MOTORIZED PUNCHING BAG APPARATUS
AND A SYSTEM AND A METHOD FOR USING THE SAME

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ABSTRACT

A training apparatus, a training system and method for training have a rotatable arm which allows the user to punch the punching bag while bobbing and weaving to avoid the rotatable arm. A balance base plate and post are provided which extend from the balance base plate. A horizontal arm extends from the post allowing a punching bag to depend from the horizontal arm. A motorized rotatable arm with an impact absorbent cushion at its distal end is attached to the horizontal arm and rotates which may require the user to avoid contact with the impact absorbent cushion positioned at the distal end of the motorized rotatable arm. This training apparatus simulates movements required in contact sports, such as boxing, kick-boxing, and other martial arts.
FIG. 5

ENTER ROTATIONAL COMMAND

TRANSMIT COMMAND TO RECEIVER APPARATUS

RECEIVE AND PROCESS COMMAND

SEND COMMAND TO ELECTRIC MOTOR

VARY OPERATION OF ELECTRIC MOTOR IN RESPONSE TO COMMAND
MOTORIZED PUNCHING BAG APPARATUS AND A SYSTEM AND A METHOD FOR USING THE SAME

BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to the field of athletic training equipment and more particularly to a free-standing punching bag training apparatus. The punching bag apparatus is provided with a rotatable arm extending toward the region of the head and shoulders of the user which provides training in counter-punching and bobbing and weaving skills.

[0002] The use of punching bags and contact pads as training devices for upper body contact sports such as boxing, kick boxing, and the martial arts, is old in the art. Many punching bag devices in the prior art focus on adjusting the height of the punching bag or improvements thereof. Other devices utilize multiple punching bags to provide training for those in the martial arts. One device, U.S. Pat. No. 5,048,822, provides a heavy punching bag on a circular rail to allow the user to simulate a sparring partner by following the punching bag as it moves around its circular track. However, this does not provide the counter-punch and bob and weave exercises necessary for effective training. Another device, U.S. Pat. No. 4,077,624, provides a striking device for training in the martial arts. This device provides multiple target elements which are located on the ends of horizontal rods suspended by a cord. By striking the target elements on one end of a horizontal rod of this device, the target element on the other end of the horizontal rod is propelled in the direction of the user in an unpredictable manner so as to simulate sparring against an opponent. However, this device makes no use of a punching bag nor does it adequately provide for a bob and weave and counter-punch type of training. Further, counter-punching against targets suspended from a cord is very likely to be quite difficult due to the amount of motion that may be generated in the cord after the first few hits by a user. Thus, those kinds of devices generally do not provide the user with a realistic sparring type environment.

[0003] Another drawback of the prior art training devices is that they are designed for use only with either a heavy-weight punching bag or a speed bag. There is generally no provision for a bobbing and weaving counter-punch exercise which can, interchangeably use a speed bag, a heavy weight punching bag, or a trainer who wears target mitts. This is particularly true in devices which require a defensive move only in reaction to the striking of a target by the user.

[0004] A need, therefore, exists for a motorized punching bag apparatus that associates a rotatable arm with an impact absorbent cushion to provide training in counter-punching and bobbing and weaving skills of a user. A need also exists for an improved motorized punching bag system and a method for using the same.

SUMMARY OF THE INVENTION

[0005] The foregoing deficiencies and drawbacks of the prior art are solved by providing a punching bag apparatus having a rotatable arm that includes a balance base, a post extending vertically upwards from the base and a horizontal arm. The horizontal arm may horizontally be mounted on the post, a punching bag may depend from the horizontal arm, and a motorized rotatable arm having an impact absorbent cushion at its distal end may be attached to the horizontal arm.

[0006] The vertical post may be vertically mounted to a balance base. The balance base may provide support to the entire apparatus and may be made with steel, wood, plastic, or a combination of appropriate elements such that it may be weighted down to provide a suitable balance. Preferably, the balance base may be heavy enough, not only to support the punching bag and entire apparatus, but also to provide enough support such that, upon contact of a user with the punching bag, the entire apparatus is maintained in a substantially stationary state. The balance base may be provided with apertures through which bolts, or other attachment devices, may be used to attach the balance base to flooring to provide the requisite support, or the balance base may be held stationary by a combination of weights and/or securement mechanisms.

[0007] In a preferred embodiment, the vertical post may support the horizontal arm, punching bag and rotating arm to an appropriate height depending on the user and may attach to the balance base at its lower end. The vertical post may be constructed from steel, metal alloys, wood and/or other suitable materials. The vertical post may attach to the balance base at a central location, or it may attach to the balance base at an edge closest to the user depending on the shape and configuration of the balance base. During use, neither the balance base nor the vertical post may obstruct the user during his or her workout.

[0008] In an alternate embodiment of the invention, the vertical post may be adjustable such that a user may adjust the height of the entire apparatus dependent on the height of the user. This embodiment allows the customization of the invention depending on the size and height of a particular user.

[0009] In an alternate embodiment of the invention, the vertical post may mount to a wall with a wall mount and the vertical post may adjust the height of the entire apparatus dependent on the height of the user. The wall mount may provide apertures through which posts, or other attachment devices, may be used to mount the wall mount to the wall. This embodiment allows the apparatus to be attached to a wall for additional support and to provide a more convenient location for using the apparatus. Furthermore, a combination of the balance base and the wall mount may be used to support the vertical post to provide the requisite support.

[0010] A horizontal arm may attach to the vertical post. In a preferred embodiment of the invention, the horizontal arm may attach to the rotatable arm and to the punching bag. In this preferred embodiment, the rotatable arm may attach to the horizontal arm towards its distal end. The rotatable arm may be operated by an electric motor which may move in a circular manner or in a side-to-side manner. The punching bag, in this embodiment, may be suspended from the horizontal arm at a point below the rotatable arm. In a similar fashion, as the embodiment described above, the rotatable arm may have sufficient padding to protect a user in the case of a user actually being struck with the moving arm. Accordingly, in this preferred embodiment, the user may bob and weave to avoid the moving rotatable arm while practicing counter-punching against the suspended punching bag.
[0011] It is important to note that the speed and direction of the rotatable arm may be adjusted by the user to increase the level of challenge of the exercise. On a similar note, the speed and direction of the rotatable arm may be adjusted by a third party during the training activity through the use of, for example, a remote control or similar variation devices. It is this aspect of the invention that may provide a user with the complete training needed in upper body contact sports. The punching bag may have what is commonly known as a heavy bag. Accordingly, the heavy bag may be constructed of canvas, leather, and/or vinyl type materials and may be filled with an appropriate padding. The heavy bag may also be adjusted to the height of a user by adjusting a chain or other suspending material which may be attached to the horizontal arm.

[0012] In other alternate embodiments, the punching bag may have a smaller medium weight bag, a speed bag, or the bag may be removed to provide for a seated trainer who may be wearing contact mitts on his or her hands and who may provide an alternative exercise to the user. It is important to note that for the apparatus to provide an effective workout, the distance to the bag may be properly coordinated with the location of the padded end of the rotatable arm when it would be in a position to be avoided by the user. Accordingly, the horizontal arm may be provided with a movable attachment which may allow the punching bag to be placed closer or further away from the user.

[0013] Preferably, an electric motor may be provided to drive the motion of the rotating arm. In one embodiment, the electric motor may be located near the axis about which the rotating arm moves and may provide either a side-to-side motion or a circular motion. In more complex preferred embodiments, the electric motor may be located away from the rotating arm, but may be connected to it through the use of common drive elements known to one skilled in the art.

[0014] In another embodiment, the electric motor may be separated from the rotating arm, but may be connected to it through an intermediate arm. Further, the intermediate arm may be attached to the electric motor at an end and may be attached to the rotating arm at a distal end. Still further, the intermediate arm may extend horizontally towards the user from a support box housing, and the rotating arm may extend downward from the distal end of the intermediate arm. In this embodiment, the electric motor may move the intermediate arm and/or the rotatable arm in a side-to-side manner.

[0015] Further, the embodiments which use a motor that is not immediate to the rotating arm may have the drive elements located within the horizontal arm and the substantially vertical post for safety and design reasons. In a preferred embodiment of the invention, the electric motor may be equipped with a force sensor which may allow the arrest of the movement of the rotating arm when the rotating arm meets with an obstruction or a force of an unacceptable level. In this embodiment, the force sensor may provide the invention with an important level of safety. Additionally, the electric motor may be equipped with a differential, or a slipping gear, which may not only arrest the movement of the arm in the case of contact with a substantially immovable obstacle, but may also protect the electric motor from damage resulting from such a contact. In another embodiment, the safety aspect may be provided by a flexible rotatable arm or a collapsible rotating arm which may be replaced.

[0016] In another embodiment of the invention, the electric motor may be used in conjunction with a microprocessor or other type of electronic control device to provide a variable movement to the rotating arm. In such an embodiment of the invention, the electronically controlled rotating arm may be used to simulate a flurry of punches, regular jab-type punches, or a combination of the two. Additionally, the electronics may be programmed by software to provide a customized workout according to what a particular user may want. Further, the electric motor may be utilized in conjunction with a U-joint wherein the motion and speed of the rotating arm may be varied in an almost endless variety of ways.

[0017] The electric motor may be of the type which allows a circular or semi-circular movement of the rotating arm in a generally horizontal plane. In practice, a ceiling fan type motor or its improved equivalent is contemplated as within the scope of the invention. The motor may, in other preferred embodiments, be of the type which may allow an alternating movement. In practice, a windshield wiper type motor or other lightweight motor is contemplated as within the scope of this embodiment of the invention.

[0018] It is, therefore, an advantage of the present invention to provide a training apparatus, a training system and a method for training with a rotatable arm which provides training for contact sports.

[0019] Another advantage of the present invention is to provide a training apparatus, a training system and a method for training with a rotatable arm which provides users with the opportunity to practice bobbing and weaving skills while working with a punching bag.

[0020] Yet another advantage of the present invention is to provide a training apparatus, a training system and a method for training with a rotatable arm that allows a user to improve counterpunching skills while bobbing and weaving to avoid the rotatable arm.

[0021] Another object of the present invention is to provide a training apparatus, a training system and a method for training with a rotatable arm which allows for a variable workout by controlling the speed of the rotatable arm in accordance with the bobbing and weaving skills of a particular user.

[0022] Additional features and advantages of the present invention are described in, and will be apparent from, the detailed description of the presently preferred embodiments and from the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. 1 is a perspective view of a motorized punching bag apparatus.

[0024] FIG. 2 is a perspective view of an embodiment of a motorized punching bag apparatus.

[0025] FIG. 3 is a perspective view of an embodiment of a motorized punching bag apparatus.

[0026] FIG. 4 is a perspective view of another embodiment of a motorized punching bag apparatus.
Figure 5 is a flowchart showing the steps required for use of an embodiment having programmable memory and a remote control device.

**Detailed Description of the Preferred Embodiments**

Referring to FIG. 1 and FIG. 2, a punching bag apparatus 10 is shown. The punching bag apparatus 10 may generally include support structures, bag associated structures, and structures of the rotatable arm. The support structures may include a balance base 12 which may have a counterweight 14. The balance base 12 may also include a post footing 16 and a post support 18 which may support a substantially vertical post 20. The substantially vertical post 20 may extend upwardly to meet along with an arm support 22 which may support a horizontal arm 24 at a post and arm joint 26.

Additionally, FIG. 1 and FIG. 2 illustrate the structures of a rotatable arm which may include a support cylinder housing 28 which may be connected to the horizontal arm 24. The support cylinder housing 28 may contain a suitable motor (not shown in the figures) which may provide rotational motion for a rotatable arm 30. The rotational motion may be a complete 360° rotation and/or rotations less than 360°. Further, the rotational motion may move the rotatable arm 30 in a side-to-side manner. The rotatable arm 30 may be attached to the support cylinder 28 at one end. At a distal end of the rotatable arm 30 may be attached an impact absorbent cushion 32. Further, FIG. 1 and FIG. 2 illustrate the bag associated structures which may include a connector headpiece 34 that may be attached to the support cylinder housing 28. Still further, FIG. 1 illustrates a punching bag chain 36 that may be connected to the connector headpiece 34 and the punching bag chain 36 in turn may support a punching bag 38. Additionally, FIG. 2 illustrates the punching bag chain 36 may support what is commonly known as a speed bag 40. However, both heavy bags and speed bags are contemplated as within the scope of the invention described herein.

FIG. 1 and FIG. 2 also illustrate the balance base 12 which, in a preferred embodiment of punching bag apparatus 10, may be constructed of a steel plate. However, in other embodiments of the invention, the balance base 12 may be made from wood, plastic, cement, and/or other materials. The function of the balance base 12 is to provide a counterweight to the rotatable arm 30 and the punching bag 38 or the speed bag 40 and to provide a sturdy and substantially immobile platform from which to support the punching bag 38 or the speed bag 40. The counterweight 14 may or may not be needed depending on the type of balance base 12 that may be utilized. However, in one embodiment of the invention, the counterweight 14 may be constructed from steel weights, sandbags, concrete blocks, and/or similar materials. The post footing 16 may be a sufficiently industrial quality as known by a person skilled in the art and may be used to attach and support the substantially vertical post 20.

In one embodiment of the invention, the post support 18 may be also utilized to support the substantially vertical post 20. However, alternate embodiments are contemplated whereby the post support 18 may not be necessary to provide adequate support to the vertical post 20. The vertical post 20 may be made from sufficiently strong material so as to support the rotatable arm 30 and the punching bag 38 or the speed bag 40. In one preferred embodiment of the invention, the vertical post 20 may be constructed of a square or a rectangular steel beam. In other alternate embodiments of the invention, the vertical post 20 may be made from wood, plastic, and/or other metals, and/or composites of the above materials. Along with the arm support 22, the vertical post 20 may support the horizontal arm 24. Again, because the horizontal arm 24 supports the rotatable arm 30 and the punching bag 38 or the speed bag 40, the horizontal arm 24 may be made from a sufficiently strong material. Accordingly, in a preferred embodiment, the horizontal arm 24 may be made from, for example, steel. In other alternate embodiments of the invention, the horizontal arm 24 may be made of materials as described above for the vertical post 20.

FIG. 1 and FIG. 2 further illustrate the support cylinder housing 28 which may be attached, in order, from top to bottom, the rotatable arm 30 and the punching bag 38 or the speed bag 40 by way of the connector headpiece 34 and the punching bag chain 36 to the horizontal arm 24. The support cylinder housing 28 may provide structural support to the rotatable arm 30 and the punching bag 38 or the speed bag 40 and also may provide a housing for more complex embodiments of the punching bag apparatus 10. The rotatable arm 30, in a preferred embodiment, may be a hollow tube. The hollow tube may reduce the weight of the rotatable arm 30, may reduce the stress associated with a heavy rotatable arm 30 on the remainder of the apparatus and may provide a degree of safety in that no significant momentum may develop in the rotatable arm 30 as might cause injury to a user. Further, the stress placed on the motor may be reduced if the rotatable arm 30 is lightweight.

In a preferred embodiment, the rotatable arm 30 may be constructed of a flexible material which may provide yet another degree of safety to the user. Materials appropriate for such flexibility generally may include, for example, polymeric plastic materials. However, lightweight wood or metal tubing may also be contemplated as within the scope of this invention. The impact absorbent cushion 32 may preferably be made of a fabric or leather outer liner and a padded stuffing. A central, hollow core may further be provided to decrease the weight of the impact absorbent cushion 32. The impact absorbent cushion 32 may be removable in one embodiment for sanitary purposes.

The support cylinder housing 28 may connect to the connector headpiece 34 which, in turn, may connect to the punching bag chain 36 and the punching bag 38 or the speed bag 40. The connector headpiece 34 in one embodiment of the invention may simply be a hook (not shown in the pictures) with which to attach the punching bag chain 36 to the support cylinder housing 28. However, in other embodiments the connector headpiece 34 may include a movable coupling (not shown in the pictures) having a swivel joint to provide better positioning of the punching bag 38 or the speed bag 40 and may remove any twist which may be generated in the punching bag chain 36. Use of such a swivel joint is considered standard in punching bag support and attachment mechanisms.

FIG. 2 further illustrates the support cylinder housing 28 which may have an infrared remote sensor 44 to
provide a third party, such as a trainer, with the capability of varying the movement of the rotatable arm 30. Further, signals to direct the motor speed/duration may be sent via a transmitter 42 and may be received by the infrared remote sensor. Moreover, remotely generated signals known by those skilled in the art are contemplated as within the scope of the invention described herein.

[0036] Alternate embodiments of the present invention may include a force sensor (not shown in the figures) in the support cylinder housing 28 to provide a mechanism which may arrest the rotating of the rotatable arm 30 when an unacceptable level of resistance meets with the rotatable arm 30. In other embodiments, a processor programmable with software (not shown in the pictures) may be included within the support cylinder housing 28 to direct the motor and thus the speed, direction and variability of the movement of the rotatable arm 30. In this embodiment, the user may engage in a customized workout which may be tailored to the particular skill level of the user.

[0037] FIG. 3 illustrates another embodiment of the invention. In this embodiment of a motorized punching bag apparatus 100, a support cylinder housing 128, a rotatable arm 130, and an impact absorbent cushion 132 may be structurally separate from a connector headpiece 134, a punching bag chain 136, and a speed bag 138. FIG. 3 further illustrates the connector headpiece 134 may attach to the horizontal arm 122 at a point closer to the vertical post 118 than a point at which the support cylinder housing 128 may attach to the horizontal arm 122.

[0038] FIG. 4 illustrates a perspective view of another embodiment of a motorized punching bag apparatus 300. In this embodiment of the punching bag apparatus 300, a substantially vertical post 318 may mount to a wall 302 with, for example, a wall mount 304 and mounting posts 306. The substantially vertical post 318 may extend upwardly and join an arm support 324 which may support a horizontal arm 322. A support box housing 328 may be connected to the horizontal arm 322. The support box housing 328 may contain a suitable motor (not shown in the figures) which may provide rotational motion to an intermediate arm 330 and a rotatable arm 332. The degree of rotation may be less than 360°, semi-circular and/or less than 180°. Further, the rotational motion may move the intermediate arm 330 and the rotatable arm 332 in a side-to-side manner. The motor may attach to an end of the intermediate arm 330 and may extend outwardly away from the vertical post 318. The rotatable arm 332 with an impact absorbent cushion 340 may attach downwardly to the intermediate arm 330.

[0039] FIG. 5 illustrates a flowchart which describes the steps involved in using an embodiment of the present invention containing a programmable memory and a remote control device. In Step 210, a rotational command may be entered into a remote control device such as, for example, a hand held remote with a keypad and an infrared capability. In Step 220, the remote control device may transmit the command to a receiver apparatus which may be located on a punching bag apparatus. The receiver apparatus may have, for example, an infrared detection crystal connected to appropriate electronic signal translation equipment. In Step 230, the command may then be received and processed. Step 230 may include an accessing of memory located in a means for rotating a rotatable arm which may include different lengths of workouts desired by individual users and variations in a rotational speed of the rotatable arm during an individual workout. Further, processing may also include an appropriate translation of the command into an electric signal for an electric motor. In Step 240, the command may be sent to the electric motor. In Step 250, the electric motor may vary its operation in response to the command. Accordingly, the punching bag apparatus, in one embodiment of the present invention, may be customized for an exercise of a particular individual.

[0040] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications may be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is, therefore, intended that such changes and modifications be covered by the appended claims.

I claim:

1. A training apparatus comprising:
   a support mechanism;
   a rotatable arm having an impact absorbent cushion attached to the rotatable arm;
   a motor connected to the rotatable arm and attached to the support mechanism wherein the motor rotates the impact absorbent cushion; and
   a bag attached to the support mechanism wherein the bag is stationary and further wherein the bag is detached from the rotatable arm.

2. The apparatus of claim 1 further comprising:
   a counter-weight attached to the support mechanism wherein the counter-weight is vertical with respect to the support mechanism and further wherein the support mechanism extends upward from the counter-weight.

3. The apparatus of claim 1 further comprising:
   an arm attached to the support mechanism wherein the arm is vertical with respect to the support mechanism and further wherein the motor connects to the arm.

4. The apparatus of claim 1 further comprising:
   a wall-mount attached to the support mechanism wherein the wall-mount is parallel to the support mechanism and further wherein the bag suspends from the support mechanism.

5. The apparatus of claim 1 further comprising:
   a post attached to the support mechanism wherein the post is vertical with respect to the support mechanism and further wherein the bag suspends from the support mechanism.

6. The apparatus of claim 1 further comprising:
   a base attached to the support mechanism wherein the base is vertical with respect to the support mechanism.

7. The apparatus of claim 1 further comprising:
   a housing connected to the support mechanism wherein the motor is within the housing.
8. The apparatus of claim 1 further comprising:
a cylinder connected to the support mechanism wherein
the cylinder is vertical with respect to the support
mechanism and further wherein the cylinder is attached
to the bag.
9. The apparatus of claim 1 further comprising:
an intermediate arm connecting the motor to the rotatable
arm wherein the intermediate arm is vertical with
respect to the rotatable arm.
10. A training system comprising:
a support means;
an impact absorbent cushion connected to the support
means;
a counter-punching means connected to the support
means;
a motor attached to the support means wherein the motor
connects to the impact absorbent cushion and further
wherein the motor rotates the impact absorbent cushion;
and
a controlling means attached to the motor.
11. The system of claim 10 further comprising:
a mounting means connected to the support means
wherein the support means suspends from the mounting
means.
12. The system of claim 10 further comprising:
a bag suspended from the support mean.
13. The system of claim 10 further comprising:
a counter-balance weight attached to the support means
wherein the support means is stationary.
14. The system of claim 10 further comprising:
an attaching means connecting the counter-punching
means to the support means wherein the counter-
punching means is stationary.
15. The system of claim 10 further comprising:
a remote device operatively connected to the controlling
means wherein the remote device provides a signal to
direct the controlling means.
16. A method for training, the method comprising the
steps of:
attaching a motor to a support mechanism;
connecting an arm to the motor;
attaching a contact pad to the arm;
suspending a bag from the support mechanism wherein
the bag is stationary and further wherein the bag is
detached from the arm and
rotating the contact pad at a speed with the motor.
17. The method of claim 16 further comprising the step of:
holding the support mechanism wherein the bag is sus-
pended and further wherein the support mechanism is
stationary.
18. The method of claim 16 further comprising the step of:
suspending the support mechanism wherein the support
mechanism is stationary.
19. The method of claim 16 further comprising the step of:
attaching the arm to the motor wherein the arm is vertical
with respect to the support mechanism.
20. The method of claim 16 further comprising the step of:
adjusting the speed of the motor.