EXERCISE DEVICE AND METHOD OF EXERCISING

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ABSTRACT
An exercise device handpiece includes a handgrip extending between a lower end and an upper end with a wrist extension disposed on the handgrip. The wrist extension extends a distance from the handgrip to the wrist of a user holding the handgrip. The wrist extension having an inner facing portion configured to be disposed adjacent to or contiguous with said user’s wrist and an opposing outer facing portion adapted to releasably receive a resistance band connector attached to a resistance band. The handpiece prevents or opposes abduction or adduction of the wrist of the user when holding the handgrip.
UPPER BODY

PUNCHING
THRUSTING THE ARMS FORWARD. INDIVIDUAL LIKE PISTONS.

SHOULDER PRESS
EXTENDING BOTH ARMS ABOVE THE HEAD.

DE尔TOID FLY
RAISING THE ARMS LATERALLY.

TRICEP EXTENSION
EXTENDING AND BENDING THE ARM.

FIG. 4 (PART 1)
LOWER BODY

LEG EXTENSION
SITTING DOWN.
BENDING AND
FLEXING THE KNEE.

SQUATS
STANDING.
BENDING AND FLEXING
BOTH LEGS.

KICKING
STANDING.
THRUSSING THE
LEG FORWARD.

FIG. 4 (PART 2)
UPPER BODY

BICEP CURL
STANDING OR SITTING
WITH THE BELT LOWERED
AROUND THE HIPS.
LIFTING THE LOWER ARM
UPWARDS.

STANDING ROWING
STANDING ON THE BELT.
BENDING FORWARD
PULLING THE ARMS UP
LIKE ROWING.

FIG. 4 (PART 3)
EXERCISE DEVICE AND METHOD OF EXERCISING

CROSS-REFERENCE TO RELATED APPLICATIONS


BACKGROUND

[0002] This disclosure relates to exercise equipment and, in particular, to an exercise device and a handpiece for the exercise device.

[0003] Embodiments described herein have been developed primarily for use as a general fitness and training exercise device and will be described hereinafter with reference to this particular application. However, it will be appreciated that the inventive concept is not limited to this particular field of use and is applicable for use in other fields such as rehabilitation.

[0004] A large variety of personal exercise equipment is known. Such comes in many shapes and sizes. A particularly common type of exercise equipment is a gymnastic machine that includes a weight stack mounted for vertical movement. The number of weights in the stack is selectable, and the stack is connected to one end of a cable. The cable is passed over one or more pulleys and extends adjacent to the machine at about the shoulder height of a person and is connected to one or more handles.

[0005] In use, a person is disposed adjacent the machine with their front pointing away from it. The person clasps the handle(s) from over their shoulder and extends their arms. This pulls the cable away from the machine resulting in the weight stack being moved vertically providing resistance to the pulling of the cable. It will be appreciated that these known types of exercise machines are capable of exercising a particular muscle group.

[0006] However, the conventional exercise machines are typically large and fixed to a floor. The machines therefore are best suited to a gymnasium or a large personal gym. Unfortunately, the use of the machines in a home environment is relatively prohibitive due to the significant cost of the machines. Furthermore, such machines are generally only configured to exercise a single muscle group, for example, the latissimus or shoulders cannot be simply used to exercise other muscle groups.

[0007] The genesis of the inventive concept is a desire to provide a portable exercise device and handpiece therefor that can be used to exercise a plurality of muscle groups and that can be used in a plurality of environments, or to provide a useful alternative.

SUMMARY

[0008] According to one embodiment of this disclosure, an exercise device handpiece includes a handgrip extending between a lower end and an upper end; a wrist extension disposed on said handgrip and extending therefrom to the wrist of a user holding said handgrip, said wrist extension having an inner facing portion configured to be disposed adjacent to or contiguous with said user's wrist and an opposing outer facing portion adapted to releasably receive a resistance band connector attached to a resistance band; wherein said handpiece prevents or opposes movement of said user's hand about their wrist when holding said handgrip.

[0009] According to another aspect of this disclosure, an exercise device includes a belt configured to be worn by a user, and a pair of exercise device handpieces according to the first aspect of this disclosure, each said handpiece being releasably attachable to said belt by respective resistance bands disposed intermediate.

[0010] It can therefore be seen that there is advantageously provided a handpiece for an exercise device the use of which maintains the hand 106 and wrist 105 in a straight position with substantially no, or some fixed, adduction or abduction; extension or flexion. Further, the handpiece allows energy expended without significant energy expenditure on the flexion/extension or adduction/abduction of the wrist which is substantially eliminated so that the user can more accurately calculates their energy expenditure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Various embodiments of this disclosure will now be described, by way of example only, with reference to the accompanying drawings in which:

[0012] FIG. 1 is a plan view of an exercise device according to an embodiment;

[0013] FIG. 2 is a front elevation of an exercise device according to a second embodiment;

[0014] FIG. 3 is a plan view of an exercise device according to another embodiment;

[0015] FIG. 4 shows the device of any one of FIGS. 1 to 3 in use;

[0016] FIG. 5 is a front perspective view of an alternative handpiece of the exercise device of FIG. 3;

[0017] FIG. 6 is a front perspective view of the handpiece of FIG. 5 with a resistance band connected thereto;

[0018] FIG. 7 is a rear perspective view of the handpiece of the exercise device of FIG. 5;

[0019] FIG. 8 is an exploded view of the handpiece of FIG. 7;

[0020] FIG. 9 is a front perspective view of the handpiece with resistance band of FIG. 6;

[0021] FIG. 10 is a right hand side view of the handpiece of FIG. 5 held by a user; and

[0022] FIG. 11 is a [front or rear] perspective view of a resistance band connector of the exercise device of FIG. 3.

DETAILED DESCRIPTION

[0023] Referring to the drawings generally, it is noted that like reference numerals are used to denote like components unless noted otherwise. In FIG. 1, there is shown a plan view of an exercise device 1 according to a first embodiment. The exercise device 1 includes a belt 2 that is configured to be secured around the waist, hips or torso of a person.

[0024] The belt 2 includes a front portion 3 that is configured to be disposed adjacent the front of a person when
secured about them. The belt 2 also includes a back portion 4 configured to be disposed adjacent the back of a person when secured to them.

[0025] The belt 2 includes a fastener 5 in the form of a buckle. The buckle 5 is disposed at one end 6 of the belt 2 such that the other end 7 of the belt 2 can be fastened thereto to secure the belt 2 about a person with a preferred degree of “tightness”.

[0026] A pair of spaced apart elastomeric cords 8 and 9 are mounted to the front portion 3 of the belt 2. The cords 8 and 9 are mounted to the front portion 3 at a proximal end of the cords and are disposed such that one cord 8 is disposed on a left hand side of the front portion 3 and the other cord 9 is disposed on a right hand side of the front portion 3.

[0027] Both of the elastomeric cords 8 and 9 are mounted to the front portion 3 of the belt 2. In FIG. 1, the cords 8 and 9 are mounted to the belt 2 to allow the cords to be selectively positioned along the front 3 of the belt 2. In this embodiment, the cords 8 and 9 have a length 10 that removably engages with notches 11 to secure the proximal end of the cords 8 and 9.

[0028] The distal end of each cord 8 and 9 includes a grip 12 in the form of a glove. Each glove 12 is in the form of a sheet having a thumb aperture 13 such that the glove 12 is wrapped around the hand of a person. The glove 12 is secured to a hand with Velcro tabs 14 that engage with each other to secure the glove 12 on a hand.

[0029] Referring to FIG. 2, there is shown an exercise device 1 according to a second embodiment. In this embodiment, the belt 2 is formed from two halves defining a belt front portion 3 and a belt back portion 4.

[0030] The belt back portion 4 includes a buckle 15 at each end, however, only one buckle is visible in FIG. 2. Each buckle 15 is configured to be secured to an end of the belt front portion 3 to secure the belt 2 to a person.

[0031] As with the embodiment of FIG. 1, the cords 8 and 9 are mounted to the front portion 3 of the belt 2. The cords 8 and 9 are retained within one of three loops disposed on each of the left and right hand sides the front portion 3 of the belt 2. In this way, the cords 8 and 9 can be moved along the belt 2 to secure the proximal ends of the cords 8 and 9 in a preferred position.

[0032] The cords 8 and 9 are each looped around one of the loops on the belt front portion 3. These cords 16 are secured by a clamp 17 that can be selectively loosened to allow the loops 16 to be increased in size and thereby reduce the length of the cords 8 and 9, or the loops 16 decreased in size and thereby increase the length of the cords 8 and 9. In this way, the clamps 17 can be used to release the cords 8 and 9 from the belt front portion 3.

[0033] In the embodiment of FIG. 2, each grip 12 at the distal end of the cords 8 and 9 is in the form of a stirrup 12. A wrist strap 18 is disposed adjacent each stirrup 12. The wrist straps 18 are configured to wrap around the wrist of a person when gripping the stirrups.

[0034] FIG. 3 is a plan view of another embodiment of the exercise device 1. In this embodiment, the device 1 includes a belt 2 having a front portion 3 and a back portion 4. The back portion 4 is in the form of a strap connected to the front portion 3. The strap of the back portion 4 is configured to releasably engage with a belt faster 5 disposed on the front portion 2.

[0035] The elastomeric cords 8 and 9 are fixedly mounted to the front portion 3 of the belt 2. The elastomeric cords 8 and 9 each include a handle 12 located to a free end.

[0036] Reference is now made to FIG. 4, where there is shown various views of a person 19 exercising with the device 1. The person 19 exercising their biceps simply secures the belt 1 around their hips and their lower arms are moved upwardly against the bias of the elastomeric cords. Punching exercises are performed by securing the belt 1 about the torso of the person 19 and thrusting the arms forward in a reciprocating or piston-like manner. It will be appreciated the punching exercises can include uppercuts or other preferred type of punch.

[0037] Shoulder press exercises are performed by securing the belt 2 about the torso of the person 19 and extending both arms above their head. A delta fly exercise can be performed by securing the belt about the torso of the person 19 and having them raise their arms laterally or move them forward. Tricep extension exercises can be performed by securing the belt 2 about the torso of the person 19 such that the person leans forward by bending at the waist and then extending and bending their arms.

[0038] In the bicep curl exercise shown in FIG. 4, it will be appreciated the belt 2 can be advantageously disposed about the knee or thighs of the person to perform the exercise in addition to about the waist/torso as shown.

[0039] Lower body exercises can also be used with the belt 2 by securing the grips 12 to the ankles of the person 19. For example, a leg extension exercise can be performed by securing the belt 2 about the waist of the person 19 where the person sits down and bends and flexes their knees. Likewise, squats exercises can be performed by securing the belt 1 about the waist of the person 19 where the person stands and bends and flexes both legs. In another lower body exercise, the belt is disposed about the waist of the person and the grips 12 secured to be ankles of the person wherein the person thrusts their leg forward in a kicking manner.

[0040] In another form of exercise using the exercise device 1, the device 1 is placed on the floor with the front portion 3 of the belt facing upward. The person 19 stands on the belt and secures the grips to their hands. The person then bends slightly forward with their arms being pulled up in a roller like manner.

[0041] The next exercise shown in FIG. 4 is a standing rowing exercise. It will be appreciated that the user can place the belt 2 about the ends of their feet when in a seated position so as to exercise by simulating a conventional rowing-type stroke. The user’s legs can be bent or straight in the rowing exercise.

[0042] Although not illustrated, it will also be appreciated that other exercises can be performed with the device 1. For example, the belt 2 can be disposed about, or otherwise secured to, a fixed object that is on or adjacent a floor. In this way, the person can lay on their back or side with their head adjacent the belt 2 so that the cords 8 and 9 extend over their shoulder(s) to provide resistance against a forward or sideways sit-up movement.

[0043] Referring to FIGS. 5 to 11, there is shown various views of a handpiece 100 for the exercise device of FIG. 3 in place of each grip 12. FIGS. 5 to 11 show a left-hand handpiece 100 and it will be appreciated like configuration can be provided for a right-handed handpiece 100. The handpiece 100 is used in the same manner as the grip 12 described above with reference to FIG. 3 and the connection means are the same.

[0044] The handpiece 100 includes a handgrip 101 to be grasped by the person 19, the hand 106 of which is shown in
The handgrip 101 extends between a lower end 102 and a spaced apart upper end 103. The handgrip 101 is contoured to fit the profile of an attached hand for comfort of a person 19.

A wrist extension 104 is integrally formed with the handgrip 103 and extends from the lower end 102 of it. The wrist extension 104 is sized and shaped to abut the wrist 105 of the person 19 beyond their hand 106 to prevent or significantly oppose adduction or abduction, and extension or flexion, of the hand 106 when holding the handpiece 100. That is, the hand 106 and wrist 105 are maintained in a straight position with substantially no, or some fixed, adduction or abduction; extension or flexion. In other words, the hand is not moveable relative to the fixed position holding the handgrip 101. This is most advantageous for the reasons described below.

The wrist extension 104 has an inner facing portion (or inner face) 107 to be disposed against the base of the hand 106 and the wrist 105 and to support the region to prevent the flexion/extension and adduction/abduction movement. This significantly reduces wrist fatigue of the person 19 when using the exercise device 1 with the handpieces 100. The wrist extension 104 has an outer facing portion (or outer face) 108 facing in a direction away from said wrist 105. The wrist extension of this embodiment is substantially planar.

The outer face is adapted to releasably receive one end 109 (best shown in FIG. 9) of a resistance band 8/9. The resistance band end 109 includes a resistance band connector 110 which is best shown in FIGS. 3, 5, 6, 9 & 11. The connector 110 has a body 111 extending between a top end 112 and a lower end 113 where the resistance band 8/9 attaches. The resistance band 8/9 is able to rotate about an axis parallel to said resistance band 8/9 but not move away from the lower end 113.

As best seen in FIG. 11, the connector 110 has a substantially cylindrical extension portion 114 mounted to the body 111 towards the top end 112. The extension portion 114 projects upwardly and outwardly. It can be seen in this embodiment that the longitudinal axes of the body 110 and extension portion 114 are disposed at an angle less than 90° to each other. A connector head support shaft 115 extends from the extension portion 114. A connector head 116 is disposed on an end of the head support shaft 115 at an end distal the extension portion 114.

The wrist extension outer face 108 includes a shaped slot 117 configured to allow the head support shaft 115 to be retained thereby to able to slide thereon. One end of the slot 117 has an opening 118 to receive the connector head 116 and the remainder of the slot is smaller than the diameter of the connector head 116 to retain the connector head 116. A latch plate 119 is disposed behind the slot 117 and extends parallel to it. The latch plate 119 prevents movement of the connector head 116 too far past the slot 117 so that the head support shaft 115 is in the slot 117 so it is retained thereby except at the opening 118.

The latch plate 119 includes a pin 120 extending into the slot 117 and movable clear of it by pressing button 121. The latch plate 119 is resiliently biased to prevent movement of the head support shaft 115 thereof. This allows connection and disconnection of the connector 110 from the handpiece 100 and whilst retained in the slot 117, the connector extension portion 114 is able to rotate about an axis substantially perpendicular to a plane formed by the outer face 108.

Advantageously, the resistance band 8/9 projects away from the wrist extension 104 when in use. A strap 122 is mounted at each end to a respective lower 102 and upper 103 ends. The strap is releasably attached at the lower end 102 and has an adjustable length. In the embodiment shown, a knob projects from the lower end 102 to retain one of a plurality of apertures along the strap.

In addition to reducing wrist fatigue and allowing the connector 110 to swivel clear of the wrist extension 104, the handpiece 100 includes position sensing and transmission means. Referring particularly to FIGS. 7 and 8, a cover 125 forms part of the handgrip 101 covering a cavity 126. Within the cavity 126, a position sensor in the form of an accelerometer in the case of this embodiment, is mounted to record movement of the handpiece 100 relative to a position receiver (not shown) disposed in the belt 2.

Signals from the position sensor are sent to the position receiver wireless and a battery (not shown) and an accelerometer control circuit and processor 127 (shown integrated) configured to receive the accelerometer signals and transmit those to the position receiver in the belt. A power button 128, USB connector port 129 for programming or data retrieval (from associated memory in the handpiece 100) and a calibration button 130 are provided. The calibration button 130 is depressed when the resistance band 8/9 are in a relaxed state or fully stretched so that a base point is determined for movement signals provided by the accelerometer.

In this way, movement of the accelerometer position sensor corresponds to the length of stretching of the resistance bands 8/9. Any preferred wireless handpiece positioning means as desired because the hand piece allows energy expended without the typical not insignificant energy expenditure in the flexion/extension or adduction/abduction of the wrist which is substantially eliminated. The person 19 thus more accurately calculates their energy expenditure of the intended anatomical regions or muscle groups from exercising with the device 1 in stretching the resistance bands 8/9.

The position receiver may have a controller associated therewith to transmit the accelerometer signals to a remote computing device for that device to process and calculate energy expenditure. Alternatively, the position receiver may compute the movement and associated energy expenditure of the accelerometer position sensor and send this data to the remote computing device. The accelerometer controller may also have associate memory to retain sensed data for transfer via the USB port 129.

The foregoing describes only one embodiment of this disclosure and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the inventive concept.

What is claimed is:

1. An exercise device handpiece comprising:
   a handgrip extending between a lower end and an upper end;
   a wrist extension disposed on said handgrip and extending therefrom to the wrist of a user holding said handgrip, said wrist extension having an inner facing portion configured to be disposed adjacent to or contiguous with said user’s wrist and an opposing outer facing portion adapted to releasably receive a resistance band connector attached to a resistance band;
   wherein said handpiece prevents or opposes movement of said user’s hand about their wrist when holding said handgrip.
2. A handpiece according to claim 1 wherein handpiece prevents or opposes adduction/abduction and/or extension/flexion of said wrist of said user holding said handgrip.

3. A handpiece according to claim 1 wherein said wrist extension extends from said handgrip terminating a predetermined distance beyond said wrist towards the elbow of said user.

4. A handpiece according to claim 1 wherein said wrist extension is substantially planar and said outer facing portion of said wrist extension is configured to releasably receive said resistance band connector.

5. A handpiece according to claim 4 wherein said outer face of said handgrip outer face includes a shaped slot, one end configured to receive said connector and an opposing end to retain said connector in said slot, and a latch movable between a locked position to prevent movement of said band connector along said slot and an open position allowing movement.

6. A handpiece according to claim 5, wherein said latch is substantially planar and spaced apart from said slot and includes a pin extending toward or in to said slot when in said latch locked position to prevent movement of said band connector along said slot, said pin being disposed clear of said slot when said latch is moved in to said open position.

7. A handpiece according to claim 5 wherein said latch is biased in to said closed position.

8. A handpiece according to claim 1, wherein said wrist extension is disposed at or adjacent said handgrip lower end and said handpiece includes a strap mounted to opposing ends of said handgrip and being releasably attachable at said handgrip lower end.

9. A handpiece according to claim 1 including a position sensor disposed within said handgrip and/or said wrist extension, said position sensor configured to transmit signals for receipt by a remotely disposed position receiver, said signals indicative of movement of said position sensor.

10. A handpiece according to claim 9 wherein said resistance bands extend from said handpiece and attach at another end to said user and said position receiver is attached to said user.

11. A handpiece according to claim 10, wherein said resistance bands connect at said another end to a belt configured to be worn around the waist or torso of said user and said position sensor is disposed in or on said belt.

12. A handpiece according to claim 5 wherein said resistance band connector includes:

   a body extending between a top end and a lower end having a resistance band rotatably mounted thereto;

   an extension portion disposed at or adjacent said body top and extending therefrom a predetermined distance, said extension portion projecting outwardly away from said body and upwardly away from said lower end;

   a head support shaft extending from said extension portion, said head support shaft configured to slide along said slot; and

   a head disposed on or about an end of said support shaft distal said body, said head having a wider diameter and said head support shaft such that said shaft is configured to slide along said slot, and wherein part of said slot on one side of said latch is narrower than set head diameter to retain said resistance band connector.

13. A handpiece according to claim 12 wherein said band connector body extension portion is configured to rotate about an axis substantially perpendicular to said slot.

14. A handpiece according to claim 10 wherein movement of said handpiece relative to said position receiver and corresponding movement of said resistance band is determined from signals received by said position receiver, and work or energy to move said resistance band is determined to provide an energy expenditure in moving said handpiece and said resistance band.

15. An exercise device comprising a belt configured to be worn by a user, and a pair of exercise device handpieces according to claim 1, each said handpiece being releasably attachable to said belt by respective resistance bands disposed intermediate.

16. An exercise device according to claim 15 including a position sensor disposed in each said handpiece and configured to wirelessly transmit a signal indicative of the position of each handpiece and movement thereof to a remote position receiver disposed within said belt.

17. An exercise device according to claim 16 wherein said position receiver is configured to transmit signals to a remote computing device to determine movement of said handpieces relative to said position receiver and corresponding movement of said resistance band and calculate work or energy to move said resistance bands determined to provide the energy expenditure in moving said handpieces and said resistance bands.

18. An exercise device according to claim 17 including a pair of position receivers, wearing one said position receiver is disposed at or adjacent said connection of said resistance bands to said belt and said energy or work is calculated corresponding to movement of each said handpiece.