Jan. 17, 1967 W. J. DOUGLAS 3,298,687

MANUALLY OPERATED THERAPEUTIC ROLLER AND EXERCISING DEVICE

Filed Dec. 17, 1963 2 Sheets-Sheet 1

FIG. 1

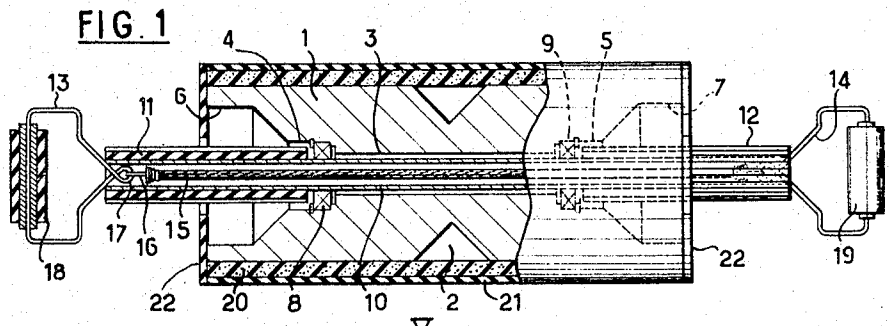


FIG. 4

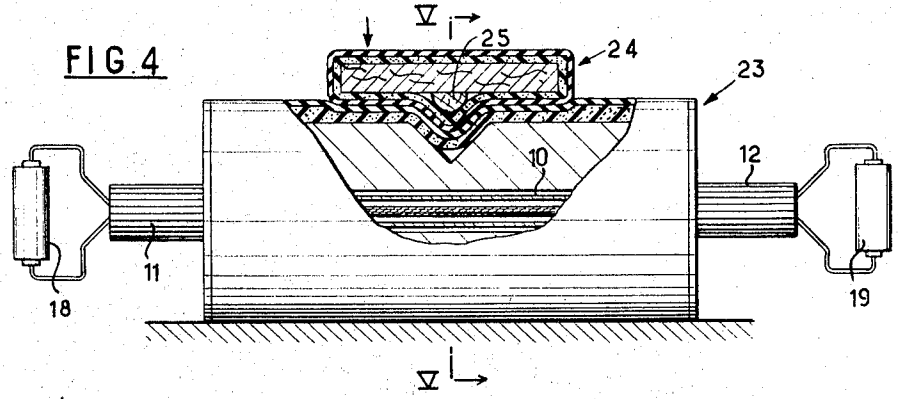


FIG. 5

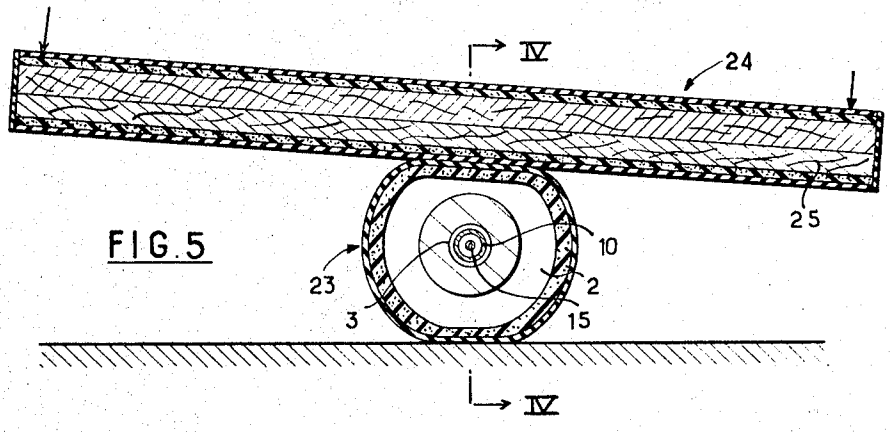
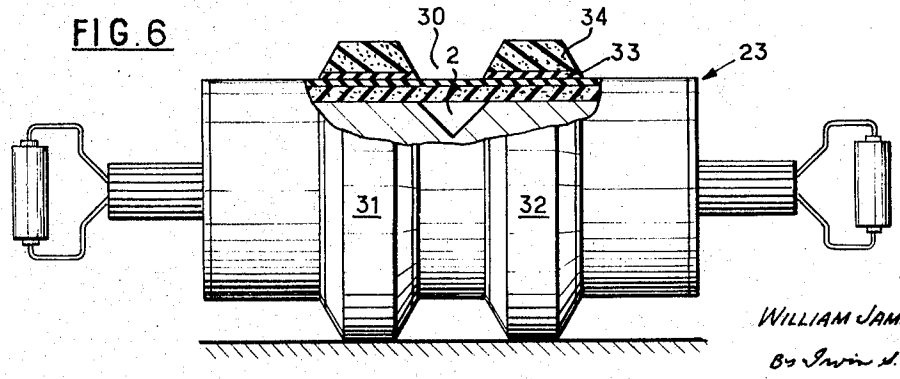


FIG. 6



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Jan. 17, 1967 W. J. DOUGLAS 3,298,687

MANUALLY OPERATED THERAPEUTIC ROLLER AND EXERCISING DEVICE

Filed Dec. 17, 1963 2 Sheets-Sheet 2

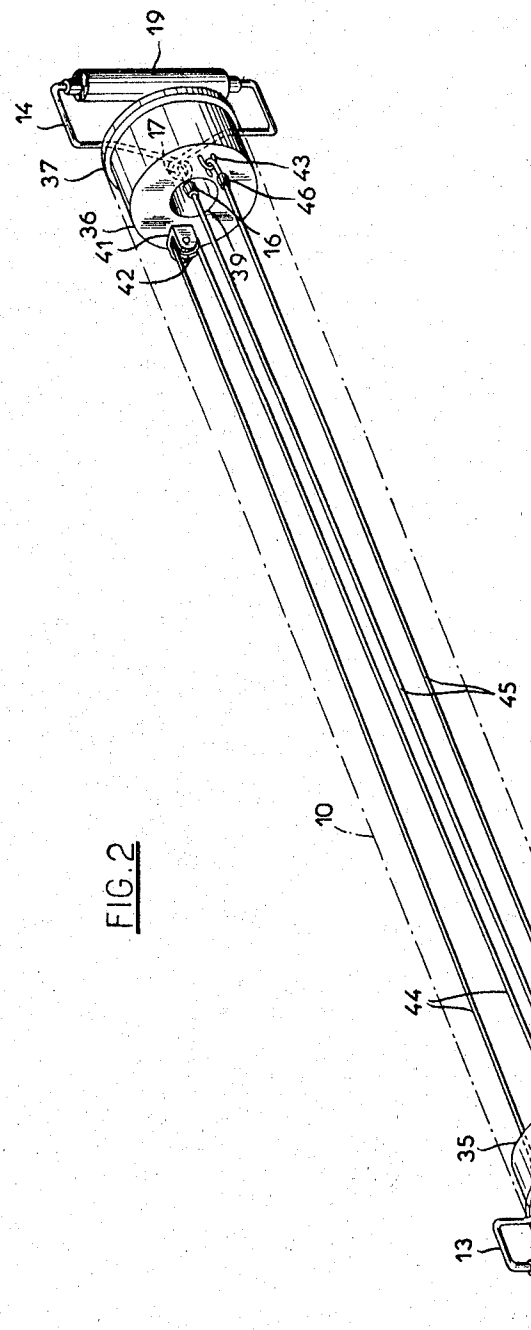


FIG. 2

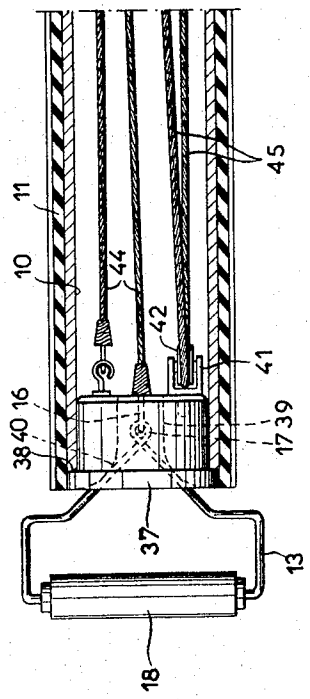


FIG. 3

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3,298,687

MANUALLY OPERATED THERAPEUTIC ROLLER AND EXERCISING DEVICE

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Claims priority, application France, May 29, 1963, 936,372
5 Claims. (Cl. 272—60)

The present invention relates to the field of exercise devices and more particularly to versatile gymnastic apparatus designed to permit the practice of a series of exercises, comprising a complete gymnastic procedure which I have conceived.

This procedure, which, broadly stated, is especially intended to produce elongation and extension of the spine, utilises, as support means, a cylindrical roller of the type described in French Patent No. 1,127,127, filed by me on May 26, 1955, and characterized particularly by a flexible covering band, of foam rubber, for example.

That prior patent has already envisaged an extension of the possible uses of the device thus constituted, initially conceived for exercises for rendering the spinal vertebrae more supple, by placing, in an axial passage in the roller, an extensible device designed to permit the performance of various exercises, more particularly those of a muscular character.

Further experiments with the earlier apparatus have meanwhile revealed the utility of developing some of the latter possibilities, by the addition of a complementary exercise unit, in order to arrive at a truly complete physical culture procedure which is adapted to permit, at the same time as the stretching and the rendering more supple of the spinal column, a strengthening of the entire skeleton, a balanced and harmonious development of the muscular system, a straining of the respiration, a toning of the cardio-vascular system, and an active toning of the peripheral tissues.

The present invention is based on the discovery that it is possible to arrive at such an extension of the variety of movements attainable by the addition of extremely simple means to said prior apparatus, and so it essentially has for its object the provision of a universal gymnastic device comprising a cylindrical roller furnished with a flexible, cylindrical covering band, or strip, with an extensible unit disposed in an axial passage in said roller, in combination with additional means adapted to permit the attainment of the results described above.

According to one aspect of this invention, the axial passage of a roller of the type described is constituted by a tubular rolling shaft, carrying on a projection extending from each lateral face (i.e. each circular base) of said roller an axially aligned gripping handle, the outer end of each said handle forming an abutting surface for the mounting of one transverse traction handle of an associated extensible unit which is disposed within the roller and which is adapted to be extended in a direction parallel to said roller axis.

This sturdy and simple arrangement produces a surprising increase in the possible uses of the rather simple original roller: while, in fact, with the original roller being normally placed on the floor, the possible movements were reduced, essentially, to a simple rolling of the body over the roller, the addition of a rotatable axle according to the present invention permits not only easier control of such rolling movement, but offers moreover the possibility of new movements, such as: displacements along a plane parallel to a support plane with either the hands or the feet being placed on the axial handles; massaging movements by rolling the roller over any part of the body; etc.

According to another aspect of this invention, the roller is given a longitudinal dimension which is of the order of the width of a person's shoulders and a diameter which is equal to at least one third of the length, and a rocking device is produced by the association of said roller with a rigid board having a width of the order of the diameter of the roller and a length of the order of four times that diameter. The assembly thus formed lends itself to the practice of three categories of new exercises, namely:

(*a*) One category of rocking, or see-saw movements wherein the board swings about a supporting line on the roller;

(*b*) One category of translational movements wherein the board moves on the roller while remaining parallel to the plane of support of the roller; and

(*c*) One category of exercises wherein the board, immovably supported by the roller, acts as an inclined plane.

In order to facilitate certain of these movements, especially those of category (*b*), above, according to one aspect of this invention a guide rib is supplied on one face of the board in cooperation with a circular depression formed in the center of the roller and extending completely around its periphery.

The invention contemplates, moreover, the optional disposition, on the cylindrical surface of the roller, of raised bands of flexible material adapted to form a pair of projecting roller bands on each side of the circular groove, said groove having a funnel-shaped, or triangular cross-section.

This arrangement is able to offer particular advantages in those exercises designed to increase vertebral mobility by permitting a greater extension of the spine.

The characteristics and advantages of this invention will become more clear from the following description taken together with the annexed associated drawings in which:

FIG. 1 is a partially cross-sectional plan view of one embodiment of the roller of the present invention;

FIG. 2 is a perspective view of an extensible unit comprising two stretchable cords;

FIG. 3 shows a cross-section of the extremity of a gripping handle enclosing a portion of an extensible unit;

FIG. 4 shows, partially in cross-section along the plane IV–IV of FIG. 5, an assembled unit ready for use;

FIG. 5 is a cross-sectional view taken along the plane V–V of FIG. 4; and

FIG. 6 is a partially cross-sectional elevational view of a roller furnished with a pair of raised bands.

According to the embodiment shown in FIG. 1, a roller comprises a mandrel, or core, of hard material, such as wood, for example, in the center of which there has been cut an annular groove **2** having a triangular, or funnel-shaped, cross-section. An axial passage **3** is provided, in alignment with the longitudinal axis of said mandrel, which extends between two cylindrical housings **4** and **5**, which housings open into the widened cavities **6** and **7**, respectively, in the ends of the mandrel. The housings **4** and **5** are furnished with anti-friction members such as the ball bearing units **8** and **9**, which are adapted to receive a cylindrical rotatable shaft **10** and to center it in the mandrel in order to permit a relative rotation to be produced between the shaft and the mandrel.

The cylindrical rotatable shaft **10** placed in the axial passage is supported by the two bearings and carries a pair of axial gripping handles **11** and **12**, each of which projects from a respective lateral face of said roller. This cylindrical shaft forms, at its extremities, abutments for a mounting, in the form of handles **13** and **14**, of an extensible device, or stretcher, **15**. Said stretcher is essentially composed of one or more elastic cords, each of which has a respective hook **16** which is designed to

be attached to a respective ring **17**, which ring forms a part of one of said mountings, each of said mountings carrying a hand grip **18**, **19** which is provided to permit a pulling movement, the pulling handles being oriented perpendicularly to the shaft axis.

In one preferred embodiment of the stretcher, as shown in FIGS. 2 and 3, a pair of sockets **35** and **36** are inserted into respective ends of the shaft **10** (here omitted for purposes of clarity). The sockets comprise shoulders **37** which provide abutting surfaces for the extremities **38** of shaft **10**.

Each of the sockets **35** and **36** contains an axial passage **39**, of circular cross-section, which increases in diameter as it approaches the outer face of the plug, as shown by the profile **40**, to form a bell-shaped opening.

On the internal lateral surface of each socket are placed a bracket **41** supporting a pulley **42**, and a hook **43**; the two units being placed diametrically across from one another.

The stretcher (FIG. 2) comprises two elastic cords **44** and **45** associated, respectively, with the handles **13** and **14**. Referring specifically to the cord **45**, as an example, it has one end connected to the handle **14**, passes over the return pulley **42** on the opposite socket **35**, and has its other end **46** attached to the hook **43** on the first socket **36**. The other cord is stretched in the same manner between the handle **13** and the hook on socket **35**. Such an arrangement permits the device to be stretched to a greater extent, while the smoothly tapered shape given to the axial socket passages **39** allows the chafing of the cords to be reduced to a minimum.

The mandrel **1** has a foam rubber covering **20** glued onto its entire cylindrical surface, on top of which there is glued a flexible rubber sheet **21**. Two circular sheets **22**, also made of flexible rubber, cover the two ends of the roller.

As is shown in FIGS. 4 and 5, the roller **23** thus constructed acts in cooperation with a board **24** which is centered on said roller, in such a way that the longitudinal axis of the board is at right angles to the roller axis. A longitudinal rib **25** is connected to the center-line of one of the board faces so as to fit into the central circular groove **2** of the mandrel **1** in such a way as to permit one member to guide the movement of the other.

The board **24** is constituted by a body, or more precisely a plank, **26** of hard material such as wood, for example. On one of its faces there is secured, by glue for example, the longitudinal rib **25**. The two elements thus connected are furnished with a covering of foam rubber **27**, and the entire resulting unit is covered by a sheet of flexible rubber **28**.

This disposition on the roller, on one hand, and on the board, on the other hand, of a relatively thick and soft covering, which is itself covered by an outer rubber sheet, offers several advantages: first of all, it offers an element of comfort to the user; in addition it assures a beneficial distribution of the weight of the user; also it assures an excellent adherence, both of the body with the roller or the board, and between these two elements. It is mainly because of this adherence that relative movement can be produced between the board and the roller practically to the exclusion of all undesirable slippage.

In accordance with FIG. 6, the roller **23** can be provided with raised, removable bands which form, on both sides of a central zone **30** which faces the mandrel groove **2**, a pair of projecting roller bands **31** and **32**. Each of these bands is advantageously constituted by a toroidal unit having a cross-section similar to that illustrated and composed of an inner sheet **33** of flexible rubber and an outer circumferential body **34** of foam rubber, or similar material.

The raised portions thus produced on each side of the central zone **30** of the roller provide a means for enhancing the effect of the groove **2**, particularly in the exercises for rendering the spine more flexible or mobile, during which exercise one can thus obtain an augmented stretching thereof.

The most beneficial use of the apparatus of this invention according to the exercise method described at the beginning of this specification, requires a suitable selection of the dimensions thereof. Particularly it is most desirable that the length of the roller be equal to the shoulder width of the average user, so that when he seizes the roller by placing his hands on the gripping handles **11** and **12**, his extended arms will be almost parallel. In one embodiment, this length is approximately 18 inches. The over-all diameter of the roller, which mainly determines the amount of bending of the reclining body when the roller is supporting the middle of the back, will be of the order of one-third the roller length. In the embodiment considered here, a diameter of 5 inches was adopted for the mandrel, the foam rubber layer **20** had a thickness of 0.8 inch, and the rubber covering **21** had a thickness of 0.2 inch, thus giving an over-all diameter of 7 inches for the unit when not in use. The length of the board **24** will be between four and five times the roller diameter, being of the order of 34 inches in the example considered herein. This dimension determines particularly the degree of possible oscillatory movement of the board when it is balanced on the roller at its center and also the degree of its inclination when it has one end placed on the floor and the other end supported by the roller.

For a complete listing of the various possible ways of using the described apparatus, it will be expedient to refer to my method, which is explained in the prior French patent referred to above; in the body of the present specification, it will suffice to here mention briefly the essential aspects of these methods, namely:

Movements of the body on the roller, the roller being moved by rolling on a supporting plane, with the possibility of control by the user by means of the axial handles;

Rolling movements of the roller over various portions of the body (i.e., massages);

Movements parallel to a plane supporting the limbs, which movements are guided by the axial handles;

Oscillating movements produced by the oscillating of the board on a stationary roller;

Translational movements produced by the displacement of the board on a moving roller;

Exercises utilizing the board as a supporting inclined plane, which inclination is produced by placing one end of the board on the floor and the other end on the roller;

Combinations with any one of the above categories of movements of muscular exercises employing the included stretchable device.

The embodiments shown and described herein are only intended to be exemplary of the modifications and embodiments which can be given to the present invention. It will be obvious that many such modifications can be made without departing from its spirit, and it is intended that the appended claims encompass such modifications.

What I claim is:

1. A versatile gymnastic apparatus comprising:

(a) a cylindrical roller having an axial passage extending therethrough;

(b) flexible material covering the rolling surface of said roller;

(c) a hollow shaft disposed within the axial passage of and supported by said roller for rotation of said shaft relative to said roller, said shaft extending from both ends of said roller to provide hand grips;

(d) a pair of sockets disposed one in each end of said shaft, each said socket having a longitudinal passage therethrough and carrying a pulley on the inner face thereof; and

(e) an extensible device disposed in part within said shaft, comprising two pulling handles and an elastic cord for each said pulling handle, each said cord having one end attached to its respective pulling

handle and having its intermediate portion passing over the pulley of the socket at the other end of said shaft and having its other end secured to the socket adjacent its associated pulling handle.

2. Apparatus as claimed in claim 1, in which the diameter of said longitudinal passage of each said socket increases toward the handle associated therewith to provide a tapered external socket surface that serves as the abutting surface for said associated handle.

3. Apparatus as claimed in claim 1, said roller having an outwardly tapered peripheral groove in its rolling surface intermediate its ends, and a rigid board rolling on the surface of said roller and having a longitudinal rib on the underside thereof fitting into said roller groove.

4. Apparatus as claimed in claim 3, said rib having a layer of flexible high friction material thereon.

5. Apparatus as claimed in claim 3, and a pair of removable flexible bands disposed around the roller to form a pair of projecting rolling surfaces disposed one on each side of said groove.

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