

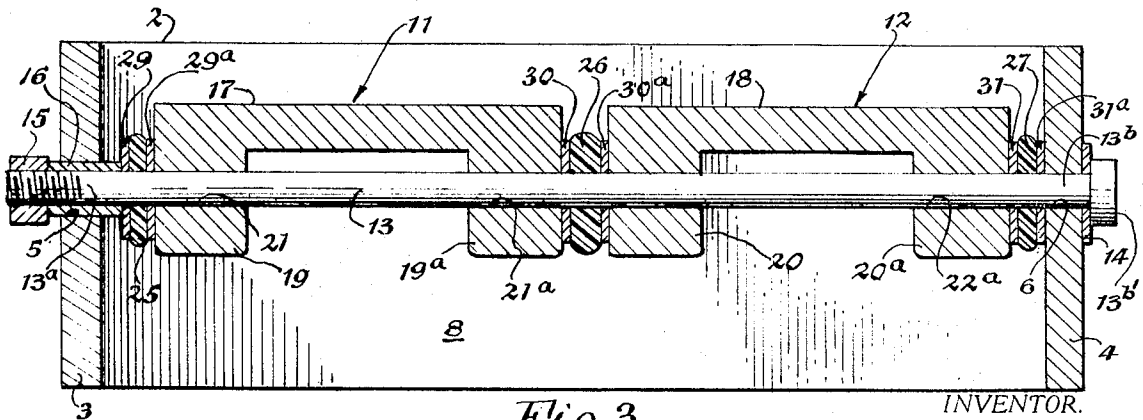
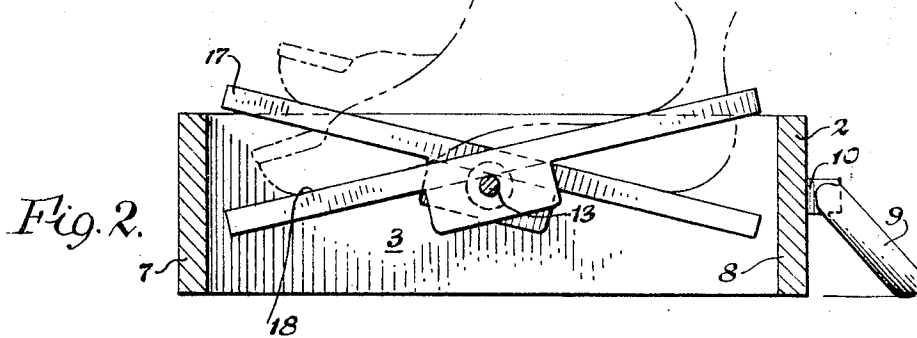
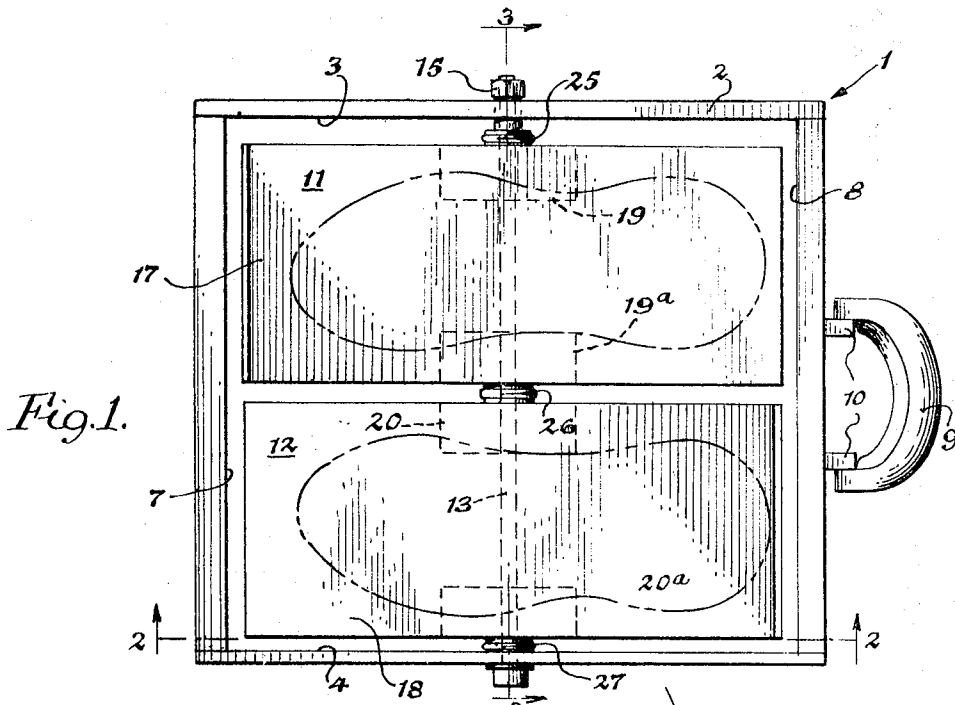
Aug. 25, 1970

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3,525,522

FRICTION TYPE FOOT EXERCISING DEVICE

Filed Sept. 4, 1968



*Fig. 3.*

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3,525,522

## FRICION TYPE FOOT EXERCISING DEVICE

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Filed Sept. 4, 1968, Ser. No. 757,262  
Int. Cl. A63b 21/00

U.S. Cl. 272—79

10 Claims

### ABSTRACT OF THE DISCLOSURE

A foot exercising device including a housing having a shaft extending transversely thereof, a pair of foot pedals pivotally supported intermediate the ends thereof in a side by side relationship on the shaft, shaft mounted means to space the foot pedals from each other and the walls of the housing and including resilient washerlike spacers, and means to adjustably compress the spacers in a direction axially of the shaft in order to vary the force necessary to effect pivotal movement of the foot pedals.

### BACKGROUND OF THE INVENTION

Foot exercising devices of diverse types are well known in the art. However, prior devices of which I am aware, have met with only limited degrees of acceptance for one or more reasons, including their bulkiness, cost and/or great difficulty with which they may be adjusted to vary the force necessary for their operation. The latter drawback is quite serious in that the ability of different users to operate a given exercise device will vary considerably.

### SUMMARY OF THE INVENTION

The present invention is directed toward the provision of a compact, readily portable and low cost foot exercising device, which may be quickly and easily adjusted to vary the force required of a user to manipulate the foot pedals.

More particularly, the exercising device, according to the present invention, includes a housing which is adapted to support a bearing shaft on which one or more foot pedals are pivotally mounted and operably coupled to each other and/or the housing by one or more elastic members adapted to retard pivotal movement of the pedals. The force required by a user to effect pivotal movement of the foot pedals with respect to the housing and/or the shaft is determined by the force required to effect shear deformation of the elastic members. Thus, the required force may be conveniently varied by adjustably compressing the members in order to vary their resistance to shear deformation.

### DRAWINGS

The mode of operation of the foot exercising device of the present invention will now be more fully described with reference to the following description taken with the accompanying drawing wherein:

FIG. 1 is a plan view illustrating the foot exercising device of the present invention;

FIG. 2 is a sectional view taken generally along the line 2—2 in FIG. 1; and

FIG. 3 is a sectional view taken generally along the line 3—3 in FIG. 1.

### DETAILED DESCRIPTION

Referring in greater detail to the drawing, it will be seen that the foot exercising device according to the present invention is generally designated as 1 in FIG. 1 and includes a housing 2, which is preferably rigid and formed by spaced side wall portions 3, 4 having axially aligned through openings 5, 6, and joining end wall portions 7, 8. Housing 2 may be fabricated of wood, metal, plastic,

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or any other suitable material which is preferably light in weight, in order to render the device readily portable. Transporting of the device may be facilitated by the provision of a suitable handle 9, which may be either affixed to end wall 8, as by hinges 10, or formed integrally therewith. Additionally, housing 2 is preferably formed with an open top and bottom in order to both reduce the weight and permit free access interiorly thereof.

In the preferred embodiment of the present invention, a pair of foot pedals 11, 12 are disposed in a side by side relationship within the confines of housing 2 and journaled intermediate the ends thereof on a shaft 13 for pivotal movement about the axis of shaft 13 with respect to both the shaft and the housing.

Shaft 13 is shown in FIG. 3 as extending transversely of housing 2 and as having its ends 13a, 13b supportedly received within housing side wall apertures 5, 6 respectively. Preferably, shaft end 13b is constrained against movement in the direction of side wall 3 in order to permit device 1 to be adjusted in the manner to be described. To this end, shaft end enlargement 13b' may bear on rigid pressure distributing washer 14, which in turn bears on the outer surface of side wall 4. The other end 13a of shaft 13 is adapted to receive an adjustment means for device 1, which for purposes of illustration is shown as being in the form of a nut 15 and a sleeve bearing 16. In FIG. 3, nut 15 is shown as being threadably received on shaft end 13a, and sleeve bearing 16 is shown as being disposed concentrically of shaft 13 and slidably received within aperture 5 of said wall 3. As will more fully be hereinafter described, nut 15 when threaded onto shaft end 13a in a direction toward shaft end 13b, is adapted to slide sleeve bearing 16 to the right, as viewed in FIG. 3, in order to increase the force required of a user to effect pivotal movement of foot pedals 11, 12.

While foot pedals 11, 12 may be of any desired construction, they are shown for purposes of illustration as including tread portions 17, 18, which are provided with integrally formed or suitably attached dependent flange portions 19, 19a and 20, 20a, respectively. Flanges 19—20a are shown particularly in FIG. 3 as having axially aligned bore openings 21—22a, respectively, in which shaft 13 is freely journaled. Preferably, the upwardly facing surfaces of foot pedal treads 17, 18 are roughened or covered with a traction producing material in order to prevent the feet of a user from unintentionally sliding off the foot pedals during use. Treads 17, 18 may be centered or balanced lengthwise thereof with respect to shaft 13 in order to permit a user to operate foot pedals 11, 12 either while he is seated on a chair or bed side, not shown, or while standing in a vertical position on the foot pedals, as indicated in FIG. 2.

Referring to FIGS. 1 and 3, it will be seen that foot pedals 11, 12 are adapted to be maintained in a spaced relationship axially of shaft 13 both with respect to each other said side walls 3, 4 by an arrangement including a plurality of shaft mounted, elastic washer-like members 25, 26, 27. Preferably, a plurality of pairs of relatively rigid pressure distributing washers 29, 29a, 30, 30a and 31, 31a are mounted on shaft 13 and disposed respectively in engagement with the spaced, oppositely facing, substantially radially extending side surfaces of members 25, 26 and 27. In order to facilitate assembly and/or replacement of members 25—27, should the need arise, pressure distributing washers 29—31a are preferably freely mounted on shaft 13. Undue slippage of the washers with respect to adjacent surfaces against which they are disposed in abutting engagement may be prevented by providing the washers with roughened surfaces or bonding the washers to such adjacent surfaces.

The force required by a use to pivot foot pedals 11,

12 with respect to each other and/or housing 2 may be varied by adjustment of nut 15, which serves to increase or decrease the amount by which elastic members 25-27 are compressed axially of shaft 13. Thus, when nut 15 is threaded onto shaft 13 towards housing wall 4, sleeve bearing 16, which is disposed in engagement with pressure distributing washer 29, serves to move foot pedals 11 and 12 along shaft 13 in the direction of side wall 4 while simultaneously effecting compression of each of elastic members 25-27. The more elastic members 25-27 are compressed, the greater will be their tendency to resist shear deformation thereof brought about by relative rotatable movement of their oppositely facing side surfaces. Accordingly, it will be understood that the side surfaces of elastic member 27 are operably associated with housing side wall 4 and flange 20a of foot pedal 12, respectively, thereby tending to retard pivotal movement of foot pedal 12 with respect to the housing. Similarly, the side surfaces of elastic member 26 are operably associated with foot pedal flanges 19a, 20, respectively, thereby tending to retard relative pivotal movement between the foot pedals. Pivotal movement of foot pedal 11 with respect to the housing is also retarded by elastic member 25, whose side surfaces are operably associated, respectively, with flange 19 and with nut 15, and thus shaft 13, via sleeve bearing 16.

A user of the exercising device of the present invention may either singularly or simultaneously operate foot pedals 11, 12, and when both foot pedals are operated, they may be pivoted in the same or opposite directions about the axis of shaft 13.

While only the preferred embodiment of the present invention has been described in detail, various modifications thereof will likely occur to one skilled in the art, in view of the foregoing description. Exemplary thereof would be to employ only one foot pedal which is operably associated with the housing by only one elastic member, wherein such pedal is either journaled on its supporting shaft or keyed thereto and made movable by journaling the ends of the shaft on the housing. Alternatively, it is anticipated that the housing may be constructed in such a manner that upon movement of the adjustment nut, the side walls of the housing may flex inwardly towards each other for the purpose of compressing the pedal motion retarding elastic members. Still further, it is envisioned that in a construction of the exercising device of the present invention which employs two foot pedals, a motion retarding elastic member may be mounted on the supporting shaft only between the foot pedals, thereby serving to retard movement of the pedals only with respect to each other, while permitting them to move relatively freely with respect to the housing. Also, if desired, adjustment means may be provided on each end of the foot pedal supporting shaft. Accordingly, it is wished that the present invention be limited only by the scope of the appended claims, wherein I claim:

1. In a foot exercising device, the combination which comprises: a housing; a shaft disposed transversely of said housing and being end supported thereon; at least one foot pedal supported intermediate the ends thereof on said shaft for pivotal movement with respect to said housing about the axis of said shaft; and foot pedal movement retarding means, including at least one member formed from an elastic material and having spaced oppositely facing surfaces disposed substantially radially of said shaft, one of said surfaces being operably associated with said housing and the other of said surfaces being operably associated with said foot pedal, whereby pivotal movement of said foot pedal with respect to said housing is adapted to be retarded by shear deformation of said member.

2. A foot exercising device according to claim 1, wherein means are provided to adjustably compress said

member by varying the distance between said member surfaces.

3. A foot exercising device according to claim 2, wherein at least a first end portion of said shaft is threaded, and a second end portion of said shaft is constrained from movement with respect to said housing in a first direction, and said compressing means includes adjustment means threadably received on said first shaft end portion and a sleeve member disposed concentrically of said shaft, and said sleeve member being adapted to be moved axially of said shaft in a direction opposite to said first direction by said adjustment means.

4. A foot exercising device according to claim 2, wherein two foot pedals are disposed in a side by side relationship and mounted intermediate the ends thereof on said shaft, one end of said shaft is mounted on said housing so as to prevent movement of said shaft in at least a first direction axially thereof, the other end of said shaft being adapted to threadably receive said compressing means for movement axially thereof, said one elastic member being disposed intermediate said one foot pedal and said housing adjacent said one end of said shaft, and there is provided a second elastic member supported on said shaft and having oppositely facing surfaces thereof operably associated with said foot pedals, said compressing means when moved axially of said shaft in a direction opposite to said first direction being adapted to effect compression of said elastic members.

5. A foot exercising device according to claim 4, wherein relatively rigid pressure distributing washers are positioned on said shaft in surface abutting engagement one with each of said surfaces of said elastic members.

6. A foot exercising device according to claim 2, wherein said housing is of generally rectangular configuration having spaced first and second side and joining end wall portions, a first end portion of said shaft being mounted on said first side wall portion such that movement thereof in the direction of said second side wall portion is constrained, a second end portion of said shaft being threaded and being mounted on said second side wall portion, two of said foot pedals are pivotally supported on said shaft in a side by side relationship and disposed intermediate said housing side wall portions, and three of said elastic members are supported on said shaft, a first of said elastic members being disposed intermediate said first side wall portion and a first of said pedals, a second of said elastic members being disposed intermediate of said pedals and a third of said elastic members being disposed intermediate of said second side wall portion and a second of said pedals, and said compressing means includes adjustment means threadably received on said shaft second end portion and a sleeve member disposed concentrically of said shaft, said adjustment means being adapted to reciprocate said sleeve axially of said shaft towards said first side wall portion to effect compression of said elastic members.

7. A foot exercising device according to claim 1, wherein said member is of washer-like configuration and is mounted concentrically of said shaft, and at least two relatively rigid pressure distributing washers are mounted on said shaft, one of said pressure distributing washers having the oppositely facing surfaces thereof disposed in surface abutting engagement with said one surface of said member and said housing, and another of said pressure distributing washers having oppositely facing surfaces thereof disposed in surface abutting engagement with said other surface of said member and said foot pedal.

8. A foot exercising device according to claim 1, wherein two foot pedals are provided, said pedals being disposed in a side by side relationship and being journaled on said shaft for movement with respect to both said housing and said shaft, and a second elastic member is disposed on said shaft intermediate said foot pedals, said second elastic member having oppositely facing sur-

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faces thereof operably associated one with each of said foot pedals.

9. A foot exercising device according to claim 8, wherein said members are of washer-like configuration and are mounted concentrically of said shaft, and there are provided pairs of relatively rigid pressure distributing washers mounted on said shaft and arranged with one pair disposed in abutting engagement with said surfaces of each said members.

10. In a foot exercising device, the combination which comprises: a housing; a shaft disposed transversely of said housing and being end supported thereon; a pair of foot pedals disposed in a side by side relationship and being journaled intermediate the ends thereof on said shaft for pivotal movement with respect to both said shaft and housing; and foot pedal movement retarding means including at least one member formed from an elastic material mounted on said shaft, said one member having spaced oppositely facing surfaces disposed substantially

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radially of said shaft and operably associated one with each of said foot pedals, whereby pivotal movement of said foot pedals relative to each other is adapted to be retarded by shear deformation of said one member; and means to vary the resistance of said one member to shear deformation.

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U.S. Cl. X.R.

272—57; 188—72