

[54] **FRictional EXERCISING APPARATUS**

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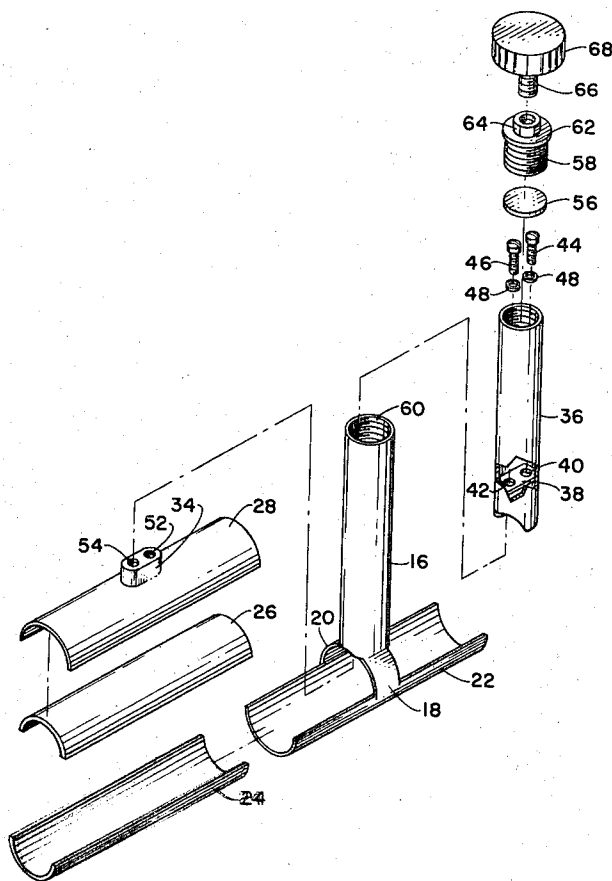
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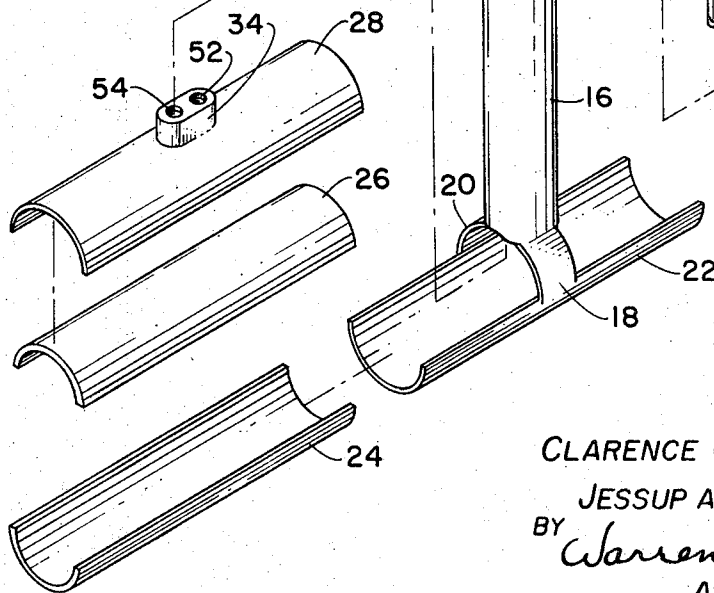
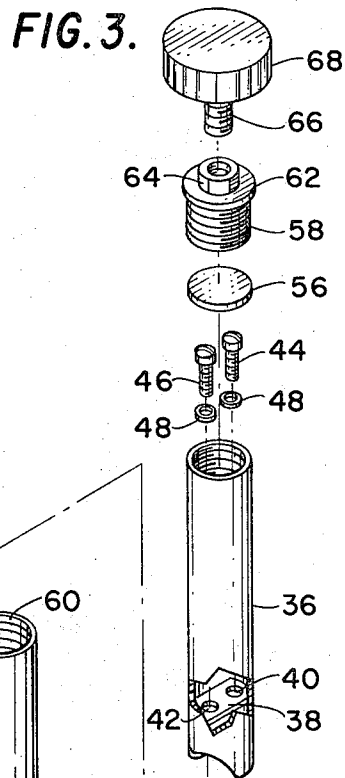
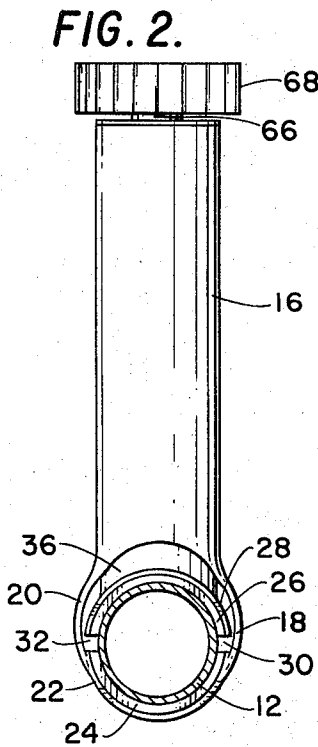
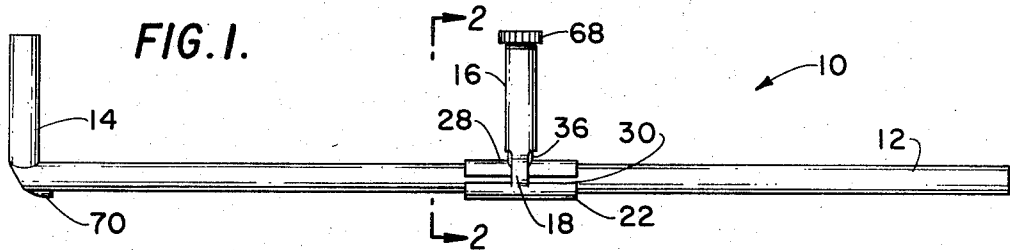
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[57] **ABSTRACT**

An exercising apparatus to be operated with push-pull movements by a single human being, a first grasping means fixedly located substantially at a right angle to a tubular elongated member, a second grasping means also located substantially at a right angle to the elongated member and being pivotally and longitudinally movable thereupon; an adjusting device associated with the second grasping means operates a braking means to vary the frictional force of the connection between the second grasping means and the longated member.

**7 Claims, 3 Drawing Figures**





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**FRictional EXERCISING APPARATUS**

This is a continuation, of application Ser. No. 50,502, filed June 29, 1970, since abandoned.

**BACKGROUND OF THE INVENTION**

It is well recognized that the human body, particularly that of an adult, ordinarily does not receive a sufficient amount of exercise for the stimulation and promotion of the circulation of blood and of deep breathing, which is essential for the maintenance of good health. This is largely due to the fact that very few persons, relatively speaking, are employed in occupations that necessitate the right kind of regular exercise in the performance of their duties, and which promotes deep breathing, especially out of doors. In order to promote the health of such individuals, various methods of exercising and various types of exercising devices have been devised.

At times it is frequently desirable to employ a type of exercise to strengthen a person's muscles for use in a specific activity. For example, in the sport of archery, the bows that are in common use require a substantial amount of strength to pull the bow at or near the position of maximum power. Further, to propel the arrow with any degree of accuracy, the person must have sufficient strength to momentarily hold the bow in this fully-pulled position.

It is known that the muscles primarily in use to accomplish the pulling of a bow are the arm muscles and the upper chest and back muscles. To strengthen such muscles, numerous forms of exercise could be performed. For example, calisthenics is one way to exercise. Many such exercisers could be employed and are presently readily available. Most such exercisers are single-action apparatuses; that is to say, the operator moves or pulls a handle in one direction against a resistance of springs or other types of resilient devices, or resistances of weights. With single-action type of exercisers, the same sets of muscles are used and are under tension in both the forward and return strokes of movement. The spring type of exerciser has the primary disadvantage of not being constant in force. The farther a spring is compressed, the greater the force needed to additionally compress the spring. Also, when in use, their own tension tends forcibly to return to their "at rest" position. This presents a certain element of danger in case they are accidentally released.

It has been known that a frictional type of exercising device exhibited a constant force during the entire range of movement. Also, a frictional type of exerciser could be readily adjustable where a spring type is normally not so adjustable. Although there are known frictional type of exercisers, many are quite complex and not readily adjustable. Also, previous such exercisers are not readily usable for push-pull type of movement and in most cases are not universal enough to be conveniently adapted to such movement.

**SUMMARY OF THE INVENTION**

The exercising apparatus of this invention has been designed primarily for strengthening and maintenance of strength of the arm muscles and upper chest and back muscles of a human being. The exercising apparatus of this invention includes the use of an elongated tubular member to which has been fixedly secured at one end thereto, and substantially at a right angle

thereto, a first grasping means. The first grasping means comprises a tubular element which has been welded or otherwise permanently fixed to the elongated member. A second grasping means is located upon the elongated member and is adapted to be longitudinally movable as well as angularly movable about the elongated member. The second grasping means is also of tubular construction and mounted substantially at a right angle to the elongated member.

Associated with the second grasping means is a braking means including first and second brake elements. Each of the brake elements are generally semi-circular in cross-section and are of a longitudinal length of approximately 5 inches. The surface of each of the brake elements which is in contact with the elongated member is to be of a composition type of material. The material has been selected to have a high co-efficient of friction and be long wearing, but will not mar the surface of the elongated member.

An adjusting device is located at the outermost extremity of the second grasping means which functions to clamp the brake elements upon the elongated member or to release the brake elements therefrom. The adjusting device is movable in small increments as by means of screw threads or the like. The adjusting device, for convenience sake, is located within the second grasping means. A stop is to be located upon the elongated member adjacent the first grasping means to cooperate with one of the brake elements to determine the minimum spacing between the first grasping means and the second grasping means.

It is an object of the apparatus of this invention to provide an exercising device which exercises a particular group of muscles in one direction and exercises a different group of muscles in another direction.

It is another object of the apparatus of this invention to provide an exercising device which permits various twisting exercises.

It is another object of the apparatus of this invention to provide an exercising device which will provide uniform resistance throughout both the forward and return stroke.

Another object of the apparatus of this invention is to provide an exercising device which will be inexpensive, simple and of rugged construction, but will, when properly used, be exceedingly efficient.

It is another object of the apparatus of this invention to provide an exercising apparatus which permits grasping closer to the "line of function" thus minimizing undesirable torque.

Another object of this invention is to provide an exercising device which can be readily varied as to resistance or load, even during use of the device.

**BRIEF DESCRIPTION OF THE DRAWING**

FIG. 1 is a longitudinal, side view of the exercising device of this invention showing the relationship of the first grasping means with respect to the second grasping means;

FIG. 2 is a partly-in-section view taken along line 2-2 of FIG. 1, showing in more detail the construction of the second grasping means; and

FIG. 3 is an exploded, partially cut-away view of the second grasping means and its associated resistance adjusting structure.

### DETAILED DESCRIPTION OF THE SHOWN EMBODIMENT

Referring particularly to the drawing, there is shown in FIG. 1 the exercising apparatus 10 of this invention having an elongated member 12, a first grasping means 14 and a second grasping means 16. The elongated member 12 has taken the general shape of a cylindrical, tubular member which is open at each end. It is contemplated that the member 12 is to be circular in cross-section; however, it is to be considered within the scope of this invention to employ the use of a polygonal configured member 12, such as a square shape or a rectangle shape. The most desirable form of material of construction of member 12 would be a metal such as stainless steel or aluminum. However, any material which is relatively high in strength, low in weight and sufficiently hard to resist damage and wear would be most satisfactory.

The length of element 12 is strictly a matter of choice or design but has been selected to be within the range of three to four feet. The exact length should be sufficiently great to permit use of the apparatus 10 by the largest individual. In other words, the distance from the right shoulder to the extended left hand of a rather large individual would determine the approximate length of member 12.

It is possible that during use of the apparatus 10 during some of the exercising movements, a substantial amount of heat energy can be generated within member 12. For this reason member 12 has been selected to be of thin wall tubular construction and opened at each end to permit passage of air therethrough to facilitate ventilation and cooling of the member 12.

Fixedly secured at one end of the member 12 is the first grasping means 14. The first grasping means 14 is also of cylindrical, tubular construction and can be attached to member 12 as by welding or other conventional permanent attaching means. First grasping means 14 extends substantially perpendicular to member 12. Again, although a cylindrical configuration for means 14 has been found to be most desirable, it is to be considered within the scope of applicant's invention to employ other configurations, such as a square shape, rectangle shape, or an elliptical shape.

Second grasping means 16 is also of the general cylindrical thin wall, tubular configuration and is also of a length similar to the length of the first grasping means 14, approximately 4 to 6 inches. The second grasping means 16, at one end thereof, is integrally connected to a first bracket 18 and a second bracket 20. Brackets 18 and 20 are attached on opposite sides to a semi-circular shaped sleeve 22. Sleeve 22 has been selected to be approximately  $4\frac{1}{2}$  inches in length with the radius of its curvature being somewhat greater than that of member 12. Permanently affixed, as by adhesive or the like, to the interior surface of sleeve 22 is a friction material 24. Material 24 is to be of a common frictional material such as is readily used in brake linings or the like. The combination of material 24 and sleeve 22 comprises the first braking element.

A similar element of friction material 26 is fixedly secured to a second sleeve 28 which is similar in configuration to first sleeve 22 and is to be located adjacent the edges of sleeve 22. The material 26 and the second sleeve 28 comprise the second braking element. The overall configuration of sleeves 22 and 28 is generally

circular with such to surround member 12 with the frictional materials 24 and 26 being in contact with the frictional materials 24 and 26 being in contact with member 12. The length of sleeve 28 is selected to be approximately identical to that of sleeve 22; however, again such would be a matter of choice or design. With the sleeves 22 and 28 mounted about member 12, gaps 30 and 32 exist which are spaced apart approximately  $180^\circ$ . The purpose for the gaps 30 and 32 is to permit movement of the sleeve 28 toward and away from sleeve 22. It is to be noted that the material of construction of sleeves 22 and 28 will also be metallic and in most cases identical to the metallic material employed in member 12.

Fixedly secured on the exterior convex surface of the sleeve 28 is a plug 34. Plug 34 is located at approximately the mid-point of the longitudinal length of sleeve 28 and also adjacent the mid-point of the width of sleeve 28. With the sleeve 28 located in position between brackets 18 and 20 and adjacent sleeve 22, plug 34 extends within second grasping means 16. A guide rod 36 is to cooperate interiorly with second grasping means 16 and to extend about plug 34. Within the guide rod 36 is secured an attaching plate 38 having spaced-apart apertures 40 and 42. The location of attaching plate 38 within the guide rod 36 is to be such as to be located adjacent the upper surface of plug 34. In actual practice it has been found that a clearance of one-eighth of an inch is satisfactory. Screws 44 and 46, which cooperate with respective washers 48 and 50, are to cooperate within apertures 40 and 42, respectively, of the attaching plate 38. Screws 44 and 46 are then tightened within their respective threaded openings 52 and 54 of the plug 34. The lower end of guide rod 36 is shaped to conform to the configuration of sleeve 28.

Located adjacent the upper end of guide rod 36 is a disc 56. A cap 58 is threadingly connected within second grasping means 16 by means of threaded opening 60. A flange 62 located upon cap 58 is to abut the upper end of the second grasping means 16 upon full cooperation with cap 58 within opening 60. A nut 64 if affixed to the upper surface of flange 62, nut 64 to cooperate in a screw threading manner with shaft 66. Shaft 66 is fixedly secured to knob 68 with a portion of second grasping means 16 being capable of extending within a portion of knob 68 upon the knob 68 being in the tightened-down position. As the shaft 66 is extended toward guide rod 36 by the turning of knob 68, the shaft 66 will contact disc 56 and will therefore cause movement of guide rod 36 toward sleeve 22. As sleeve 28, through plug 34, is connected to guide rod 36, movement of sleeve 28 toward sleeve 22 also occurs. As is clearly apparent, a compressing engagement of the friction materials 24 and 26 about member 12 then occurs.

The operation of the exercising apparatus of this invention is as follows:

The resistance or load created by the friction between the friction materials 24 and 26 and the elongated rod 12 is to be adjusted according to the strength of the individual using the apparatus 10. The resistance can be readily varied from a value suitable for a small boy to that which exceeds the requirements of the strongest man. This adjustment is accomplished by rotating the knob 68 to either press the sleeve 28 towards sleeve 22 or retract sleeve 28 away from sleeve 22. It

is believed to be made clear that movement of sleeve 28 towards sleeve 22 increases the frictional resistance while movement of sleeve 28 from sleeve 22 decreases the resistance. Because the knob 68 is located at the free end of second grasping means 16, such adjustment can be accomplished during operation of the device. Generally, the adjustment can be easily made with the operator's thumb and forefinger without removing the operator's hand from the second grasping means 16. Once the desired resistance has been established such will normally be maintained substantially constant during the entire use of the apparatus (choice of operator).

Once the desired resistance has been selected, one type of exercise is to rotate the second grasping means 16 until such is parallel to and in the same direction as first grasping means 14. To effect the "bow and arrow" type of exercise, designed primarily for a right-handed person, the first grasping means 14 is grasped by the right hand and the second grasping means 16 is grasped by the left hand (the opposite would be the case if the party was left handed). The operator then extends his left arm at full extension in front of his chest and then proceeds to pull with his right hand the first grasping means toward his right shoulder. The return stroke would be accomplished by a pushing movement with the right hand on the first grasping means toward the second grasping means. It is to be noted that to prevent the operator's fingers from being pinched between either sleeve 22 or 28 and the first grasping means 14, a stop 70 is attached to member 12 adjacent the first grasping means 14. Stop 70 is to contact either sleeve 22 or sleeve 28. It is to be noted that because the second grasping means 16 is pivotable about the member 12, the operator may include "twisting" exercises as variations of this basic "bow and arrow" type of exercise.

Many variations of the above basic exercising procedure may be accomplished. For example, the right hand and first grasping means 14 may be located adjacent the right shoulder of the operator. The left arm and the second grasping means 16 is then moved with similar push-pull movement towards and away from the first grasping means 14. A further variation of the exercising procedure may be accomplished by rotating the second grasping means to different angular relationships with respect to member 12 so as to not be in alignment with first grasping means 14. The same exercising movements would be effected; however, because of locating the second grasping means ninety degrees from the first grasping means (or one hundred and eighty degrees), slightly different muscles are exercised or similar muscles are exercised in a different way.

Another type of exercise which can be performed with the exercising apparatus 10 of this invention is by locating a first grasping means 14 upon the floor or ground. The operator then places a foot upon the first grasping means and then grasps the second grasping means 16 with one of his hands. The exercise is then accomplished by moving the second grasping means 16 toward and away from the first grasping means 14 while maintaining the first grasping means stationary upon the floor with the person's foot. Also there are exercises designed primarily for the wrists and forearms in which the second grasping means is twisted around the member 12.

It is believed that numerous other types of exercises could be readily employed with the apparatus 10 of this invention. For example, exercises behind a person's back or over a person's head which are accomplished by movements of the arms may readily be employed, or the "crusher" type exercise in which the device is operated directly in front of and near the chest of the operator bringing into play the chest and back muscles. Because in some types of exercise, such variance can be readily accomplished through the operation of knob 68. It is to be known that ingenious persons desiring exercise may discover many new and different forms of exercise employing applicant's exercising apparatus 10.

What is claimed is:

1. Exercising apparatus comprising:

an elongated member;

first means immovably fixed to said elongated member for grasping by a user;

second means mounted for longitudinal movement along said elongated member toward and away from said first means, said second means having third means for circumscribing said elongating member, and said third means further having a hollow handle immovably fixed to said third means and extending at a right angle to the longitudinal axis of said elongated member and along a radius from the center line of said elongated member;

fourth means housed at least partially within said third means and in sliding frictional engagement with said elongated member for causing said second means to be slidably frictionally engaged with said elongated member during an exercise program; and

a rod-like element in operative engagement with said fourth means and including varying means for varying the frictional engagement between said second means and said elongated member,

said varying means comprising a screw means, and a manually operated knob means operatively connected to said screw means to vary the position of said rod-like element.

2. Apparatus as defined in claim 1, wherein:

said rod like element is attached to said fourth means, and is capable of being fixed at a plurality of positions with respect to said hollow handle, each of said positions resulting in a different amount of frictional force between said fourth means and said elongated member.

3. Apparatus as defined in claim 2 wherein:

said fourth means extends along said elongated member on each side of said handle for a substantial distance away from said handle.

4. Apparatus as defined in claim 2 wherein:

a separate layer of friction material is interposed between said fourth means and said elongated member.

5. Apparatus defined in claim 1, wherein:

said third and fourth means comprise respectively first and second brake elements, movable with respect to each other by said varying means.

6. Exercising apparatus comprising:

an elongated member;

first means fixedly secured to said elongated member for grasping;

second means for grasping mounted for longitudinal movement along said elongated member toward and away from said first means, said second means

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having third means for circumscribing said elongated member and further having a handle element rigidly attached to said third means and extending at a right angle to the axis of said elongated member in a radial relationship therewith; 5

fourth means mounted at least partially in said third means in sliding frictional engagement with said elongated member for causing said second means to be slidably frictionally engaged with said elongated member during an exercise program; 10

varying means for varying the frictional engagement between said second means and said elongated member; 15

said varying means including a rod like adjusting element attached to said fourth means, and capable of being fixed at a plurality of linear positions with respect to said handle element, each of said positions resulting in a different amount of frictional force between said fourth means and said elongated member; and 20

a manually operated, threaded knob means in engagement with said rod like adjusting element, and located at the end of said handle element of said second means to axially move said rod like adjusting element. 25

7. Exercising apparatus comprising:  
an elongated member;

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first grasping means fixedly secured to said elongated member;

an assembly mounted on and around said elongated member for variable sliding frictional movement along said elongated member and comprising:  
an elongate bracket circumscribing said elongated member, and having a longitudinal division dividing said bracket into a first portion and a second portion;

an elongate second grasping means secured to said bracket, extending laterally along a radius from said elongate bracket, and having a diameter substantially shorter than the length of said bracket;

said second grasping means including a first part and a second part movable with respect to said first part along said radius;

said first part engaging the first portion of said bracket said second part engaging second portion of said bracket;

a manually operated adjusting means mounted on said second grasping means operative to shift said first part with respect to said second part along said radius, thereby to alter the spatial relationship between said portions of said bracket; and

a layer of friction material interposed between said bracket and said elongated member.

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