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[54] **EXERCISING STEPS**

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[51] **Int. Cl.** **A63b 23/04**

[58] **Field of Search** ..... 272/57 R, 58, 60, 272/25, 63, 2, 70; 182/131, 132, 89, 90, 91, 92; 108/111, 129, 131, 132; 52/182, 183

[56] **References Cited**

UNITED STATES PATENTS

1,010,036	11/1911	Foltz	108/111
3,045,831	7/1962	Pendergrast, Jr. et al.	108/111 X
1,817,961	8/1931	Bouda	108/111 X
915,618	3/1909	Mattison	108/111
2,132,331	10/1938	Wanamaker	182/132 X
3,091,345	5/1963	Hoose et al.	108/111
3,322,077	5/1967	Kovacik	108/111
2,637,445	5/1953	Patterson	108/111 UX

FOREIGN PATENTS OR APPLICATIONS

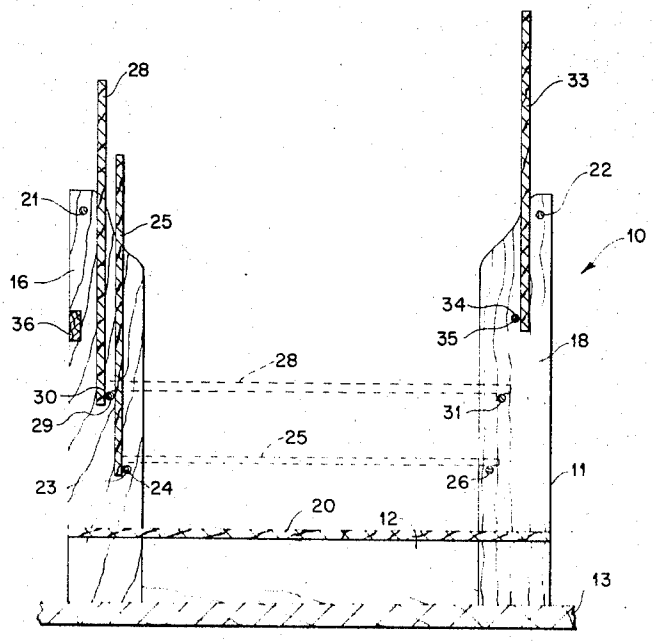
1,130,027	10/1968	Great Britain	108/111

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[57] **ABSTRACT**

An exercising device having a plurality of vertically, and preferably uniformly, spaced step members, each of the step members, except the first or lowest step member, being movable between its horizontal operative position and an inoperative position out of vertical alignment with the other step members, so that a person may step from the floor to any one of the step members at its particular elevation in an exercising routine.

6 Claims, 3 Drawing Figures



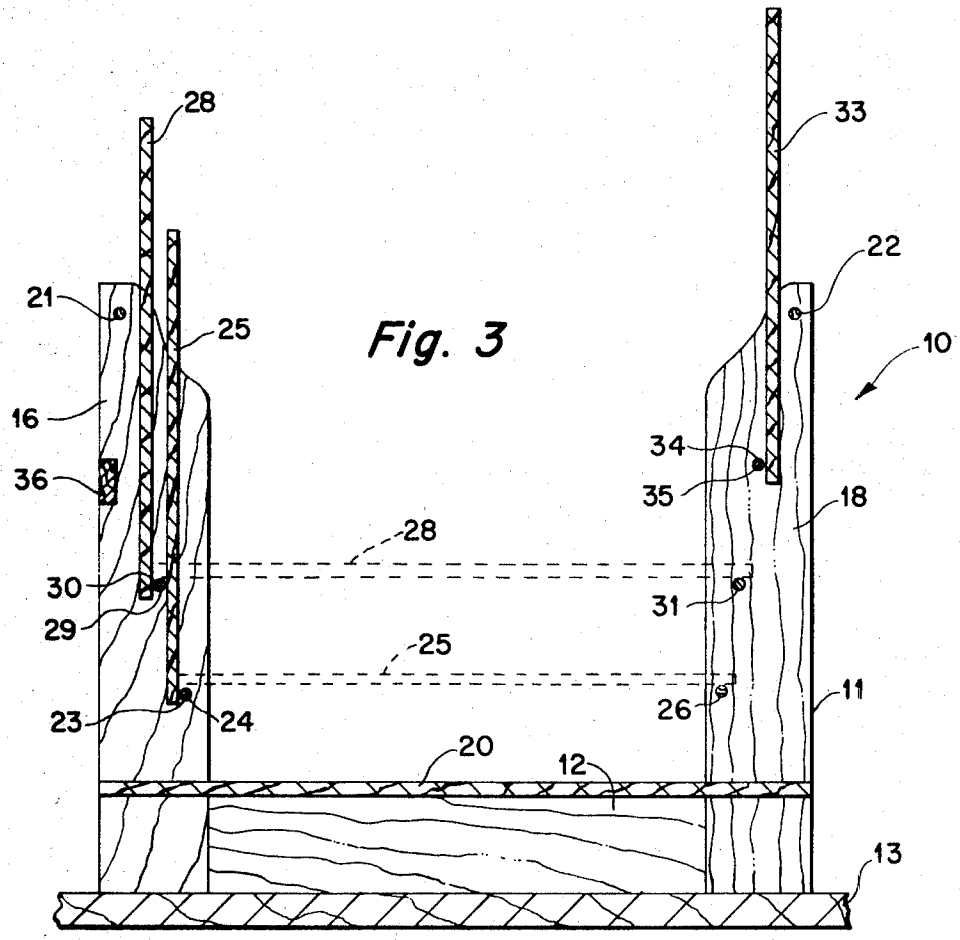


Fig. 3

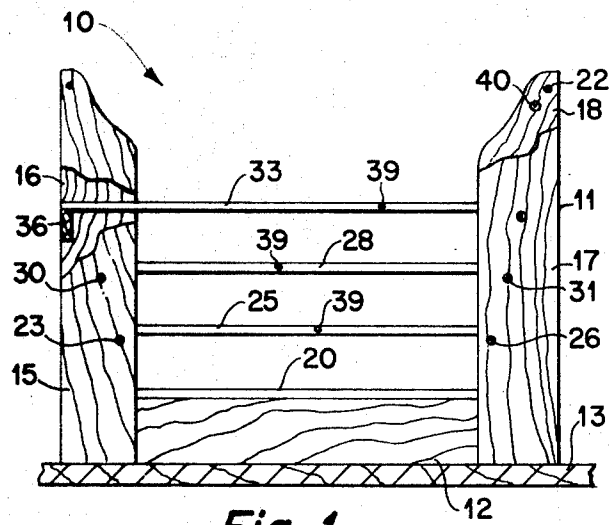


Fig. 1

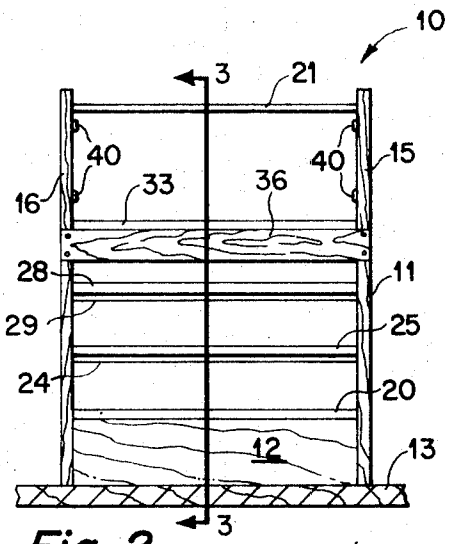


Fig. 2

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EXERCISING STEPS

BACKGROUND OF THE INVENTION

This invention relates to an exercising device, and more particularly to exercising steps.

For several years, cardiologists and internists have used the "Masters Two-Step Test" to obtain an exercise electrocardiogram, and to evaluate a patient's tolerance for exercise. This test involves stepping from the floor level repeatedly up and down to a single platform or step at a fixed elevation. Accordingly, such a test is quite limited since it is too strenuous for some people and not exacting enough for others. For those for whom the test is not strenuous enough, the electrocardiogram does not depict an accurate evaluation of the individual's heart condition and therefore his tolerance for exercise.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide an exercising device having a plurality of step members located directly above each other at different levels and also movable into and out of the operative or step position, to obtain a more accurate evaluation of the exercising person's electrocardiogram, and therefore of his ability to participate in exercises of varying degrees of strenuousness.

The steps comprise a frame having a base adapted to rest upon the floor and a first step member elevated a predetermined distance above the base, preferably fixed to the frame. The additional step members at varying elevations are mounted upon the frame to move between their horizontal operative positions and their inoperative positions out of the way or out of vertical alignment with the other step members. The step members are preferably spaced vertically from each other at uniform intervals in order to provide a systematic testing device.

The step members are spaced directly over each other so that the exercising person may step directly from the floor to the topmost horizontal step member in its operative position, without obstruction or hindrance by any of the other step members either above or below the topmost horizontal step member.

In the particular form of the exercising steps made in accordance with this invention, the step members are pivotally mounted to swing between horizontal operative and upright inoperative positions relative to the frame. Such an arrangement provides an exercising device which will occupy a minimum of space, and as a matter of fact will occupy the same space regardless of the operative or inoperative positions of the step members. Where space is not at a premium, it is of course possible to mount the step members for other types of movement, such as coplanar swinging movement or coplanar sliding movement.

The exercising steps can also be used as an exercising device for improving physical fitness, as well as for a testing device to determine tolerance for physical exercise.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of an exercising device made in accordance with this invention, with all of the step members in operative position, and with portions broken away to better illustrate the construction of the device;

FIG. 2 is a left end elevation of the device disclosed in FIG. 1; and

FIG. 3 is an enlarged section taken along the line 3—3 of FIG. 2, with all of the movable step members disclosed in their inoperative positions in solid lines, and with some of the movable step members disclosed in operative position in phantom.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in more detail, the exercising device **10** comprises a frame **11** having a base **12** adapted to rest upon and be supported by a horizontal floor **13.**

Projecting upward from each corner of the substantially rectangular base **12** are upright standards or posts **15, 16, 17** and **18.**

Fixed to the frame **11** a predetermined elevation above the bottom of the base **12,** for example a distance of 4 inches, is the first or lowest step member **20,** which is preferably made of a planar material, such as wood, large and strong enough to support the person who is exercising.

The spacing between the posts **15** and **17,** and also **16** and **18,** is sufficient to permit the exercising person to step upon the platform **20** without obstruction, while he is exercising.

Reinforcing rods **21** and **22** may be employed to rigidly connect the respective pairs of posts **15** and **16,** and **17** and **18.** The reinforcing rods **21** and **22** may also be used as handles for lifting and moving the exercising device **10.**

Also extending between the posts **15** and **16** is a first hinge rod **23** upon which is journaled, by any convenient means such as sleeve **24,** one edge portion of the second step member **25.** Joining the posts **17** and **18** at substantially the same horizontal level as the hinge rod **23** is an elongated rest member or rod **26.** The rest rod **26** supports the opposite edge portion of the second step member **25** when the second step member **25** is disposed in its horizontal operative position, disclosed in solid lines in FIGS. **1** and **2** and in phantom in FIG. **3.** In operative position, the second step member **25** is vertically spaced above the first step member **20,** and preferably by the same distance that the first step member **20** is above the floor level or bottom of the base **12.** The second step member **25** may be swung about the hinge rod **23** to a substantially upright position as disclosed in solid lines in FIG. **3.**

Spaced another uniform increment above the second step member **25** is a third step member **28.** One edge portion of the step member **28** is also journaled by sleeve **29** about hinge rod **30** which is also fixed at its opposite ends in the posts **15** and **16.** The hinge rod **30** is not only spaced above the hinge rod **23,** but preferably offset outwardly, that is, in a direction away from the opposite posts **17** and **18,** in order to permit the second step member **25** to swing back to a substantially vertical position. The opposite edge portion of the third step member **28** is adapted to rest upon a rest member or rod **31** fixed at its opposite ends to the posts **17** and **18** and spaced above and also offset outwardly from the lower rest member **26.** The rest member **31** is also substantially in the same horizontal plane with the hinge rod **30** to support the third step member **28** in a horizontal operative position. By spacing the second rest member **31** outwardly above the first rest member **26,**

the second step member **25** will clear the rest member **31** as it swings between its operative and inoperative positions.

Although any desired number of step members may be employed, the device **10** is disclosed with four step members. The fourth step member **33** has one edge portion journaled by sleeve **34** about the hinge rod **35** between the posts **17** and **18.** As best disclosed in FIG. **1,** the free edge portion of the fourth step member **33** is adapted to be supported in its horizontal operative position by means of a rest member or bar **36** extending between and fixed to the posts **15** and **16.** Here again, the spacing between each adjacent pair of first, second, third and fourth step members **20, 25, 28** and **33** is preferably uniform, and equal to the elevation of the first step member **20** above the floor level.

It will be noted that the hinge rod **35** is not only spaced above the second rest rod **31,** but is also offset laterally outward to permit free swinging movement of the third step member **28.** For the same reason, the rest bar **36** is also spaced, above and outwardly to permit the third step member **28** to be substantially vertical in its inoperative position.

Although each of the movable step members **25, 28,** and **33** may remain in its in operative upright position by virtue of a tight frictional fit between the respective journal sleeves and hinge rods, or they may be swung across the vertical or dead-center to their inoperative positions, another alternative is to provide positive latch means for retaining the step members in their inoperative positions. As best disclosed in FIG. **1,** detents **39** are mounted on the side edges of each of the movable step members **25, 28** and **33.** When the respective step member has attained its upright inoperative position, the detent **39** will engage a corresponding depression or socket member **40,** such as those disclosed in FIGS. **1** and **2.**

In the operation of the exercising device **10,** all of the movable step members **25, 28** and **33** are swung to their upright inoperative positions as disclosed in FIG. **3.** If a person is to be tested for his tolerance for exercise, electrodes of the electrocardiogram machine are attached to the thoracic areas of the body determined by the operator of the machine. The test person is then instructed to walk back and forth upon the level floor **13,** while a resting tracing is obtained on the electrocardiograph machine. The person is then instructed to perform the same stepping procedure between the floor **13** and the first step member **20,** while an electrocardiogram is obtained. Then the person is instructed to perform the same stepping procedure between the floor **13** and each of the second, third, and possibly the fourth step members in progression as electrocardiograms are taken for each stepping procedure. It will be borne in mind that no intermediate steps are taken. That is, the test person does not step from the floor **13** to any intermediate step members. In other words, if the test procedure is for the level of the third step member **28,** the subject does not first step on the step members **20** and-/or **25,** but steps directly from the floor **13** to the third step member **28.**

After the cardiogram for the first step member **20** has been completed, the operator then swings second step member **25** from its inoperative solid-line position of FIG. **3** down to its operative position disclosed in phantom in FIG. **3** and in solid lines in FIG. **1.** After the test on second step member **25** has been completed, the third step member **28** is swung down to its operative position above the second step member **25** in its operative position. Then, if the fourth step member **33** is to be used, it also is swung down to its operative position disclosed in FIG. **1.**

In order that the topmost step member used in the test

In order that the topmost step member used in the test or exercising procedure is readily accessible to the person, the step members are preferably of substantially equal size, but primarily they should be spaced directly vertically above each other, so that none of the intermediate step members in their operative positions will interfere with the person stepping to the topmost step member in its operative position.

The spacing between each pair of adjacent step members After the floor **13** is preferably 4 inches.

AFter the tests are completed for any step level, the electrocardiogram tracings are examined require any abnormalities and analyzed accordingly other determine if they are indicative of ischemic heart disease which would required medical attention or for any otehr indications of heart disorder.

As previously mentioned, the exercising device **10** can be used in the same manner, without the electrocardiogram, to improve the physical fitness of a person. That is, the person can periodically participate in a stepping procedure in which he will repeatedly step up and down between the floor **13** and the first step member **25.** As his physical condition improves he can step to higher and higher step members at a uniform cadence and for increasing periods of time. Moreover, exercising device cadence can also be progressively increased.

It is thereofre apparent that a very useful exercisingdevice has been devised which can be used not only for exercising, but also for testing the physical tolerance for exercise, for individuals of widely varying physical abilities and conditions.

What is claimed is:

1. A step device for use by an exercising person comprising:

a. a unitary frame having opposite sides and opposite ends,

b. said frame having a base spanning said opposite sides and opposite ends and adapted to be supported upon a floor,

c. said frame comprising a first upright standard fixed to and projecting upward from one end of said base, and a second upright standard fixed to and projecting upward from the opposite end of said base to define an exercising space between said standards and above said base,

d. a first step member mounted on said frame at a first level a predetermined distance above the floor level of said base and extending between said standards within said exercising space,

e. a second step member long enough to extend between siad upright standards and having a free end,

f. a rest member on said second standard for freely supporting said free end in operative position,

g. hinge means mounting said second step member on said first standard for swinging movement between said operative position at a second level in said exercising space spaced vertically above said first step member, and an inoperative upright posi-

tion substantially coextensive with said first standard, said

h. upward means on sad first standard for limiting the upwaard swinging movement of said second step member to said inoperative upright position,

i. each of said first and second step members being strong enough to support the weight of an exercising person standing on said corresponding step member in said operative position,

j. the length of said exercising space being approximately equal to the width of a person exercising on said step device,

k. both of the side portions of said frame defining said exercising space being completely open and unobstructed above the uppermost step member in operative position to permit an exercising person to step upon and member fully supported by only the uppermost step membe in operative position,

l. the vertical distance between said first and second step members being less than the length of any step member.

2. The invention according to claim **1** further comprising a third step member having a free end, a second rest member on one of said standards for freely supporting the free end of said third step member in operative position, second hinge means mounting said third step member on the other of said standards for swinging movement between said operative position at a third level in said exercising space spaced vertically above said second member in said second level position, and an inoperative upright position substantially coextensive with said other standard, said third step member being strong enough to support the weight of an exercising person standing on said third step member in operative position, second stop means on said other standard for limiting the swinging movement of said third step member to said inoperative upright position.

3. The invention according to claim **2** in which said hinge means for both said second and third step members are journaled in said first standard and said rest members are supported on said second standard in such a manner that the upward swinging movement of said second step member will clear said second rest member, and the stop means for said second step member comprises the hinge means for said third step member.

4. The invention according to claim **3** further comprising a fourth step member having a free end, a third rest member on said first standard for freely supporting the free end of said fourth step member in operative position, hinge means mounting said fourth step member on said second standard for swinging movement between said operative position at a fourth level in said exercising space spaced level vertically above said third step member in said third elvel position, and an inoperative upright position substantially coextensive with said second standard, said fourth step member being strong enough to support the weight of an exercising person standing on said fourth step member in operative position, third stop means on said second standard for limiting the upward swinging movement of said fourth step member to said inoperative upright position, said hinge means for said fourth step member being spaced on said second standard above and outward of the swinging path of the free end of said third step member.

5. The invention according to claim **4** in which the spacing between adjacent levels is substantially uniform.

6. The invention according to claim **1** in which said first step member is a rigid part of said base and fixed to said first and second standards.

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