United States Patent [19]

Dalton et al.

[11] **3,807,730**

[45] **Apr. 30, 1974**

[54] **ELASTIC TYPE EXERCISING DEVICE**

[76] Inventors: **George E. Dalton,** 1714 El Rey Rd., San Pedro, Calif. 90732; **Karl E. Kerr,** 3305 Lees Ave., Long Beach, Calif. 90808; **Donald T. Larsen,** 123 Sierra St., El Segundo, Calif. 90245

[22] Filed: **June 2, 1972**

[21] Appl. No.: **259,004**

[52] **U.S. Cl.** **272/82,** 272/68

[51] **Int. Cl.. A63b 23/00,** A63b 23/02, A63b 21/00

[58] **Field of Search**..... 272/79 R, 82, DIG. 4, 68, 272/67, 75

[56] **References Cited**

UNITED STATES PATENTS

1,638,003	8/1927	Neumann	272/82

FOREIGN PATENTS OR APPLICATIONS

463,958	12/1913	France	272/82
345,823	5/1960	Switzerland	272/75
1,802,516	5/1970	Germany	272/82

Primary Examiner—Richard C. Pinkham
Assistant Examiner—William R. Browne
Attorney, Agent, or Firm—Harris, Kern, Wallen & Tinsley

[57] **ABSTRACT**

A physical exercise device having two dome-shaped members of rigid material each including a semispherical top, a substantially flat base, and a rounded annular edge portion joining the top and base. Each dome-shaped member is dimensioned to nest in the palm of a hand with the fingers and thumb thereof following their natural curvature upward along the outer surface of the top with terminal joints of the thumb and fingers adjacent the annular edge portion to bend thereover. This enables the fingers and thumb to tightly grip the dome-shaped member along the natural lines followed thereby with finger ends tightly gripping a marginal edge portion of the base along radial lines extending toward a center of the base. Two such dome-shaped members are used in combination with a length of resilient flexible tubing. In such instances, the members include central holes for slidably receiving ends of the tubing and whose ends are crimped and locked in place by the hands gripping the members during exercises involving both a gripping of the members and a stretching of the tubing.

3 Claims, 7 Drawing Figures

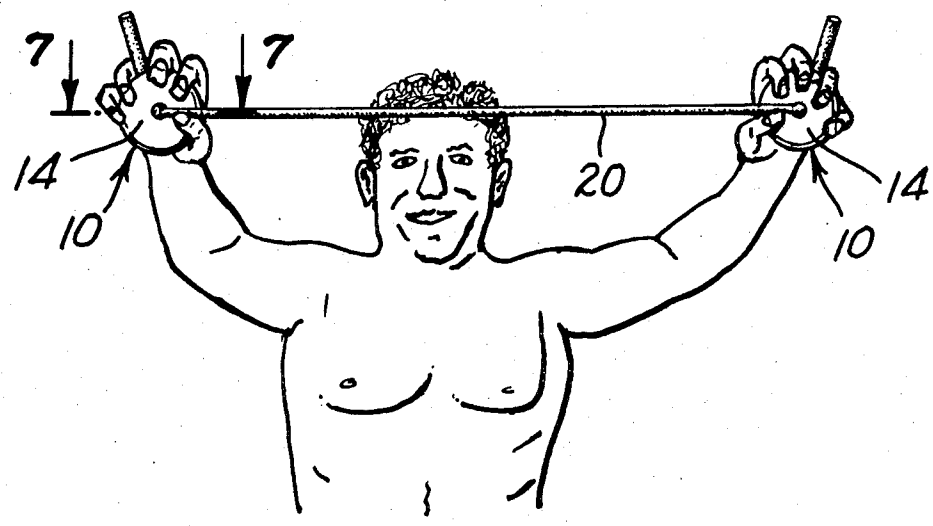


FIG. 1.

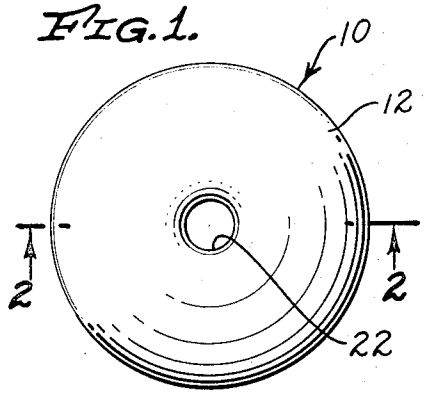


FIG. 3.

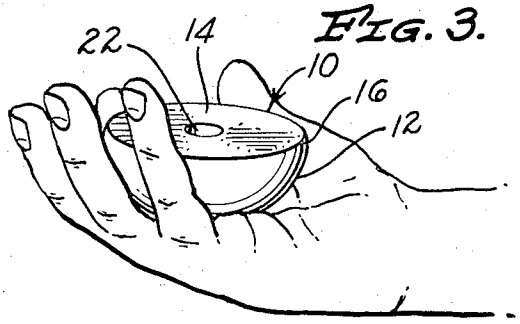


FIG. 2.

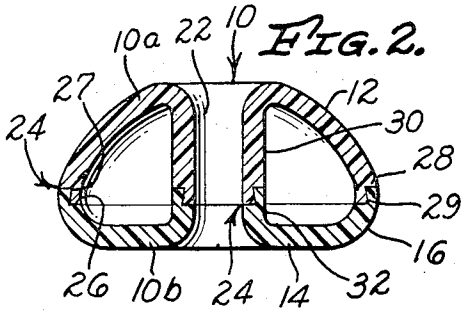


FIG. 4.

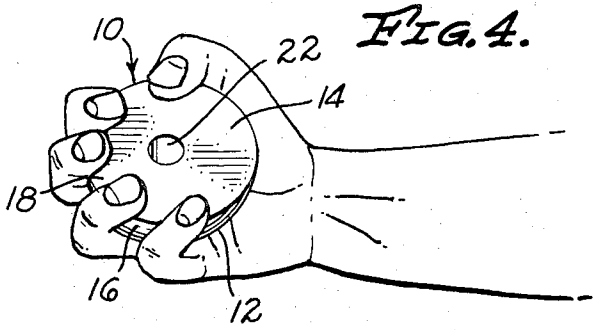


FIG. 5.

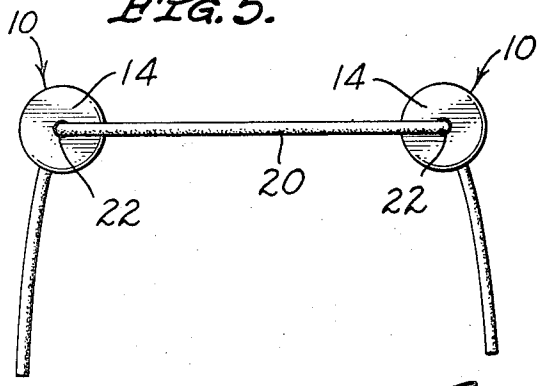


FIG. 7.

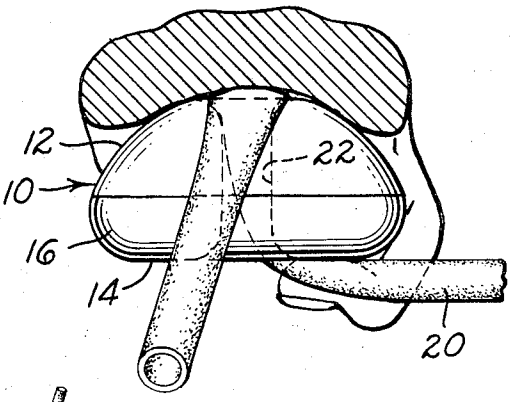
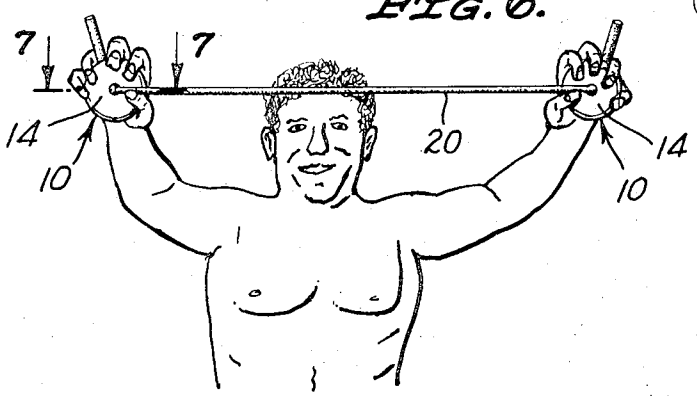


FIG. 6.



ELASTIC TYPE EXERCISING DEVICE

DISCLOSURE

The present invention relates to improvements in physical exercise devices and more particularly to a simple and inexpensive exercise device for use at home or office.

Over the years, numerous exercise devices have been developed to assist in improving and maintaining muscle tone and condition. Many such devices have been designed for primary use in the home. Today, possibly the most popular forms of home exercise devices may be termed the expander type and the controlled-resistance type. The expander type basically includes an axially expandable member such as a strong coil spring or length of rubber cord secured between a pair of handles. In exercising with such an expander, the handles are gripped and forced away from each other against the resistance of the expandable member.

In the coil spring expander, the ends of the spring are hooked to U-shaped handles having generally cylindrical handgripping rods. When it is desired to increase the resistance offered by such an expander, additional springs must be connected between the handles. The converse is true when it is desired to reduce the resistance offered by the expander. Such adjustments are time-consuming and annoying and are limited to fixed increments of increase and decrease in resistance.

In the rubber cord expander, the handles usually comprise loops formed at the ends of the cord. To increase the resistance offered by such an expander requires either a doubling of the cord or a handgripping thereof inward of the loops to shorten the cord's effective length. While such adjustments provide better control over resistance than is possible with the coil spring expander, in many exercises it is difficult to hold and grip the effectively shortened rubber cord.

The controlled-resistance type of expander basically includes a cord or cable of fixed length connected between a pair of handles and passing through an adjustment member. The adjustment member is adapted for connection to a door, wall, or other fixed member and is hand adjustable to control the resistance offered to a pulling on the cord. Thus, in use, the adjustment member is first set and attached to a fixed object. Then the handles of the controlled-resistance expander are gripped and one pulled away from the adjustment member while the other handle is moved toward the adjustment member. The operation is then reversed and the other handle is pulled away from the adjustment member while the first handle moves toward the adjustment member. When it is desired to change the resistance offered by the adjustment member, the handles are released and the adjustment member manually readjusted. Thus, the procedures required to set up and adjust the controlled-resistance type of expander are time consuming. Further, such controlled-resistance type expanders are rather expensive.

The present invention, on the other hand, provides a home exercise device which is inexpensive yet longlasting and capable of rapid and simple adjustment to offer a controlled resistance to a separation of handle members included therein. Further, the handle members of the exercise device of the present invention are of a particularly unique design permitting maximum forces to be developed in the hands and forearms during all exercises with the exercise device thereby materially

increasing the effectiveness of the device in improving muscle strength and tone.

With regard to the handle members, they comprise small rigid domes each including a semispherical top, a substantially flat base, and a rounded annular portion joining the top and base. Each dome is dimensioned to nest top down in the palm of the hand with the fingers and thumb thereof following their natural curvature upward along the outer periphery of the top and with terminal joints of the thumb and finger adjacent the annular edge portion to bend thereover. This enables the fingers and thumb to tightly grip the dome along the natural lines followed thereby with finger ends pressing inwardly on a marginal edge portion of the base along radial lines extending toward a center thereof.

After extensive experimentation, it has been found that with such small domes substantially greater gripping forces are developed in the hands and forearms than with any other handle configuration included in conventional exercise devices. The domes therefore permit greater work forces to be generated during all exercises in which they are employed to substantially increase the effectiveness of the exercises in improving muscle tone and strength. In fact, the domes are so effective that they may be employed alone as basic isometric exercise devices for the hands, forearms, upper arms, and shoulder muscles. Preferably, they are designed both for use alone and with a length of axially strong yet resilient, radially compressible and flexible tubing to produce a superior expander-type home exercise device.

To provide for their combination with such tubing, each dome has a hole extending therethrough from a central portion of the base to an apex of the semispherical top thereof. Opposite ends of the tubing are adapted to slidably pass through the holes from the base sides. Further, the tube ends are adapted to bend sharply over and compress against the semispherical tops of the domes as the domes are tightly handgripped to lock the ends in place during exercises with the device involving a gripping of the domes and a stretching of the tubing. When it is desired to alter the resistance offered by the tubing, one of the domes is simply released and slid along the tubing to alter the effective length of the tubing between the domes as desired. Thus, in the expander-type exercise device of the present invention, adjustment and control of resistance is a simple and rapid procedure.

The foregoing as well as other features and advantages of the present invention may be more clearly-understood by reference to the following detailed description when considered with the drawing which, by way of example only, illustrates one form of dome member and a combination of such domes with a length of flexible tubing as an expander-type exercise device.

In the drawing:

FIG. 1 is a top view of a dome member constructed in accordance with the present invention;

FIG. 2 is a sectional side view of the dome member taken along the line 2—2 in FIG. 1;

FIG. 3 is a perspective view illustrating the manner in which the dome member nests top down in the palm of the hand with the thumb and fingers thereof following their natural curvature upward along the outer surface of the dome with the terminal joints of the thumb

and fingers adjacent an annular edge portion thereof;

FIG. 4 is a perspective view showing the manner in which the dome member is gripped with the thumb and fingers pressing inwardly on a marginal edge portion of the base of the dome along radial lines extending toward a center of the base to develop maximum gripping forces in the fingers, hands, and forearms;

FIG. 5 is a front view of an expander-type exercise device including a pair of dome members such as shown in FIG. 1 in combination with a length of flexible tubing;

FIG. 6 is a front view illustrating one manner in which the exercise device of FIG. 5 may be utilized, the domes being tightly gripped and separated to stretch the tubing therebetween; and

FIG. 7 is a sectional view taken along the lines 7—7 in FIG. 6 illustrating the manner in which the ends of flexible tubing passes through the dome members are bent and compressed by the hands gripping the dome members to lock the ends in place during exercises with the device.

Referring initially to FIGS. 1–4, the physical exercise device illustrated therein comprises a rigid dome-shaped member **10** including a semispherical top **12**, a substantially flat base **14**, and a rounded annular edge portion **16** joining the top and base.

As depicted most clearly in FIGS. **3** and **4**, the dome-shaped member **10** is dimensioned to nest top down in the palm of a hand with the fingers and thumb thereof following their natural curvature upward at an acute angle along the outer surface of the top **12** with terminal joints of the thumb and finger adjacent the annular edge portion **16** to bend thereover. As shown most clearly in FIG. **4**, this enables the fingers and thumb to tightly grip the dome-shaped member **10** along the natural lines followed by the thumb and fingers with the terminal ends thereof pressing inwardly on a marginal edge portion **18** of the base **14** along radial lines extending toward a center of the base.

Experimentally, it has been found that the hand in the position around the dome-shaped member **10** illustrated in FIG. **4** is capable of developing maximum gripping forces in the fingers, hands, and forearms when compared with cylinders, spheres, and other irregular bodies of a solid or resilient structure. Thus, the dome-shaped member **10** is capable of functioning as a physical exercise device in isometric exercises for the fingers, hands, and forearms. In this regard, it has been found that the preferred diameter of the base of the member **10** is about three and ¼ inches and the height from the base to an apex of the top is about ¾ inches.

Further, the dome-shaped member **10** has been found to materially increase the effectivenes of isotonic exercises particularly as an element of the physical exercise device illustrated in FIGS. **5** and **6**. As shown therein, a pair of dome-shaped members **10** are employed in combination with a length of axially strong yet resilient, radially compressible and flexible tubing **20**. To receive the tubing **20**, each of the dome-shaped members **10** includes a hole **22** extending from a central portion of the base **14** to an apex portion of the semispherical top thereof. Each hole **22** is adapted to slidably receive an end portion of the tubing **20** as illustrated more clearly in FIG. **7**.

Thus, the home exercise device of FIGS. **5**, **6**, and **7** is simply assembled by slipping opposite ends of the flexible tubing **20** upwardly through the holes **22** from the bases **14** of the dome-shaped members **10**. The length of the tubing **20** between the dome-shaped members **10** is then adjusted as desired and the dome-shaped members gripped as previously described in connection with FIGS. **3** and **4**. As this occurs, the ends of the flexible tubing adjacent the tops of the holes **22** are bent sharply over the semispherical tops of the dome-shaped members **10** and radially collapsed as the dome-shaped members are gripped. This is most clearly shown in FIG. **7**. Thus bent and collapsed, the ends of the tubing **20** are locked relative to the dome-shaped members **10** during all exercises involving a combination gripping of the dome-shaped members and stretching of the tubing **20** such as the exercise illustrated in FIG. **6**.

When it is desired to alter the resistance offered by the tubing **20** or to change to a different exercise, it is a simple matter to change the effective length of the tubing between the dome-shaped members **10** by releasing one or both of the dome-shaped members and slipping the members closer together or farther apart. Thus, the home exercise device as illustrated in FIGS. **5** and **6** may be rapidly and simply adjusted to offer different resistances in the exercises performed therewith.

It bears noting that the dome-shaped members **10** need not be heavy articles to produce the desired strengthening results in an isometric exercise device or as a component of the exercise device shown in FIG. **5**. In fact, the dome-shaped members **10** are preferably of a light-weight hollow, rigid plastic construction formed in two sections **10*a*** and **10*b***. As illustrated in FIG. **2**, the section **10*a*** comprises the semispherical top **12** and the section **10*b*** comprises the base **14** and the rounded annular edge portion **16**. A bottom edge of the section **10*a*** and a top edge of the section **10*b*** carry cooperative means **24** for locking the sections together. Preferably, the cooperative means comprises an annular step **26** on an inside of the section **10*b*** including an inwardly and upwardly projecting shoulder **27** and a mating annular step **28** on an outside of the section **10*a*** including an outwardly and downwardly projecting shoulder **29**. The step and shoulders tightly mate to lock the sections **10*a*** and **10*b*** together. To form the hole **22**, the section **10*a*** includes a central tubular portion **30** mating with an upwardly projecting sleeve **32** and locking thereto by the cooperative means **24** as previously described.

Thus constructed, the preferred form of the dome-shaped member **10** is rigid yet lightweight and easy to manufacture and assemble on a mass-production basis at a relatively low cost. This of course means that the isometric exercise device comprising the dome-shaped members **10** is relatively inexpensive. It also means that the physical exercise device as shown in FIGS. **5** and **6** is quite inexpensive particularly when compared with the conventional home exercise devices as previously described.

While particular forms of exercise devices have been described and discussed herein, changes and modifications may be made without departing from the spirit of the invention. It is therefore intended that the present invention be limited in scope only by the terms of the following claims.

We claim:

1. A physical exercise device comprising:

first and second dome-shaped means for use by a user in stretching an elastic tubing after it has been threaded through each one of said first and second dome-shaped means and wherein a user's hands grasp said means and tubing to compress the tubing on the dome of each one of said means and the base of each one of said first and second means being substantially planar and serving as a pressure area for fingers of a user's hand, each one of said dome-shaped means comprising,

a semispherical top,

a substantially flat base, and

a rounded annular edge portion joining said top and base,

each dome-shaped means nesting in the palm of a user's hand with fingers and thumb thereof following their natural curvature upward along the outer surface of said top with terminal joints of thumb and fingers adjacent an associated annular edge portion to bend thereover and enable fingers and thumb to tightly grip said member along natural lines followed thereby with terminal ends thereof tightly gripping a marginal edge portion of an associated base along radial lines extending toward a center of said base;

means defining first and second central holes through said first and second dome-shaped members, said holes each extending from a central portion of a base to an apex portion of semispherical top of an associated member; and

a length of axially strong yet resilient, radially compressible and flexible tubing extending between the bases of said dome-shaped members with ends slidably passing through said first and second holes.

2. The physical exercise device of claim 1 wherein each of said dome-shaped means is a hollow rigid plastic member formed of two sections, a first section comprising said semispherical top and a second section comprising said base and rounded annular edge portion, a bottom edge of said first section and a top edge of said second section carrying cooperative means for locking said sections together.

3. The physical exercise device of claim 2 wherein said cooperative means comprises an annular step on an inside of said second section including an inwardly and upwardly projecting shoulder, and a mating annular step on an outside of said first section including an outwardly and downwardly projecting shoulder, said steps and shoulders tightly mating to lock said first and second sections together.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,807,730 Dated April 30, 1974

Inventor(s) George E. Dalton, Karl E. Kerr, and Donald T. Larsen

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 54, after "about" insert --one and--.

Signed and sealed this 1st day of October 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents