

Oct. 16, 1962

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3,058,742

ADJUSTABLE MUSCLE BUILDING APPARATUS AND MANIPULATOR

Filed Dec. 12, 1960

2 Sheets-Sheet 1

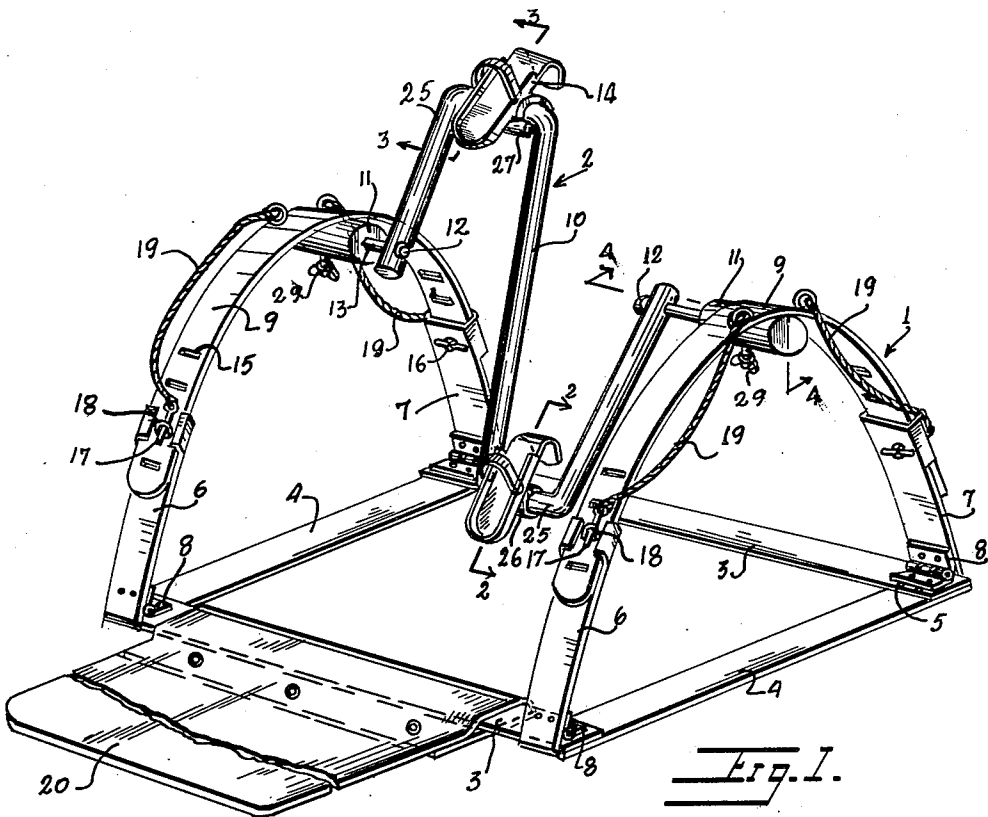


Fig. 1.

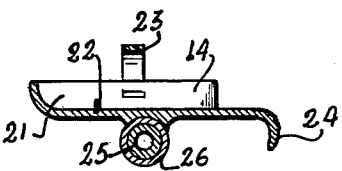


Fig. 2.

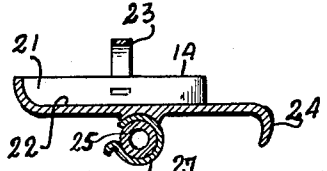


Fig. 3.

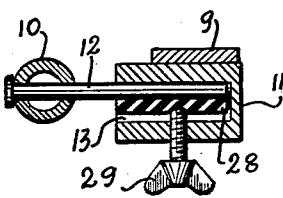


Fig. 4.

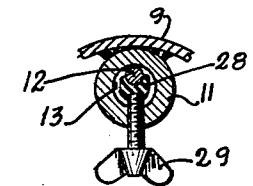


Fig. 5.

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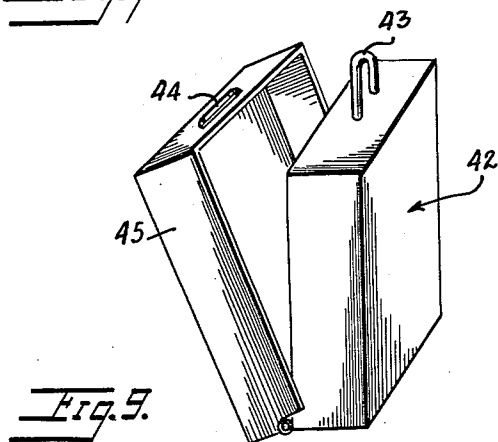
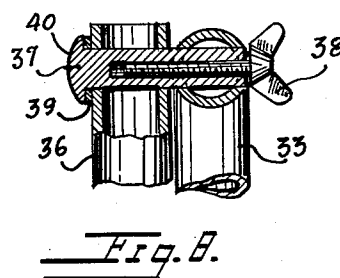
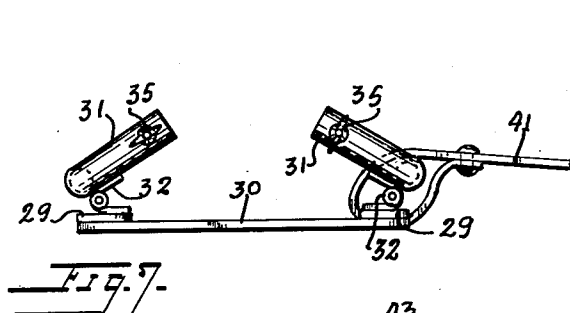
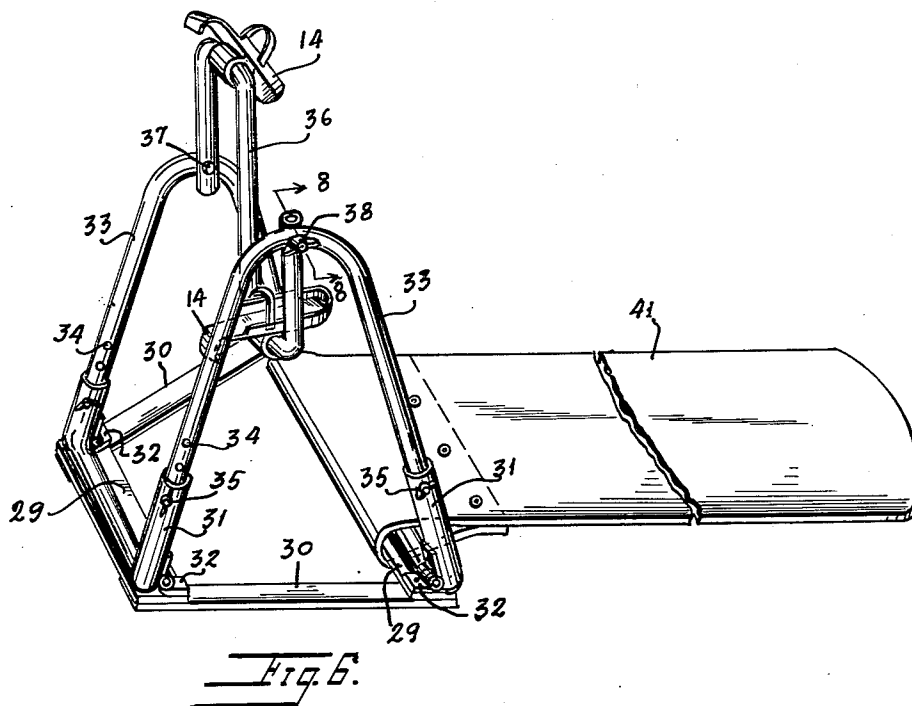
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ADJUSTABLE MUSCLE BUILDING APPARATUS AND MANIPULATOR

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2 Sheets-Sheet 2



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1

3,058,742

ADJUSTABLE MUSCLE BUILDING APPARATUS AND MANIPULATOR

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7 Claims. (Cl. 272-58)

This invention relates to a device having versatile use in the field of physiotherapy. More particularly, this invention comprises a mechanical muscle exerciser which utilizes a structure analogous to a portion of a bicycle. The device simulates the pedal action of a bicycle and may be used to exercise the same body muscles required in cycling and is adaptable to be operated by a person whether in the sitting position, on the floor or in a chair, or while the person is in a lying position. Additionally, the exerciser may be used to exercise the arm muscles in a similar fashion. The improved exercising device may be used to exercise the limbs, particularly the legs, of bedridden patients, patients convalescing from crippling diseases such as infantile paralysis, or as a means of expending energy for reducing the body weight of the user.

Accordingly, a primary object of this invention is the provision of an improved exercising device for exercising the arm or leg muscles of a person for therapeutic or weight reducing necessities.

A further object of the present invention is to provide a device that reproduces the action of bicycle pedaling and is adaptable for use by the operator while in a sitting or lying posture whether in bed or out of bed.

A further object of the present invention is the provision of a device for exercising the limbs, particularly the legs of a person wherein the pedaling action of a bicycle is simulated.

A still further object of the present invention is the provision of a device for exercising the limbs of a person, particularly the legs, which simulates the pedal action of a bicycle and can be adjusted to increase or decrease the resistance offered by the pedaling action.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 shows a perspective view of one form of the device of the present invention.

FIG. 2 shows one form of the footrest or pedal of the device of FIG. 1.

FIG. 3 shows another form of the footrest or pedal of the device of FIG. 1.

FIGS. 4 and 5 show an alternative brake structure for regulating the action of the device shown in FIG. 1.

FIG. 6 shows another embodiment of the exercising device of the invention.

FIG. 7 shows details of construction of the device of FIG. 6.

FIG. 8 shows a brake structure and mode of assembly of the device of FIG. 6.

FIG. 9 shows an example of a carrying case which can be utilized with all forms of the present invention.

Referring now to FIG. 1 of the drawings, broadly the device shown in FIG. 1 comprises a framework 1 for supporting in adjusted position the pedal mechanism identified by reference character 2. As can be seen, the framework comprises horizontal metal base members 3 and attaching members 4. These members are joined at their junctions by any known fasteners, such as bolts or rivets 5, to form a rectangular base for supporting front rising members 6 and rear rising members 7. Each rising

2

member is attached to the base by means of ordinary hinges 8 whereby they may be folded to facilitate storage or transport, or to accommodate the change of angle of disposition when the device is desired to be used in different adjustments, to be explained later.

The device of FIG. 1 is further provided with detachable adjustable spanning members 9 which join the front and rear hinged rising members 6 and 7 to provide a solid support for the pedal yoke 10 which is attached to the yoke 10 by any suitable means, such as welding, by means of the simple bearings 11 and the trunnion bolts 12 which pass through the yoke 10 and fit into the bore 13 of the bearing members. The pedal yoke 10 is provided with pivotal pedal members 14 which are free to rotate thereon as the user rotates the yoke by foot or arm action as the case may be. The adjustable spanning members 9 are provided on each end with openings 15 which may be superimposed over corresponding openings 16 on the rising members to select the adjustment most appropriate to the height or use, whether sitting or lying posture, of the operator. Openings 15 and 16 are caused to be fixed in adjustment by the pins 17 which are received in retractile eyes 18 carried by rising members 6 and 7. The pins 17 are securely attached to the members 9 by ties 19.

The front member 3 of the base frame is provided with a fabric member 20 of canvas or plastic material upon which the user sits or lies and thereby maintains proper orientation between the user and the device.

FIGS. 2 and 3 show alternative means for attaching the pedal members 14 to the yoke member 10. Pedal members 14 are provided with a heel guard 21 which rises above the foot engaging surface 22, and has affixed thereto a foot securing strap 23 which may be of elastic material. The front ends of pedals 14 are provided with a depending hand grip 24 which may be utilized by an attendant to assist weakened or crippled patients in using the exerciser. The pedal members may be permanently attached to the sections 25 of pedal yoke 10 as shown in FIG. 2 wherein sleeve bearings 26, which may be conveniently secured to the pedals by means of welding or riveting, are pivotally fitted on sections 25 of the pedal yoke. Or, if desired, the pedals may be detachably secured to the pedal yoke by means of spring clips 27 which are suitably attached to the underside of the pedals and pivotally embrace the sections 25.

The force necessary to turn the yoke 10 may be adjusted by means of the friction brake shown in FIGS. 4 and 5. Bearing sleeves 11 may be provided with floating brake members 28 which are caused to frictionally engage the trunnion bolts 12 by adjustment of the wing bolts 29 which are threaded into the underside of bearing sleeves 11. This feature is important in that it makes possible a progressive increase of the energy expended by the user, thus gradually strengthening the muscles being exercised.

FIGS. 6, 7 and 8 show an alternative form of the exercising device. This modification comprises a flat base formed by cross members 29 and bridging members 30 which are connected to each other in the same manner as corresponding members of the modification shown in FIG. 1. U-shaped riser members 31 are pivotally attached to the base by means of hinges 32. The U-shaped members 31 are spanned by yoke members 33 of tubular construction which telescope into the rising portion of members 31. The left-hand ends of members 33 are provided with several adjustment openings 34 which receive securing bolts 35 which pass through similar openings in members 31. The right-hand ends of members 33 as seen in FIGS. 6 and 7 have only a single opening and similarly cooperate with bolts 35 for secure attachment with the right-hand member 31. A revolving yoke mem-

3

ber 36 of tubular construction is equipped with pedal member 14 in a manner similar to that described in conjunction with FIGS. 2 or 3. Yoke member 36 is pivotally secured to the spanning yokes 33 by means of a pivotal brake assembly as shown in FIG. 8. The brake assembly of FIG. 8 comprises a smooth shanked nut 37 which is centrally threaded to receive a wing bolt 38. Sufficient clearances are provided to permit the yoke 36 to rotate relative to fixed spanning members 33. A washer 39 of fibrous material is positioned between the head flange 40 of nut 37 to provide a braking effect whose force is determined by the degree to which wing bolt 38 is tightened. The canvas or plastic member 41 is similar and serves the same purpose as the one designated as 20 in the modification shown in FIG. 1 of the drawings.

FIG. 9 shows a carrying case 42 having a handle 43 which cooperates with slot opening 44 of lid 45. This case can be used to store or transport the disassembled parts of the exerciser of FIG. 1 or FIG. 6.

Thus it can be seen that the exerciser of this invention in the form shown in FIGS. 1 or 6 provides varied forms of operation in that it can be used while in the seated position on the floor or in a chair or could be used by the operator in a lying position. Also the feature of a frictional brake allows the user to progressively increase the force necessary to operate the pedals. This permits gradual strengthening of the muscles which would be very desirable in certain ailments.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An exercising device comprising a rectangular base member, two pairs of confronting rising members hinged to said base member, arcuate spanning members connecting each pair of rising members, each rising member being provided with attaching means, one end of said spanning members being provided with means cooperating with said attaching means on one rising member of each pair, the opposite end of each spanning member being provided with a plurality of means for cooperation with the attaching means of the other rising member of each pair, confronting bearing means attached to the midpoints of said spanning members, an S-shaped pedal

4

yoke rotatively journaled in said bearing means, pedal means rotatively attached to each bight of said S-shaped pedal yoke.

2. An exercising device as recited in claim 1, wherein adjustable brake means are provided in combination with said confronting bearing means for cooperation with said S-shaped yoke whereby the force required to revolve said S-shaped yoke may be adjusted.

3. An exercising device as defined in claim 2, wherein a fabric sheeting member is secured to said base member between said pairs of rising members and confronting said S-shaped yoke whereby an operator may fix himself on said sheeting in sitting or lying position to maintain a fixed orientation between the exerciser and operator.

4. An exerciser as defined in claim 3, wherein each pedal means is provided with a securing strap for securing a limb of an operator thereto and each pedal means also being provided with hand grip means whereby an assistant may help the operator turn the S-shaped yoke.

5. An exercising device as defined in claim 4, wherein said pedal means are provided with spring clip journals for detachable connection to said bight portions of said S-shaped yoke whereby the exerciser is adaptable to hand operation by the operator with the pedal means removed.

6. An exercising device comprising a base having two parallel members connected by two additional parallel members to form a rectangle, rising members connected by means of hinges to each of the four ends of said two parallel members, U-shaped yoke members connecting confronting rising members, confronting bearing means positioned at the midpoints of said U-shaped yoke members, an S-shaped pedal yoke journaled for rotation in cooperation with said bearing means, pivotal pedal members positioned on the bights of said S-shaped member.

7. An exerciser as defined in claim 6, wherein adjustable brake means are provided in conjunction with each bearing means for cooperation with said S-shaped yoke member whereby the amount of force required to rotate said S-shaped member may be selectively adjusted.

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