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(54) APPARATUS FOR ASSISTING WITH  
PUSH-UPS

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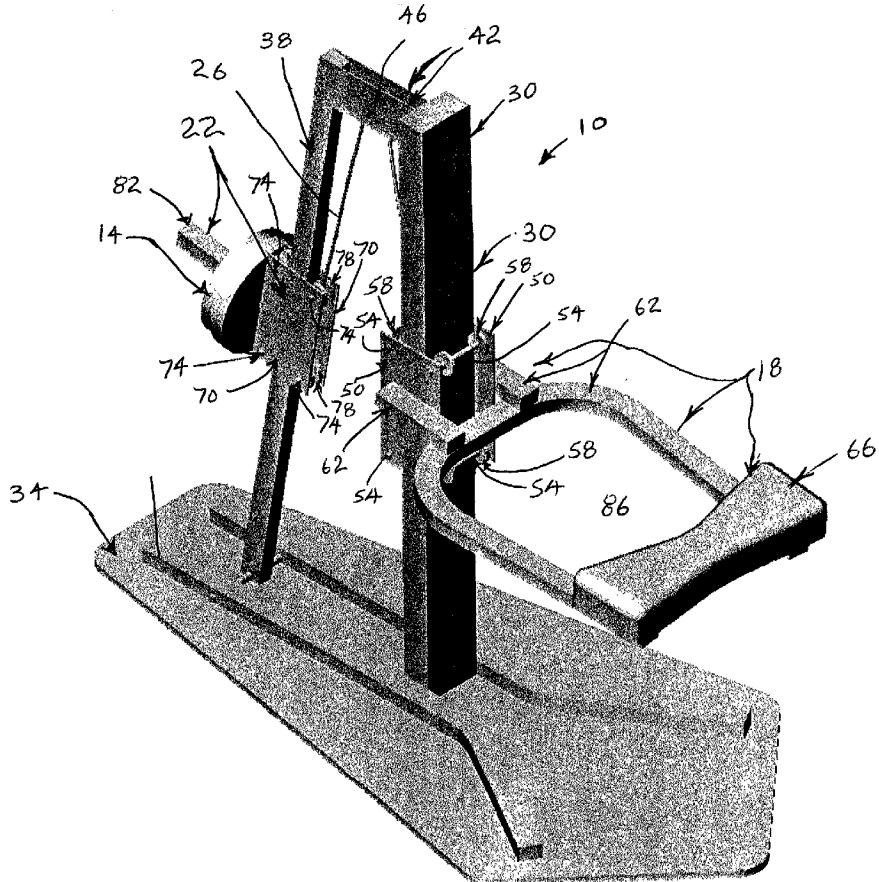
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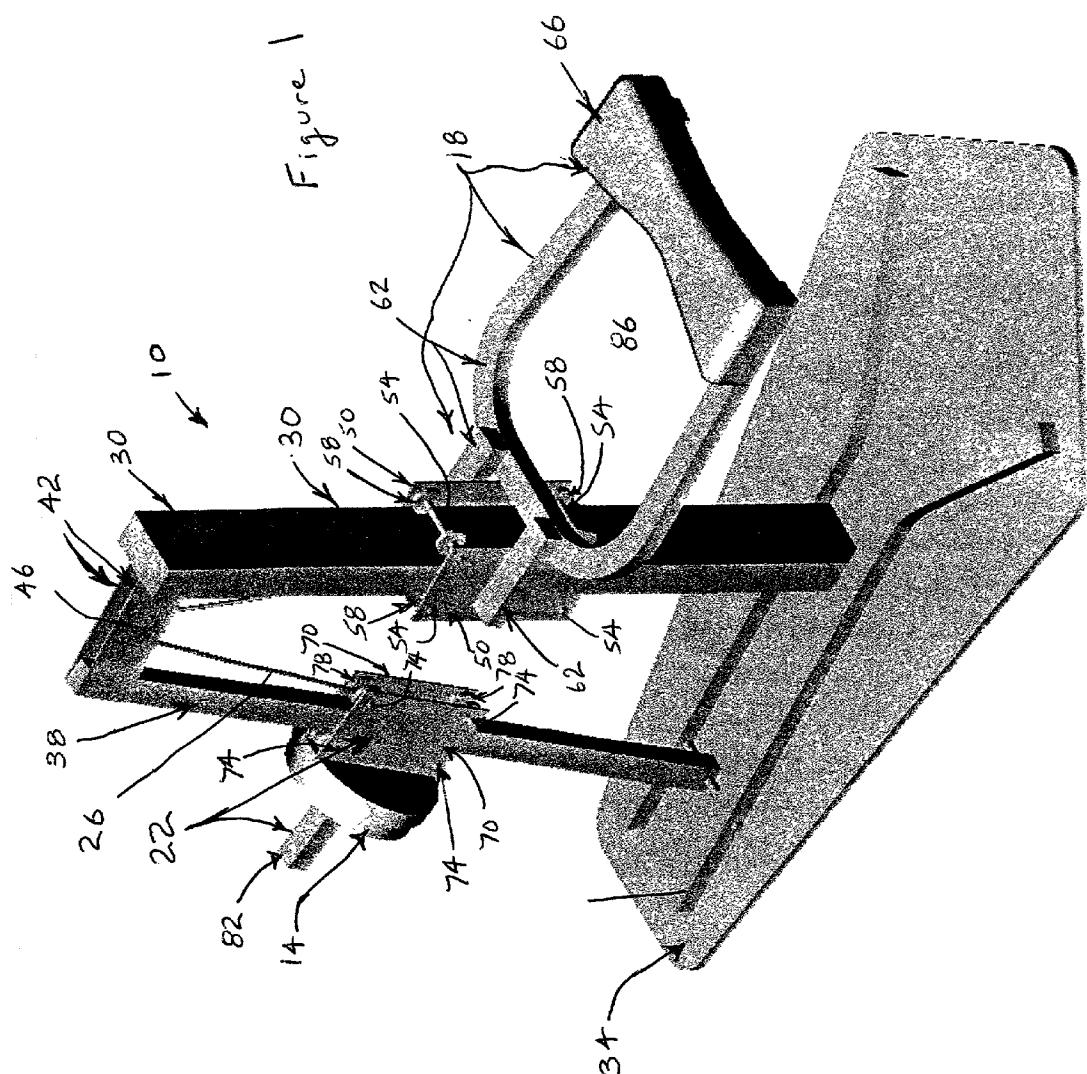
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(57) ABSTRACT

The present invention is an apparatus for assisting a user performing push-ups with the use of a counter-weight. A

user-force accepting arm is provided for interacting with the user to accept a force exerted by the user in a generally downward direction. A counter-weight receiver is provided for receiving the counter-weight and for generating a counter-weight force, the counter-weight receiver being operably connected to the user-force accepting arm for transferring the counter-weight force from the counter-weight receiver to the user-force accepting arm to counteract the force exerted by the user. A wire is provided for operably connecting the counter-weight receiver to the user-force accepting arm. An accepting arm force guide is operably connected to the user-force accepting arm, and is provided for allowing the user-force accepting arm to move along the accepting arm force guide, wherein the wire is operably attached to the user-force accepting arm. In addition, a counter-weight force guide is operably connected to the counter-weight receiver, and is provided for allowing the counter-weight receiver to move along the counter-weight force guide, wherein the wire is operably attached to the counter-weight receiver. A pulley is rotatably engaged with the wire for transferring forces between the counter-weight receiver and the user-force accepting arm.





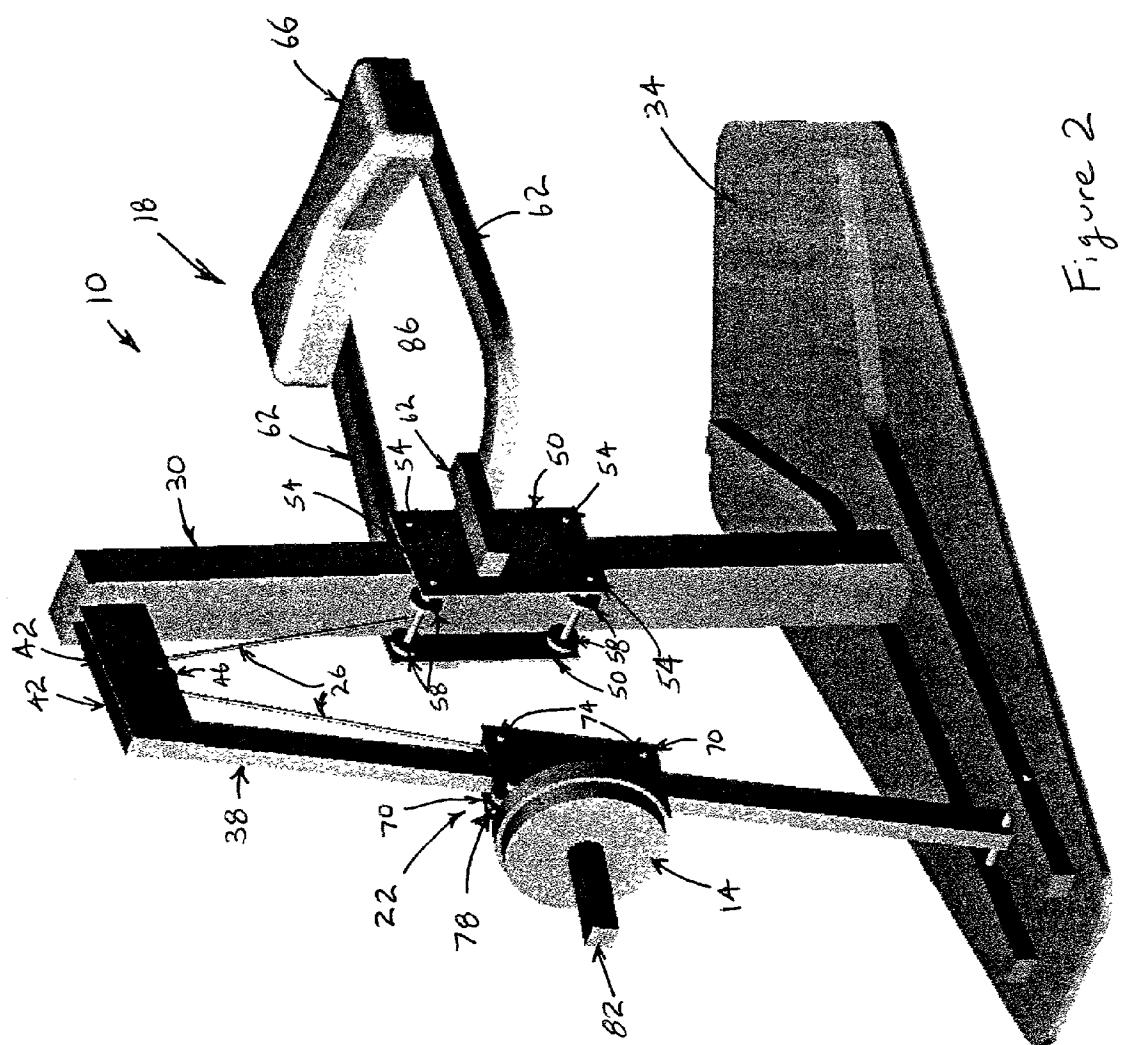


Figure 2

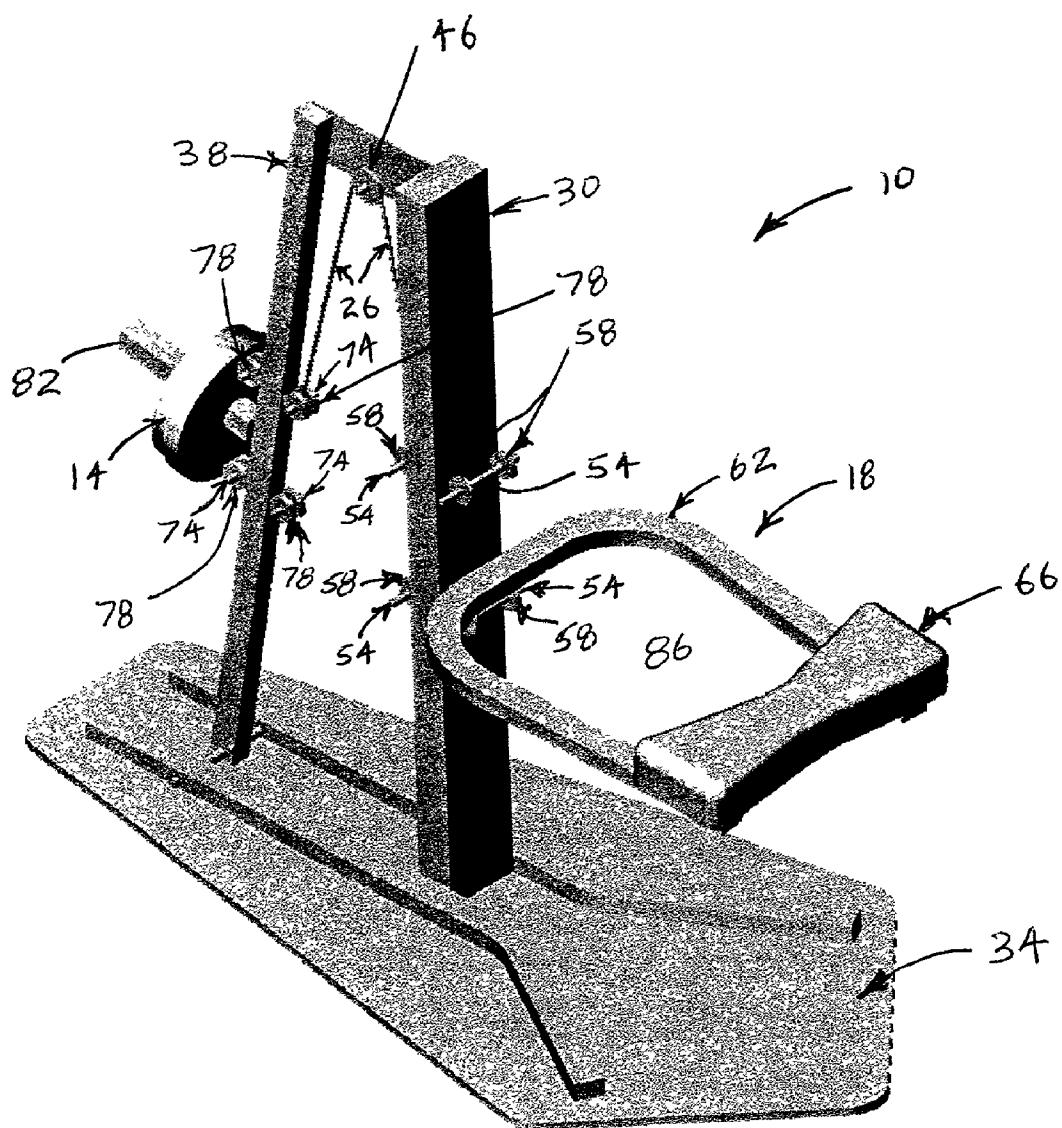


Figure 3

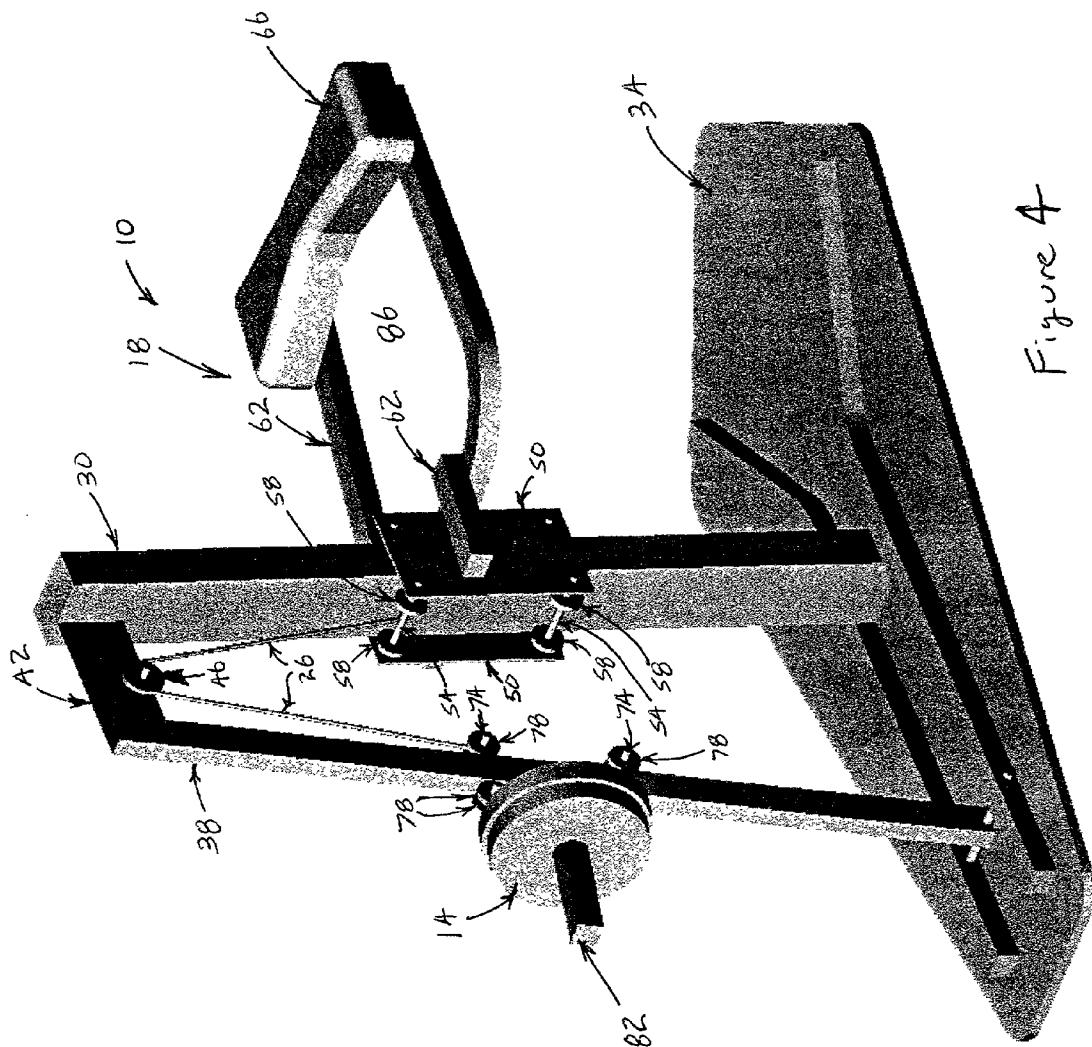


Figure 4

**APPARATUS FOR ASSISTING WITH PUSH-UPS****TECHNICAL FIELD**

[0001] The present invention generally relates to exercise machines. More particularly, the present invention relates to an apparatus for assisting with an exercise, such as push-ups.

**BACKGROUND OF THE INVENTION**

[0002] In the past, there have been several apparatuses which have been provided to create increased force or resistance in performing push-ups. For example, U.S. Pat. No. 5,106,079 to Escobedo discloses an exercise apparatus for enabling a person to perform extended push-ups with a variable and adjustable weight on his back. The apparatus includes a frame with elevated longitudinal members carrying handles near their forward ends. A weight platform is pivotally supported near the rear end of the frame. A locking arrangement manipulated by the feet of the user selectively locks or unlocks the weight platform against downward movement. The exercise apparatus does not assist the user in making the push-ups easier, it makes it more difficult for the user.

[0003] In the past, there have also been several apparatuses which have been provided to reduce the force needed to be exerted by a person in performing push-ups. For example, U.S. Pat. No. 5,421,800 to Mullen discloses a portable device that assist exercisers who do push-ups or use free weights through the difficult portion of the exercise motion, so as to allow exercisers to obtain better results more efficiently: Upper and lower surfaces, a force-generating device and a force-transferring device cooperate to transfer a selected amount of upward force to an exerciser's body (in the case of pushups) or a barbell (in the case of free-weight exercise) through a predetermined portion of the exercise motion. The device is also capable of being folded up into a compact briefcase size and shape for travel or storage. The device utilizes a surface designed to come into contact with the exerciser's body. This surface is connected to a means of generating force, such as springs or pistons, so that it assists the exerciser throughout the weak point but has no effect throughout the strong point. However, the device does not allow for change in the amount of assistance that the user is provided. The device also does not provide for a consistent level of assistance because as the body lowers, the springs are compressed to provide even more assistance than when the user is at the top point of the push-up. Other disadvantages readily come to mind as well.

[0004] As an additional example, U.S. Pat. No. 5,042,796 to Jibril discloses an apparatus having a torso encircling bag that is securable about an individual, with the bag having a chamber medially between a plurality of mounting straps, with the chamber receiving a predetermined number of resistance weights to enhance resistance during exercise such as in conventional push-ups. The organization utilizes an overlying plurality of pulleys, with the plate member mounted within the vest structure to provide assistance for individuals requiring such in an initial phase of convalescence in attempting push-up type exercise. However, the requirement of the user using the torso encircling bag may be cumbersome and uncomfortable in performing push-ups, as well time consuming in putting the bag on and taking it off. Other disadvantages readily come to mind as well.

[0005] The present invention is provided to solve these and other problems.

**SUMMARY OF THE INVENTION**

[0006] It is an object of the invention to provide an apparatus for assisting a user performing push-ups with the use of a counter-weight. A user-force accepting arm is provided for interacting with the user to accept a force exerted by the user in a generally downward direction. A counter-weight receiver is provided for receiving the counter-weight and for generating a counter-weight force, the counter-weight receiver being operably connected to the user-force accepting arm for transferring the counter-weight force from the counter-weight receiver to the user-force accepting arm to counteract the force exerted by the user. A wire is provided for operably connecting the counter-weight receiver to the user-force accepting arm. An accepting arm force guide is operably connected to the user-force accepting arm, and is provided for allowing the user-force accepting arm to move along the accepting arm force guide, wherein the wire is operably attached to the user-force accepting arm. In addition, a counter-weight force guide is operably connected to the counter-weight receiver, and is provided for allowing the counter-weight receiver to move along the counter-weight force guide, wherein the wire is operably attached to the counterweight receiver. A pulley is rotatably engaged with the wire for transferring forces between the counter-weight receiver and the user-force accepting arm.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0007] FIG. 1 is a right perspective view of one embodiment of the apparatus of the present invention.

[0008] FIG. 2 is a left perspective view of the embodiment of the present invention from FIG. 1.

[0009] FIG. 3 is a right cut-away perspective view of the embodiment of the present invention from FIG. 1.

[0010] FIG. 4 is a left cut-away perspective view of the embodiment of the present invention from FIG. 1.

**DETAILED DESCRIPTION**

[0011] While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiment illustrated.

[0012] With reference to FIGS. 1-4, in one embodiment, the present invention is an apparatus 10 for assisting a user performing push-ups with the use of a counterweight 14. The apparatus 10 has a user-force accepting arm 18 for interacting with the user to accept a force exerted by the user in a generally downward direction. A counter-weight receiver 22 is provided for receiving the counter-weight 14 and for generating a counter-weight force. The counter-weight receiver 22 is operably connected to the user-force accepting arm 18 for transferring the counter-weight force from the counter-weight receiver 22 to the user-force accepting arm 18 to counteract the force exerted by the user, as will be explained further below.

[0013] The counter-weight receiver 22 is operably connected to the user-force accepting arm 18 with a wire 26. The wire 26 can be a cable or other connecting device so long as it has sufficient flexibility and strength. Other connecting devices can be used as well. The user-force accepting arm 18 is operably connected to an accepting arm force guide 30 for allowing the user-force accepting arm 18 to move along the accepting arm force guide 30, and for assisting in transferring forces between the user-force accepting arm 18 and the counter-weight receiver 22, as will be explained further below. The counter-weight receiver 22 is operably connected to a counter-weight force guide 38 for allowing the counter-weight receiver 22 to move along the counter-weight force guide 38, and for assisting in transferring forces between the counter-weight receiver 22 and the user-force accepting arm 18, as will be explained further below.

[0014] The present invention also has a base 34. The accepting arm force guide 30 is fixedly attached to the base, which supports the accepting arm force guide 30.

[0015] The counter-weight force guide 38 is fixedly attached to the base 34, which supports the counter-weight force guide 38. A central support 42 comprising two plates in the embodiment shown in FIG. 1, is connected between the accepting arm force guide 30 and the counter-weight force guide 38. A pulley 46 is rotatably attached to the central support 42. The pulley 46 is rotatably engaged with the wire 26 for transferring forces between the counter-weight receiver 22 and the user-force accepting arm 18.

[0016] In the embodiment shown in the Figures, the user-force accepting arm 18 has two plates 50 which are attached to one another through a plurality of rods 54. The user-force accepting arm 18 also has a plurality of accepting arm rollers 58 which are rotatable about the plurality of rods 54, and which are operably engaged with the accepting arm force guide 30 for allowing the user-force accepting arm 18 to move along the accepting arm force guide 30. The user-force accepting arm 18 also has a plurality of rods 62 which are attached to the plates 50 for transferring forces to the wire 26. A pad 66 is provided as a part of the user-force accepting arm 18 for engagement with the user, and in particular the user's chest area, as appropriate for the user. In the embodiment shown in the Figures, the accepting arm force guide 30 is angled away from the user, thereby providing a vertical component and a horizontal component to the movement of the user-force accepting arm 18.

[0017] In the embodiment shown in the Figures, the counter-weight receiver 22 also has two plates 70 which are attached to one another through a plurality of rods 74. The counter-weight receiver 22 also has a plurality of counter-weight rollers 78 which are rotatable about the plurality of rods 74, and which are operably engaged with the counter-weight force guide 38 for allowing the counter-weight receiver 22 to move along the counter-weight force guide 38. A weight receiving rod 82 extends in a generally lateral direction from the plates 70 of the counter-weight receiver 22 for receiving free-weights so that the user can select the amount of weight to assist the user in performing push-ups. In the embodiment shown in the Figures, the counter-weight force guide 38 is angled toward the user, thereby providing a vertical component and a horizontal component to the movement of the counter-weight receiver 22. A stop (not

shown) can be fixedly attached to the counter-weight force guide 38 for preventing the counter-weight receiver 22 from moving below a predetermined height. The location of the stop is preferably a height that will allow the top position of a user's push-up to be associated with the height of the top position of the user-force accepting arm 18.

[0018] In operation, a user will assume a full push-up position with their chest facing down and engaging the pad 66, with the user's head above gap 86. When the user moves from a top position of a push-up to a bottom position of a push up the downward force of the user is exerted downward on the pad. This force transfers through the rods 62 to the plates 50 and to the wire 26. This force is then further transferred to the plates 70 and to the rod 82. When the force exerted by the user in the downward direction approximately equals the free-weights on the rod 82 (taking into consideration frictional forces), then the counter-weight receiver 22 will begin to move upwards, and the user-force accepting arm 18 will begin to move downward with the user's position in performing the push-up. When the user reaches the bottom position of the push-up, then the action reverses, and moves the opposite direction, until the user reaches the top position of the push-up. The operation then repeats for additional push-ups.

[0019] While the specific embodiment has been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention and the scope of protection is only limited by the scope of the accompanying claims.

#### What is claimed is:

1. An apparatus for assisting a user performing push-ups with the use of a counter-weight, comprising:
  - a user-force accepting arm for interacting with the user to accept a force exerted by the user in a generally downward direction; and,
  - a counter-weight receiver for receiving the counter-weight and for generating a counter-weight force, the counter-weight receiver being operably connected to the user-force accepting arm for transferring the counter-weight force from the counter-weight receiver to the user-force accepting arm to counteract the force exerted by the user.
2. The apparatus of claim 1 further comprising:
  - a wire for operably connecting the counter-weight receiver to the user-force accepting arm.
3. The apparatus of claim 1 further comprising:
  - an accepting arm force guide operably connected to the user-force accepting arm, allowing the user-force accepting arm to move along the accepting arm force guide.
4. The apparatus of claim 3 further comprising:
  - a base fixedly attached to and supporting the accepting arm force guide.
5. The apparatus of claim 3 wherein the user-force accepting arm comprises:
  - a plurality of accepting arm rollers operably engaged with the accepting arm force guide for allowing the user-force accepting arm to move along the accepting arm force guide.

**6.** The apparatus of claim 3 wherein when the user-force accepting arm moves along the accepting arm force guide, there is a vertical component and a horizontal component to such movement.

**7.** The apparatus of claim 1 wherein the force exerted by the user in a generally downward direction includes a vertical component and a horizontal component.

**8.** The apparatus of claim 1 further comprising:

a counter-weight force guide operably connected to the counter-weight receiver, allowing the counter-weight receiver to move along the counter-weight force guide.

**9.** The apparatus of claim 8 further comprising:

a base fixedly attached to and supporting the counter-weight force guide.

**10.** The apparatus of claim 8 wherein the counter-weight receiver comprises:

a plurality of counter-weight rollers operably engaged with the counterweight force guide for allowing the counter-weight receiver to move along the counter-weight force guide; and,

a weight receiving rod extending in a generally lateral direction.

**11.** The apparatus of claim 8 wherein when the counter-weight receiver moves along the counter-weight force guide, there is a vertical component and a horizontal component to such movement.

**12.** The apparatus of claim 8 wherein the counter-weight force guide comprises a stop for preventing the counter-weight receiver from moving below a predetermined height.

**13.** The apparatus of claim 1 further comprising:

a wire for operably connecting the counter-weight receiver to the user-force accepting arm;

an accepting arm force guide operably connected to the user-force accepting arm, allowing the user-force accepting arm to move along the accepting arm force guide, wherein the wire is operably attached to the user-force accepting arm;

a counter-weight force guide operably connected to the counter-weight receiver, allowing the counter-weight receiver to move along the counter-weight force guide, wherein the wire is operably attached to the counter-weight receiver; and,

a pulley rotatably engaged with the wire for transferring forces between the counter-weight receiver and the user-force accepting arm.

**14.** The apparatus of claim 13 further comprising:

a central support connected between the accepting arm force guide and the counter-weight force guide, wherein the pulley is rotatably attached to the central support.

**15.** An apparatus for assisting a user performing push-ups with the use of a counter-force, comprising:

a user-force accepting arm for interacting with the user to accept a force exerted by the user in a generally downward direction; and,

a counter-force creating device for generating the counter-force, the counter-force creating device being operably connected to the user-force accepting arm for transferring the counter-force from the counter-force creating device to the user-force accepting arm to counteract the force exerted by the user.

**16.** The apparatus of claim 15 further comprising:

a wire for operably connecting the counter-force creating device to the user-force accepting arm.

**17.** The apparatus of claim 15 further comprising:

an accepting arm force guide operably connected to the user-force accepting arm, allowing the user-force accepting arm to move along the accepting arm force guide.

**18.** The apparatus of claim 17 wherein when the user-force accepting arm moves along the accepting arm force guide, there is a vertical component and a horizontal component to such movement.

**19.** An apparatus for assisting a user performing push-ups with the use of a counter-weight, comprising:

a user-force accepting arm for interacting with the user to accept a force exerted by the user in a generally downward direction;

a counter-weight receiver for receiving the counter-weight and for generating a counter-weight force, the counter-weight receiver being operably connected to the user-force accepting arm for transferring the counter-weight force from the counter-weight receiver to the user-force accepting arm to counteract the force exerted by the user;

a wire for operably connecting the counter-weight receiver to the user-force accepting arm;

an accepting arm force guide operably connected to the user-force accepting arm, allowing the user-force accepting arm to move along the accepting arm force guide, wherein the wire is operably attached to the user-force accepting arm; and,

a counter-weight force guide operably connected to the counter-weight receiver, allowing the counter-weight receiver to move along the counter-weight force guide, wherein the wire is operably attached to the counter-weight receiver.

**20.** The apparatus of claim 19 further comprising:

a pulley rotatably engaged with the wire for transferring forces between the counter-weight receiver and the user-force accepting arm.

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