

Aug. 21, 1951

E. W. BROCKMAN ET AL

2,565,348

EXERCISING MACHINE

Filed Nov. 23, 1948

4 Sheets-Sheet 1

FIG. 1.

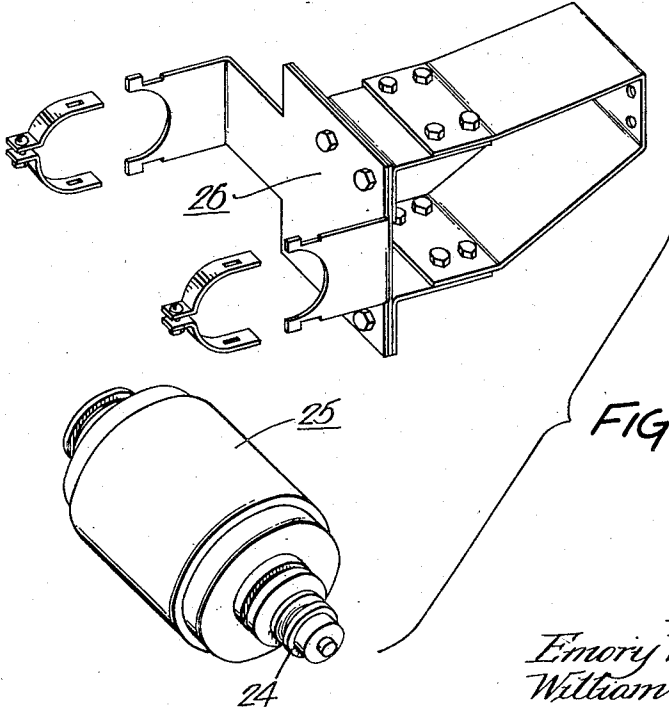
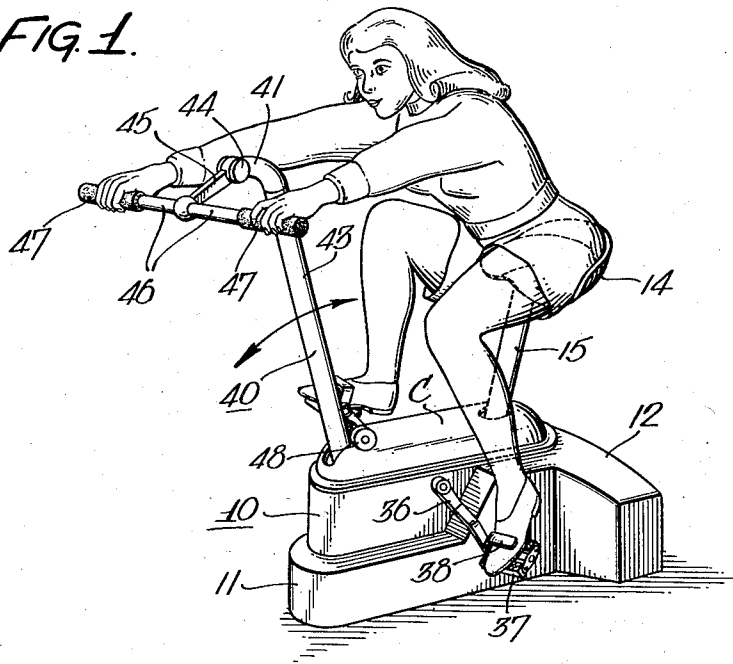


FIG. 4.

Inventors:
Emory W. Brockman
William L. Parsons, Jr.
by their Attorneys
Hudson & Hudson

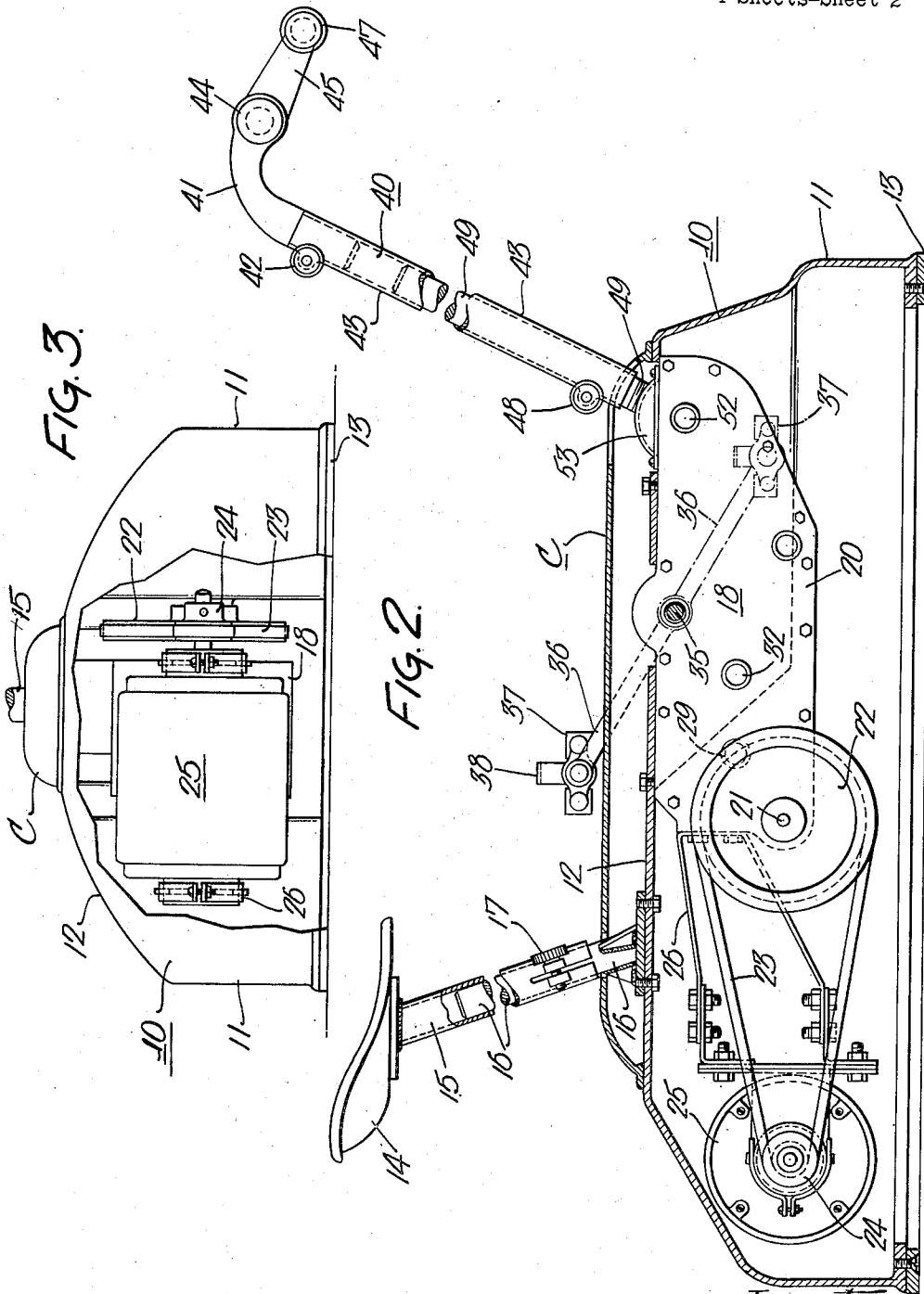
Aug. 21, 1951

E. W. BROCKMAN ET AL
EXERCISING MACHINE

2,565,348

Filed Nov. 23, 1948

4 Sheets-Sheet 2



Inventors:
Emory W. Brockman
William L. Parsons, Jr.
by their Attorneys
Howson & Howson

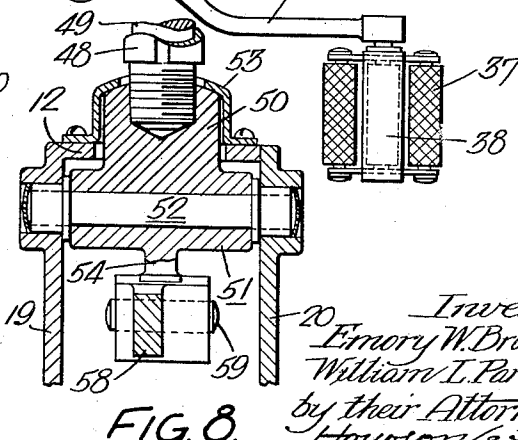
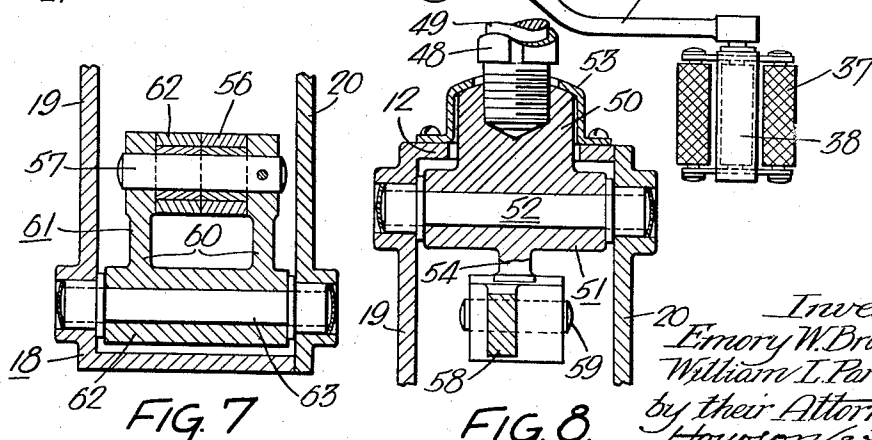
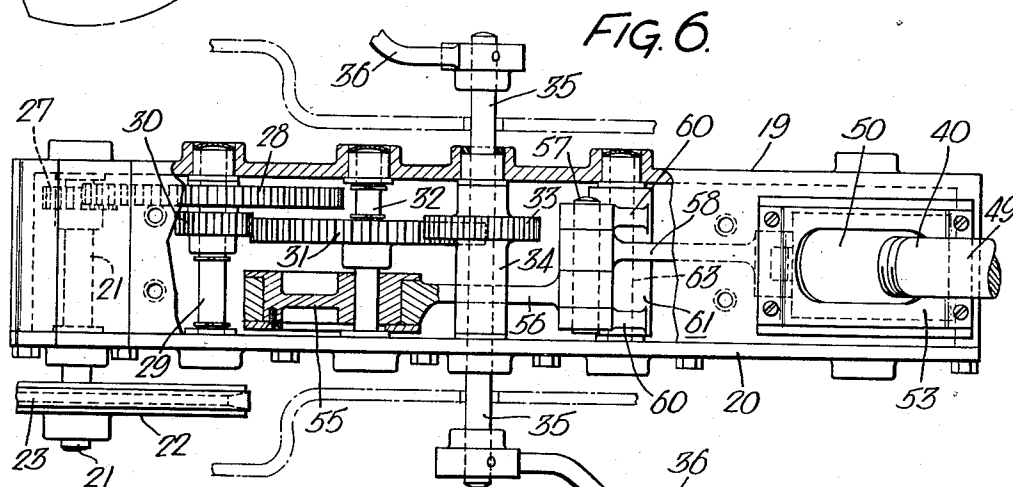
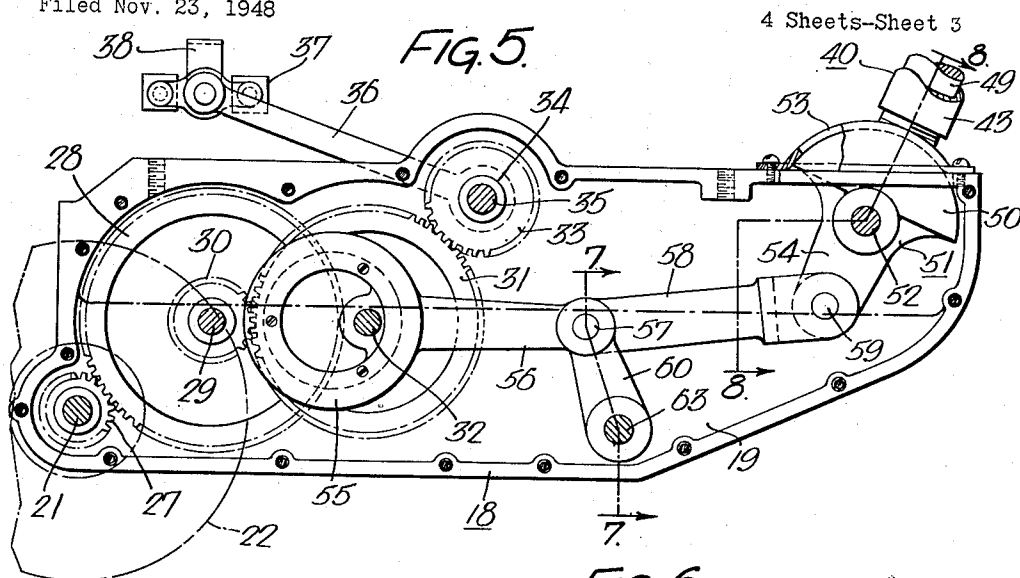
Aug. 21, 1951

E. W. BROCKMAN ET AL
EXERCISING MACHINE

2,565,348

Filed Nov. 23, 1948

4 Sheets-Sheet 3



20 Inventors:
Emory W. Brockman
William I. Parsons, Jr.
by their Attorneys
Hawson &
Hawson

Aug. 21, 1951

E. W. BROCKMAN ET AL

2,565,348

EXERCISING MACHINE

Filed Nov. 23, 1948

4 Sheets-Sheet 4

FIG. 10.

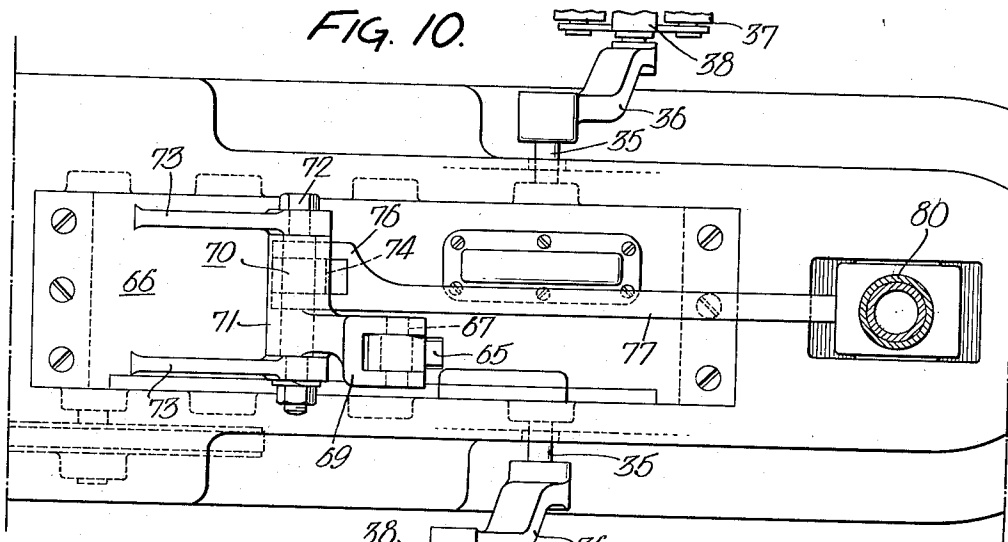


FIG. 11.

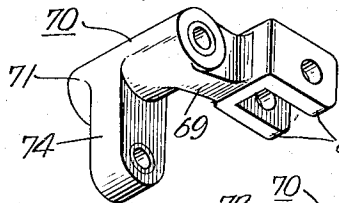
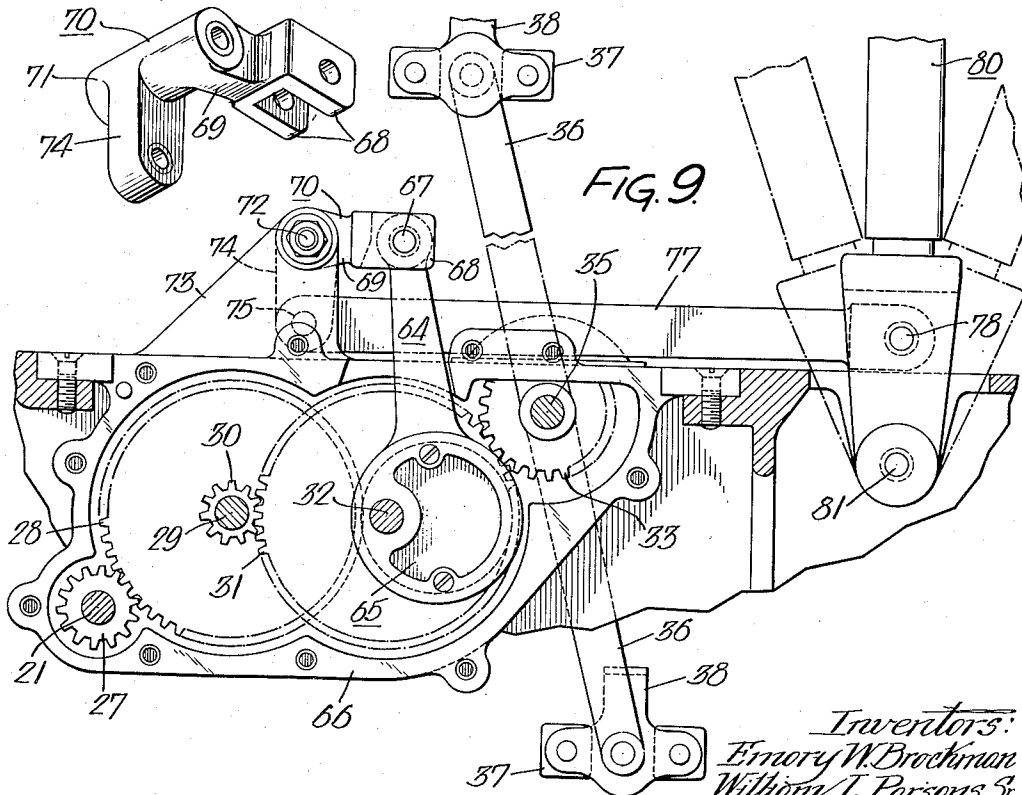


FIG. 9.



Inventors:
Emory W. Brockman
William L. Parsons, Jr.
by their Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE

2,565,348

EXERCISING MACHINE

Emory W. Brockman, Hartsville, and William L. Parsons, Sr., Philadelphia, Pa., assignors, by mesne assignments, to Reconstruction Finance Corporation, Philadelphia, Pa., a corporation of the United States

Application November 23, 1948, Serial No. 61,714

8 Claims. (Cl. 128—25)

1

This invention relates to new and useful improvements in exercising machines. The principal object of the present invention is to provide an exercising machine which effectively affords the muscular activity suitable to physical therapy needs.

Another object of the invention is to supply a machine of the type described which may be adjusted readily to meet the needs of individuals with functional limitations.

Another object of the invention is to provide a machine of the character set forth which incorporates with hand controlled adjustments to allow for various arm and leg lengths of users.

Another object and highly important object of the invention is to provide an exercising machine having the foregoing characteristics which embodies easily controlled adjustments to regulate the degree and location of the activity. In order to satisfactorily control the location and degree of exercise activity, it is essential to maintain one part of the body in a fixed position and radiate the activity from this fixed point. Since the hip joints are the central hinge of the body structure, only by keeping the seat stationary and having all movement related to this fixed point is it possible to definitely control the amount of activity and the parts of the body in which it is localized.

A further object of the invention is to provide a machine of the stated type which may be operated either as a passive exerciser by power or manually by the user.

A further and important object of the invention is to provide a machine as set forth wherein the drives to the pedals and handles are constructed and arranged to provide a constantly changing relationship between the pedals and handles.

Still a further object of the invention is to provide a machine having the foregoing features and characteristics which is pleasing in appearance, quiet and efficient in operation and free from vibration.

These and other objects of the invention and the various features and details of the construction and operation thereof are hereinafter fully set forth and described with reference to the accompanying drawings, in which:

Fig. 1 is a view in perspective of an exercising machine made in accordance with the present invention showing a person seated thereon;

Fig. 2 is an enlarged vertical sectional view taken longitudinally through the exercising machine shown in Fig. 1;

2

Fig. 3 is a rear end elevational view of the machine with a portion of the casing thereof broken away to illustrate the construction and arrangement of certain of the operating elements disposed interiorly thereof;

Fig. 4 is a detached view in perspective showing the drive motor and mounting bracket therefor;

Fig. 5 is an enlarged side elevational view of the drive transmission of the exercising machine, the coverplate of the transmission housing having been removed to better illustrate the construction and arrangement of the gearing and linkage therein;

Fig. 6 is a top plan view of the transmission housing a portion of which has been broken away to further illustrate the construction and arrangement of the gearing and connections therein;

Fig. 7 is a fragmentary sectional view taken on line 7—7, Fig. 5;

Fig. 8 is a sectional view taken on line 8—8, Fig. 5;

Fig. 9 is a fragmentary side elevational view of an exercising machine showing a modified arrangement of the drive transmission;

Fig. 10 is a top plan view of the disclosure in Fig. 9; and

Fig. 11 is a detached view in perspective of a bell crank lever embodied in the modified transmission mechanism shown in Figs. 9 and 10.

Referring now more particularly to the drawings, an exercising machine made according to the present invention comprises a hollow base structure 10 including a continuous enclosing side wall portion 11 and a top portion 12. Feet 13 of rubber or other resilient material are secured to the bottom edge of the wall 11 of the base which is adapted to rest upon the floor or other flat supporting surface.

The base 10 mounts a relatively fixed seat 14 which is secured at the upper end of a tubular sleeve 15 that receives telescopically therein a rod or support 16 which is fixedly secured to the upper surface of the base top portion 12 so as to extend obliquely upward therefrom as illustrated. The relative position telescopically of the tube 15 and support rod 16 are adjustable through the medium of a lock screw 17 to permit the seat 14 to be adjusted to the desired height with respect to pedals hereinafter described.

Secured internally of the base 10 to the underside of the top portion 12 thereof is a substantially closed transmission housing 18 including

3

vertically extending parallel spaced side walls 19 and 20, the latter being removable and serving as a cover. Extending transversely of the housing 18 adjacent the lower rearward corner thereof is a drive shaft 21 which has its opposite end portions rotatably mounted in the housing side walls 19 and 20. The shaft 21 extends a short distance laterally beyond the housing wall 20 and has fixedly secured thereon a pulley 22 of predetermined diameter.

Preferably the pulley 22 is of relatively heavy construction and functions in the manner of a fly-wheel when rotationally driven. The circumference of the pulley 22 is grooved as shown to receive therein a V-belt 23 which is in turn driven from a relatively smaller pulley 24 secured on the drive shaft of an electric motor or other source of rotational power 25. In the illustrated embodiment of the invention the motor 25 is supported from the rear wall of the transmission housing 18 by means of a bracket structure 26, for example, constructed and adapted to support the motor 25 in the manner shown in Figs. 2 and 4 of the drawings.

Fixedly mounted upon the drive shaft 21 within the housing 18 is a gear 27 which is meshed with a gear 28. This gear 28 is fixed upon an idler shaft 29 which extends transversely of the housing 18 parallel to the drive shaft 21 and has its opposite ends journaled in the housing side walls 19 and 20 as shown, for example in Fig. 6 of the drawings. Also secured upon the shaft 29 is another gear 30 which is meshed with a gear 31 fixed upon an idler shaft 32 that likewise extends transversely of the housing 18 with its opposite ends journaled in the housing side walls 19 and 20.

The gear 31 in turn is meshed with a gear 33 which is mounted on a tubular sleeve 34. The sleeve 34 extends transversely of the housing 18 and has its opposite ends rotationally journaled in the side walls 19 and 20 of the housing. The sleeve 34 is keyed or otherwise secured rotationally to a pedal shaft 35 which is adapted to be slidably inserted through the sleeve and housing. As shown in Fig. 6 of the drawings, the opposite ends of the pedal shaft 35 are designed to project laterally from opposite sides of the housing 18 and have fixedly secured thereon pedal shanks 36. The pedals or foot supports 37 on the pedal shanks 36 are provided with spring clips 38 which are constructed and operable to engage over and retain user's feet of various sizes firmly in position upon the pedals. In addition, the pedal shanks 36 are readily detachable from the pedal shaft 35 in order that pedal shanks of various lengths may be mounted on the shaft 35 as required.

From the foregoing it will be apparent that the motor 25 will operate through the belt 23 to drive the fly-wheel pulley 22 and its shaft 21 with the result that the said shaft 21 will operate through the train of gears 27, 28, 30, 31 and 33 to rotationally drive the pedals 36 at a predetermined rate of speed. The transmission is designed with reference to a predetermined pitch diameter gearing so that the relationship between pedal speed and oscillation of handle can be varied, either faster or slower by changing the gear combination without changing the center distances of the journal bores in the housing.

Mounted for oscillatory movement toward and away from the fixed seat 14 is a handle structure 40. This handle structure 40 includes a goose neck 41 which has one end thereof adjustably secured by means of a hand screw 42 in the

4

upper end of a tubular sleeve 43. Likewise adjustably secured as at 44 to the other end of the goose neck 41 is a handle bar member 45 having opposite lateral extensions 46 provided at their extremities with handgrips 47 which preferably are rotationally mounted upon the said extensions 46.

The sleeve 43 in turn is adjustably mounted, for example, by means of a hand screw 48 upon a rod or support 49 which has its lower end threaded in or otherwise secured to the semi-circular portion 50 of a mounting member 51. The member 51 is rotatably mounted upon a transversely extending shaft 52 that has its opposite ends supported in the opposite side walls 19 and 20 of the housing 18. The semi-circular portion 50 of the member 51 projects through a slot or opening in the top portion 12 of the base 10 and cooperable with said portion 50 is a cap or seal 53 which serves to prevent the entrance of dust and other foreign matter into the transmission housing 18 and also prevents oil leakage therefrom.

Depending from the handle mounting 51 below the shaft 52 is an arm 54 and the handle structure 40 previously described is oscillated toward and away from the fixed seat 14 about the axis of the shaft 52 through connections to the arm 54 from an eccentric 55 which is mounted on the aforesaid shaft 32. Thus, the eccentric 55 has a forwardly extending arm portion 56 which has its outer end pivotally connected by a pin 57 to one end of a link 58 which has its other end pivotally connected by a pin 59 to the arm 54. The pin 57 is carried by the spaced arm portions 60 of a rocker 61 having a sleeve portion 62 which is rotatably mounted upon a shaft 63 extending transversely of the housing 18 and having its opposite ends supported in the housing side walls 19 and 20.

The construction and arrangement of the drives to the pedal shanks 36 and to the handle structure 40 are such that the pedals are rotated slightly in excess of a complete number of revolutions for each complete oscillatory stroke of the handle structure 40. By this arrangement, instead of providing a fixed relationship between the pedals and handle, it will be apparent that there is provided a constantly changing relationship between the pedals and handle. Furthermore, by the described construction and arrangement it will be apparent that the relative speeds of operation of the pedals and handle may be varied as desired without altering the ratio between the drives merely by varying the diameters of the pulleys 22 and 24. In addition, the construction and arrangement of the drives is such that the device may be pedaled manually, the fly-wheel effect produced by the pulley 22 providing smoothness and adequate momentum to such manual operation. The mountings on the top portion 12 of the base 10 for the seat and its support as well as for the handle structure 40 may be concealed and the general appearance of the machine improved by providing in the top of the base a cap or cover C, for example, as shown in Figs. 1 and 2 of the drawings. Alternatively, the base 10 and cover C may be a unitary structure such as a single or one-piece casting.

A modification of the drive to the handle structure is shown in Figs. 9, 10 and 11 of the drawings. In the modification there illustrated, the arm 64 is disposed circumferentially of the eccentric 65 approximately 90° from the shaft 32 and extends or projects upwardly through a slot or opening in the top of the transmission housing

66. The free end of the eccentric arm 64 is pivotally connected by means of a pin 67 intermediate the forwardly extending bifurcated portions 68 of one arm 69 of a rocker member 70. The rocker 70 has its central portion in the form of a sleeve 71 which is rotatably supported upon a pin 72 which is supported in spaced parallel ears 73 provided on the top surface of the transmission housing 66. The rocker 70 also has a depending arm portion 74 arranged at right angles with respect to the aforesaid arm portion 69 and the free end of the depending arm 74 is pivotally connected, for example, by means of a pin 75 to the inner bifurcated end portion 76 of a link 77. The forward end of the link 77 is pivotally connected, for example, by means of a pin 78 to the lower end portion of a handle structure 80 at a point above the pivot 81 thereof. As in the case of the embodiment first described, the exposed operating members may be enclosed and the general appearance improved by providing a cap or cover therefor such as, for example, the cover C shown in Fig. 1 of the drawings and previously referred to.

From the foregoing description, it will be apparent that the invention provides a novel exercising machine which affords effective muscular activity suitable to physical therapy needs. The invention also provides an exercising machine the elements of which are readily adjustable to meet the needs of individuals with functional limitations and also to allow for various arm and leg lengths of the users. Furthermore, the invention provides a machine affording regulation of the degree and location of the exercising activity and wherein the drives to the pedals and handle are constructed and arranged so that there is a constantly changing relationship between them. In addition, the invention affords a machine which may be operated either as a passive exerciser by power or manually by the user, and which is pleasing in appearance, quiet and efficient in operation, and free from vibration.

While certain embodiments of the invention have been illustrated and described herein it is not intended to limit the invention to such disclosures and changes and modifications may be made therein and thereto within the scope of the following claims.

We claim:

1. An exercising machine comprising a base having a relatively fixed seat adjustably supported therefrom, a pivoted handle extending upwardly from the base for oscillatory movement toward and away from the seat, a transmission housing supported by said base, a pedal shaft supported by said housing, pedals mounted on the opposite end portions of said pedal shaft, a rotatable drive shaft supported by the housing and extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft transversely within the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft, and connections between said eccentric and said handle to oscillate the handle.

2. An exercising machine comprising a base having a relatively fixed seat adjustably supported therefrom, a pivoted handle extending upwardly from the base for oscillatory movement toward and away from the seat, a transmission

housing supported by said base, a pedal shaft supported by said housing, pedals mounted on the opposite end portions of said pedal shaft, a rotatable drive shaft supported by the housing and extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft supported by the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft, and connections between said eccentric and said handle to oscillate the handle, the construction and arrangement of the drives to the pedals and handle being such that the pedals rotate slightly in excess of a whole number of revolutions for each complete stroke of the handle to thereby provide a constantly changing relationship between the pedals and handle during operation of the machine.

3. An exercising machine comprising a base having a relatively fixed seat adjustably supported therefrom, a pivoted handle extending upwardly from the base for oscillatory movement toward and away from the seat, a transmission housing supported by said base, a pedal shaft extending transversely through said housing, pedals mounted on the opposite end portions of said pedal shaft, a rotatable drive shaft transversely of the housing extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft transversely within the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft having an arm extending therefrom, a pivotally mounted rocker member having said eccentric arm connected thereto, and a link connected to said rocker and to said handle to oscillate the handle.

4. An exercising machine comprising a base having a relatively fixed seat adjustably supported therefrom, a pivoted handle extending upwardly from the base for oscillatory movement toward and away from the seat, a transmission housing supported by said base, a pedal shaft extending transversely through said housing, pedals mounted on the opposite end portions of said pedal shaft, resilient clips associated with said pedals operable to engage and retain feet of various sizes firmly upon said pedals, a rotatable drive shaft transversely of the housing extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft transversely within the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft having an arm extending therefrom, a pivotally mounted rocker member having said eccentric arm connected thereto, and a link connected to said rocker and to said handle to oscillate the handle, the construction and arrangement of the drive to the pedals and to the handle being such that the pedals rotate slightly in excess of a whole number of revolutions for each complete stroke of the handle to thereby provide a con-

7

stantly changing relationship between the pedals and handle during operation of the machine.

5. An exercising machine comprising a base having a relatively fixed seat adjustably supported from the base, a transmission housing mounted internally of said base, a handle structure pivoted internally of said housing and extending upwardly from the base for oscillatory movement toward and away from the seat, a pedal shaft extending transversely through said housing, pedals mounted on the opposite end portions of said pedal shaft, a rotatable drive shaft transversely of the housing extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means mounted internally of the base and operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft transversely within the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft having an arm extending within said housing in the direction of the handle pivot therein, a rocker member pivotally mounted in said housing and having said eccentric arm pivotally connected thereto, and a link pivotally connected to said rocker and to the mounting bracket of said handle to oscillate the handle.

6. An exercising machine as claimed in claim 5 wherein the construction and arrangement of the drives to the pedals and the handle are such that the pedals rotate slightly in excess of a whole number of revolutions for each complete stroke of the handle to thereby provide a constantly changing relationship between the pedals and handle during operation of the machine.

7. An exercising machine comprising a hollow base having a relatively fixed seat adjustably supported from the base structure, a transmission housing mounted internally of said base, a han-

8

dle structure pivoted to the base and extending upwardly therefrom for oscillatory movement toward and away from the seat, a pedal shaft supported by said housing, pedals mounted on the opposite end portions of said pedal shaft, a rotatable drive shaft supported by the housing and extending exteriorly thereof, a flywheel fixed on said drive shaft exteriorly of said housing, power means mounted internally of the base and operatively connected to the flywheel to rotationally drive the flywheel and said drive shaft, at least one idler shaft supported by the housing having geared connection with said drive shaft and said pedal shaft so that the former operates to drive the latter at a predetermined rate of speed, an eccentric on said idler shaft having an arm extending upwardly and outwardly of said housing, a rocker member pivotally mounted on and exteriorly of said housing and having said eccentric arm pivotally connected thereto, and a link pivotally connected to said rocker and to said handle to oscillate the handle.

8. An exercising machine as claimed in claim 7 wherein the construction and arrangement of the drive to the pedals and to the handle are such that the pedals rotate slightly in excess of a whole number of revolutions for each complete stroke of the handle to thereby provide a constantly changing relationship between the pedals and handle during operation of the machine.

EMORY W. BROCKMAN.
WILLIAM L. PARSONS, Sr.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,320,489	Turner	June 1, 1943
2,406,344	Bergfors	Aug. 27, 1946