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(54) **Electrical treadmill**

(57) The present invention relates to an electric treadmill in which the tread base (10) neighboring upon the running belt (14) and based upon the central reference point is provided with sensing lines for acceleration, sensing lines for deceleration both of which are arranged one after the other. When the runner touches the fixed sensing position by light wave or acoustic wave, a CPU located within the electric console (12) gives a

command according to the sensing position to accelerate or decelerate the motor (13) such that an immediate control of the rotational speed of the running belt (14) is achieved. In addition, a sensing line for stop can be disposed behind the decelerating sensing line. When the operator continues to be shifted forwards, thereby contacting with the sensing line for stop, CPU gives a command to stop the motor (13) immediately. Thus, the safety of the operator can be more ensured.

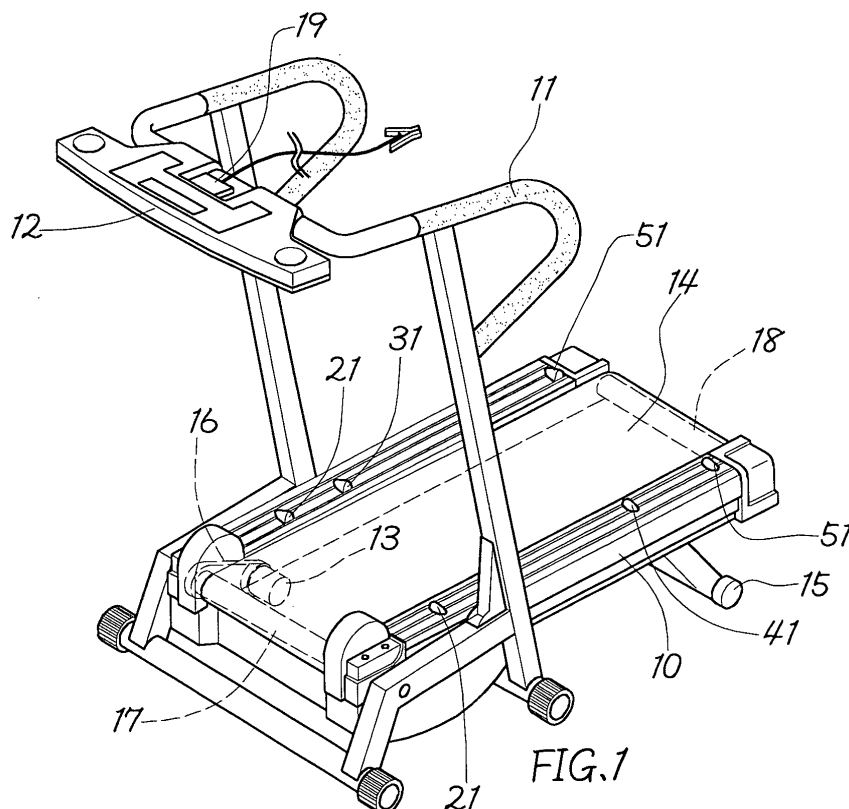


FIG. 1

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Description

BACKGROUND OF THE INVENTION

1. Fields of the Invention

[0001] The present invention relates to an electric treadmill, and more particularly, to a device which is provided with a plurality of fixed sensing lines. When the operator touches one of them, a command is given to accelerate, decelerate or stop the operation of the treadmill.

2. Description of the Prior Art

[0002] First of all, it is noted that the present invention is continuation-in-part of the US patent applications SER. No. 09//247,571 (now US 6,126,575) and 09/467,224 (now US 6,179,754) hereinafter called "the first prior art" and "the second prior art", respectively. It's described in the first prior art that an automatic roll-up rope is tied around the operator's body. In addition, a sensor is disposed to detect the position of the runner. After a central processing unit processes the detection parameters, a command is given to accelerate or decelerate the motor.

[0003] The second prior art describes that a detector is fitted to both sides of the tread base for detecting the position of the runner. After a central processing unit processes the detection parameters, a command is given to accelerate or decelerate the motor.

[0004] In brief, the central processing units of both prior arts are used to evaluate the detection parameters to obtain the exact position of the runner. Thereafter, a command is given to accelerate or decelerate the motor. Consequently, the motor reacts after the steps of the runner or the body displacement. Although both prior arts can obtain more accurate parameters to give command for accelerating or decelerating the motor, this is the reason why difficulties are caused in programming and in cooperation with other components. Therefore, the production costs thereof are considerably increased and the price thereof is always kept in a high level.

SUMMARY OF THE INVENTION

[0005] Therefore, it is a primary object of the present invention to eliminate the above-mentioned drawbacks and to provide an electric treadmill which is provided with a plurality of fixed sensing lines. When the operator touches one of them, a command is given to accelerate, decelerate or stop the operation of the treadmill. Thus, the operation procedure of the central processing unit is tremendously simplified to efficiently increase the ability of the instant reaction.

[0006] It's another object of the present invention to provide an electric treadmill which can considerably reduce the production cost by means that a more simple

and cheaper central processing unit is used to automatically accelerate and decelerate the motor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The accomplishment of this and other objects of the invention will become apparent from the following description and its accompanying drawings of which:

FIG. 1 is a perspective view of a preferred embodiment of the present invention; and
FIG. 2 is a top view in accordance with FIG. 1, illustrating the position of the sensing lines.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] Before dealing with features of the present invention, the applicant has to give a brief description about the walking, jogging or running exercise on the electric treadmill in order to understand the basic control principles of the present invention.

1. The position of the runner is unchanged when the running speed of the operator is equal to the rotational speed of the running belt.
2. The position of the runner is shifted forwards when the running speed of the operator is higher than the rotational speed of the running belt.
3. The position of the runner is shifted backwards when the running speed of the operator is lower than the rotational speed of the running belt.

[0009] Accordingly, the position of the operator will be changed in accordance with his running speed when he stands at the centre of the running belt.

[0010] As shown in FIGS. 1 and 2, the electric treadmill includes a tread base 10, a handrail 11, an electric console 12, a motor 13, a running belt 14 and a rear support 15. The motor 13 brings a drive belt 16 into rotation which drives a front roller 17. The running belt 14 is placed around the front and rear rollers 17, 18, thereby creating an endless rotation by means of the operation of the motor 13.

[0011] Based on the central reference point, the tread base 10 neighbouring upon the running belt 14 is provided with a multiple accelerating sensing line 20, a basic accelerating sensing line 30 and a decelerating sensing line 40 three of which are arranged one after another. When the runner touches the fixed sensing position by light wave or acoustic wave, a CPU located within the electric console 12 gives a command according to the sensing position to accelerate or decelerate the motor 13. Accordingly, an immediate control of the rotational speed of the running belt 14 is achieved.

[0012] The operation principle and method of the sensing lines 20, 30, 40 are shown in FIG. 2. The sensing lines 20, 30, 40 are created by means that the sens-

ing elements 21, 31, 41 (e.g. infrared rays, laser rays, radar waves, etc.) each send out a straight signal crossing through said tread base 10 (see dashed line in FIG. 2), respectively. When one signal of the sensing lines 20, 30, 40 senses the appearance of the operator, CPU will immediately and automatically send out a command to perform the speed control of the motor 13.

[0013] Accordingly, an optimal position of the operator is at the centre of the running belt 14 when the running speed of the operator is equal to the rotational speed of the running belt. The position of the runner is shifted forwards when the running speed of the operator is higher than the rotational speed of the running belt 14, thereby contacting with basic accelerating sensing line 30. Therefore, the motor 13 is accelerated according to the preset value. The position of the runner is shifted more forwards when the running speed of the operator is still higher than the rotational speed of the running belt 14 after the first adjustment, thereby contacting the multiple accelerating sensing line 20. Thus, the motor will be accelerated once again. The motor 13 won't be accelerated only if the operator doesn't contact the sensing lines 20, 30 any more. On the other hand, when the running speed of the operator is lower than the rotational speed of the running belt 14, the position of the runner is shifted backwards to contact with the decelerating sensing line 40. Immediately, the motor 13 won't be decelerated only if the operator doesn't contact with the decelerating sensing line 40 any more.

[0014] In brief, the central position of the running belt 14 stands for the normal exercise position, that is, the exercise state when the running speed and the speed of the running belt 14 are identical. The sensing lines 20, 30, 40 are arranged based on the reference point of the normal exercise position. The multiple accelerating sensing line 20 differs from the basic accelerating sensing line 30 by the running speed of the operator. That is, when the running speed is gradually increased, the motor 13 is correspondingly accelerated (at the basic acceleration). When the running speed is sharply increased, the motor 13 is correspondingly accelerated (at the multiple acceleration) to meet the exercise needs. Similarly, when the running speed is decreased, the motor 13 is correspondingly decelerated.

[0015] Besides, a sensing line 50 for stop can be disposed behind the decelerating sensing line 40. When the operator continues to be shifted forwards, thereby contacting with the sensing line 50 for stop, CPU gives a command to stop the motor 13 immediately. Thus, the safety of the operator can be more ensured.

[0016] In fact, the sensing line 50 for stop (with the sensing element 51) can be individually fitted to any electric treadmill and replace the safety pin 19 for disconnection. Of course, both safety devices (the sensing line 50 for stop and the safety pin 19 for disconnection) can be used together for a double safety effect.

[0017] Many changes and modifications in the above-described embodiments of the invention can, of course,

be carried out without departing from the scope thereof. Accordingly, to promote the progress in science and the useful arts, the invention is disclosed and is intended to be limited only by the scope of the appended claims.

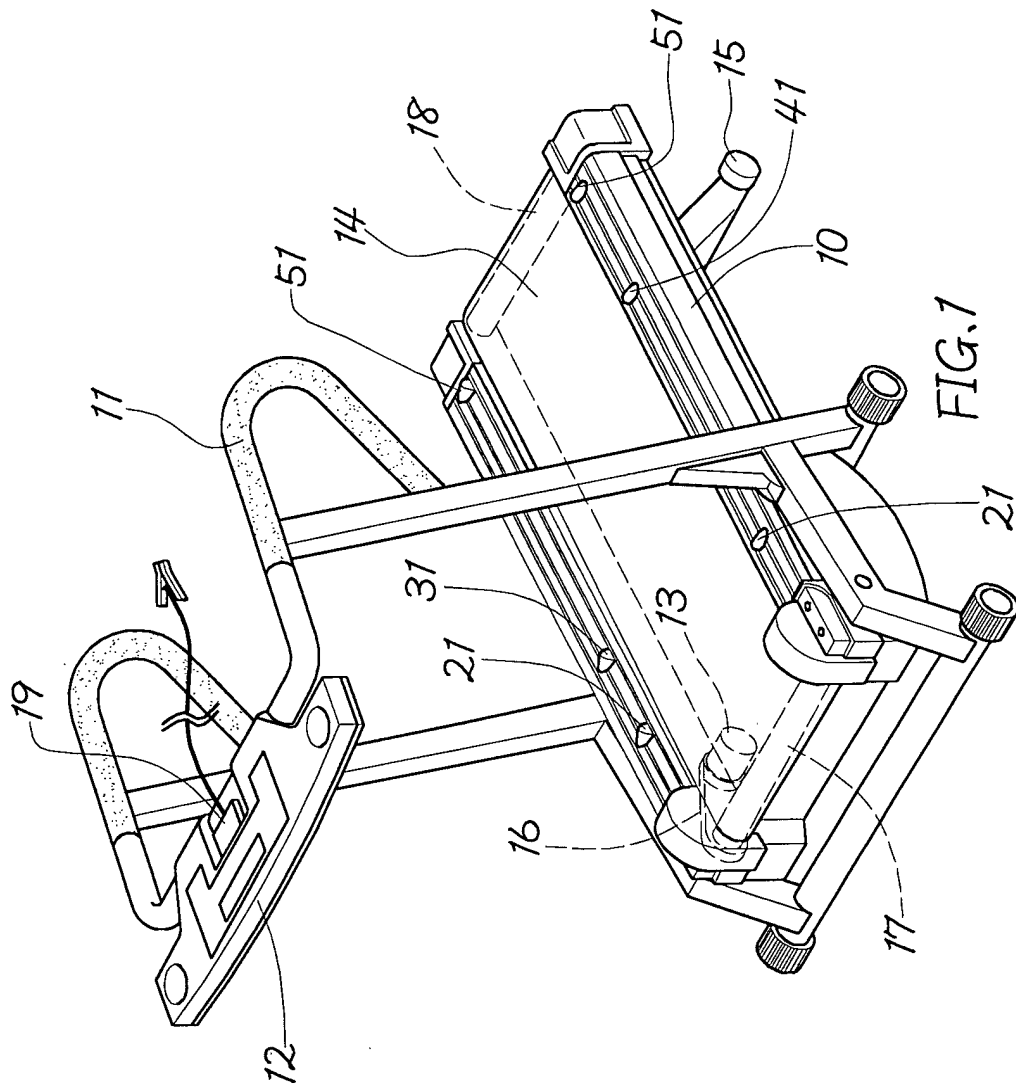
Claims

1. An electric treadmill comprising a tread base (10), a handrail (11), an electric console (12), a motor (13), a running belt (14) and a rear support (15), said motor (13) bringing a drive belt (16) into rotation which drives a front roller (17), said running belt (14) being placed around said front (17) and rear (18) rollers, thereby creating an endless rotation by means of the operation of said motor (13); wherein, based upon the central reference point, said tread base (10) neighbouring upon said running belt (14) is provided with sensing lines (20, 30) for acceleration, sensing lines (40) for deceleration both of which are arranged one after the other, and wherein, when the runner touches the fixed sensing position by light wave or acoustic wave, a CPU located within said electric console (12) gives a command according to the sensing position to accelerate or decelerate said motor (13) so that an immediate control of the rotational speed of said running belt (14) is achieved.
2. The electric treadmill of claims 1, wherein it's preferable that the central reference point is located at the centre of said running belt (14).
3. The electric treadmill of claims 1, wherein sensing elements (21, 31, 41) of said sensing lines (20, 30, 40) each send out a straight signal crossing through said tread base (10).
4. The electric treadmill of claims 1, wherein said sensing lines (20, 30) for acceleration are divided into a multiple accelerating sensing line (20) and a basic accelerating sensing line (30).
5. The electric treadmill of claims 1, wherein said sensing lines (40) for deceleration are divided into a multiple decelerating sensing line and a basic decelerating sensing line.
6. An electric treadmill comprising a tread base (10), a handrail (11), an electric console (12), a motor (13), a running belt (14) and a rear support (15), said motor (13) bringing a drive belt (16) into rotation which drives a front roller (17), said running belt (14) being placed around said front (17) and rear (18) rollers, thereby creating an endless rotation by means of the operation of said motor (13); wherein, based upon the central reference point, said tread base (10) neighbouring upon said running belt (14)

is provided with sensing lines (20, 30) for acceleration, sensing lines (40) for deceleration and a sensing line (50) for stop three of which are arranged one after another, and wherein, when the runner touches the fixed sensing position by light wave or acoustic wave, a CPU located within said electric console (12) gives a command according to the sensing position to accelerate, decelerate or stop said motor (13) so that an immediate control of the rotational speed of said running belt (14) is achieved.

7. The electric treadmill of claims 6, wherein it's preferable that the central reference point is located at the centre of said running belt (14). 15
8. The electric treadmill of claims 6, wherein sensing elements (21, 31, 41, 51) of said sensing lines (20, 30, 40, 50) each send out a straight signal crossing through said tread base (10). 20
9. The electric treadmill of claims 6, wherein sensing lines (20, 30) for acceleration are divided into a multiple accelerating sensing line (20) and a basic accelerating sensing line (30). 25
10. The electric treadmill of claims 6, wherein sensing lines (40) for deceleration are divided into a multiple decelerating sensing line and a basic decelerating sensing line. 30
11. An electric treadmill comprising a tread base (10), a handrail (11), an electric console (12), a motor (13), a running belt (14) and a rear support (15), said motor (13) bringing a drive belt (16) into rotation which drives a front roller (17), said running belt (14) being placed around said front (17) and rear (18) rollers, thereby creating an endless rotation by means of the operation of said motor (13); wherein said tread base (10) neighbouring upon said running belt (14) is provided with a sensing line (50) for stop, and wherein, when the runner touches the fixed sensing position by light wave or acoustic wave, a CPU located within said electric console (12) gives a command to stop the operation of said motor (13). 35 40 45
12. The electric treadmill of claims 11, wherein said sensing elements (51) of said sensing line (50) each send out a straight signal crossing through said tread base (10). 50

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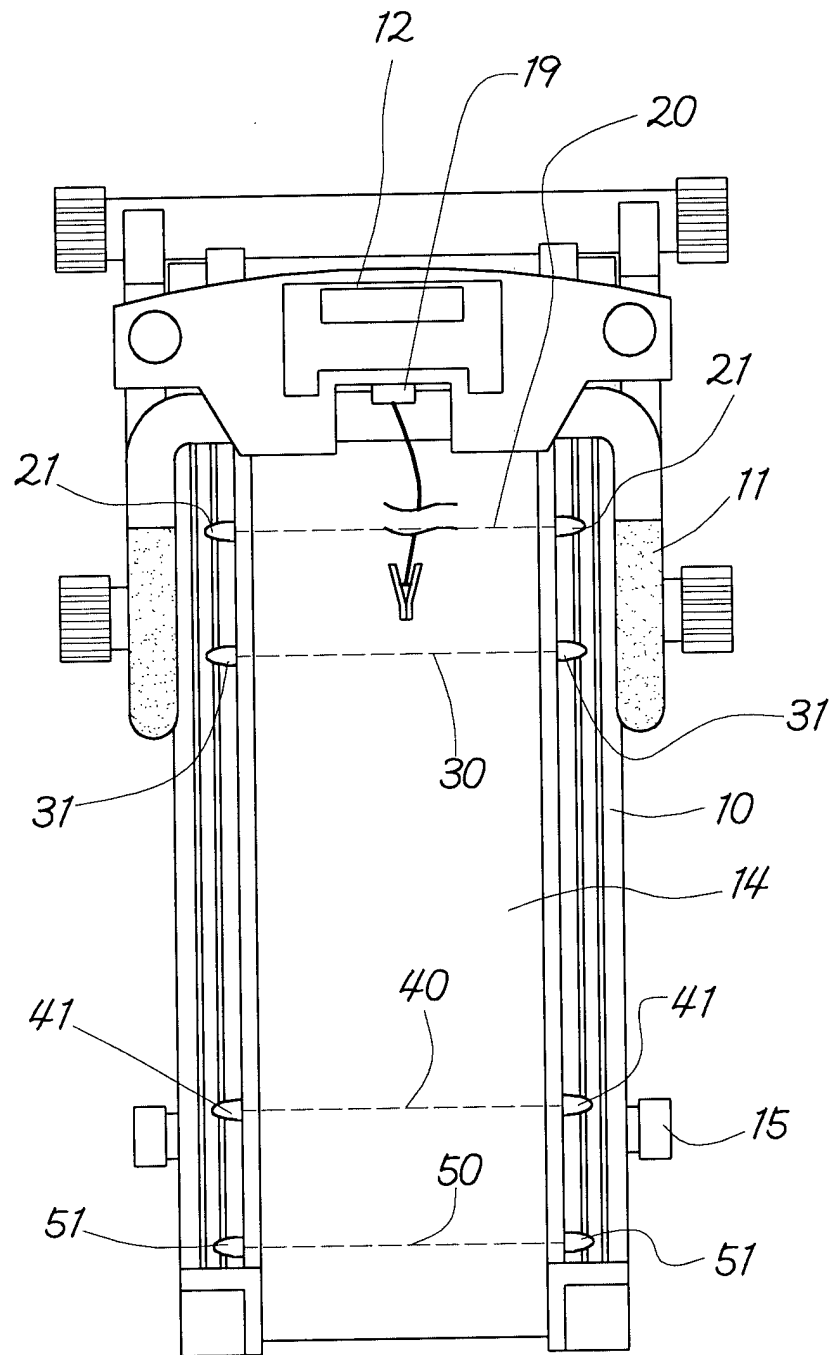


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 02 02 4020

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 200 08 636 U (ZAGORNI OLIVER) 14 December 2000 (2000-12-14) * the whole document *	1-12	A63B22/02
X	DE 39 33 999 A (JAEGER ERICH GMBH & CO KG) 18 April 1991 (1991-04-18) * the whole document * * figures 1.3,5 *	1-12	
X,D	US 6 179 754 B1 (WANG LEAO ET AL) 30 January 2001 (2001-01-30) * the whole document *	1-5	
A	FR 1 565 616 A (PIERRE TRONVILLE) 2 May 1969 (1969-05-02) * the whole document *	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) A63B
Place of search THE HAGUE		Date of completion of the search 28 January 2003	Examiner Knoflachner, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 4020

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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28-01-2003

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