

[54] **APPARATUS FOR PASSIVELY EXERCISING A PERSON'S ABDOMINAL MUSCLES**

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[56] **References Cited**

UNITED STATES PATENTS

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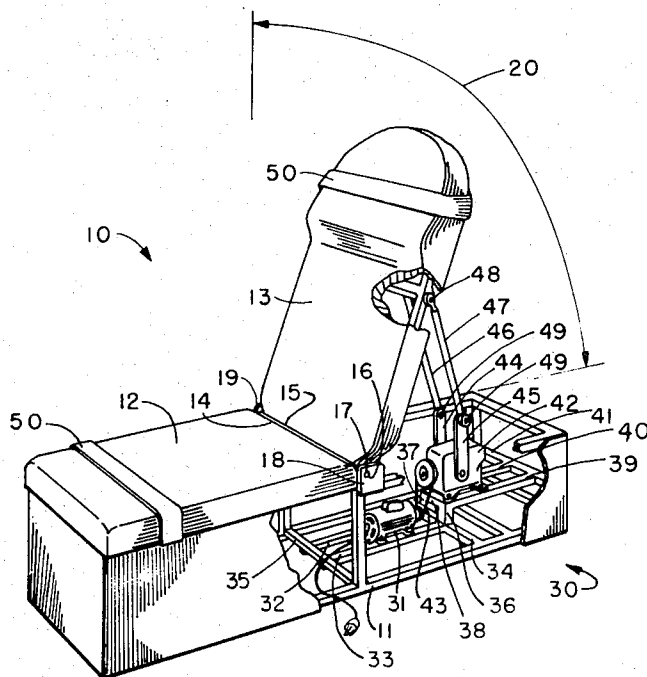
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[57] **ABSTRACT**

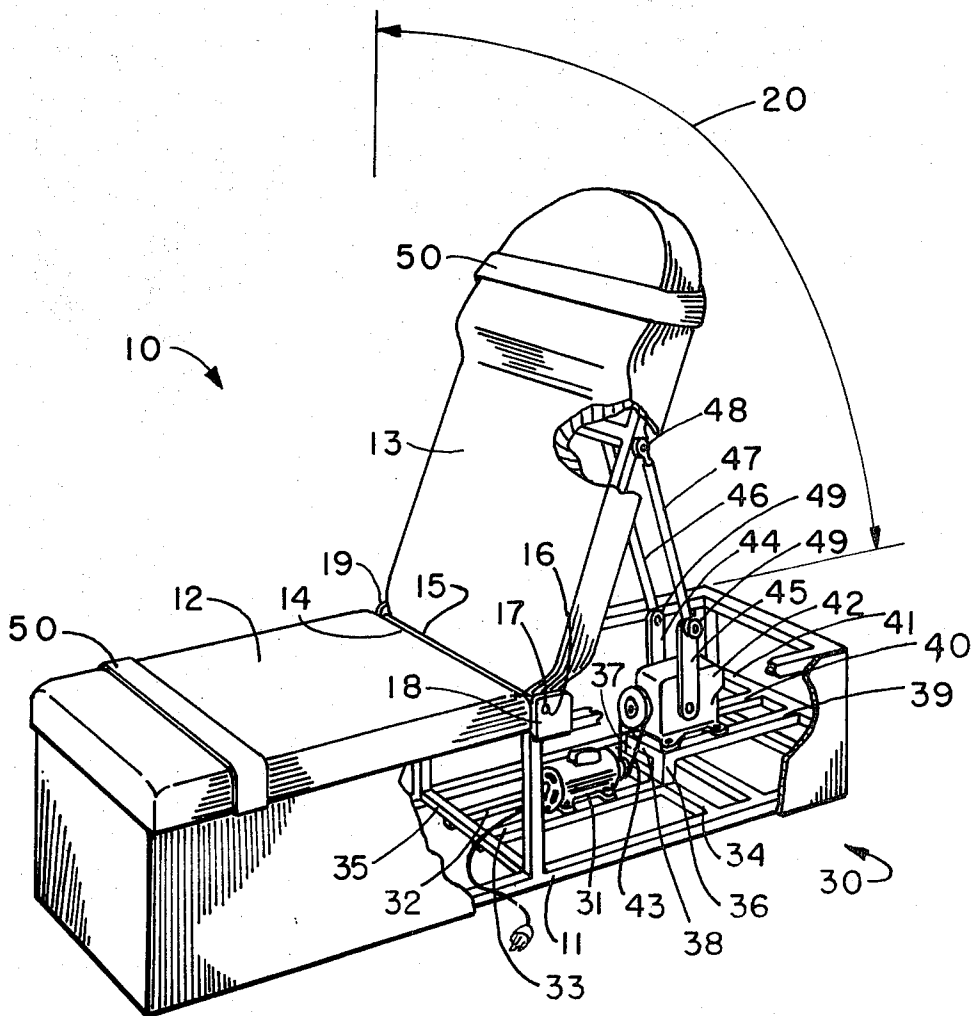
Apparatus for passively exercising a person's abdominal muscles including a stationary table and a reciprocating table, upon which the person to be exercised is disposed with a portion of his body on each table. The reciprocating table is then moved upward and downward to effectuate a 90° movement of the person to be exercised, from a prone position to a sitting position. The reciprocating table may be moved by an oscillating mechanism which includes a motor which drives a gear box, turning arms appropriately connected to the reciprocating table to change the rotary output from the gear box to reciprocate the table between the 0° and 90° positions.

5 Claims, 1 Drawing Figure



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APPARATUS FOR PASSIVELY EXERCISING A PERSON'S ABDOMINAL MUSCLES

BACKGROUND OF THE INVENTION

Many persons, especially overweight persons and those who have been sick or disabled for extended times, have extremely weak muscles. Often, these muscles may be so weak, in fact, that it is impossible for the person to do even the exercises designed to strengthen such muscles, such as "sit-ups," "leg-ups," or the like, for example, to strengthen abdominal muscles. It has been found that one way of strengthening such overly weak muscles is to cause them to be moved by mechanical or other externally applied force to simulate that movement encountered in the appropriate strengthening exercise. Thus, the muscles thereby become toned to a sufficient degree as to then allow the person to engage in the proper strengthening exercise. Such so-called "passive" exercise is, of course, really a preliminary or toning measure to allow the person to subsequently engage in the more vigorous strengthening exercises.

DESCRIPTION OF THE PRIOR ART

Many passive exercising devices have been proposed, some particularly directed to exercise the muscles of the stomach or abdominal body regions. As appears more fully below, one of the main purposes of the exercising apparatus of the invention is to cause the muscles of the abdominal body region which may not be strong enough for even the exercises such as "sit-ups" or "leg-ups" to be passively exercised to subsequently enable the person to himself perform exercises to strengthen those muscles. Although many exercising devices proposed heretofore include one or more platforms or tables upon which a person may lie and which may be movable with respect to each other to exercise those muscles, most of the devices advanced include weights, springs, or other biasing means against which the person must actively work or exercise. Such devices, of course, are unsuitable to achieve the above-mentioned purpose of providing movement or passive exercise for muscles otherwise too weak to lift a portion of the person's body, even without extra resistance provided by weights or springs.

One attempt to provide a passive exercise apparatus directed to such abdominal muscles is presented by Ragon, et al., U.S. Pat. 3,450,132, who disclose an exercising apparatus, which, among other things, includes a first table hinged at one end and which is oscillatable between various angles with respect to a second stationary table. A person who is to be passively exercised is positioned on the table with his back on the oscillating table and his legs and buttocks on the stationary table. The oscillating table is then caused to be moved upwards from a horizontal position, to an angle of, perhaps, about 15°, thereby moving the person's torso with respect to his legs, which may remain still on the stationary table. Although the Ragon, et al. apparatus passively exercises the person's abdominal muscles to a limited extent, the small amount of vertical movement appears to be insufficient for maximum effective exercise of those muscles.

BRIEF DESCRIPTION OF THE INVENTION

In light of the above, it is an object of the invention to provide an exercising apparatus to passively exercise the user's abdominal body region muscles to strengthen and tone them, with little or no effort by the user.

It is a further object of the invention to provide passive exercising apparatus which moves the user's torso from an angle of about 0° to an angle of about 90° with respect to his legs, or from a prone to a sitting position.

In accordance with the invention, an apparatus is presented for passively exercising the user's abdominal muscles. The apparatus includes a first horizontal stationary table which is carried by a frame. A second table is provided which pivots axially about an end of the first table upon the frame to be movable between substantially horizontal and vertical positions.

Additionally, an oscillating means is connected between the second table and the frame for reciprocating the second table between the substantially horizontal and vertical positions to passively exercise the user's abdominal muscles by causing the user to alternately be moved between the prone and sitting positions.

BRIEF DESCRIPTION OF THE DRAWING

The invention is illustrated in the sole accompanying drawing which shows a perspective view partially cut away of the exercising device in accordance with a preferred embodiment of the invention. Various parts and elements of the exercising device illustrated have been distorted or exaggerated for clarity of illustration and ease of description.

DETAILED DESCRIPTION OF THE INVENTION

A preferred embodiment of the exercising apparatus of the invention, denoted generally by the reference numeral 10, is shown in the accompanying drawing. The apparatus is fabricated upon a frame 11, which may be of channel or angle iron or other rigid material. The various members of the frame 11 may be configured in any of a variety of supportive structures, the particular structure not being material to the invention; since, however, a motor mechanism 30, described below in detail, is included as a part of the invention, it is preferred that the frame 11 present an overall box structure upon which the two table portions 12 and 13 may be constructed and in which the motor mechanism 30 may be contained.

A first platform or table 12 is horizontally disposed on a portion of the frame 11. The table 12 is stationary in the operation of the apparatus, and may, therefore, be rigidly affixed to the frame 11 by bolts, screws, or the like (not shown). The particular dimensions of the table 12 are not critical, but should be sufficient to support the portion of the user's body disposed thereon.

A second platform or table 13 is mounted at one of its ends 15 to frame 11 near an end 14 of the stationary table 12 to be axially rotatable about that end. This may be achieved, for example, by hinges or the like, or as shown, by pins 16 which may be journaled in corresponding bearing holes 17 in plates 18 and 19 welded to the frame 11. As shown by the arrow 20, by virtue of the rotating arrangement, table 13 is movable between a horizontal position, corresponding to a prone position of the user, above and parallel to the frame 11, and a vertical position, corresponding to a sitting position of the user, perpendicular to the frame 11. The tables 12 and 13 may be upholstered as shown with a soft material, if desired, to be more comfortable in use.

Interconnecting the frame 11 and the second table 13 is a moving or oscillating means 30 for reciprocating the second table 13 between the horizontal and vertical positions. The oscillating means 30 may include an electric motor 31, the speed of which may be controlled by a variable resistor or other means (not shown) to provide a controllable rotational torque. The motor 31 may be mounted upon brace members 32 and 33 of the frame 11, which may be conveniently of the same material as the frame 11, and may be welded or otherwise rigidly affixed at each end to supporting cross members 34 and 35 which, in turn, are rigidly affixed to the frame 11. Another frame constructed on cross member 34 includes upright braces 36 and 37 and horizontal braces 38, 39, 40, and 41, to carry a gear box 42. The gear box 42 functions to appropriately change the speed and direction of the rotational torque of the motor 31 to be applied to the table 13. The output torque from the motor 31 may be conveniently directly coupled into the gear box 42, or, as shown, may be transmitted from the motor 31 to gear box 42 by a rubber belt 43.

To apply the output torque from the motor 31 to the table 13, rotating arms 44 and 45 are provided and affixed to the gear box 42 in a manner such as to rotate in a plane parallel to the direction of rotation of the table. Rotatably connected to each of the rotating arms 44 and 45 are push arms 46 and 47,

respectively, which, in turn, are rotatably connected to a back portion of the table 13. The rotational connections, such as the interconnections of arms 46 and 47 with the table 13 and with the respective rotating rods 44 and 45 may be achieved, for example, by pins or bolts or the like, such as pin 48 at the connection of arm 47 and table 13 and pins 49 at the junction between arms 45 and 47 and arms 44 and 46. Thus, as the rotating arms 44 and 45 are rotated by the gear box 42, the push arms 46 and 47 are alternately pushed upward and pulled downward, along an arc about the axis of rotation of table 13. The table 13, thus, is reciprocated between the limits of travel of the attached end of push arms 46 and 47, which, to achieve maximum exercise of the user, may correspond to the natural sitting and prone positions of the user.

An alternative oscillating means, not shown, may include a plurality of pulleys driven by belts, chains, or the like connected ultimately to the motor. In such instances, the speed reduction of the motor may be achieved by interconnecting a series of one or more pulleys, each having a large and small pulley on a single axle, small pulley to large pulley, thereby achieving a lower rotational frequency to drive the reciprocated table. In such instance, additionally, the axles of the pulleys may be journaled directly into receiving bearings mounted on the frame, and the rotating arms affixed to the axle of the last pulley in the series.

In operation, the user is positioned on the apparatus 10 heading in either direction, that is, with his feet and legs upon the stationary table 12 or upon the movable table 13. The oscillating means 30 is actuated, by starting motor 31. The rotational torque created by the motor 31 is transmitted by the belt 43 to the gear box 42 which rotates arms 44 and 45, in turn, pushing and pulling as they rotate upon arms 46 and 47. The arms 46 and 47, then, raise and lower table 13 between the vertical and horizontal positions indicated by arrow 20.

To ease the person in utilizing the apparatus 10, straps 50 and 51 may be provided under which the person may hook his arms or legs.

In constructions in which the gear box and other components of the apparatus 10 do not provide adequate upward support upon the table 13 as it is moved from the vertical to horizontal positions, resulting in the table 13 falling, a dashpot or other mechanical shock absorber (not shown) may be provided between the frame 11 and table 13 for the required support during that downward cycle of the table 13 to eliminate this potential hazard.

Although the invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. An apparatus for passively exercising a person's abdominal muscles comprising,
 - a frame, first and second tables carried by said frame, said first table being stationary and disposed horizontally, said second table rotatable about an axis along one of its ends near an end of said first table and being movable between substantially horizontal and vertical positions, and means interconnecting said frame and said second table for reciprocating said second table between the substantially horizontal and vertical positions.
2. The apparatus of claim 1 wherein said means for reciprocating said second table comprises,
 - a motor mounted on said frame to provide a rotational torque, means connected to said motor for reducing the speed of its rotational torque and means interconnecting said second table and said converter for reciprocating said second table between the horizontal and vertical positions.
3. The apparatus of claim 2 wherein said means for reciprocating said second table comprises,
 - an axle carried upon said frame and rotated by said motor, at least two arms, one of the said at least two arms being affixed at one of its ends to said axle and rotated thereby, and being rotatably connected at its other end to one end of another of said at least two arms, and said other of said at least two arms being rotatably connected at its other end to said second table, whereby said second table is reciprocated between the substantially vertical and horizontal positions.
4. The apparatus of claim 3 further comprising,
 - a dashpot interconnecting said frame and said second table to support said table when it is reciprocated between its vertical and horizontal positions.
5. The apparatus of claim 3 wherein said converter comprises a gearbox which carries and rotates said axle.

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