United States Patent

[11] 3,591,174

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[54] **FRICTIONAL RESISTANCE TYPE EXERCISING DEVICE**
6 Claims, 6 Drawing Figs.

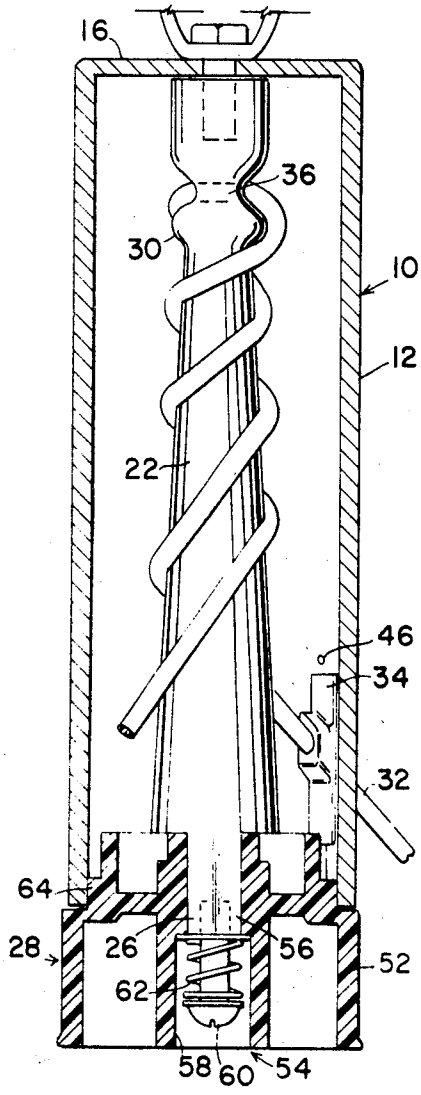
[52] **U.S. Cl.** **272/79,** 242/100.1
[51] **Int. Cl.** **A63b 21/00**
[50] **Field of Search** 272/79, 82, 72, 80; 242/154, 100, 100.1

[56] **References Cited**
UNITED STATES PATENTS

3,197,204 7/1965 Holkesvick et al. 272/79
3,460,392 8/1969 Kolbel ..... 272/79 (A) X

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Assistant Examiner—William R. Browne
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ABSTRACT: An exercising device including a housing, a shaft positioned within the housing and having one end attached thereto, and a rope disposed in frictional engagement about the shaft. The rope enters into and exits from the housing through the sides thereof adjacent one end of the housing so that the rope may be pulled against the resistance produced by the frictional engagement of the rope with the shaft. A plastic dial member is rotatably fixed to the other end of the shaft and releasably engages the housing so that the rotational position of the shaft with respect to the housing may be adjusted to thereby vary the amount of frictional engagement of the rope with the shaft.



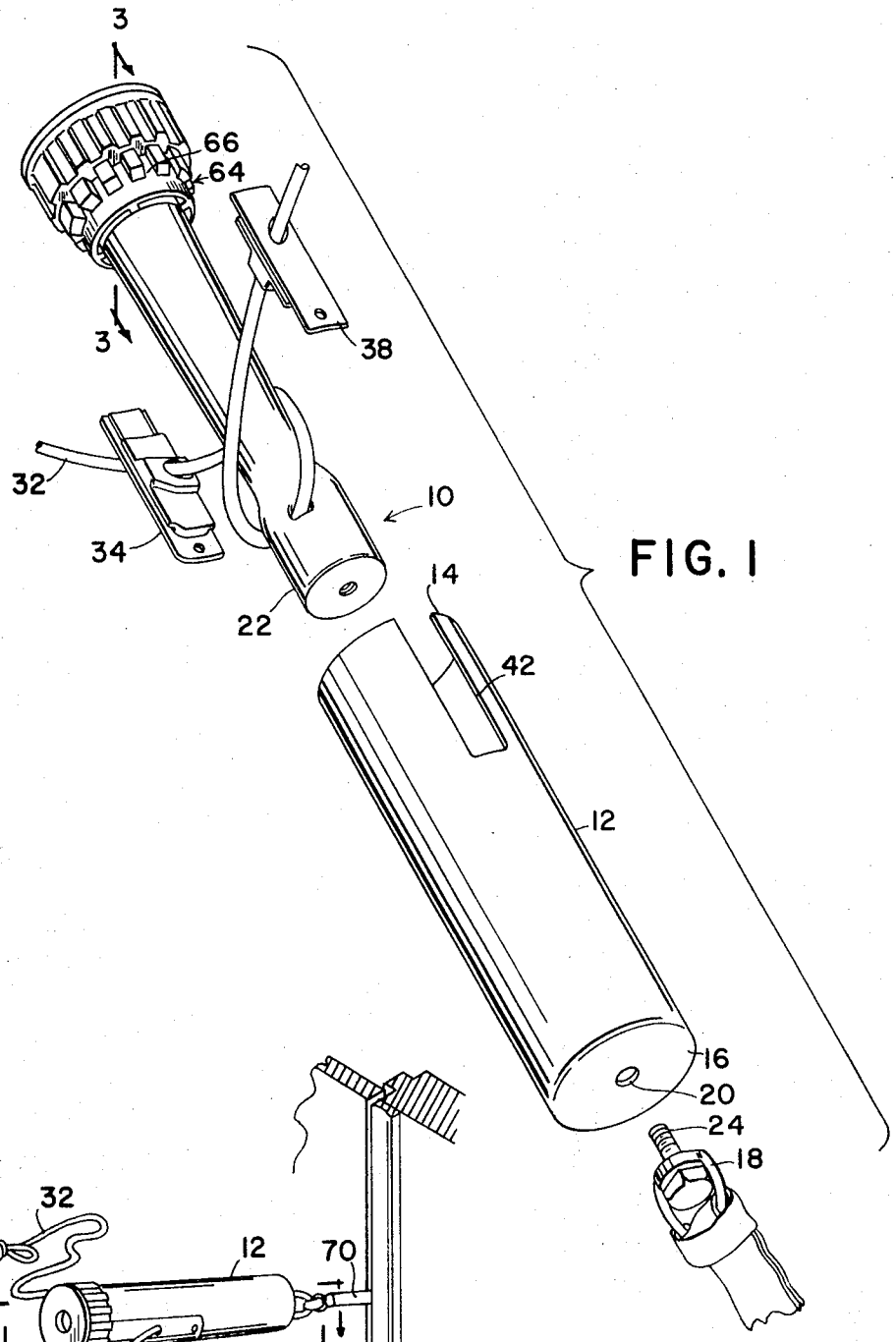


FIG. 1

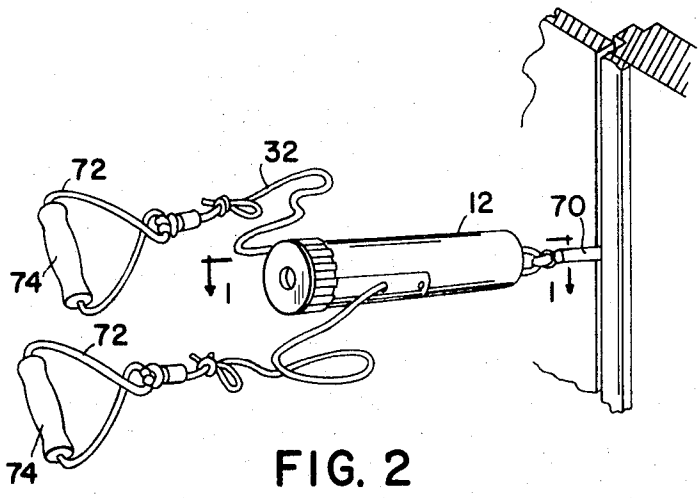


FIG. 2

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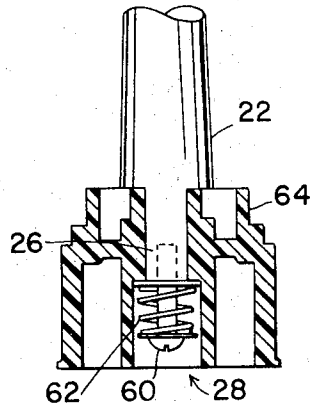


FIG. 6

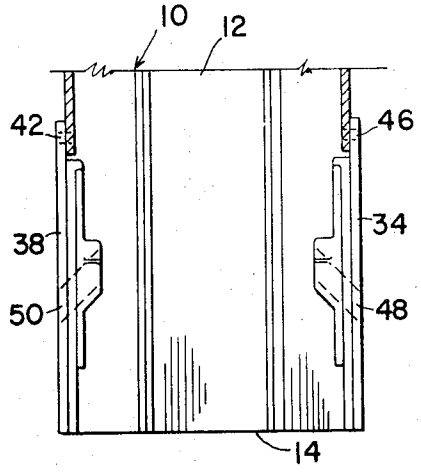


FIG. 5

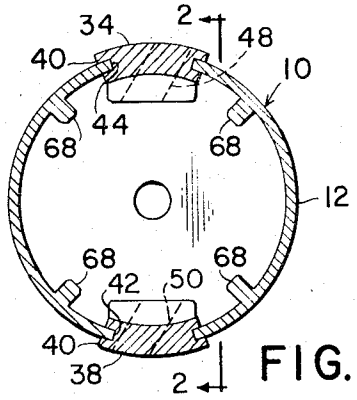


FIG. 4

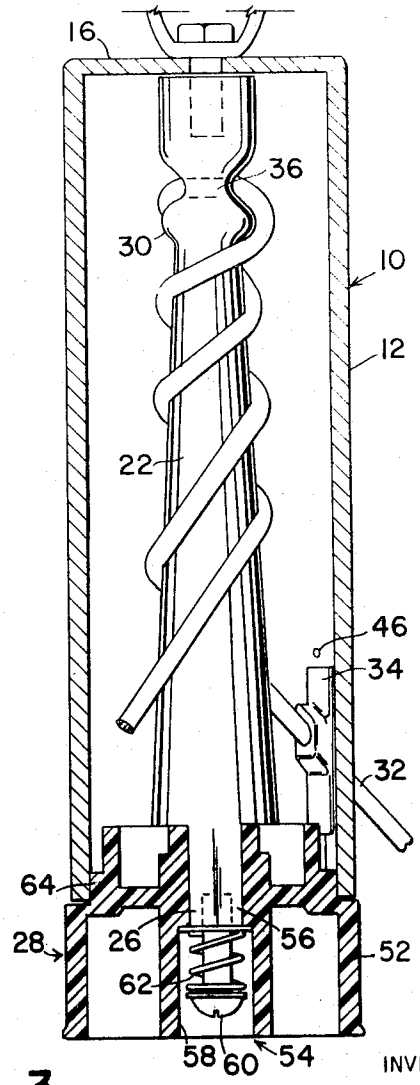


FIG. 3

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FRICTIONAL RESISTANCE TYPE EXERCISING DEVICE

SUMMARY

A well-known method of exercising is the use of ones muscles in pulling on a rope or strand, which pulling is opposed by a force comprised of weights or springs. Many such devices are found in gymnasiums and are large in size and generally are a permanent fixture.

The present invention utilizes the concept of such known devices but is compact, portable and is easily used at home. The device of the present invention utilizes the force produced by the frictional engagement of a rope with a shaft to achieve the resistance to be overcome for exercising. The shaft is positioned within a housing and comprises therewith a resistance member through which the rope passes. A similar device is illustrated in U.S. Pat. No. 3,197,204. Devices such as those presently available have many disadvantages. Due to their compact construction the rope often becomes entangled in the resistance member so that the rope cannot be pulled through.

One very serious disadvantage of such exercising devices is that the housing of the resistance member becomes heated from the friction of the rope moving about the shaft and through the resistance member. Such devices have been known to become heated to temperatures as high as 300° F. during their use. It is readily apparent that this is dangerous as well as objectionable to the user.

It is therefore an object of this invention to overcome the disadvantages of such prior art devices.

It is another object of this invention to provide a compact exercising device which may be safely and conveniently used in the home.

It is still a further object of this invention to provide such a device that can be adjusted readily to the desired conditions of the user.

These and other objects of the device may be accomplished by the structure described herein and illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the device partially disassembled;

FIG. 2 is a perspective view of the device with handgrips secured thereto in an operative condition being anchored to a doorway;

FIG. 3 is a sectional view taken on line 1–1 of FIG. 2;

FIG. 4 is a bottom plan view of the device with the end, inner member and rope removed;

FIG. 5 is a partial sectional view taken on line 2–2 of FIG. 4 with the rope removed; and

FIG. 6 is a sectional view of an end member of the device taken on line 3–3 of FIG. 1 with the inner member, partially shown, secured thereto.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

Referring now to the drawings, the exercising device **10** comprises a tubular housing **12** having an open end **14** and the other end being closed by a wall **16**. A connector means **18** is rotatably secured to the housing by a bolt **24** which extends through an aperture **20** in the end wall **16**.

An elongated shaft **22** is adapted to be positioned within the housing **12** in spaced relation to the housing. The shaft **22** is secured in the housing **12** for rotational movement relative thereto by the bolt **24** of the connector means **18**.

The free end of the shaft **22** has a necked down portion **26** which is adapted to receive a dial member **28**. The dial member **28**, which will be described in detail below, fits into the open end **14** of the housing **12** and supports the shaft **22** in spaced relation with the housing **12**.

The shaft **22** is tapered along its length and is provided with an enlarged portion **30** adjacent the thin end.

A rope **32** enters the housing **12** through a guide **34** and winds in a helical path along the shaft **22** over the enlarged portion **30** and through a bore **36** extending diametrically through the shaft **22**. The rope **32** extends back along the shaft **22** in the same helical manner between the turns of the entering path. The enlarged portion **30** aids to maintain the proper position of the rope **32** on the shaft and guides the rope **32** through the bore **36** in a smooth manner. A second guide **38** is provided for the exit of the rope **32**.

Guides **34** and **38** are formed of platelike elements having an arcuate cross section of a radius equal to that of the tubular housing **12**. Grooves **40** extend along a major portion of the sides of the guides **34** and **38**.

The guides **34** and **38** are slidably received in substantially diametrically opposed openings **42** and **44** adjacent the open end **14** of the housing **12**. Rivets **46** or other suitable means may be provided to secure the guides **34** and **38** in place. The guide **34** is provided with a bore **48** extending therethrough at an angle to guide the rope **32** through its tortuous path about the shaft **22**. The guide **38** is provided with a similar bore **50**.

It will now be understood that as the user pulls alternately on the ends of the rope **32**, the rope will slide about the shaft **22** through its tortuous path with a predetermined amount of resistance. The resistance may be adjusted easily by varying the number of turns of the rope **32** about the shaft **22**.

The dial member **28** comprises a cylindrical element formed of plastic or other suitable material, preferably of a material having low heat conducting properties. A bore **54** extends through the center of the dial member, a first portion **56** has a diameter slightly larger than the necked down portion **26** of the shaft **22** and a further portion **58** has a diameter slightly larger than that of the portion **56**. The necked down portion **26** and the bore portion **56** have similar cross-sectional shapes of a configuration to prevent rotational movement of the dial member **28** relative to the shaft **22**. A screw **60** with a spring **62** about its shank secures the dial member **28** to the necked down portion **26**. The dial member **28** is thus mounted on the necked down portion **26** so it may not rotate relative thereto buy may move axially relative thereto against the force of the spring **62**.

The dial member **28** includes a portion **64** which extends into the housing **12**. The portion **64** is provided with a plurality of slots **66** about its periphery. The slots **66** cooperate with lugs **68** extending radially inwardly of the housing **12** to prevent relative rotation of the dial member **28** relative thereto.

When it is desired to adjust the resistance of the device by changing the number of turns of the rope **32** about the shaft **22**, the dial member **28** is moved axially from the housing **12** against the force of the spring **62** sufficiently to disengage the lugs **68** from the slots **66**. The dial member **28** along with the shaft **22** is then rotated relative to the housing **12** to increase or decrease the number of turns of the rope **32** about the shaft **22**.

From the foregoing description it will be readily apparent that the various elements may be formed in an inexpensive and convenient manner suitable to the present manufacturing methods.

A very undesirable feature of similar prior art devices has been overcome by the construction of the present device. The rope as it slides about the shaft creates considerable heat, which has been known to result in creating temperatures in the housing of up to 300° F., thus making it rather painful for the user to touch the device either intentionally or accidentally. With the present construction the shaft **22** is in thermal contact with the housing only through the bolt **24**. As a result, little of the heat generated by friction is transferred to the housing **12**.

Also, the amount of heat generated by the present device is reduced substantially by the manner in which the rope **32** is guided through its double helical path.

In operation, the cylinder canister or housing **12** is anchored by connector means **18** to a fixed object and the handles **74**

carried by bales 72 on the free ends of rope 32 are manipulated by pulling on one handle as the other is released. By rotating dial member 28 greater or less tension may be set on the device.

The problem of rope 32 overlapping or binding on the shaft 22, which commonly occurred in the prior art devices, is substantially eliminated with the present invention. This is accomplished primarily through providing the opposed tangentially and upwardly angled guides, holes or bores 48 which is only slightly larger than rope 32 for frictionally resisting sliding movements of the rope 32 so as to maintain the rope 32 in its helically wound condition around shaft 22. As viewed in cross section, as in FIG. 4, the holes 48 are parallel. Rather than increasing the wear on the rope 32, as would be expected, the rope 32, since it is guided by holes 48, actually wears for a longer time.

The slight upward conical taper of the shaft 22, below transverse or radial bore 36 cooperates with the bores 48 in tending to direct the rope 32 upwardly on the shaft 22, thereby causing even spacing of the convolutions of rope 32 as the shaft 22 is rotated to take up the rope 32 and also maintains a constant resistance to pull of rope 32 in use.

The importance of this arrangement is readily appreciated when it is understood that, at times, the device is used upside down and, at times, the housing 12 is jerked from side to side by the rope 32. This arrangement of the angular holes 48 which tension rope 32 and the tapered shaft 22 enables the setting of dial member 28 to reflect more accurately the actual resistance to pull on rope 32 and also enables the rope's resistance to pull to remain more constant.

The connector 18 is adapted to be connected with various anchor means. For example, as shown in FIG. 2 a flexible strap 70 is provided with a bar (not shown) on the end. When the strap 70 is inserted through the crack between a door and its frame, the device is firmly anchored. Other anchor means may be utilized, such as a bar on the end of the strap adapted to be held on the floor by the user's feet.

We claim:

1. An exercising device comprising:

a housing including a pair of rope guides mounted adjacent one end thereof;

a shaft positioned within said housing and having an opening therethrough adjacent one end thereof, said one shaft end being rotatably secured to the housing;

a member made from a nonmetallic heat insulating material on the other end of the shaft for rotation with the shaft, the said member being in releasable locking engagement with housing;

a biasing means mounted on said other shaft end and urging the member into locking engagement with the housing so that the shaft normally is prevented from rotating with respect to the housing; and

a rope extending into the housing through one of said guides and spaced from the member, then onto the shaft end, about the shaft in frictional engagement therewith, through said shaft opening, again about the shaft in frictional engagement therewith, then off the shaft adjacent said other shaft adjacent said other shaft end, and out of the housing through the other of said guides and spaced from the member so that the rope may be pulled about the shaft without contacting the member, whereby the shaft may be rotated with respect to the housing to adjust the amount of frictional engagement of the rope with the shaft by disengaging the member from, and turning the member and shaft with respect to, the housing, and the member insulates the housing from the heat generated in the shaft by the pulling of the rope about the shaft.

2. A device as recited in claim 1, wherein the member engages the housing at said one housing end.

3. A device as recited in claim 1, wherein the only portion of the shaft which contacts the housing consists of the surface area of said one shaft end.

4. A device as recited in claim 1, wherein the member is axially slidable on the shaft and includes means for engaging the housing upon axial movement of the member toward said one shaft end; and wherein said biasing means urges the member toward said one shaft end.

5. A device as recited in claim 4, wherein said releasable locking engagement is provided by at least one slot formed in the member; and wherein said housing includes at least one lug engageable by said slot.

6. A device as recited in claim 1, wherein the member extends out of the housing when the member is engaged therewith so that the member may be grasped easily by a user for rotating the shaft with respect to the housing.