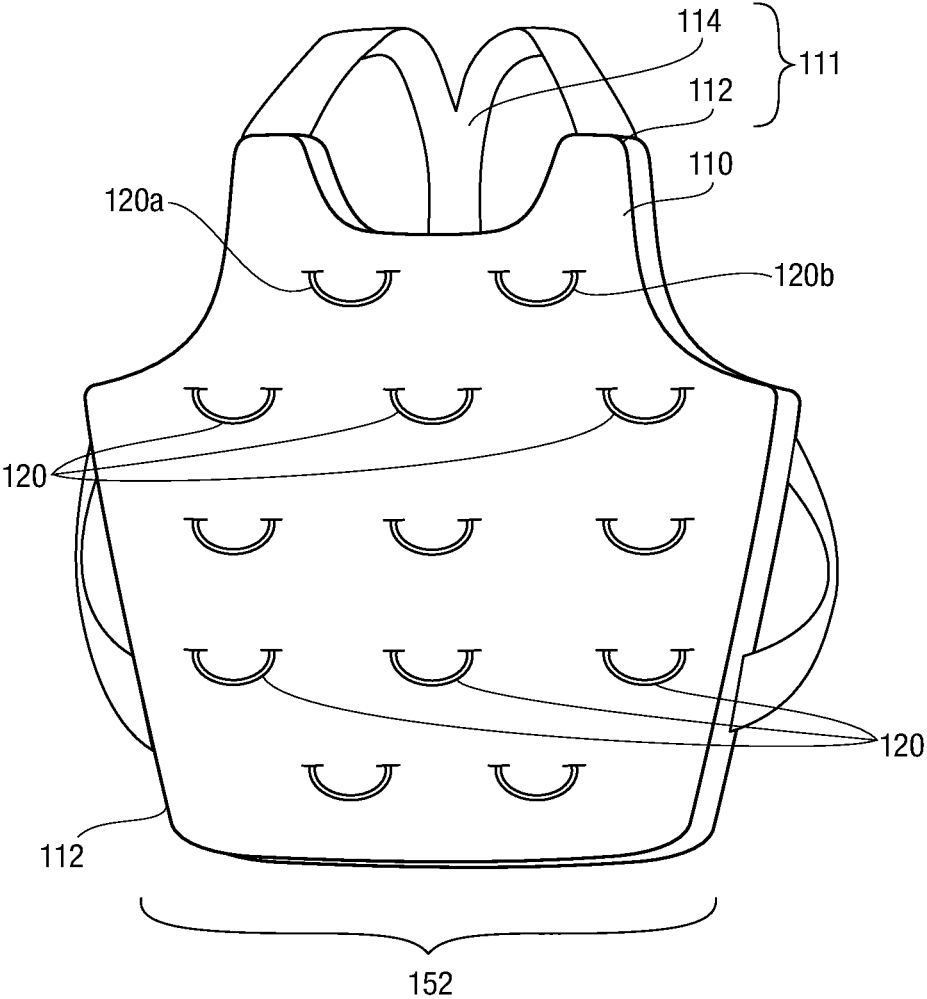


FIG. 2

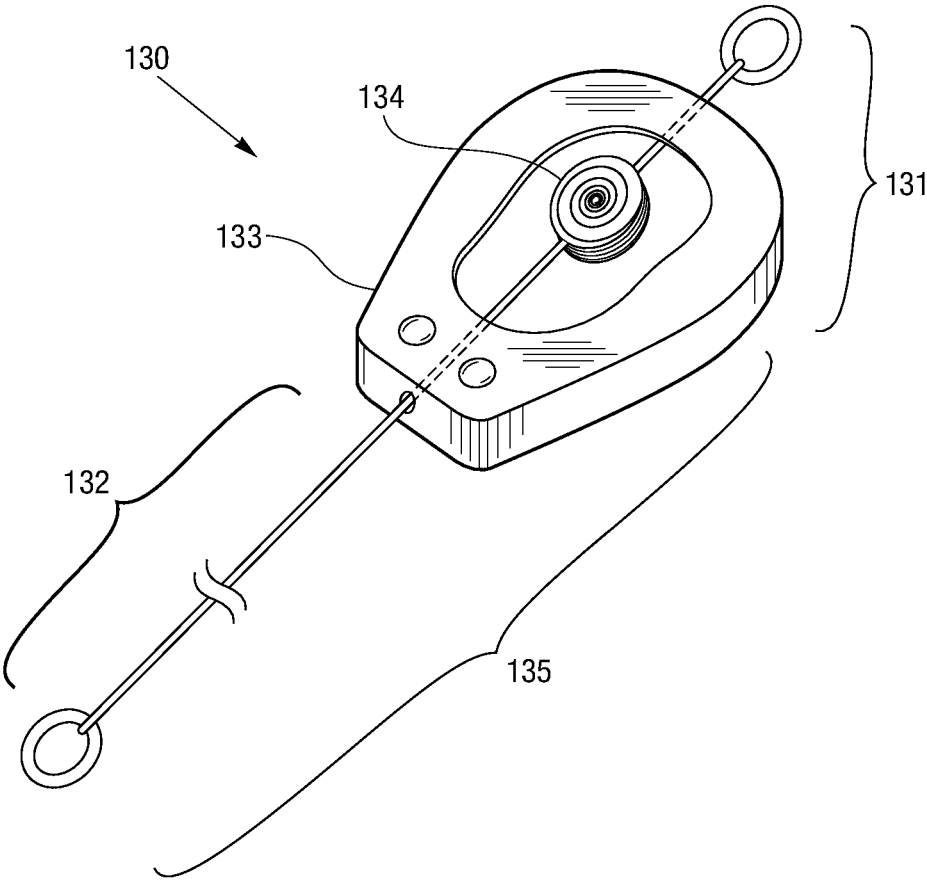


FIG. 3

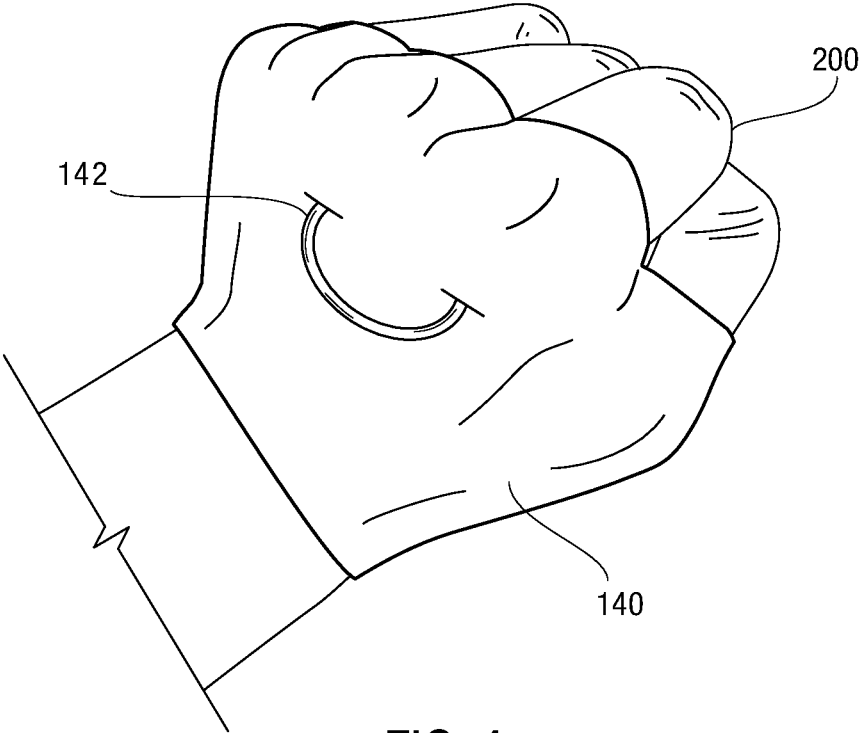


FIG. 4

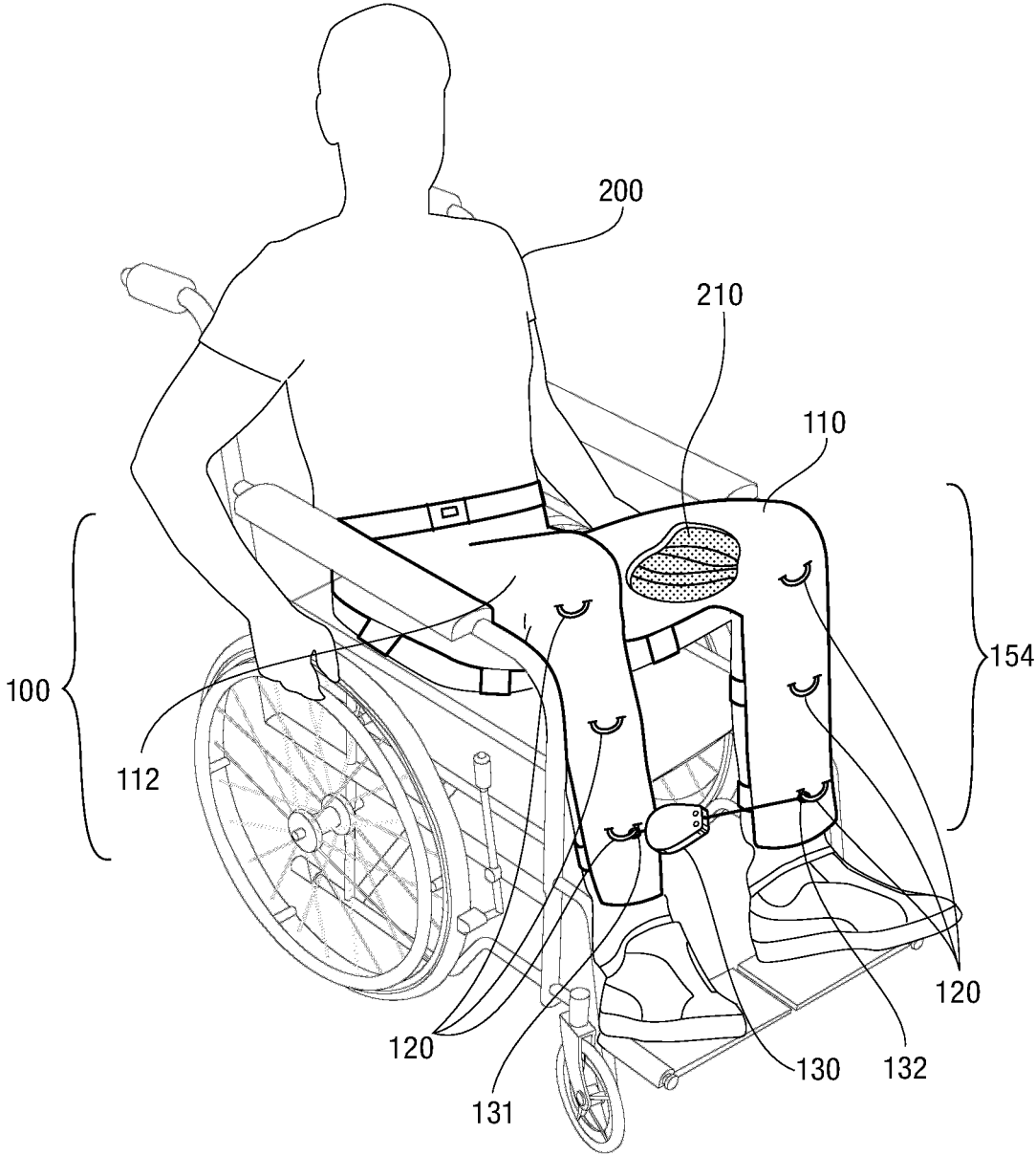


FIG. 5

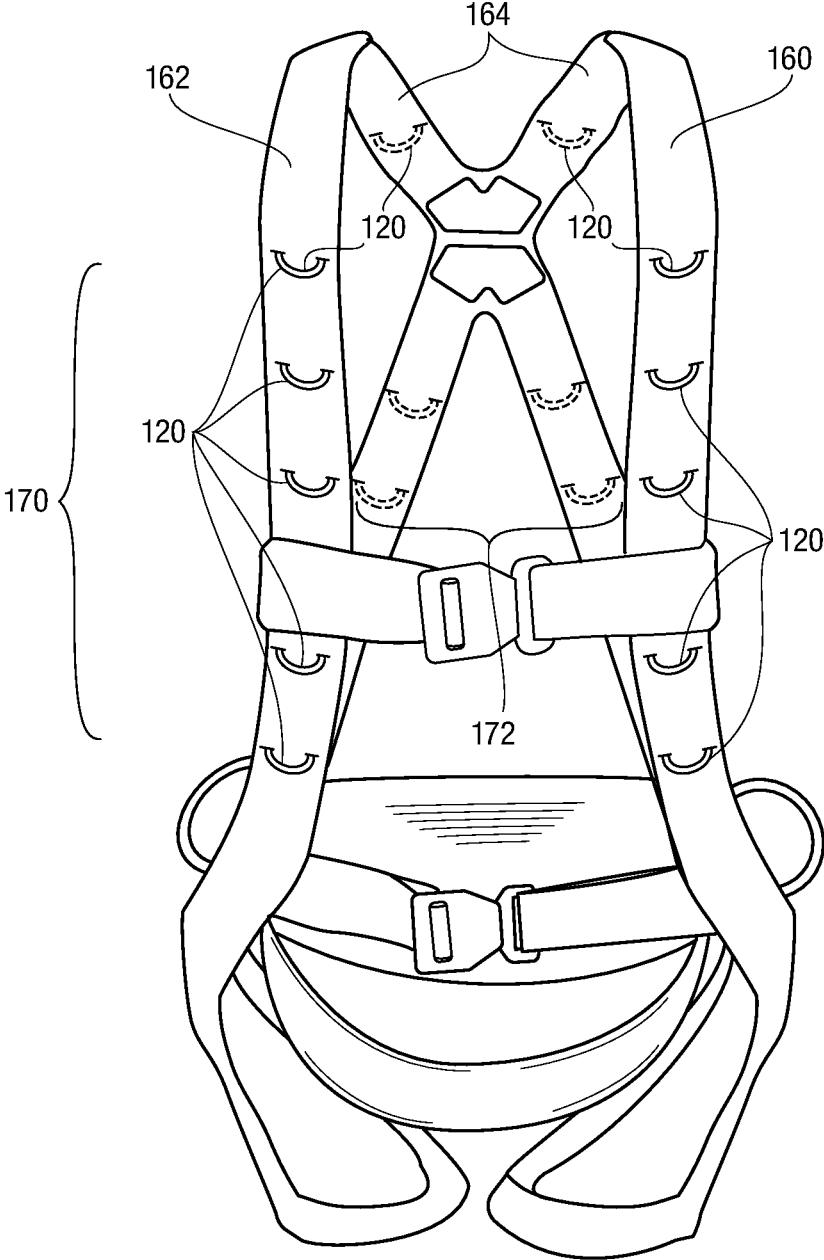


FIG. 6

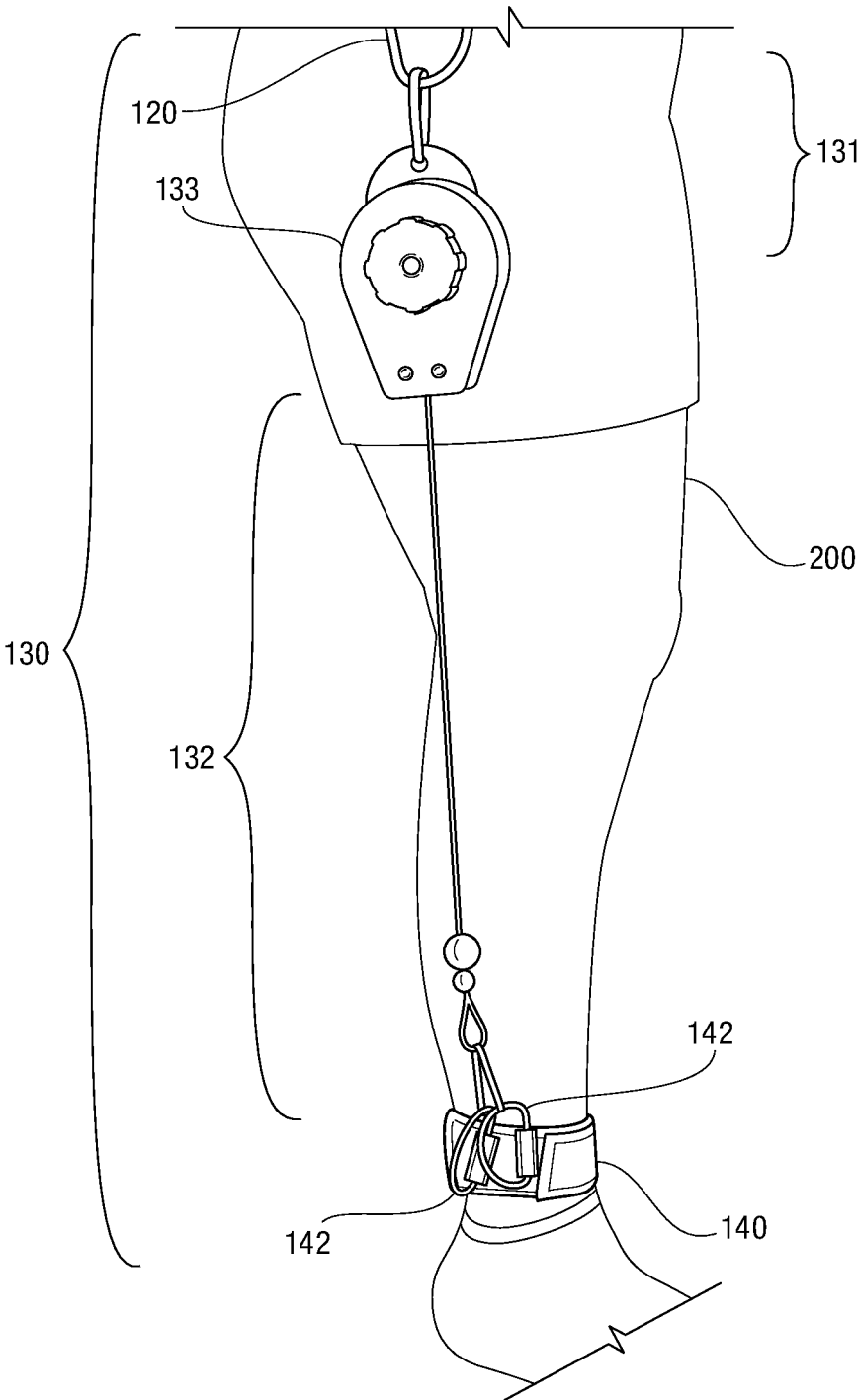


FIG. 7

## WEARABLE EXERCISE APPARATUS

### FIELD OF THE INVENTION

[0001] The presently disclosed subject matter relates to providing apparatus for physical therapy and exercise, and more particularly, to wearable exercise apparatuses having adjustable and moveable resistance components.

### BACKGROUND OF THE INVENTION

[0002] In physical therapy or in any exercise training regimen, more broadly than physical therapy, a person must usually be able to access and use some equipment that offers weight and resistance. This equipment may be free weights, or exercise machines, or objects to move or carry, or objects that offer some resistive force so that the person must exert in order to move the object. Other exercises exist, of course, such as aerobic or cardiovascular exercise, that generally require both the space and the ability to move around: running a distance or on a treadmill, swimming, playing sports, and other forms of exercise.

[0003] For people who do not have the space for large exercise equipment, or the ability to use traditional weights or exercise equipment, or the ability or time to travel to a gym, current exercise apparatus have several shortcomings. Free weights are bulky to store, and pose risk of injury if not stored and used carefully. Elastic-band exercisers are not generally bulky or heavy, but they have at least two shortcomings: they pose a risk of injury if and when they break, which is common with them, and the resistance they offer changes in use, following Hooke's physical law of springs at least approximately ( $F=kx$ , where  $F$  is the force required to hold a spring at a length of extension  $x$ , and where  $k$  is constant for a given spring). In practice, this means that a person can never get consistent exercise with elastic-band exercisers, as they require almost no force to extend a small amount and a great deal of force to extend fully, so that a person extending an arm or leg would feel little resistance at the start of the range of motion and a great deal more resistance at the end of the range of motion. While elastic-band exercisers are affordable and widespread, they have these shortcomings for people wishing to train or to recover with physical therapy.

[0004] Body-weight exercisers exist, and some may be easily transported, and used in multiple locations. But, these do not allow for any adjustment of the weight or resistance, as they rely on the weight of the person using them in some form, and the person must push or pull against his or her own weight. Therefore, body-weight exercisers and other portable exercisers known in the art do not allow for adjustment of the tension or resistance offered, which limits their utility and functions. Additionally, body-weight exercisers cannot be used from any position: a person must be near to some fixed object, and must be able to be in a particular position relative to that fixed object.

[0005] Prior-art exercise apparatus generally do not allow a user to use the same equipment from a broad range of positions and range of angles of use, so that the same exercise equipment can be used to provide exercise to a full range of muscle groups from a variety of angles.

[0006] Prior art devices exist, such as products including but not limited to the Balkowitsch products, BoxBandz products, and Juke Performance products (a harness or handles with elastic bands attached); the X3 products (elas-

tic band with bar and platform); the Clench, Chair Gym, and WSXX products (elastic-bands and handles for training attached to a fixed object); and the Vertimax products (elastic bands attached to a platform which may be moveable) disclosed in the Information Disclosure Statement by Applicant filed with this application. These have the same shortcomings as described herein: variable resistance over the range of motion of the user; requirement to use large equipment and/or fixed objects; inability to use from any position.

[0007] Finally, the prior art does not allow a user to use exercise equipment from any position: seated or in a wheelchair or other mobility device, lying down, standing but away from walls or doors, or outdoors. This is because prior art devices are either not easily transported (weights, exercise machines) or require some attachment to a fixed object (body-weight exercisers, most elastic-band exercisers).

### SUMMARY OF THE INVENTION

[0008] The present invention meets all these needs, by disclosing apparatus that may be worn and adjusted, with a range of spring resistance components at different levels of resistance, and a range of user grips, and which spring resistance components may be moved around on the apparatus. The present invention further addresses the problem of other exercise apparatus present in the prior art. The present invention may be used for physical therapy, for exercise, or for any combination of those or other goals. The apparatus of the present disclosure may be used for stretching, for bending and extending joints, for regaining mobility and support, for reducing or eliminating pain, and may be used without the use of a user's hands. The apparatus of the present disclosure may help a user to avoid surgery, improve mobility, recover from a stroke, recover from or prevent a sports or other injury, and/or improve balance and coordination. A person may use the apparatus to exercise with full range of motion and with adjustable resistance while training in free motion or while stationary, from any position or location. The apparatus allows to exercise any of a range of muscle groups, with a full or recovering range of motion, while seated, lying down, standing, or running, in any location or setting, providing a better exercise experience than prior art training devices.

[0009] The present invention addresses the problems of the prior art, which do not present apparatus that may be easily transported, and may be used from any position without a need for anything in the vicinity, and may be used without need for travel or a large amount of space, and may be adjusted both for level of resistance and which muscle group or groups a particular exercise targets. The apparatus of the present disclosure further allows for adjustment of the tension or resistance setting, such that low resistance can be used for muscle toning, and high resistance can be used for muscle building, all in the same apparatus. Other bands physical therapy and exercise equipment doesn't offer this range of uses and functions.

[0010] Further, the present invention introduces a product that allows a person to wear a garment (which may be a vest, shorts, leggings, or other configuration), the garment having or being a harness, and attach to it one or more spring resistance components, and attach to one or more of the spring resistance components one or more attachment pulls, and use those to offer resistance to exercise movements by the person.

[0011] In one aspect, the present invention comprises a garment, where the garment comprises a plurality of attachment points; a plurality of resistance components, each having a proximal end and a distal end; and a plurality of user grips.

[0012] In one aspect, the present invention comprises an apparatus in which the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points at the proximal end of each resistance component.

[0013] In one aspect, the present invention comprises an apparatus in which the plurality of attachment points are distributed on the garment in a first pattern on a first side of the garment.

[0014] In one aspect, the present invention comprises an apparatus in which the plurality of attachment points are distributed on the garment in a first pattern on a first side and a second pattern on a second side of the garment.

[0015] In one aspect, the present invention comprises an apparatus in which any of the plurality of user grips may be reversibly attached to and removed from the plurality of resistance components, at the distal end of each resistance component.

[0016] In one aspect, the present invention comprises an apparatus in which any of the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points, at both the proximal end and the distal end of each resistance component.

[0017] In one aspect, the present invention comprises an apparatus in which one or more of the plurality of resistance components comprise constant-force springs.

[0018] In one aspect, the present invention comprises an apparatus in which one or more of the plurality of resistance components comprise an adjustable-resistance mechanism.

[0019] In one aspect, the present invention comprises an apparatus in which the first pattern places the plurality of attachment points to be near to a plurality of muscle groups of a user.

[0020] In one aspect, the present invention comprises an apparatus in which the plurality of user grips may be attached to any body part of a user.

[0021] In one aspect, the present invention comprises a harness having a plurality of attachment points, and a first side and a second side; a plurality of resistance components, each having a proximal end and a distal end; and a plurality of user grips.

[0022] In one aspect, the present invention comprises an apparatus in which the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points at the proximal end of each resistance component.

[0023] In one aspect, the present invention comprises an apparatus in which the plurality of attachment points are distributed on the harness in a first pattern on a first side of the harness.

[0024] In one aspect, the present invention comprises an apparatus in which the plurality of attachment points are distributed on the harness in a first pattern on a first side and a second pattern on a second side of the harness.

[0025] In one aspect, the present invention comprises an apparatus in which any of the plurality of user grips may be reversibly attached to and removed from the plurality of resistance components, at the distal end of each resistance component.

[0026] In one aspect, the present invention comprises an apparatus in which any of the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points, at both the proximal end and the distal end of each resistance component.

[0027] In one aspect, the present invention comprises an apparatus in which one or more of the plurality of resistance components comprise constant-force springs.

[0028] In one aspect, the present invention comprises an apparatus in which one or more of the plurality of resistance components comprise an adjustable-resistance mechanism.

[0029] In one aspect, the present invention comprises an apparatus in which the first pattern places the plurality of attachment points to be near to a first plurality of muscle groups of a user.

[0030] In one aspect, the present invention comprises an apparatus in which the plurality of user grips may be attached to any body part of a user.

[0031] These aspects of the present invention, and others disclosed in the Detailed Description of the Drawings, represent improvements on the current art. This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description of the Drawings. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The foregoing summary, as well as the following detailed description of various aspects, is better understood when read in conjunction with the appended drawings. For the purposes of illustration, the drawings show exemplary aspects; but the presently disclosed subject matter is not limited to the specific methods and instrumentalities disclosed. In the drawings, like reference characters generally refer to the same components or steps of the device throughout the different figures. In the following detailed description, various aspects of the present invention are described with reference to the following drawings, in which:

[0033] FIG. 1 shows a schematic view of an aspect of the apparatus of the present disclosure in use by a user.

[0034] FIG. 2 shows a front perspective view of an aspect of the apparatus of the present disclosure.

[0035] FIG. 3 shows a perspective view of a component of the apparatus of the present disclosure.

[0036] FIG. 4 shows a perspective view of an aspect of the apparatus of the present disclosure, in use by a user.

[0037] FIG. 5 shows a schematic view of an aspect of the apparatus of the present disclosure in use by a user.

[0038] FIG. 6 shows a front perspective view of an aspect of the apparatus of the present disclosure.

[0039] FIG. 7 shows a perspective view of an aspect of the apparatus of the present disclosure, in use by a user.

#### DETAILED DESCRIPTION OF THE DRAWINGS

[0040] The presently disclosed invention is described with specificity to meet statutory requirements. But, the description itself is not intended to limit the scope of this patent. Rather, the claimed invention might also be configured in other ways, to include different steps or elements similar to the ones described in this document, in conjunction with other present or future technologies. Moreover, although the

term “step” or similar terms may be used herein to connote different aspects of methods employed, the term should not be interpreted as implying any particular order among or between various steps herein disclosed unless and except when the order of individual steps is explicitly described. The word “approximately” as used herein means within 5% of a stated value, and for ranges as given, applies to both the start and end of the range of values given.

**[0041]** In the following description, numerous specific details are set forth to provide a thorough understanding of the invention. But, the present invention may be practiced without these specific details. Structures and techniques that would be known to one of ordinary skill in the art have not been shown in detail, in order not to obscure the invention. Referring to the figures, it is possible to see the various major elements constituting the apparatus and methods of use the present disclosure.

**[0042]** The present disclosure presents a wearable exercise apparatus **100** for wearable exercise, which may be worn and used by a user **200**, in a variety of positions, from any location. With reference to FIGS. **1** and **2**, the wearable exercise apparatus **100** may comprise a garment **110** to be worn by or secured on the user **200**, the garment **110** comprising a plurality of sides **111**, which plurality of sides **111** comprises a front side **112** and may comprise a back side **114**, and may also comprise one or more additional sides, a top, and/or a bottom; and the garment **110** comprising a plurality of attachment points **120**, which attachment points **120** are herein referred to as a first attachment point **120a**, a second attachment point **120b**, and so on for any number of the plurality of attachment points **120**.

**[0043]** With further reference to FIG. **3**, the wearable exercise apparatus **100** further comprises a plurality of resistance components **130**. Each of the plurality of resistance components **130** comprises a proximal end **131** which may be reversibly attached to and removed from any of the plurality of attachment points **120**, a distal end **132** being the end distant from the proximal end **131**, a resistance body **133** having the proximal end **131** and the distal end **132** attached thereto, and a resistor element **134** enclosed in or attached to the resistance body **133**. The distal end **132** comprises an extension element **135**, which may reversibly be extended from and be retracted into or adjacent to the resistance body **133**. One or more of the plurality of resistance components **130** may comprise constant-force springs. One or more of the plurality of resistance components **130** may comprise an adjustable-resistance mechanism.

**[0044]** With reference to FIG. **4** and FIG. **1**, the wearable exercise apparatus **100** further comprises a plurality of user grips **140**, each of the plurality of user grips **140** herein referred to as a first user grip **140a**, a second user grip **140b**, and so on for any number of the plurality of user grips **140**. Each of the plurality of user grips **140** comprises a plurality of user grip anchors **142**, where each of the plurality of user grip anchors **142** allow each of the plurality of user grips **140** to be reversibly attached to and removed from the distal end **132** of that resistance component **130**. Each of the plurality of user grips **140** may be worn, used, held, or otherwise reversibly secured to or on the user **200**.

**[0045]** With reference to FIG. **1**, FIG. **2**, FIG. **5**, and FIG. **6**, the plurality of attachment points **120** may be distributed on the wearable exercise apparatus **100** in a first pattern **150**, or in a second pattern **152**, or in a third pattern **154**, or, as will be apparent to one of skill in the art, in any other

distribution of the plurality of attachment points **120** on the wearable exercise apparatus **100** as may be desirable. Any such distribution of the plurality of attachment points **120**, including but not limited to the first pattern **150**, the second pattern **152**, or the third pattern **154**, may, in some aspects of the present disclosure, place the plurality of attachment points **120** to be near to a first plurality of muscle groups **210** of a user **200**; where “near” means, in this context, in proximity to, and/or situated in a manner that will allow the user **200** to use the wearable exercise apparatus **100** to exercise a desired set of muscle groups **210**, meaning a plurality of muscle groups **210**. The plurality of attachment points **120** may be placed on any of the front, back, sides, top, or bottom of the wearable exercise apparatus **100** or of the garment **110**.

**[0046]** With reference to FIG. **6** and FIG. **7**, the wearable exercise apparatus **100** may comprise a harness **160**, to be worn by or secured on a user **200**. The harness **160** comprises a front side **162** and a back side **164**, and may also comprise one or more additional sides, a top, and/or a bottom. The harness **160** may be worn by the user **200**, and may comprise the plurality of attachment points **120**, wherein the plurality of attachment points **120** are distributed in a first pattern **170**, or a second pattern **172**, or other pattern of the plurality of attachment points **120** as are desirable. The plurality of attachment points **120** may be used by the user **200** to place a plurality of resistance components **130** to allow the user **200** to exercise a first plurality of muscle groups **210** of the user **200**, or more than one set of muscle groups. The plurality of attachment points **120** may be placed on any of the front, back, sides, top, or bottom of the harness **160**.

**[0047]** With reference to FIG. **1**, FIG. **4**, and FIG. **5**, the user **200** may choose the plurality of muscle groups **210** to exercise, by placing the plurality of resistance components **130** on the plurality of attachment points **120** and by placing the plurality of user grips **140** on a body part, meaning a part of the body, of the user **200**, including but not limited to one or more of the hands, feet, ankles, wrists, arms, legs, elbows, knees, neck, or other body parts of the user **200**. By placing the plurality of resistance components **130** and the plurality of user grips **140**, the user **200** may exercise nearly any muscle groups **210**.

**[0048]** With reference to FIG. **3**, the plurality of resistance components **130** allow for variation of weight or force resistance levels experienced by the user **200** in using the wearable exercise apparatus **100** for exercise. The plurality of resistance components **130** may, in some embodiments of the present disclosure, be adjustable, by varying the resistance or tension of each resistor element **134**, to allow, advantageously, a weight resistance level of from approximately 1.5 lbs. to approximately 100 lbs. With such an adjustable resistance, lower weight resistance levels offer toning of the muscle groups **210** of the user **200**, while higher weight resistance levels offer muscle building. The prior art cannot offer this combination of customization, portability, and adjustability.

**[0049]** Certain aspects of the present invention were described above. From the foregoing it will be seen that this invention is one well adapted to attain all the ends and objects set forth above, together with other advantages, which are clear in and inherent to the inventive apparatus disclosed herein. It will be understood that certain features and sub-combinations are of utility and may be employed

without reference to other features and sub-combinations. It is expressly noted that the present invention is not limited to those aspects described above, but rather the intention is that additions and modifications to what was expressly described herein are also included within the scope of the invention. Moreover, it is to be understood that the features of the various aspects described herein are not mutually exclusive and can exist in various combinations and permutations, even if such combinations or permutations were not made express herein, without departing from the spirit and scope of the invention. In fact, variations, modifications, and other implementations of what was described herein will occur to those of ordinary skill in the art without departing from the spirit and the scope of the invention. As such, the invention is not to be defined only by the preceding illustrative description.

Accordingly, what is claimed is:

1. A wearable exercise apparatus, the wearable exercise apparatus comprising:
  - a garment, where the garment comprises a plurality of attachment points and a plurality of sides;
  - a plurality of resistance components, each having a proximal end and a distal end; and
  - a plurality of user grips.
2. The wearable exercise apparatus of claim 1, in which the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points at the proximal end of each resistance component.
3. The wearable exercise apparatus of claim 1, in which the plurality of attachment points are distributed on the garment in a first pattern on a first side of the garment.
4. The wearable exercise apparatus of claim 3, in which the first pattern places the plurality of attachment points to be near to a first plurality of muscle groups of a user.
5. The wearable exercise apparatus of claim 1, in which the plurality of attachment points are distributed on the garment in a first pattern on a first side and a second pattern on a second side of the garment.
6. The wearable exercise apparatus of claim 1, in which any of the plurality of user grips may be reversibly attached to and removed from the plurality of resistance components, at the distal end of each resistance component.
7. The wearable exercise apparatus of claim 1, in which any of the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points, at both the proximal end and the distal end of each resistance component.

8. The wearable exercise apparatus of claim 1, in which one or more of the plurality of resistance components comprise constant-force springs.

9. The wearable exercise apparatus of claim 1, in which one or more of the plurality of resistance components comprise an adjustable-resistance mechanism.

10. The wearable exercise apparatus of claim 1, in which the plurality of user grips may be attached to any body part of a user.

11. A wearable exercise apparatus, the wearable exercise apparatus comprising:

- a harness having a plurality of attachment points, and a first side and a second side;
- a plurality of resistance components, each having a proximal end and a distal end; and
- a plurality of user grips.

12. The wearable exercise apparatus of claim 11, in which the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points at the proximal end of each resistance component.

13. The wearable exercise apparatus of claim 11, in which the plurality of attachment points are distributed on the harness in a first pattern on a first side of the harness.

14. The wearable exercise apparatus of claim 13, in which the first pattern places the plurality of attachment points to be near to a first plurality of muscle groups of a user.

15. The wearable exercise apparatus of claim 11, in which the plurality of attachment points are distributed on the harness in a first pattern on a first side of the harness and a second pattern on a second side of the harness.

16. The wearable exercise apparatus of claim 11, in which any of the plurality of user grips may be reversibly attached to and removed from the plurality of resistance components, at the distal end of each resistance component.

17. The wearable exercise apparatus of claim 11, in which any of the plurality of resistance components may be reversibly attached to and removed from the plurality of attachment points, at both the proximal end and the distal end of each resistance component.

18. The wearable exercise apparatus of claim 11, in which one or more of the plurality of resistance components comprise constant-force springs.

19. The wearable exercise apparatus of claim 11, in which one or more of the plurality of resistance components comprise an adjustable-resistance mechanism.

20. The wearable exercise apparatus of claim 11, in which the plurality of user grips may be attached to any body part of a user.

\* \* \* \* \*