Sept. 20, 1971 C. L. ERWIN, JR 3,606,320

TREADMILL

Filed June 6, 1968 2 Sheets-Sheet 1

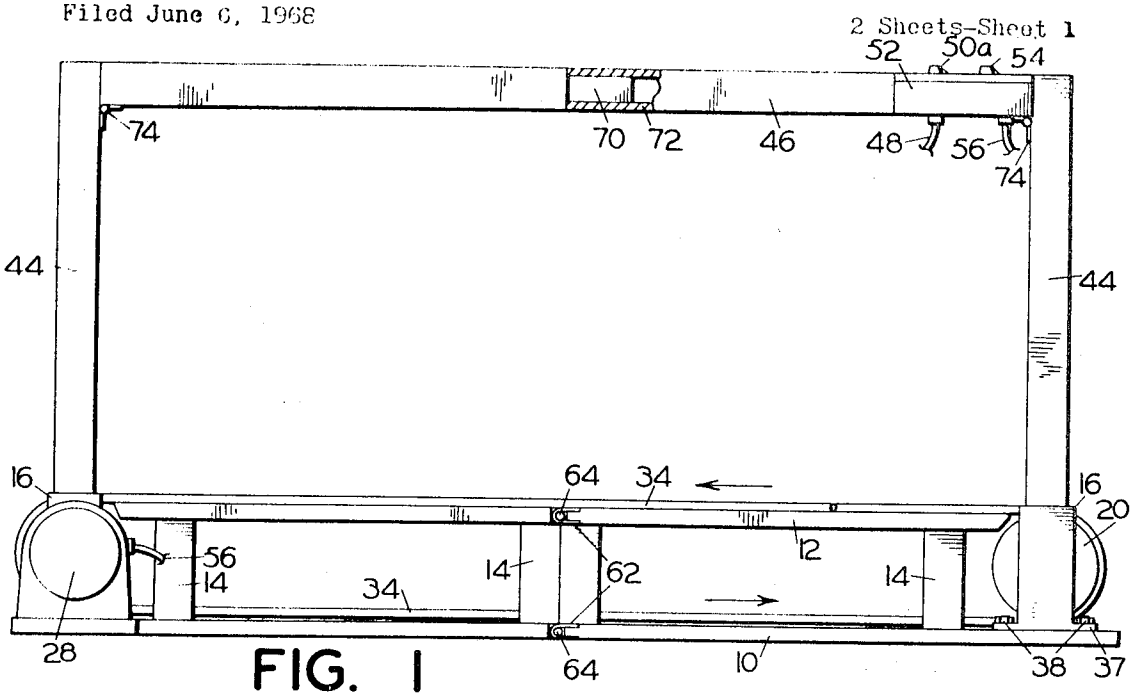

FIG. 1

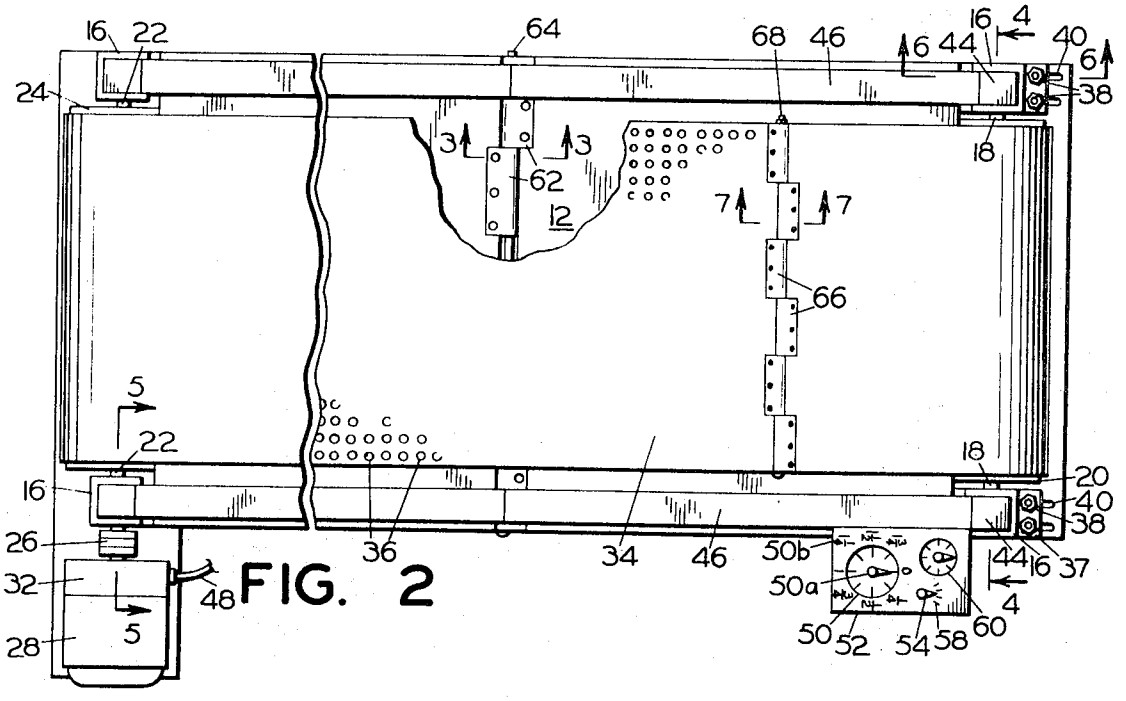

FIG. 2

FIG. 3

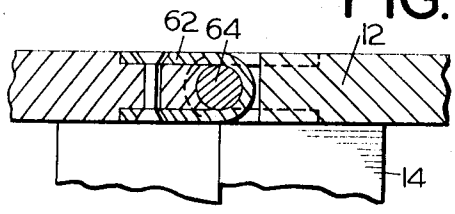

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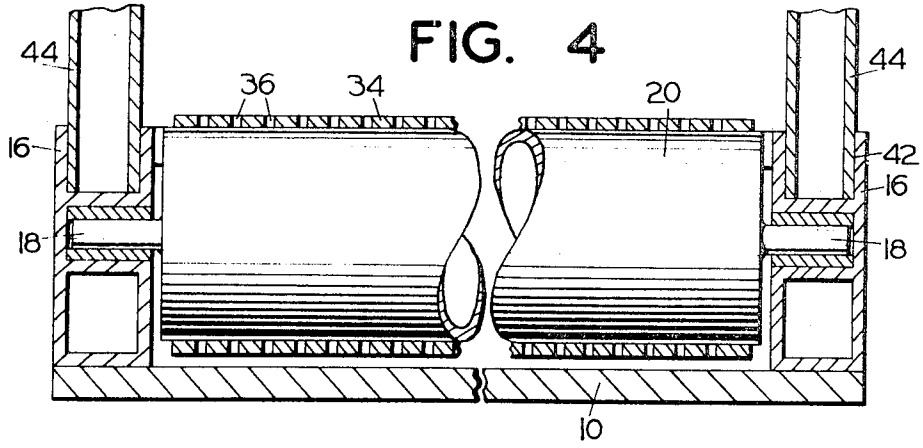
FIG. 4



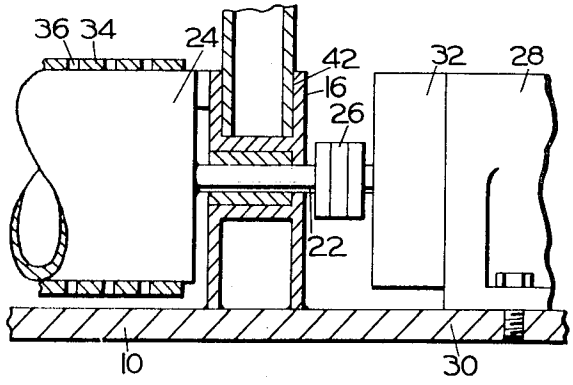


FIG. 5

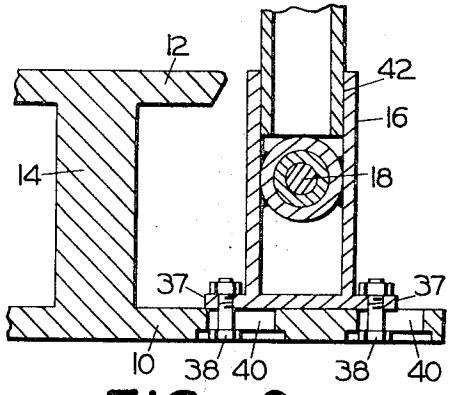


FIG. 6

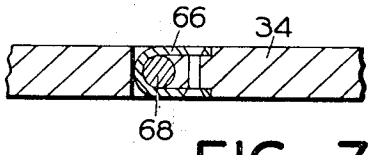
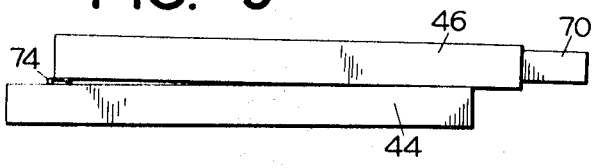


FIG. 7

FIG. 9



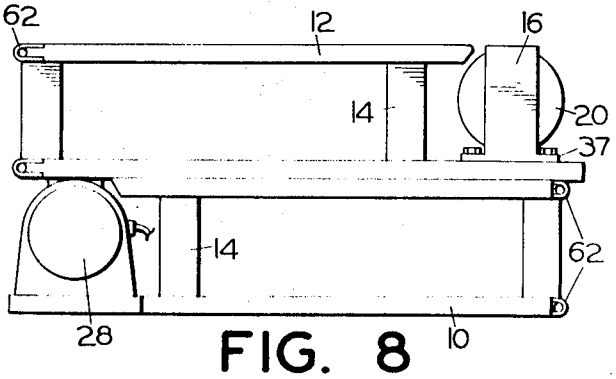


FIG. 8

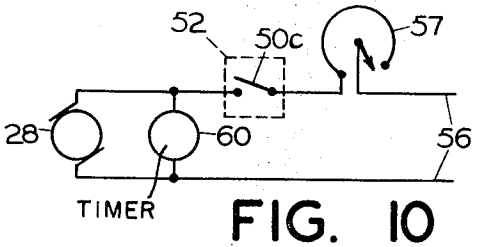


FIG. 10

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TREADMILL

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Int. Cl. A63f 23/06
U.S. Cl. 272—69 1 Claim

ABSTRACT OF THE DISCLOSURE

A frame has a pair of end drums over which operates an endless belt. One of the drums is driven by a variable speed electric motor to cause traveling movement of the belt whereby a person can exercise by running on the belt. An odometer is connected into the drive system to measure the distance traveled by the belt. The odometer has a distance indicating dial, preferably miles and fractions thereof, and operates a switch in the circuit to the drive motor to control operation of the motor. Also provided are variable speed control means for the motor and also a time indicator, the speed control means operating a switch in the circuit to the drive motor and arranged to control off and on operation of the motor. A hand rail is provided on the frame, and a housing is mounted on the handrail for supporting the odometer, speed control means and time indicator in a conveniently accessible and viewable position. The belt has a roughened surface for conditioning the feet. The frame and belt have a disconnectable joint allowing them to be folded into a compact package for shipment and storage.

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in treadmills.

The exercise of running, commonly known as jogging, has been established as beneficial to the health and is being widely accepted. Many persons desiring to exercise in this manner are not able to do so in view of the lack of facilities such as a place to run. The art of such exercise can be developed under a specific program, namely the traveling of a certain distance in a certain time. Such a program to be successful must be closely supervised in order to advance the training as determined by the distance to be run as well as the rate of running. Treadmills have heretofore been provided but a planned program of running is not conveniently possible in their use because the distance and rate of travel can not be accurately established in a planned program of running.

SUMMARY OF THE INVENTION

Accordingly, applicant's invention is directed to a treadmill having as its primary objective to employ distance measuring means in combination therewith. Other objects are to provide a treadmill of the type described having a belt driven by an electric motor and also having distance measuring means operating a switch in the circuit of the motor arranged to shut off the motor after a selected distance is traveled by the belt; to provide variable speed control means also in the circuit of the motor for varying the speed of the belt; and to provide timing means in the circuit of the motor to keep track of belt operating time.

Another object is to provide a treadmill having a hand rail and means on the hand rail for supporting an instrument housing in a conveniently viewable and accessible position.

Another object is to provide a treadmill with a traveling belt having a conditioning surface for the feet of runners exercising thereon.

Yet another object is to provide a treadmill of the type described having a jointed frame and belt arranged such that said frame and belt can be compacted for shipment and storage.

The invention will be better understood and additional objects and advantages will beome apparent from the following description illustrating a preferred form of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the treadmill of the present invention, a portion of such treadmill being broken away;

FIG. 2 is a top plan view of the treadmill, a portion of this view also being broken away;

FIG. 3 is an enlarged fragmentary sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is an enlarged foreshortened and fragmentary sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary sectional view taken on the line 5—5 of FIG. 2;

FIG. 6 is an enlarged fragmentary sectional view taken on the line 6—6 of FIG. 2;

FIG. 7 is an enlarged fragmentary sectional view taken on the line 7—7 of FIG. 2;

FIG. 8 is a side elevational view of a frame portion of the treadmill knocked down for shipment or storage;

FIG. 9 is a side elevational view of rail means also knocked down for shipment or storage; and

FIG. 10 is a wiring diagram of electrical operating means for the treadmill.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in particular to the drawings and first to FIGS. 1–6, the treadmill of the invention comprises a frame including a bottom plate **10**, a belt support plate **12** and upright reinforcing struts **14** connecting the bottom plate **10** and belt support plate **12** into a rigid frame. Supported at each corner of the bottom plate **10** are short posts **16**. A pair of the posts **16** at one end of the frame support for free rotation end shafts **18** of a drum **20**. A pair of the posts **16** at the other end of the frame rotatably support end shafts **22** of a drum **24**. One of the end shafts **22** extends through its respective post **16**, as seen in detail in FIG. 5, and has a drive connection **26** with a variable speed electric motor **28** secured to a side extension **30** of the bottom plate **10**. Motor **28** operates the shaft **22** through a gear reduction mechanism **32**.

Operative over the drums **20** and **24** and driven by the latter drum is an endless belt **34** traveling over the top surface of plate **12**, the said plate supporting the belt in a flat plane to provide a good running surface. Preferably, the belt **34** is provided with a plurality of apertures **36** which serve in one instance to provide traction on the belt and in a second instance to massage and condition the feet. Although the conditioning means for the belt are illustrated as apertures, it is to be understood that other means, such as small cleats or knobs can be used to accomplish the gentle massage desired while the person is walking or running on the treadmill. Also, the drive connection **26** preferably comprises an overrunning clutch type connection or the like so that the belt will not come to a sudden halt when the motor stops. Thus, the runner will not lose his balance when the motor stops.

A pair of the end posts **16**, preferably at the idler drum end, have adjustable support longitudinally of the frame **10** so that a desired drive tension can be applied to the belt **34**, and for this purpose the posts have flanges **37** which receive bolts **38** passing through elongated adjustment slots **40** in the frame **10**.

Posts **16** have upwardly opening sockets **42**, FIGS. 4–6, for receiving end standards **44** for a handrail **46**, FIGS.

1 and 2. By means of the handrails **46** a person can steady himself while getting on or off the treadmill and while in the act of walking or running on the treadmill.

Means are provided for indicating the distance traveled by the belt **34**, and for this purpose a conventional odometer cable **48**, FIGS. 1 and 2, leads from the gear reduction mechanism **32** to an odometer **50** supported in a housing **52** secured to the handrail **46**. The mechanical connection of the odometer cable between the gear reduction mechanism **32** and the instrument **50** is accomplished by conventional and well understood means. The odometer **50** has a distance indicating needle **50***a* and mileage designations **50***b* as desired, such designations preferably comprising 0 to 2 miles in fractions of one-fourth miles.

Also supported in the housing **52** are variable speed control means **54** for the motor **28**, whereby the motor can be operated at selected r.p.m.'s to achieve a desired miles per hour linear travel of the belt. The variable speed control means **54** may have a selected number of settings **58**, comprising slow, medium and fast or additional settings including an "off" setting.

The housing **52** also supports a timer **60** of conventional construction. Preferably the timer has minute and second hands and suitable minute and second designations clearly imprinted thereon for ready viewing by the runner.

In a preferred construction, and with particular reference to FIG. 10, odometer **50** operates a switch **50***c* in circuit wires **56** of the motor **28**. Switch **50***c* is arranged such that when the needle **50***a* is at the zero mileage position the switch is open but at all other positions of the needle the switch is closed. Thus, the switch is in closed circuit position in all settings except its zero setting. Preferably, the needle **50***a* is driven in one direction only, namely, in the counterclockwise direction as viewed in FIG. 2, and may be hand set in a clockwise direction whereby the runner can set the odometer needle to a desired distance and the odometer needle will then be returned to zero under driving power of the cable **48**. Such odometer structure is of conventional structure and therefore is not detailed herein.

As thus apparent, the motor is capable of operation while the odometer needle is set on any mileage designation except zero and will be shut off when said needle reaches zero. The variable speed control **54** is also arranged to control the operation of the motor in that it operates a switch **57**, FIG. 10, in the circuit to the motor. More particularly the switch **57** is arranged to be open in the "off" position of the speed control **54** but to be closed in all other positions. Thus, in order for the motor to be put in operation, switch **57** must be on any position other than its "off" position and the needle **50***a* must at the same time be in any position other than its zero position.

In the operation of the treadmill a person can set the pace desired by suitable adjustment of the variable speed control means **54**. Such speed control means can cause operation of the belt at a walking speed or at a maximum running speed such as a speed amounting to a four-minute mile if desired. By proper setting of such control means a person can run at the desired miles per hour in following a conditioning program. That is, he may wish to run at a slow speed in initiating the training program and as his condition improves he may run at a faster pace. Such is accomplished by proper settings of the control means **54**. The distance to be walked or run is set by selected adjustment of the odometer needle **50***a*. Thus, certain distances can be walked or run at a selected pace. When a person desires to exercise, he first steps onto the treadmill and then sets the odometer needle to the distance desired. Although the switch **50***c* closes when such setting is made, the circuit to the motor is still closed, assuming of course that the speed control means **54** is set on its "off" position. The person can then move the speed control means **54** to its first position to close the circuit to the motor and place the treadmill in operation.

This first position may comprise a walking speed of the belt, so that the person can initiate his movements with balance. The speed control means can then be moved up to a faster setting gradually so that the runner can still maintain his balance. Such gradual build-up of speed is not mandatory, however, since the handrails can be used for maintaining balance even when starting out at a fast pace.

Timer **60** is observed by the runner in conjunction with the reading of the odometer to determine the speed at which the running is pregressing. Since the timer is in the circuit with the motor it will be initiated in its operation simultaneously with said motor. The timer is hand set to its zero position before the switches **50***c* and **57** are closed. The instruments on the housing are conveniently viewable and accessible to the runner as he exercises and can be manipulated as he runs. Although the treadmill is shown as having a horizontal run of the belt for supporting the runner, it is to be understood that such run may be inclined simply by supporting the frame on an inclined surface.

It is desired that the treadmill be knocked down for shipment and storage, and for this purpose the bottom frame plate **10** and belt support plate **12** have transverse jointed connections **62** at approximately their centers, FIGS. 1 and 3. Such connections comprise a hinge connection which may be readily separated by removal of a hinge pin **64**. Belt **34** has a similar jointed connection **66**, FIGS. 2 and 7, disconnectable by a cross pin **68**. Also the handrails **46** are formed in two parts with one of the parts having a projection **70** removably fitted into a hollow end **72** of the other part as shown in FIG. 1. Each of the railing parts has a hinged connection **74** with their respective standards **44** for folding and each of the standards **44** is removable from the sockets **42** in the posts **16**. Thus, for shipment or storage the standards for the side rails can be removed from the sockets **42** and then the two portions of the side rails separated and folded to a condition shown in FIG. 9. Thereupon, the belt may be removed from the drums by removing the pin **68** and the frame knocked down in two parts by disconnection of joints **62**. The frame may be stored or shipped in the condition shown in FIG. 8. For the purpose of partial dissasembly as just described, odometer cable **48** and the electrical lines have suitable conventional plug-in connections, not shown.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A treadmill comprising:

(a) a frame,

(b) a pair of parallel drums on said frame disposed in spaced relation,

(c) an endless belt operating over said drums,

(d) power means for driving one of said drums to cause linear movement of said belt such that a person can run on the belt to keep up with the travel thereof,

(e) said belt having a plurality of apertures substantially covering the length and the width of the treadmill for conditioning the feet of the runner,

(f) an odometer operative with the endless belt to measure the linear movement of said belt,

(g) said odometer having a dial of distance designations comprising a start designation and selected distance designations and a setting needle associated with said designation,

(h) said needle being arranged for setting manually for preselecting a distance to be run,

(i) said needle being returned to its start position by said power means whereby to move from a set position to its start position by operation of the treadmill.

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RICHARD C. PINKHAM, Primary Examiner

R. T. STOUFFER, Assistant Examiner

U.S. Cl. X.R.

128—25B