ISOMETRIC EXERCISER HAVING INITIALLY-OPERATIVE RESILIENT RESISTANCE

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8 Claims

ABSTRACT OF THE DISCLOSURE

An exercising device for use in isometric exercises in which a pair of spaced apart bars are connected by a device that expands under the pulling force of a user a slight amount against a resilient member and then contacts a positive stop structure, allowing the user to be aware that he has exerted sufficient force on the device to move the bars against the force of the resilient member and thus consciously perform isometric exercises when the connecting device is in the stop condition.

BACKGROUND OF THE INVENTION

Various systems and devices have been developed for performing isometric exercises. These systems and devices require the user to strain his muscles either against another of his muscles or against an immovable object for a short duration of time. Thus the user is able to experience large muscle strain at a constant muscle length. This has resulted in the fiber links of the muscles remaining constant or in isometric contraction, which has been found to be capable of improving muscular development and tone. However, it has been found that with many persons the extraordinary results obtained from isometric exercising does not continue. Rather, the benefits tend to taper off to a point of being unsatisfactory. Thus in spite of the large gains in increased muscle strength and development obtained through this relatively non-violent muscular contraction of isometric exercising, this form of exercising still fails to give satisfactory results to a large number of persons over any extended period of time in performing the exercises.

It is believed that this failure to produce continued results from isometric exercises occurs because of the adaptability of the human system to adapt to this type of exercise. The coordinated brain control of the muscle is such that the conscious of subconscious mental processes soon learn that no matter how much strain the muscle exerts in either pulling or pushing against the immovable object, the object will not move. Thus after performing isometric exercises for a period of time, many persons are unable to consciously, continuously control their muscles to such an extent required to exert maximum strain against the immovable object for the approximately six seconds that is required to produce satisfactory results from the isometric contractions. The brain control consciously or subconsciously recognizes the futility of having the muscle strain to move an immovable object and causes what amounts to an involuntary release of the maximum strain by the muscles.

Therefore, it is an object of this invention to provide a novel and improved exercising device for use in isometric exercising.

It is another object of this invention to provide a novel and improved exercising device that indicates when at least a given force or strain is applied to the exercising device during isometric exercises.

It is still another object of this invention to provide a novel and improved exercising device that indicates when at least a given selective force or strain is applied to the exercising device during isometric exercises.
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30. Movable arm, or member 28, is also pivotally connected to member 24 at the end of the leg 37 by strap 41 through the pin bearing 29. It may be observed that considering the longitudinal axis of straps 10 and 12 as a center line of pull, the pivotal connection 30 on member 28 lies closer to the center line of the two members 22 and 24 than does pivotal connection 32. Thus counter-clockwise rotational movement of member 22 and clockwise rotational movement of member 24 around pivot point 26 will cause a clockwise movement of the end 40 of floating member 28. Leg 31 of member 24 has two shoulder portions 42 and 43 that bracket end 40 of member 28. These shoulders, 42 and 43, limit the pivotal movement of the end 40 around connection 32 and thereby limit the amount of opposite rotational movement of the right sides of members 22 and 24 around pivot point 26.

A spring, 20, that in this embodiment is a tension spring, see FIGURE 2, is held in position by rod members 21 and 34. These rod members are inserted respectively through apertures 19 in the sides of members 24 and 28 to the position shown. As can be seen, the tension spring, 20, opposes clockwise movement of the end 40 around pivot point 32. Thus spring 20 resistently biases members 22 and 24 toward each other around pivot point 26 and arm 25 acts as a fulcrum. The spring, 20, has a given tension that establishes the amount of force required to move members 22 and 24 in a direction away from each other and to force end 40 of member 28 into contact with shoulder 42. The magnitude of this force may be easily determined through measurement of the force required to force end 40 into contact with shoulder 42 for any given position of spring 20. Spring 20 may be moved right or left along the length of rods 21 and 34. This causes an increase or decrease in the amount of force or strain required to move the end 40 from shoulder 43 into contact with shoulder 42, because the tension of the spring 20 is moved along the fulcrum of arm 28 either toward or away from point 32. Bars 21 and 34 have indicia 55 thereon for calibrating and then selective-ly setting the exact force or strain required to operate the mechanism. A metallic spring, member 54, is fixed to shoulder 42 and constitutes a well-known "cricket" that will make a noise when end 40 is rotated. This noise is an audible indication, in addition to the physical one, that a force or strain has been placed on the device, 15, sufficient to cause its operation.

The opposite ends of members 22 and 24 have aligned apertures 16 and 18, 23 and 25, 17 and 39 for receiving connecting members 10 and 12 that either hook into or pass through a pair of the apertures to connect bar members 9 and 11. The particular pair of apertures used determines the range of forces that will be required to rotate end 40 as previously described. When the straps are connected to the pair of apertures 17 and 39, then a low range of force through spring 20 is required. On the other hand, when the strap is connected through apertures 16 and 18, then a high range of force is required. Apertures 23 and 25 are used for the mid-range force connections.

To permit another method of operation, there is mounted in the sides of members 22 and 24 rods 58 and 64. These rods, 58 and 64, are capable of being moved in recesses 60 and 66 by projections 62 and 68. Projections 62 and 68 also provide a limit to the extension of members 58 and 64. The purpose of the members 58 and 64 will be described hereinafter.

OPERATION

In operation a user, 13, places bar 11 under his feet and the same bar, 9, in his hands and raises bar 9 to a point of immovable tension. If the indicating device, 15, were not positioned between straps 10 and 12, then the user, 13, would have the known prior art device for doing isometric exercises. As previously described, after a period of use of the prior art device, the user, 13, becomes accustomed to the fact that bar 9 cannot be lifted and his muscles will involuntarily refuse to exert the strain required for isometric contractions.

Now assuming the ends of straps 10 and 12 are connected to apertures 17 and 39, then when the force or strain exerted by the user, 13, on bar 9 is sufficient to overcome the spring tension, 20, the end, 40, of member 28 is rotated on pivot points 30 and 32 to a point of contacting cricket 54. In response, cricket 54 makes the well-known noise indicating to the user, 13, that his force or strain has operated the mechanism and his muscles are in a condition of isometric contraction. Should user, 13, involuntarily relax his muscles, then end 40 of member 28 would rotate in a counter-clockwise direction releasing cricket 54 which would again give off the well-known noise. Of course, it is understood that while cricket 54 is a part of the invention, it is not absolutely required since the user, 13, can always observe the movement of the member 40. It should be recognized though that in normal construction end 40 may move only about one quarter of an inch and the total extended movement across device 15 will only be about one tenth of an inch.

Should the positioning of spring 20 not create a tension closely approaching the limit of the user's strength and that is close to the point of muscular isometric contractions, then spring 20 may be adjustably positioned along rods 21 and 34 to a point where such tension does exist.

This established tension may be then read on indici 55 and recorded for later settings and appropriate increases upon the increasing strength of the user, 13. As previously described, the ends of straps 10 and 12 may be connected to given pairs of apertures 16 and 18, 23 and 25, and 17 and 39 as desired to obtain the desired range of tensions to be created by spring 20.

As an alternative use, rods 58 and 64 may be extended by extensions 62 and 68 and grasped by the user's hands. The rods are then either pulled apart or pushed together creating the appropriate strain on spring 20 and placing the user's muscles in isometric contraction. It can be recognized that spring 20 can either be a tension spring or, with an appropriate aligning means such as a rod on which the convolutions of the spring are wound and it can be a compression spring.

As a further alternative use, it should be recognized that either side 20 or 24 can be rigidly secured to a wall member or the like and bar member 9 pulled or pushed by the user, 13, from any of several positions to accomplish the isometric exercises.

While I have illustrated and described the preferred embodiments of my invention, it will be understood that changes in construction in detail might be made without departing from the principle of the invention and I desire to be limited only by the state of the prior art and the appending claims.

I claim:

1. An exercising device for use in isometric exercises comprising:
   a pair of bars being connected for use in isometric exercises,
   means for connecting said pair of bars and establishing a center line of pull in said isometric exercises, indicating means connected in said means for indicating when a given force has been applied to said bars, said indicating means having first and second opposing members that are pivotally connected by a first connection at one side of adjacently positioned ends, said other side of said adjacently positioned ends being spaced apart and having an arm with one of its ends pivotally connected therewith by a second connection, said arm having its other end substantially directed toward said first connection, resilient bias means connected between said arm and said second opposing member,
said second connection including a first pivotal attachment between said arm and said first member and a second pivotal attachment between said arm and said second member,
said second pivotal attachment being a greater distance from said center line of pull than said first pivotal attachment causing said other end of said arm to function as a fulcrum,
said second member having a pair of opposing shoulder means that bracket in spaced relation said other end of said arm for restraining movement of said arm beyond a given amount,
and said resilient means being capable of being moved along the length of said arm for varying the force required to pivot said arm.

2. An exercising device for use in isometric exercises comprising:
a pair of bars being connected for use in isometric exercises,
measures for connecting said pair of bars and establishing a center line of pull in said isometric exercises,
indicating means connected to said bars for indicating when a given force has been applied to said bars,
said indicating means having first and second opposing members that are pivotally connected by a first connection at one side of adjacent positioned ends, said other side of said adjacent positioned ends being spaced apart and having an arm with one of its ends pivotally connected therebetween by a second connection,
said arm having its other end substantially directed toward said first connection, resilient bias means connected between said arm and said second member,
said second member having a pair of opposing shoulder means that bracket in spaced relation said other end of said arm for restraining movement of said arm beyond a given amount,
and indicia means for indicating the magnitude of said force.

3. An exercising device for use in isometric exercises comprising:
a pair of bars being connected for use in isometric exercises,
indicating means connecting said bars together for indicating when a given force has been applied to said bars,
said indicating means having first and second opposing members that are pivotally connected by a first connection at one side of adjacent positioned ends, said other side of said adjacent positioned ends being spaced apart and having an arm with one of its ends pivotally connected therebetween by a second connection,
said arm having its other end substantially directed toward said first connection, resilient bias means connected between said arm and said second member,
said second member having a pair of opposing shoulder means that bracket in spaced relation said other end of said arm for restraining movement of said arm beyond a given amount,
and indicia means for indicating the magnitude of said force.

4. An exercising device for use in isometric exercises comprising:
a pair of bars being connected for use in isometric exercises,
indicating means connecting said bars together for indicating when a given force has been applied to said bars,
said indicating means having first and second opposing members that are pivotally connected by a first connection at one side of adjacent positioned ends, said other side of said adjacent positioned ends being spaced apart and having an arm with one of its ends pivotally connected therebetween by a second connection,
said arm having its other end substantially directed toward said first connection, resilient bias means connected between said arm and said second member,
said second member having a pair of opposing shoulder means that bracket in spaced relation said other end of said arm for restraining movement of said arm beyond a given amount,
and indicia means for indicating the magnitude of said force.

5. An exercising device for use in isometric exercises comprising:
a pair of bars being connected for use in isometric exercises,
measures for connecting said pair of bars and establishing a center line of pull in said isometric exercises,
indicating means connected to said bars for indicating when a given force has been applied to said bars,
said indicating means having first and second opposing members that are pivotally connected by a first connection at one side of adjacent positioned ends, said other side of said adjacent positioned ends being spaced apart and having an arm with one of its ends pivotally connected therebetween by a second connection,
said arm having its other end substantially directed toward said first connection, resilient bias means connected between said arm and said second member,
said second member having a pair of opposing shoulder means that bracket in spaced relation said other end of said arm for restraining movement of said arm beyond a given amount,
and indicia means for indicating the magnitude of said force.
7. An exercising device for use in isometric exercises comprising,

a pair of spaced apart rigid elements for being moved in opposite directions,
first and second opposing members pivotally connected at one of their adjacent ends,
said first opposing member being connected to one of said rigid elements and said second opposing member being connected to the second of said rigid elements,
resilient means interconnecting said first and second opposing members at a point displaced from said pivotal connection for expanding only upon a force being applied to said rigid elements in a direction to move said rigid elements in said opposite directions,

stop means for positively stopping the movement of said rigid elements in opposite directions against said resilient means after said rigid elements have moved a given short distance,
non-extensible elements for connecting said first and second opposing members to said pair of rigid elements,

and said first and second opposing members having connecting means for selectively connecting said non-extensible elements in selective ones of several aligned positions along the length of said first and second opposing members.

8. An exercising device for use in isometric exercises as claimed in claim 6 in which,
a fulcrum arm is rotatably connected between the other ends of said opposing members and extends in a direction toward said pivotal connection,
said fulcrum is rotated in a given direction upon movement in opposite directions of said opposing members around said pivotal connection,

and said resilient means is connected to said fulcrum arm to be expanded by movement of said fulcrum in said given direction.

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