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(54) **Fitness apparatus**

(57) A fitness apparatus with a member mounted on a support frame which rotates about a first axis, with a handle mounted on said member for gripping by a user, offset from said first axis and rotating about a second axis, the distance between the first and second axes

changing during rotation of the member as the user exerts a force on the handle, such that the handle describes an elliptical arc and aligns itself to the correct position with respect to the member in relation to the height and reach of the user at each instant of the revolution.

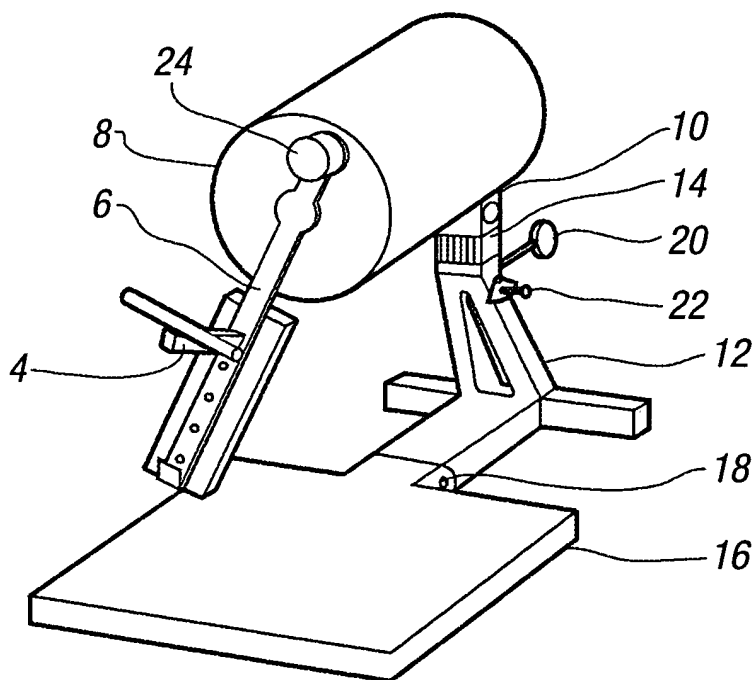


FIG. 3

Description

[0001] The invention to which this application relates is fitness apparatus for use by a person to enable the muscles of the lower body, mid section/torso, upper body and arms to be exercised through all or part of a 360 degree revolution of a single crank arm.

[0002] Although the following description refers almost exclusively to use of a fitness apparatus to enable a range of muscles to be exercised, it will be appreciated by persons skilled in the art that the present invention can also be used to exercise particular muscles as desired.

[0003] Exercise machines that exercise a particular group of muscles are well known, for example a treadmill is used principally to exercise the leg muscles. Machines capable of exercising several groups of muscles are less common, and tend to be highly complex. For example a rowing machine is a relatively complicated piece of machinery, allowing the arms, legs and back to be exercised in one cycle, and the user requires some training to maximise the benefits of exercise using the same.

[0004] The aim of the present invention is to provide alternative fitness apparatus capable of exercising a wide range of muscle groups in one cycle.

[0005] In a first aspect of the invention, there is provided a fitness apparatus including a support frame, a member mounted on the frame for rotation about a first axis, a handle mounted on said member, at a location spaced from said first axis, for gripping by the hand or hands of a user to exert a force to rotate said member about said first axis, said handle rotatably mounted with respect to said member at least about a second axis parallel to the first axis, and wherein the distance between said first axis and said second axis can change during the rotation of the member.

[0006] Typically the member and handle are capable of being moved through a complete revolution and repeated revolutions in use provide the desired exercise with the person moving between extended stretch and crouched positions as the revolution is performed. In one embodiment adjustment means are provided such that the distance between the axis of rotation of the member and the handle can be adjusted.

[0007] In one embodiment the member is an arm. In one embodiment the arm is formed of two portions, a first portion rotationally mounted on the axis and the second portion pivotally mounted on the first portion and including the handle thereon. In one embodiment the second portion is pivotally mounted to an end of the first portion at a location intermediate the ends of the second portion. In one embodiment the first portion is axially mounted on the frame of the apparatus at a location intermediate the ends of the first portion.

[0008] In one embodiment as rotation of the arm is caused by the user, the second portion of the arm pivots from a position where it is extended from the first portion

in parallel, through to a position where the two portions substantially overlap.

[0009] Preferably, the first and second portions are retained in a particular angular orientation which acts as the default position by a resilient means such as any or any combination of pistons, springs, levers, and/or the like. The strength of the resilient means can be adjusted so as to provide particular resistance to the user. During use the angular orientation of the portions will be adjusted as the rotation of the arm is caused by the user and this adjustment of angular orientation ensures that the arm can always be at a safe and comfortable position for the user as their body position changes with respect to the apparatus.

[0010] In one embodiment the second portion can be locked by locking means at a particular angle with respect to the first portion as required by the user. By fixing the two portions at an angle which is fixed the distance between the handle and the axis of rotation of the arm can be selected and then locked such that a predetermined sized arc can be defined by the handle when using the apparatus. This is believed to be of particular use for new users for whom it is found to be an advantage and after initial use and training the portions can be unlocked to allow the change in distance to occur.

[0011] In one embodiment the handle can be addressed by the person standing with their side to the handle, or alternatively with the person facing the same.

[0012] In one embodiment the handle includes a body portion in contact with said member and a bar portion rotatably mounted on said body portion such that the bar portion is rotatable about an axis of said body portion. Typically the axis of rotation between the body portion and the member is perpendicular to the axis of rotation between the body portion and the bar portion.

[0013] In one embodiment the axis of rotation is substantially parallel to the lengthwise axis of said arm portion.

[0014] In one embodiment, at least one grip portion is rotatably mounted on the bar portion, such that the grip portion rotates around an axis substantially parallel to the lengthwise axis of said bar portion.

[0015] Typically the first and second parts of the arms include a counterbalance such as a weight at the opposite end to the handle, to balance the arm in use.

[0016] In an alternative embodiment, the member is a one part arm and includes a track on which the handle is slidably mounted, either directly or via an intermediate slider mounting. The track and/or handle can include damping means which allow a controlled movement of the handle along the track and in a manner which reduces the risk of injury to the user due to a sudden movement and/or provides a more controlled and smooth sliding movement. Such damping means could include a piston, spring or the like so as to provide a regulated movement.

[0017] In one embodiment the handle is free to move along a predetermined length of the arm and in use as

the user rotates the arm by gripping the handle and/or grip portions the arc shape defined by the handle can vary in shape and size, as the handle aligns itself along the arm member to the correct position in relation to the height and reach of the user at each instant of the revolution.

[0018] Preferably the track portion includes shock absorbers at either end, such that potential impact damage is reduced if the handle is dropped and/or is moved into contact with the end of the track at speed.

[0019] Preferably, the slider and/or handle includes holes along the same for interengagement with one or more pins, or alternative clamping means can be used. These allow the user to adjust the handle portion position with respect to the arm and retain the same in a fixed rather than a sliding arrangement with the arm.

[0020] Preferably, the pins can be used either side of the slider mounting to allow restricted movement of the same.

[0021] In a further embodiment, the handle is rotatably mounted on the end of the arm, such that the handle rotates around an axis parallel to the axis of rotation of the arm.

[0022] Preferably the arm is formed from a first portion and at least a second portion.

[0023] Preferably the first portion is rotatably mounted on the support as hereinbefore described and the at least second portion is pivotally connected to the first portion.

[0024] In a further embodiment, the handle includes a body portion in contact with said arm and a bar portion pivotally mounted on said body portion such that the bar portion pivots around an axis substantially parallel to the lengthwise axis of said bar portion.

[0025] In one embodiment, at least one grip portion is rotateably mounted on the bar portion, such that the grip portions rotate around the lengthwise axis of each grip portion, typically perpendicular to the lengthwise axis of the bar portion

[0026] In one embodiment the support includes an upper portion and a lower portion.

[0027] Preferably the arm portion is rotationally mounted on the upper portion.

[0028] Preferably rotation of the arm portion is restricted by inter-engagement of a resistance mechanism with the same.

[0029] Preferably the resistance mechanism is at least partially covered by a drum or other housing, to protect the user from the same, and the mechanism from external material which may cause damage to the mechanism.

[0030] The covering is typically cylindrical but can be any suitable shape to protect the user and the resistance mechanism.

[0031] Preferably the resistance mechanism can include any or any combination of friction based pads, eddy current magnetic brake, flywheel counterbalance, and/or the like. Typically the degree of resistance to the

rotation of the arm is adjustable either by manual manipulation of control means, or electronic means such as, for example, via a remote control, which upon activation by the user causes the control of the resistance means to alter accordingly.

[0032] In one embodiment the upper portion of the support member is connected to the lower portion via a tilt mechanism, which allows the upper portion to be tilted away from the lower portion.

[0033] Preferably the tilt mechanism is controlled by at least two adjustment means; one for forwards-backwards tilting, the other for left-right tilting.

[0034] Preferably the lower portion of the support member extends along the surface on which the fitness apparatus rests, to help prevent the same from falling over.

[0035] In one embodiment the fitness apparatus includes a base member, upon which a user may stand when using the apparatus, thereby further lowering the centre of gravity of the apparatus.

[0036] Preferably the base member is pivotally connected to the lower portion of the support member, such that the same can be folded up when not in use or for transport.

[0037] Adjustment means may also be provided for the base member and/or support members to allow the height of the handle and arm to be adjusted by the user to suit the user's heights and build thereby allowing the comfortable and optimum positioning of the apparatus and helping to reduce the risk of injury.

[0038] In a further aspect of the invention there is provided fitness apparatus including a support frame, a member mounted on the frame for rotation about a first axis, a handle mounted on said member, at a location spaced from said first axis, for gripping by the hand or hands of a user to exert a force to rotate said member about said first axis, said handle mounted with respect to said member at a spaced location from the first axis, and wherein the member is formed of two portions, a first portion rotationally mounted on the first axis and the second portion pivotally mounted on the first portion and including the handle thereon.

[0039] In one embodiment the distance between said first axis and the handle changes during the rotation of the member.

[0040] Specific embodiments of the invention are now described wherein:-

Figures 1a-g illustrate views of the apparatus in use in accordance with one embodiment of the invention;

Figure 2 illustrates a partial enlarged front view of the apparatus of Figures 1a-g illustrating a front perspective view of the fitness apparatus in this first embodiment

Figure 3 illustrates fitness apparatus in a further em-

bodiment;

Figure 4 illustrates a side view of the fitness apparatus of Figure 3

Figure 5 illustrates a front view of the fitness apparatus of Figures 3 and 4

Figure 6 illustrates a partial enlarged front view of fitness apparatus of Figures 3-5;

Figure 7 illustrates a partial enlarged side view of the fitness apparatus of Figures 3-6;

Figure 8 illustrate views of a handle in one embodiment of the invention;

Figure 9 illustrates a front view of an alternative handle arrangement; and

Figures 10-15 illustrate views of the handle of Figure 10.

[0041] With reference to Figures 1-2, there is illustrated a fitness apparatus 2 with a handle 4 connected to an arm 6 of two parts 54, 56 which acts as a crank arm. The crank arm 6 is rotationally mounted on an upper support member 10 which interengages with a resistance mechanism which is at least partially protected by drum 8, and can rotate in a clockwise or anti-clockwise direction.

[0042] The operation of the arm portions is described with reference to Figures 1g and 2 wherein the crank arm 6 second portion 54 is pivotally connected to the first portion 56 about pivot location 57. The first portion 56 is rotatably mounted on the upper support member covered by drum 8 as hereinbefore described. The second portion 54 can pivot about the pivot location 57 as the arm is rotated thereby ensuring that the arm portion 54 and hence handle 4 is always located at a suitable height and orientation for the user as the arm is rotated by the user. Movement is controlled by spring 60 which acts resiliently to encourage the first and second portions to a default angular orientation such as that shown in Figure 2. Thus in this arrangement the first portion 56 rotates around axis 55 and the second portion pivots around axis 57 and the handle 4 also rotates in a manner which will be subsequently described.

[0043] In one embodiment the second portion 54 can be locked at a particular angle with respect to the portion 56 as required by the user. In this way the size of the arc of rotation of the crank arm can be constant as desired by the user. However it is envisaged that the greater advantage is that the portions 54 56 angularly move during rotation of the arm about the pivot 55 thereby allowing comfortable and safe use by the user as the handle is always then positioned at a usable height for the user and can change during the rotation of the arm so

as to allow the radius distance from the handle to the axis 55 to change during rotation so as to react the to the required body position for comfortable operation of the apparatus at any given instant during the rotation as is illustrated in Figures 1a-d where various stages of rotation are shown.

[0044] Handle 4 is rotatably mounted on the end of second portion 54 such that movement is allowed around an axis 61 substantially perpendicular to the axis of rotation of the first portion 56.

[0045] Referring now to the remaining drawings a different embodiment of arm 6 is shown but the other aspects of the invention as now described are common to both embodiments. The drum 8 can be any suitable shape and is shown as a cylinder in this example. The frame includes an upper support member 10 supported by lower support member 12 via tilt and/or height adjustment mechanism 14. The lower support member is also connected to base member 16, upon which the user stands when using the apparatus. The base has a pivot 18 which allows the base to be pivoted towards the support member to lie in a vertical plane, thereby allowing the apparatus to be folded up when not in use or for transport.

[0046] The resistance mechanism in the drum 8 can include any or any combination of friction based pads, eddy current magnetic brake, or flywheel counterbalance. Additional weight to exercise against can be provided by counterweight 24 or the selection of counterweights located on the end of the crank arm 6 distal to the handle 4. The counterweight also acts to balance the arm when in rotation so as to provide a relatively uniform speed of movement as the arm is revolved by the user through 360 degrees.

[0047] Tilt mechanism 14 allows the upper apparatus to be tilted from side to side with respect to the lower support member 12 by actuation of lever 20. The upper apparatus can also be tilted forwards and backwards with respect to the lower support member 12 by actuation of lever 22. This adjustment allows the user to change the emphasis of exercise between the torso/midsection and upper arm muscles, and the lower body muscles.

[0048] With reference to Figures 6-7, further detail is shown of the crank arm 6 in this second embodiment. The arm is provided to be rotated through 360 degrees by the application of a turning force by the user via the handle which they grip. The handle 4 is mounted on a slider 26 which is slideably mounted on a track 30 on the crank arm 6. The slider 26 can in the preferred embodiment slide along the track 30 over a predetermined length but movement sideways is restricted. Movement along the track 30 is restricted by shock absorbers 28 at the end of the track 30 which reduce potential impact damage if the slider 26 comes into contact with the end of the track 30. There is also shown in Figure 7 the provision of a damping means, in this case in the form of a piston 27 which allows the regulated sliding movement

of the handle along the track. For alternative use the slider 26 and or track includes engagement means such as a number of holes 32 for fixing the handle and slider 26 in a particular position with respect to the track and hence arm by interengagement with a pin 34 passing through complementary holes 36 to allow the user to position and retain the handle with respect to the track during use as required. Although the arm is provided to be rotated through a complete revolution it should be appreciated that for certain muscular exercises only part of the revolution needs to be performed and/or forward and reverse movement is utilised.

[0049] Typically, the handle 4 in this second embodiment is free to slide up and down the track 30 when the apparatus 2 is being used whereas in the first embodiment the position of the handle on the arm is fixed.

[0050] With reference to Figures 8-11, further detail is shown of the handle 4. The handle 4 includes a bar portion 40 which is rotatably mounted on the end of the handle body 42 about axis 61. This rotation allows the bar portion which is gripped in use, to be properly oriented with respect to the user as the user rotates the arm. In one embodiment grip portions 38 are rotateably mounted on the ends of the bar portion 40, provided for rotational movement around the lengthwise axis 63 of the bar portion 40 as indicated by Figure 11.

[0051] With reference to Figures 12-15, detail is shown of an alternative handle 44, which includes a bar portion 46 pivotally mounted on the handle body 48 by pivot point 52, allowing movement around the lengthwise axis substantially parallel to the bar portion as indicated by Figure 15. Grip portions 50 are rotateably mounted on the ends of bar portion 40, allowing movement around the lengthwise axis of each grip portion 50, typically perpendicular to the lengthwise axis of the bar portion 46.

[0052] It will be appreciated by persons skilled in the art that the present invention also includes further additional modifications made to the device which does not effect the overall functioning of the device, such as the provision of decoration, a fabric or plastic covering to provide improved aesthetic appearance, and/or the like.

Claims

1. Fitness apparatus including a support frame, a member mounted on the frame for rotation about a first axis, a handle mounted on said member, at a location spaced from said first axis, for gripping by the hand or hands of a user to exert a force to rotate said member about said first axis, said handle rotatably mounted with respect to said member at least about a second axis parallel to the first axis, and wherein the distance between said first axis and said second axis can change during the rotation of the member.

2. Apparatus according to claim 1 wherein the handle is rotated through at least part of a revolution during the application of force by the user to move the member.

3. Apparatus according to claim 1 wherein the member and handle are capable of being moved through a complete revolution and repeated revolutions in use to provide the desired exercise.

4. Apparatus according to claim 1 wherein adjustment means are provided such that the range of distance change between the axis of rotation of the member and the handle can be adjusted.

5. Apparatus according to claim 1 wherein the member is an arm formed of two portions, a first portion rotationally mounted on the first axis and the second portion pivotally mounted on the first portion and including the handle thereon.

6. Apparatus according to claim 5 wherein the second portion is mounted on an end of the first portion at a location intermediate the ends of the second portion.

7. Apparatus according to claim 5 wherein the first portion is mounted on the frame of the apparatus at a location intermediate the ends of the first portion.

8. Apparatus according to claim 5 wherein in one revolution, the second portion of the arm pivots from a position where it is extended from the first portion at an obtuse angle, through to a position where the two portions are at an acute angle.

9. Apparatus according to claim 5 wherein the first and second portions are retained in a particular angular orientation which acts as the default position by a resilient means.

10. Apparatus according to claim 9 wherein the strength of the resilient means can be adjusted so as to provide particular resistance to the user.

11. Apparatus according to claim 5 wherein during use the angular orientation of the portions change as the rotation of the arm is caused by the user.

12. Apparatus according to claim 5 wherein the second portion can be locked by locking means at a particular angle with respect to the first portion as required by the user.

13. Apparatus according to claim 1 wherein the handle includes a body portion in contact with said member and a bar portion rotatably mounted on said body portion such that the bar portion is rotatable about

an axis of said body portion.

14. Apparatus according to claim 13 wherein the axis of rotation between the body portion and the member is perpendicular to the axis of rotation between the body portion and the bar portion.

15. Apparatus according to claim 13 wherein at least one grip portion is rotatably mounted on the bar portion, such that the grip portion rotates around an axis.

16. Apparatus according to claim 1 wherein the member includes a counterbalance.

17. Apparatus according to claim 16 wherein the counterbalance is provided at the opposite end of the member to the handle.

18. Apparatus according to claim 1 wherein the member is an arm and includes a track on which the handle is slidably mounted, either directly or via an intermediate slider mounting.

19. Apparatus according to claim 18 wherein the handle is free to move along a predetermined length of the arm and in use as the user rotates the arm by gripping the handle and/or grip portions the arc shape defined by the handle can vary in shape and size, as the handle aligns itself along the arm member to the correct position in relation to the height and reach of the user at each instant of the revolution.

20. Apparatus according to claim 18 wherein the track and/or handle includes damping means to control the movement of the handle along the track.

21. Apparatus according to claim 18 wherein the track portion includes shock absorbers at either end.

22. Apparatus according to claim 18 wherein the slider and/or handle includes holes along the same for interengagement with engagement means to allow the user to adjust the handle portion position with respect to the arm.

23. Apparatus according to claim 1 wherein the frame includes an upper portion and a lower portion.

24. Apparatus according to claim 1 wherein rotation of the member is acted against by inter-engagement with a resistance mechanism.

25. Apparatus according to claim 24 wherein the resistance mechanism is at least partially covered by a drum or other housing.

26. Apparatus according to claim 24 wherein the resist-

ance mechanism can include any or any combination of friction based pads, eddy current magnetic brake, flywheel counterbalance.

27. Apparatus according to claim 23 wherein the upper portion of the support member is connected to the lower portion via a tilt mechanism, which allows the upper portion to be tilted away from the lower portion.

28. Apparatus according to claim 27 wherein the tilt mechanism is controlled by at least two adjustment means; one for forwards-backwards tilting, the other for left-right tilting.

29. Apparatus according to claim 28 wherein the apparatus includes a base member, upon which a user may stand when using the apparatus, thereby further lowering the centre of gravity of the apparatus.

30. Fitness apparatus including a support frame, a member mounted on the frame for rotation about a first axis, a handle mounted on said member, at a location spaced from said first axis, for gripping by the hand or hands of a user to exert a force to rotate said member about said first axis, said handle mounted with respect to said member at a spaced location from the first axis, and wherein the member is formed of two portions, a first portion rotationally mounted on the first axis and the second portion pivotally mounted on the first portion and including the handle thereon.

31. Apparatus according to claim 30 wherein the distance between said first axis and the handle changes during the rotation of the member.

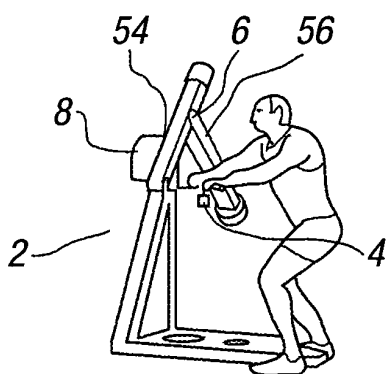


FIG. 1a

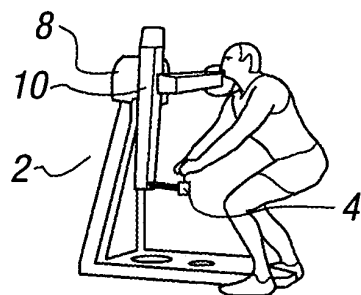


FIG. 1b

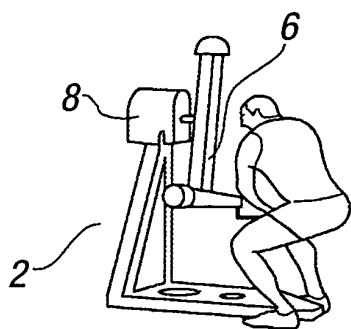


FIG. 1c

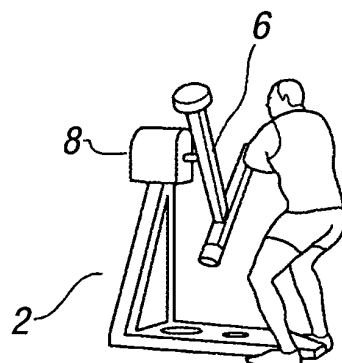


FIG. 1d

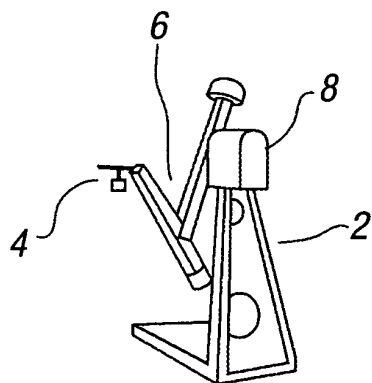


FIG. 1e

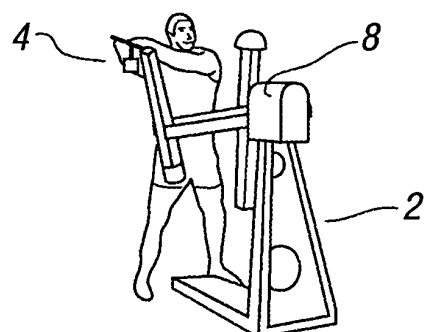


FIG. 1f

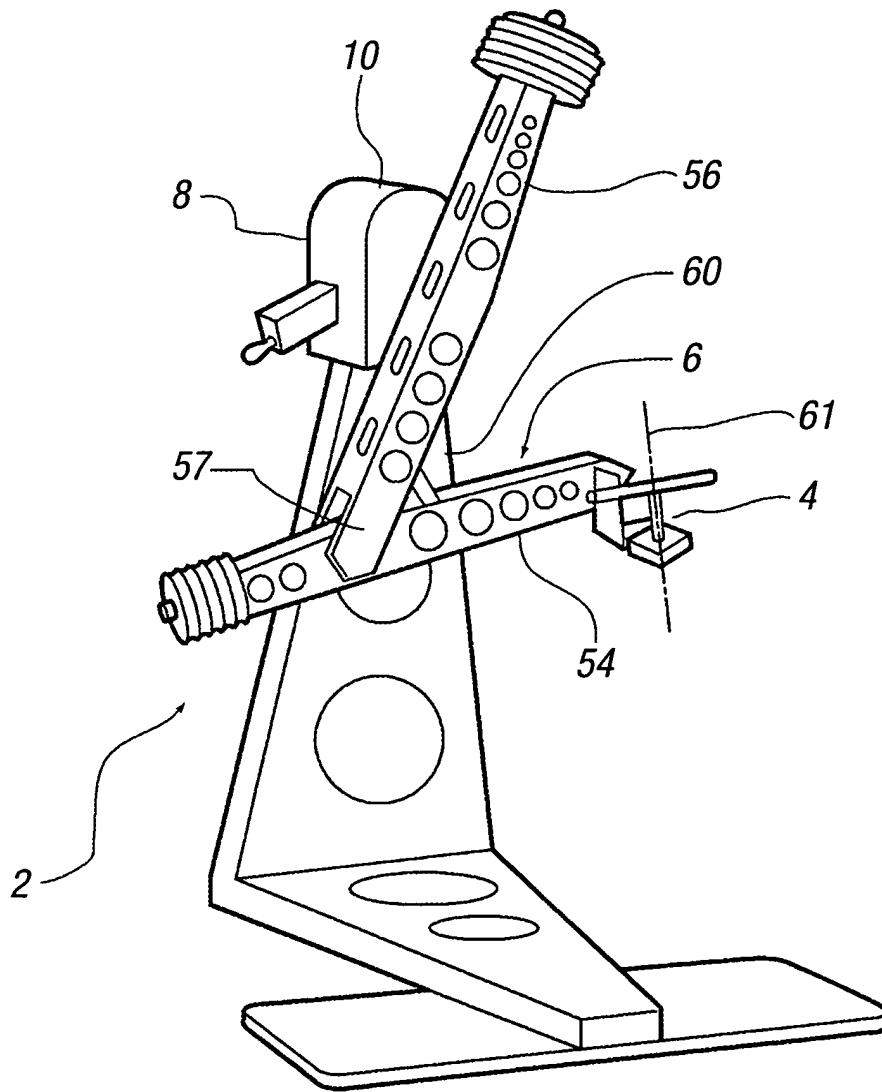
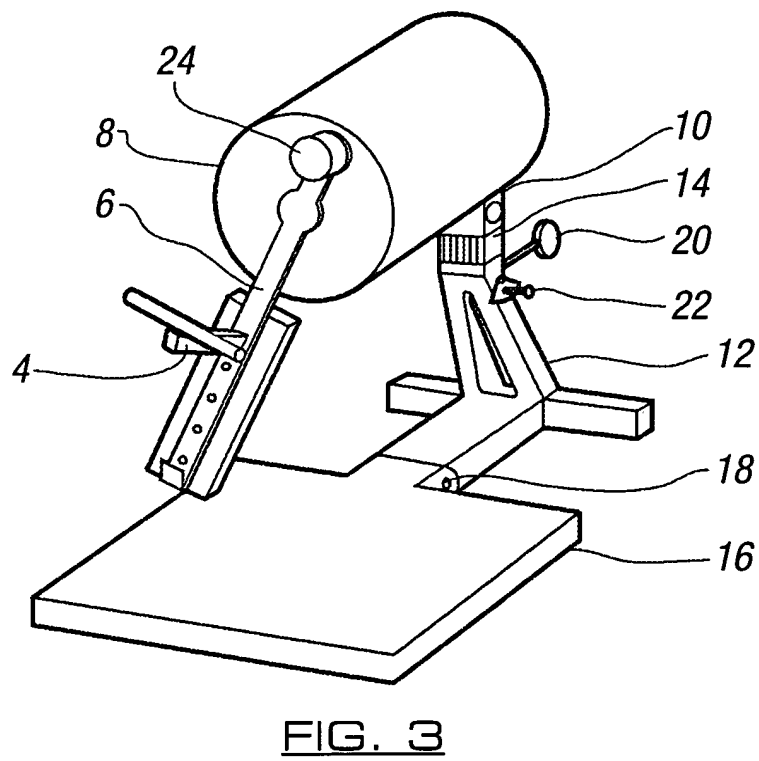
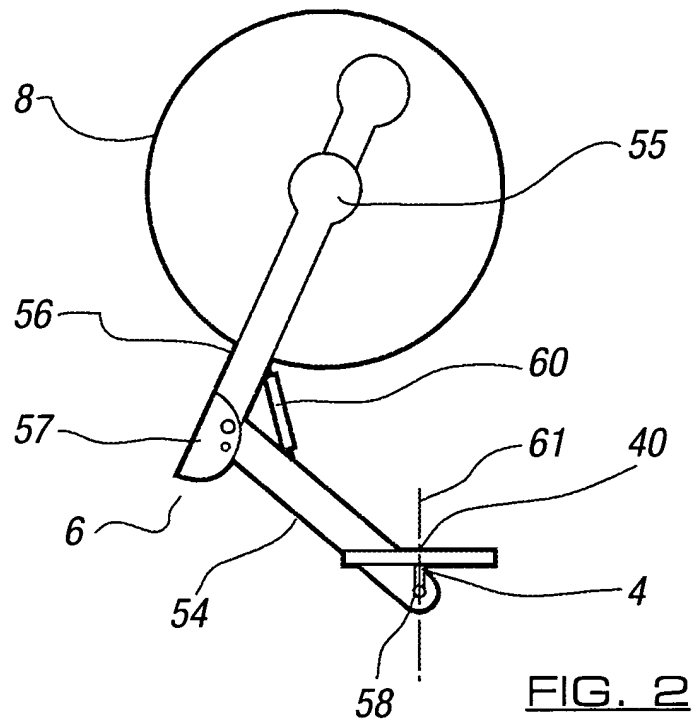


FIG. 1g



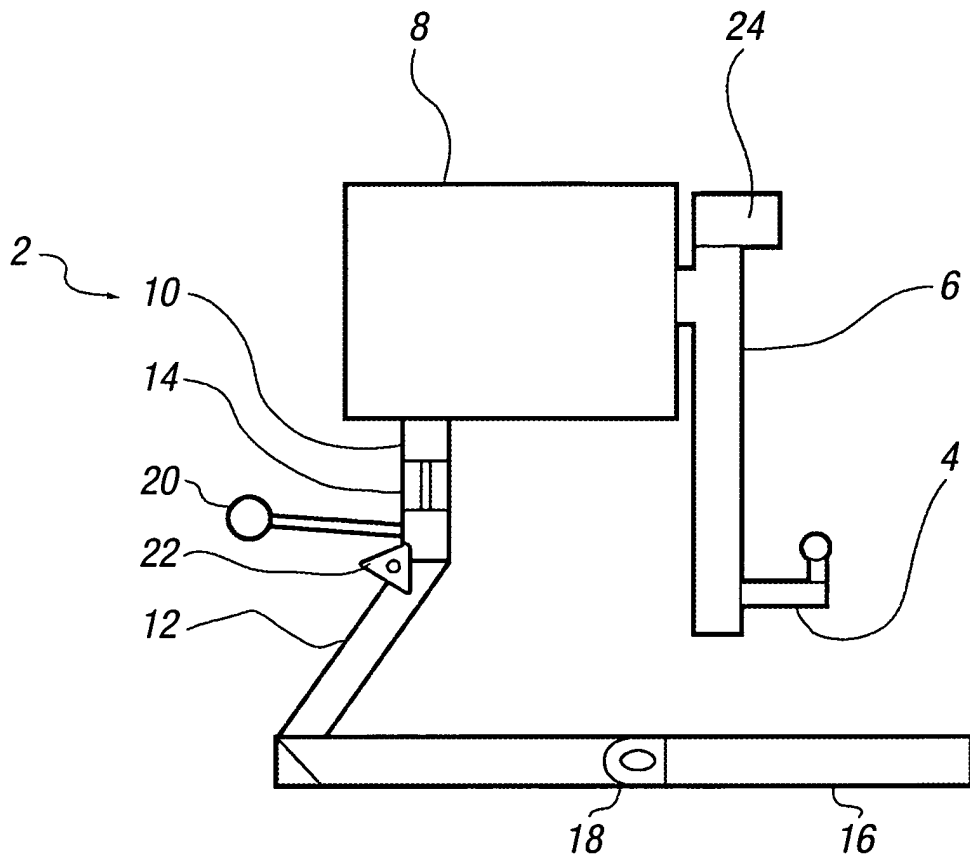


FIG. 4

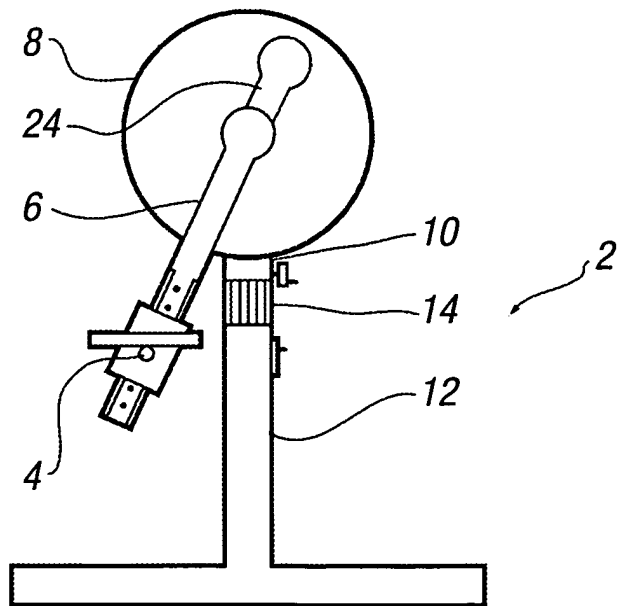


FIG. 5

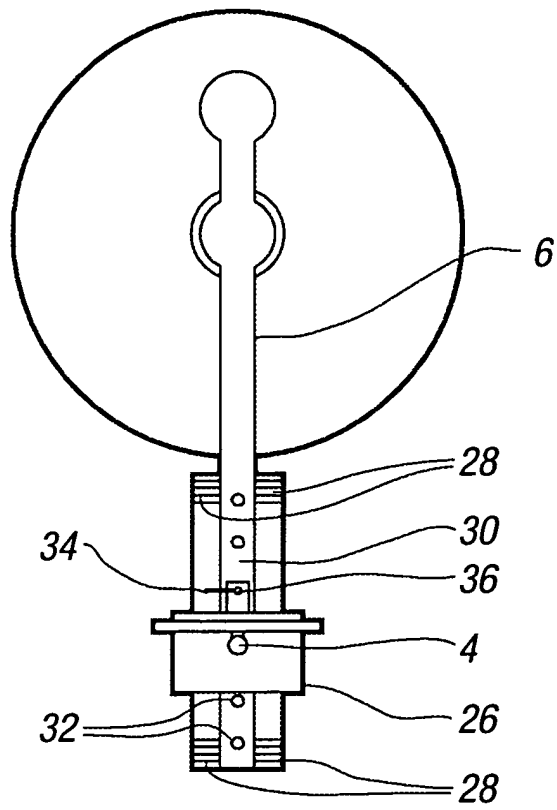


FIG. 6

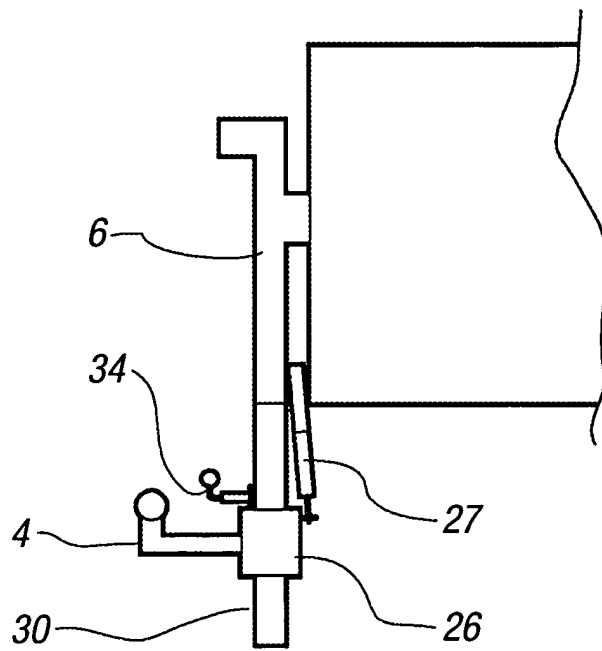


FIG. 7

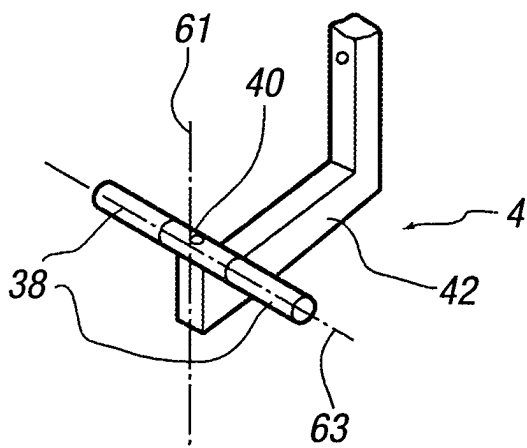


FIG. 8

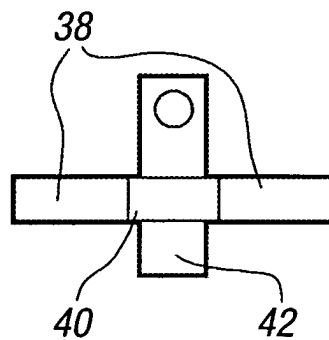


FIG. 9

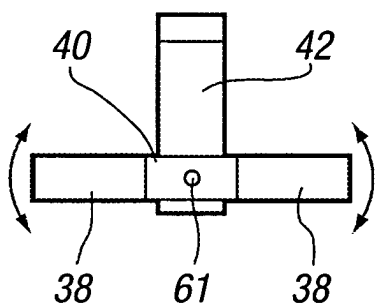


FIG. 10

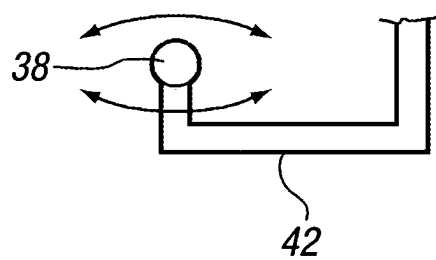


FIG. 11

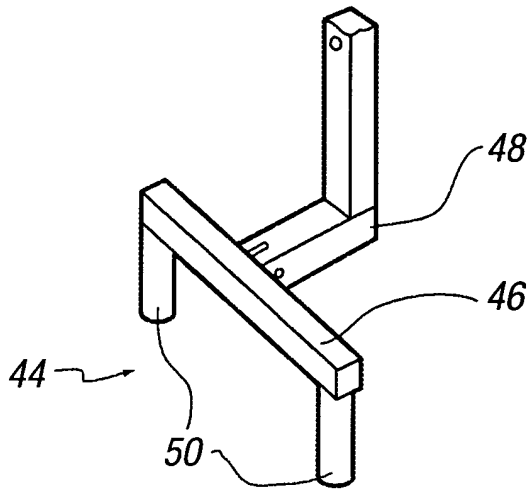


FIG. 12

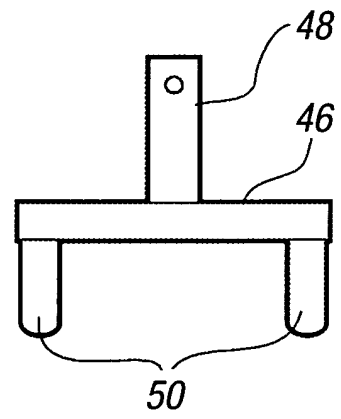


FIG. 13

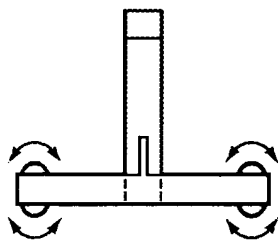


FIG. 14

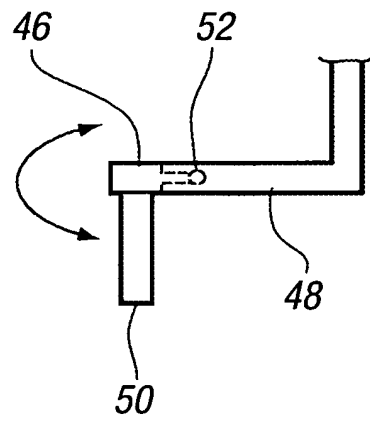


FIG. 15