

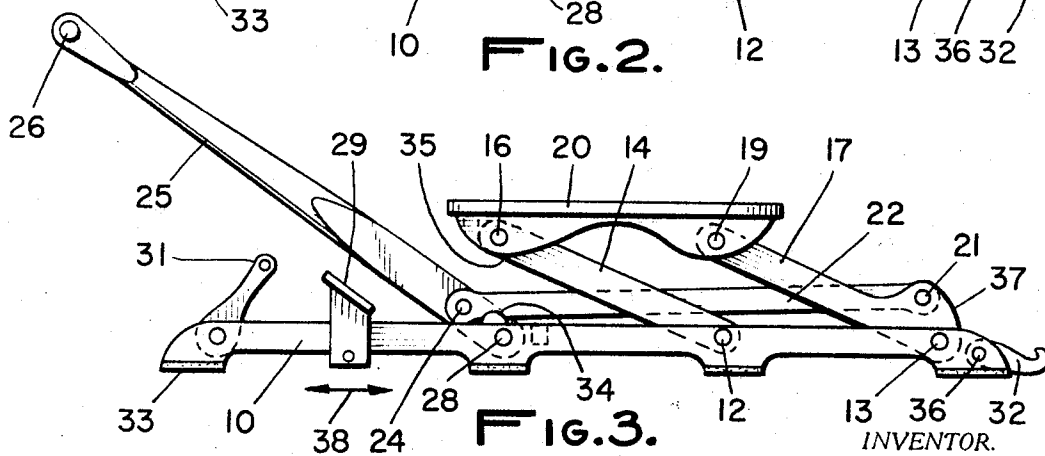
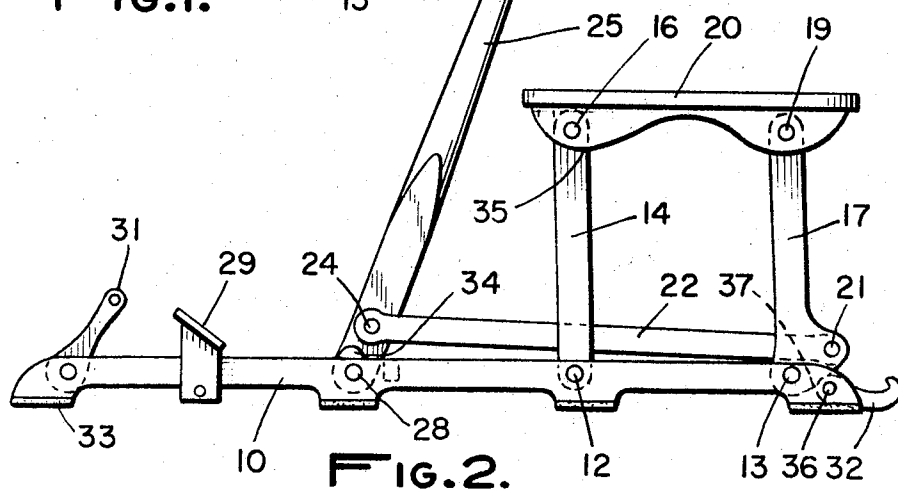
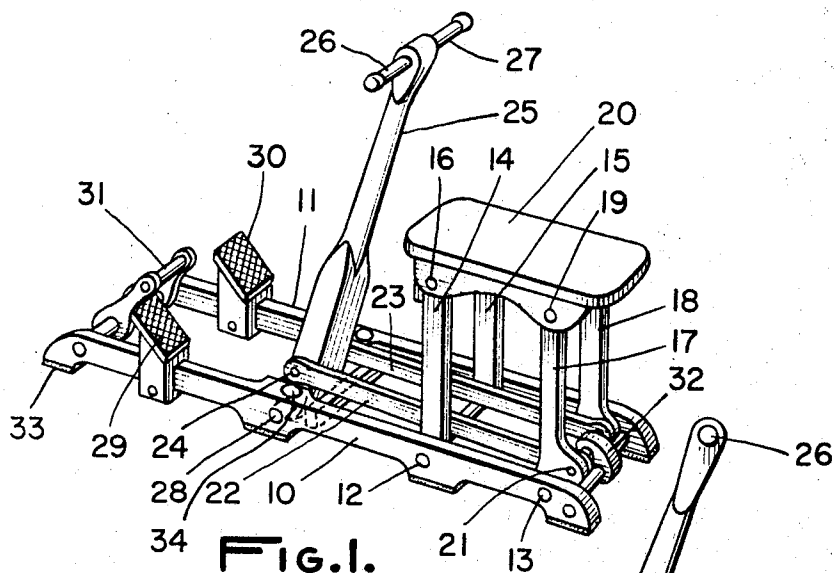
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PULL TYPE EXERCISING DEVICE

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ABSTRACT OF THE DISCLOSURE

This disclosure relates to a portable exercising machine comprising a support structure and seat. The seat is coupled to the support structure by legs pivoted at their lower and upper ends to the support structure and the seat respectively to define a parallelogram. An actuating bar is pivoted at its lower end forward of the seat to the support structure, and a connecting rod in turn is pivoted at one end to the actuating bar at a point above its pivot point to the support structure and pivoted at its other end to an eccentric point above and to the rear of one of the leg pivot points. The arrangement is such that the weight of a person seated on the seat will cause the seat to rock forward and downwardly which action through the medium of the connecting rod will move the actuating bar in a swinging arc forwardly and downwardly. The person may then pull on the actuating bar which, through the medium of the connecting rod, will raise the seat.

This invention relates generally to exercising apparatus and more particularly to an improved, portable exercising device primarily designed for home use.

Most portable type home exercising machines usually incorporate an assemblage of springs, pulleys, or weights. Among the types wherein a "rowing" action is provided, there is usually included a seat mounted on wheels for movement along rails and suitable springs or weights for providing a resistance force to a handle grip means which, for example, may simulate the oars of a rowboat. This particular type of structure provides very beneficial results in that both the legs and arms are simultaneously exercised, bending of the legs occurring as the seat rolls back and forth upon pulling against a spring or weight force.

In most exercising machines of the foregoing type, the pull force required is fixed for the particular apparatus involved. Therefore, large persons of considerable strength experience relatively little resistance during their exercise. On the other hand, slight people of small relative strength oftentimes are tired too quickly by the relatively large forces involved. The foregoing is necessarily a consequence of employing springs and weights in the machine to provide the resistance force.

In addition to the foregoing, present day exercising machines are relatively expensive to manufacture and maintain because of the various movable parts involved in the form of wheels, pulleys, and the like. Further, the assemblies as presently provided are usually of unattractive appearance and are thus consigned to closets or closed rooms when not in use.

With the above in mind, it is a primary object of the present invention to provide a vastly improved portable exercising machine in which the foregoing problems are overcome.

More particularly, it is an object to provide a portable exercising device simulating a "rowing" type of exercise wherein both the arms and legs are exercised and yet which does not require springs, wheels, pulleys, and the like and wherein the pulling force is a function of the weight of the person using the device all to the end that the resistance force provided by the device is well suited to the stature of the particular person using the machine.

Other important objects are to provide an exercising device which is relatively economical to manufacture, attractive in appearance, and easy to use.

Briefly, these and other objects and advantages of this invention are attained by providing a basic support structure and a flat seat. The seat is mounted above the support structure by first and second leg means pivoted respectively at their lower and upper ends to the support structure and under portions of the seat in such a manner as to define a parallelogram. An actuating bar in turn is pivoted at its lower end to the support structure forward of the seat and terminates at its upper end in handle means. A connecting rod has one end pivoted to the actuating bar above its pivot point to the support structure and its other end pivoted at an eccentric point to one of the leg means above and to the rear of the pivot point of the one leg means to the support structure.

With the above arrangement, a person seated on the seat will tend to collapse the parallelogram structure unless he restrains forward and downward rocking movement of the seat by holding the actuating bar. The resistance force offered by the actuating bar through the medium of the connecting rod and seat necessarily constitutes a function of the weight of the person on the seat. The linkage effected by the connecting rod is such that a desired resistance to the pulling force on the bar can be provided when the seat is raised from its lowermost position to its highest contemplated position.

It will thus be evident that the entire structure can provide beneficial exercise without the necessity of independent weights or springs and further the degree of resistance force is automatically suited to the particular person using the exerciser.

Preferably, the device is formed of finished wood to provide an attractive appearing structure.

A better understanding of the invention as well as various additional features and advantages will be had by now referring to a preferred embodiment as illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of the self-energizing exerciser of this invention;

FIGURE 2 is a side elevational view of the exerciser of FIGURE 1 showing the seat portion in its highest contemplated position; and,

FIGURE 3 is a view similar to FIGURE 2 but showing an intermediate position assumed by the seat when the device is in use.

Referring first to FIGURE 1, the exerciser includes a support structure preferably formed of first and second elongated rails 10 and 11 parallel to each other and stabilized by suitable cross dowels as shown. First and second leg means are pivoted to this support structure at their lower ends as by cross pivoting rods or shafts 12 and 13 extending between the rails 10 and 11. These first and second leg means preferably comprise a front pair of legs 14 and 15 extending upwardly to pivotally connect to an upper pivot rod 16 and a rear pair of legs 17 and 18 extending upwardly to pivotally connect to an upper pivot rod 19. The pivot rods 16 and 19 are secured to front and rear underside portions of a flat seat 20 respectively such that the pairs of legs 14, 15, and 17, 18 define with the support structure and seat a parallelogram.

An eccentric pivot rod extends between the rear legs 17 and 18 at a point spaced above and to the rear of the pivot rod 13 and serves to pivot the ends of a pair of connecting rods 22 and 23. The forward ends of the connecting rods 22 and 23 in turn are pivoted at 24 on either side of actuating bar 25. The bar 25 terminates at its upper end in handle means 26 and 27 and at its extreme lower end in a lower pivot rod 28 secured between the rails 10 and 11 forward of the front legs of the seat.

Foot support means in the form of foot rests 29 and 30 are slidably mounted on the rails 10 and 11, respectively, forward of the actuating bar 25. The extreme forward end of the rails includes a raised cross bar 31 serving as a forward stop for the actuating bar 25. The extreme rear of the rails 10 and 11, on the other hand, support a hook 32 arranged to engage about the pivot rod 21 when the seat 20 is in its highest contemplated position as illustrated in FIGURE 1 to prevent forward rocking movement of the seat when the exerciser is not in use.

The underside of the rails 10 and 11 include cutouts defining suitable floor engaging surfaces which may be provided with cushions or pads such as indicated at 33.

Further features of the exerciser shown in FIGURE 1 will be evident from FIGURE 2. In FIGURE 2, it will be noted that the upper edges of the rails include small stops such as indicated at 34. These stops are arranged to engage underside portions 35 of the seat structure when the seat is in its lowest position.

Stop means are also included to limit the highest contemplated position of the seat and in the embodiments shown, this stop means is provided by a cross rod 36 positioned to engage the eccentric surface portions 37 of the rear legs. This same cross rod serves as a pivot for the lock hook 32.

It will be noted in FIGURE 2, that when the seat 20 is in its highest contemplated position, the legs such as 14 and 17 are inclined slightly forwardly of the vertical. On the other hand, the length of the connecting rod 22 is such that the actuating bar 25 is inclined to the right of the vertical as viewed in FIGURE 2, or towards the seat 20. The weight of the rod 25 at its angle of inclination is such as to provide a sufficient rearward force on the connecting rod 22 to hold the seat 20 in its highest contemplated position in the absence of any weight on the seat notwithstanding the slight forward inclination of the legs.

In FIGURE 3, the seat 20 is shown in an intermediate position and it will be evident that upon further lowering of the parallelogram structure, the underside edge 35 of the seat structure will engage the stop 34. The linkages defined by the connecting rod 22 and its pivot points to the actuating bar 25 and rear leg structure 17 is such that when the seat is in its lowermost position, the actuating bar 25 will engage the front raised cross rod 31 so that a stable structure results when the seat is collapsed.

It will also be noted in FIGURES 2 and 3 that the hook structure 32 pivotally mounted on the cross rod 36 is moved to the rear so as to not engage the eccentric pivot rod 21. In this position, the seat is in ready condition for use. On the other hand, by swinging the hook 32 upwardly to engage the cross rod 21 as illustrated in FIGURE 1, the seat will be locked in its higher contemplated position and thus is rendered stable in this position when the exerciser is not in use.

In operation, the hook 32 is first swung downwardly to disengage the rod 21. The seat 20 will remain in its highest contemplated position as described until such time as a person who desires to use the exerciser seats himself on the seat. At this time, the person will slidably adjust the foot rests 29 and 30 as indicated by the double headed arrow 38 in FIGURE 3 to a suitable position ahead of the seat depending upon his size to provide proper support for his feet. In this respect, the openings in the foot rests are slightly larger than the rails passing therethrough so that the sliding action is simplified. On the other hand, the engaging force of the person's feet will tend to cant the foot rests so that they will then frictionally lock to the rails 10 and 11 in the desired positions.

The person using the exercising machine can hold himself in the highest contemplated position by grasping the handles 26 and 27 at the upper end of the actuating bar 25 and exerting a slight rearward pulling force. Relaxing of this force however will result in the seat rocking forwardly and downwardly from the position illustrated in FIGURE 2 through the position illustrated in FIGURE 3 be-

cause of the slight forward inclination of the legs 14 and 17 as described in FIGURE 2. In this respect, the user's weight on the seat is sufficient to cause the eccentric pivot point 21 to move in a counterclockwise direction about the pivot point 13 and thus swing the actuating bar 25 arcuately to the left. It will be evident however that the person on the seat may easily hold himself in the upright position by applying a pulling force on the bar.

With the person relaxing his pulling force on the actuating bar 25, the seat will move down until it reaches its lowermost position at which time the bar 25 will engage the raised cross stop 31 and the underside of the seat structure 35 will engage the stop 34. In this position, the exerciser's knees are bent as a consequence of the stationary relationship of the foot rests after they have once been adjusted.

The person using the exercising machine will then pull back on the actuating bar 25 by means of the handles 26 and 27. In this respect, the handles 26 and 27 may be rotatably mounted in the upper end of the actuating bar 25 so that the person need not change his grip.

Rearward upward pulling on the actuating bar 25 will result in a raising of the seat 20 through the medium of the connecting rod 22. It will be clear that the leverage applied by the connecting rod 22 to the rear leg structure 17 as viewed in FIGURE 3 will initially be fairly large because of the positioning of the eccentric point 21 close to its maximum vertical distance above the pivot point 13. Since the weight of the person on the seat 20 is most effective when the parallelogram is almost collapsed as shown in FIGURE 3, the pulling force on the actuating rod 25 would ordinarily be quite large. However, the positioning of the eccentric pivot 21 at its maximum leverage distance from the pivot 13 as described lessens this force somewhat. As the seat is raised towards the position illustrated in FIGURE 2, it will be evident that the vertical distance of the eccentric pivot 21 decreases with respect to the pivot 13 thus decreasing the leverage applied by the connecting rod 22 so that a greater force would ordinarily be required on the actuating bar 25. On the other hand, as the seat approaches its highest contemplated position wherein the legs 14 and 17 tend towards a vertical position, the effect of the person's weight in providing a force in the connecting rod 22 is correspondingly reduced. The entire arrangement is such that by suitably adjusting the positions of the eccentric pivot 21 and the pivot 24 for the connecting rod 22 relative to the rear legs and the actuating bar 25 during the manufacture of the exerciser, the pulling force may be carefully controlled. For example, this force can be rendered substantially constant throughout the arcuate swinging of the actuating bar 25 for any given weight on the seat 20.

It will also be apparent from the foregoing that the actual magnitude of the pulling force will be a function of the person's weight on the seat 20, heavier persons who are normally stronger experiencing a greater resistance to the pulling force than lighter persons.

The user may simply swing the actuating rod 25 back and forth to raise and lower the seat 20 and thus raise and lower himself thereby gaining all the beneficial effects of the arm movements necessary to actuate the bar 25 and corresponding leg movements resulting from the positioning of the foot rests and the forward and downward rocking movement of the seat.

From the foregoing description, it will thus be evident that the present invention has provided a greatly improved self-energizing exercising device wherein beneficial exercise can be realized without the necessity of springs pulleys, independent weights, and the like. Thus, all of the various objects set forth heretofore are fully realized by this invention.

What is claimed is:

1. A self-energizing exerciser comprising, in combination: a support structure; a seat disposed above said support structure; first and second leg means pivoted at their

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lower ends to said support structure and at their upper ends to said seat to define with said support structure and seat a parallelogram such that said seat can rock forwardly and downwardly while remaining parallel to said support structure; an actuating bar pivoted at its lower end to said support structure ahead of said seat and terminating at its upper end in handle means; and a connecting rod pivoted at one end to one of said leg means at an eccentric point spaced above and to the rear of the pivot point of said one leg means to said support structure when said seat is at its highest contemplated position, and pivoted at its other end to said actuating bar at a point above the pivot point of said actuating bar to said support structure, whereby the weight of a person seated on said seat will rock the same forwardly and downwardly and said person may then pull on said actuating bar to move said connecting rod and raise his weight on said seat, the pulling force required being a function of said person's weight.

2. An exerciser according to claim 1, in which said support means includes first stop means engaging one of said leg means to limit the maximum height of said seat above said support structure to a distance such that said leg means are inclined slightly forwardly of the vertical, said connecting rod being of a length such that said actuating bar is inclined rearwardly of the vertical towards said seat when said seat is at said distance, whereby the weight of said actuating bar in its inclined position is sufficient to hold said seat through said connecting rod at said distance in the absence of a person's weight on said seat.

3. An exercise according to claim 1, in which said eccentric point is positioned to swing through an arc from its position to the rear of the vertical from said pivot point of said one leg means to said support structure, to a position forward of said vertical to thereby control the pulling force applied to said bar necessary to raise said seat as said seat is moved from its lowest position to its highest contemplated position.

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4. An exerciser according to claim 1, including foot support means adjustably coupled to said support structure such that they may be positioned ahead of said seat on said support structure a suitable distance in accordance with the size of a person using said exerciser for supporting said person's feet when the person is seated on said seat.

5. An exerciser according to claim 4, in which said support structure includes first and second parallel rails, said first and second leg means comprising a pair of front legs and a pair of rear legs respectively, said one of said leg means to which said connecting rod is pivoted constituting said rear legs, and said foot support means comprising first and second foot rests slidably mounted on said first and second rails forward of the lower pivot point of said actuating bar to said support structure.

6. An exerciser according to claim 2, including hook means on the rear of said support structure adapted to be positioned to block said leg means from forward movement whereby when said hook means is in operative position, said seat is locked in said highest contemplated position and will not rock forwardly and downwardly when a person's weight is placed on said seat whereby said seat may be rendered stable when said exerciser is not in use.

7. An exerciser according to claim 2, including second stop means on said support structure for limiting the lowest position of said seat to a given distance above said support structure.

References Cited

UNITED STATES PATENTS

2,825,563 3/1958 Lawton 272—79

FOREIGN PATENTS

497,059 5/1930 Germany.

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