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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Method and apparatus of counting steps for treadmill

(57) The present invention discloses a method and an apparatus of counting steps for a treadmill. The method measures a load exerted on the treadmill and detects the number of instant loads caused by a user applying a force by the user's legs for each time of the exercise to count the steps of leg exercise during an exercise. The treadmill includes a treadmill body, a load detection unit, a display unit, and a base of the treadmill. The base has a motor and a treadmill belt, and the load detection unit is provided for detecting the load exerted on the motor and recording the number of instant loads of the motor, and the display unit is electrically connected to the load detection unit for outputting the number of loads of the motor.

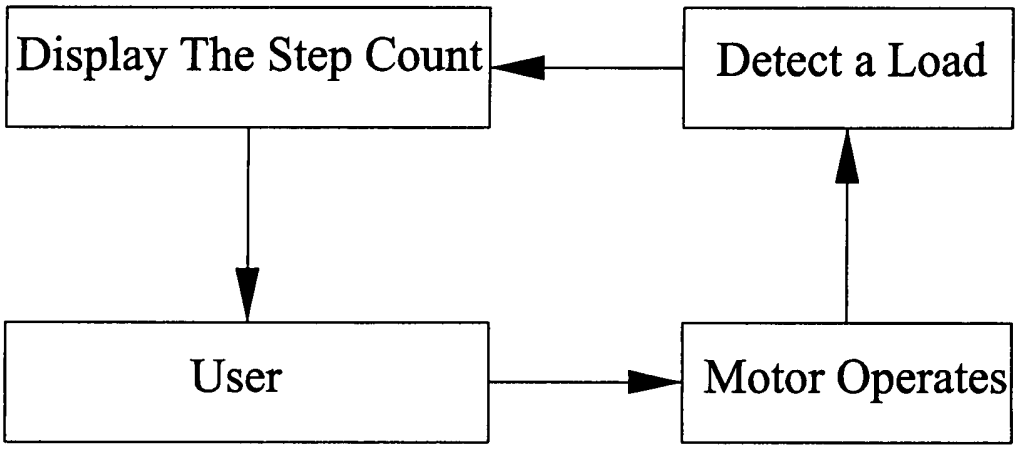

FIG. 1

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a method and an apparatus of counting steps for a treadmill, and more particularly to a method and an apparatus of measuring a step count of an exerciser on a treadmill by an instant load.

Description of the Related Art

[0002] When users are doing exercises, they usually keep track of the time and quantity of the exercises and the exercise time is generally measured by a regular stopwatch. However, it is not objective to evaluate the quantity of exercise per day simply by the exercise time, and it is not easy to evaluate the quantity of exercise by the exercise time either, because every user may do exercise in different ways. Therefore, it is more objective to measure the quantity and time of exercise for the same kind of exercises.

[0003] As to the common exercises: jogging and walking, a general pedometer available in the market can be used to count the steps of an exerciser's walking or jogging, so as to let exercisers know about their physical conditions and the quantity of exercises.

[0004] However, it is necessary to wear a pedometer on an exerciser's body for counting the steps of walking and jogging, and thus it causes inconvenience to exercisers. Furthermore, an exerciser may not feel comfortable or get used to the wearing of a pedometer while doing exercises, and thus the prior art requires improvements.

[0005] For general treadmills, users can select their desired exercise modes (including exercise time, exercise type, and exercise speed, etc.), but users still cannot be aware of the quantity of their exercise.

SUMMARY OF THE INVENTION

[0006] In view of the shortcomings of the prior art, the inventor of the invention based on years of experience in the related industry to conduct extensive researches and experiments, and finally invented a method and an apparatus of counting steps for treadmill in accordance with the present invention.

[0007] Therefore, it is a primary objective of the present invention to provide a feasible solution and overcome the foregoing problems by providing a method and an apparatus of counting steps for a treadmill, such that exercisers no longer need to wear a pedometer, but directly read the step count of their walking or jogging from the treadmill. When exercisers are using the treadmill, they can control the quantity of exercises on their own.

[0008] A secondary objective of the present invention is to provide a procedure of determining the load of a treadmill, such that the motor will stop operating, either there is no load in predetermined discrete time or during continuous load of the treadmill.

[0009] To achieve the foregoing objectives, the present invention provides a method as defined in claim 1 and a treadmill as defined in claim 5. Preferred embodiments are claimed in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a schematic view of a method of counting steps in accordance with the present invention;
FIG. 2 is a schematic view of the structure of a treadmill in accordance with the present invention;
FIG. 3 is a schematic view of operating a treadmill in accordance with the present invention; and
FIG. 4 is a flow chart of determining a load in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] Referring to FIG. 1 for a method of counting steps for a treadmill in accordance with this embodiment, the method comprises the steps of using an existing treadmill with a motor and a treadmill belt as a basis (and the treadmill, motor, and treadmill belt will be described in the structure of a treadmill) and the motor drives the treadmill belt to operate, and the treadmill belt is provided for a user to pedal. The user just follows the general sequence of exercising on the treadmill directly for counting the steps.

[0012] In FIG. 1, the motor will cause an intermittent load when a user is exercising his/her legs on a treadmill. The load exerted on the treadmill is measured and the number of instant loads caused by the user applying a force by the legs on the treadmill belt of the treadmill is detected when the user is exercising for each time, and the number of leg exercises is calculated when the user is exercising.

[0013] The number of loads is defined as a step count of a user stepping on the treadmill belt. The step count in a numeric form is outputted on a display panel.

[0014] The method of measuring the load exerted on the treadmill is one selected from the collection of a voltage feedback of the motor, a current feedback of the motor and an optical disk installed in the motor.

[0015] Therefore, users need not to wear a pedometer while doing exercise, but they can know about the step count directly from the treadmill while jogging on the treadmill. The invention not only provides convenience and avoids discomfort, but also saves the trouble of wearing a pedometer while doing exercises. In the meantime, it is not necessary for users to specially learn how to operate the treadmill or preset the treadmill, and thus the

operation is very convenient.

[0016] Referring to FIGS. 2 and 3, the present invention also provides a treadmill, comprising: a treadmill body 1, a load detection unit, and a display unit 3.

[0017] The treadmill body 1 has a base 11, a rail 12 connected to the base 11, and an operating panel 13 connected to the rail 12 (for installing a load detection unit). The base 11 has a motor 2 and a treadmill belt 21. The motor 2 is installed on a side of the base 11, and the base 11 has two tracks 111, and an axle 112 is disposed separately at the front and the rear of the two tracks 111. The treadmill belt 21 is wound circularly between the two tracks 111 of the base 11 and also wound around the axle 112 of the two tracks 111, and the treadmill belt 21 is driven to rotate by the motor 2.

[0018] The load detection unit (this embodiment adopts a current detection circuit of the motor as a load detection unit which is not shown in the figure) is provided for detecting a load exerted on the motor 2, and recording the number of instant loads of the motor 2 at the same time.

[0019] The display unit 3 is electrically connected to the load detection unit and outputs the number of loads of the motor 2. The display unit 3 of this embodiment is a screen installed at the operating panel 13, and the load of the motor 2 is displayed in a numeric form on the screen.

[0020] The load detection unit is one selected from the collection of a voltage feedback detector of the motor, a current feedback detector of the motor, and an optical disk installed at the motor for detecting the load of the motor.

[0021] Referring to FIGS. 3 and 4, the invention further comprises a load determination step that measures the load exerted on the treadmill and defines a continuous load and a discrete load.

[0022] A continuous load is exerted on a motor by a user, such that the motor will be controlled to stop operating, if a load is determined as a continuous load; a discrete load is exerted onto the motor, such that a predetermined discrete time will be used to determine whether or not the user stops moving if a load is determined as a discrete load; the motor will keep on operating if another load shows up in the motor within a discrete time; and the motor will be controlled to stop operating if no more load is in the motor within a discrete time.

[0023] If a load is determined as a continuous load, it shows that the user has stopped jogging and stands on the treadmill belt or the treadmill belt gets stuck (by the user's bottom of a trouser leg, a shoelace or the user's body) and thus the motor 2 will stop immediately to prevent accidents.

[0024] If a load is determined as a discrete load, it shows that the user is using the treadmill. If the user stops jogging at this point, then there will be no more load within the suspended time and it shows that the user has left the treadmill, and thus preventing children or other people from standing on the treadmill suddenly and also preventing accidents.

Claims

1. A method of counting steps for a treadmill;
using a current existing treadmill with a motor and a treadmill belt as a basis, and said motor driving said treadmill belt to operate, and said treadmill belt being provided for a user to pedal;
measuring a load exerted on said treadmill, and detecting the number of times of an instant load of said motor caused by applying a force by a user's legs for each time of the user's exercise, and counting the steps performed by the user's exercise, and displaying the step count of the user's legs.

2. The method of counting steps for a treadmill of claim 1, wherein said load per time is defined as a user who has stepped on said treadmill belt once by the user's leg.

3. The method of counting steps for a treadmill of claim 1, wherein said method of measuring a load exerted on said treadmill is measured by one selected from the collection of a voltage feedback of said motor, a current feedback of said motor, and an optical disk installed in said motor.

4. The method of counting steps for a treadmill of claim 1, wherein said number of steps is outputted in form of a number on a display panel.

5. A treadmill, comprising:

a treadmill body, having a base, a motor and a treadmill belt installed at said base, and said motor being installed at a side of said base and having two tracks, and said treadmill belt being wound circularly between said two tracks of said base, and said treadmill belt being driven to rotate by said motor;
a load detection unit, for detecting a load exerted on said motor and recording the number of instant loads of said motor in the same time; and
a display unit, electrically coupled to said load detection unit, for displaying the number of loads of said motor.

6. The treadmill of claim 5, wherein said display unit is a screen, and said load of said motor is displayed in a form of numbers on said screen.

7. The treadmill of claim 5, wherein said load detection unit is one selected from the collection of a voltage feedback detector of said motor, a current feedback detector of said motor, and an optical disk installed in said motor.

8. The method of counting steps for a treadmill of claim 1, further comprising:

a load determination step that measures a load exerted on said treadmill, and separately defines a continuous load and a discrete load, wherein said continuous load is exerted onto said motor by a user, such that said motor will be controlled to stop operating, if a load is determined as a continuous load; and said discrete load is exerted onto said motor, such that a predetermined discrete time will be used to determine whether or not the user stops moving if a load is determined as a discrete load; and said motor will keep on operating if another load shows up in said motor within a discrete time; and said motor will be controlled to stop operating if no more load is in the motor within a discrete time.

Amended claims in accordance with Rule 137(2) EPC.

1. A method of counting steps for a treadmill; the method comprising:

using an existing treadmill (1) with a motor (2) and a treadmill belt (21) as a basis, said motor (2) driving said treadmill belt (21) to operate, and said treadmill belt (21) being provided for a user to pedal;
measuring a load exerted on said treadmill (1), detecting the number of times of an instant load of said motor (2) caused by applying a force by a user's legs for each time of the user's exercise, and
counting the steps performed by the user's exercise, and displaying the step count of the user's legs

characterized in that the method further comprises:

determining the measured load to be either a continuous or a discrete load exerted by the user onto the motor (2);
if the load has been determined to be a continuous load, controlling the motor (2) to stop operating; and
if the load has been determined to be a discrete load, performing the following steps:

detecting within a predetermined discrete time whether another load occurs in the motor (2) and,
if no other load occurs within the predetermined discrete time, controlling the motor (2) to stop operating; and
if another load occurs within the predetermined discrete time, keeping the motor (2) in operation.

2. The method of counting steps for a treadmill of claim 1, wherein said load per time is defined as a user who has stepped on said treadmill belt (21) once by the user's leg.

3. The method of counting steps for a treadmill of claim 1, wherein said method of measuring a load exerted on said treadmill (1) is measured by one selected from the collection of a voltage feedback of said motor (2), a current feedback of said motor (2), and an optical disk installed in said motor (2).

4. The method of counting steps for a treadmill of claim 1 wherein said number of steps is outputted in form of a number on a display panel (3).

5. A treadmill, comprising:

a treadmill body (1), having a base (11), a motor (2) and a treadmill belt (21) installed at said base (11), and said motor (2) being installed at a side of said base (11) and having two tracks (111), and said treadmill belt (21) being wound circularly between said two tracks (111) of said base (11), and said treadmill belt (21) being driven to rotate by said motor (2);
a load detection unit, for detecting a load exerted on said motor (2) and recording the number of instant loads of said motor (2) in the same time; and
a display unit (3), electrically coupled to said load detection unit, for displaying the number of loads of said motor (2);

characterized in that the treadmill further comprises:

a load determination unit for determining a detected load to be either a continuous or a discrete load exerted by the user onto the motor (2);
a movement detection unit for detecting within a predetermined discrete time whether another load occurs in the motor 82), if a detected load has been determined to be a discrete load,
stopping means for controlling the motor (2) to stop operating, if a detected load has been determined to be a continuous load or if it has been determined as a discrete load and no other load has been detected within the predetermined discrete time.

6. The treadmill of claim 5, wherein said display unit (3) is a screen, and said load of said motor (2) is

displayed in a form of numbers on said screen.

7. The treadmill of claim 5, wherein said load detection unit is one selected from the collection of a voltage feedback detector of said motor (2), a current feedback detector of said motor (2), and an optical disk installed in said motor (2).

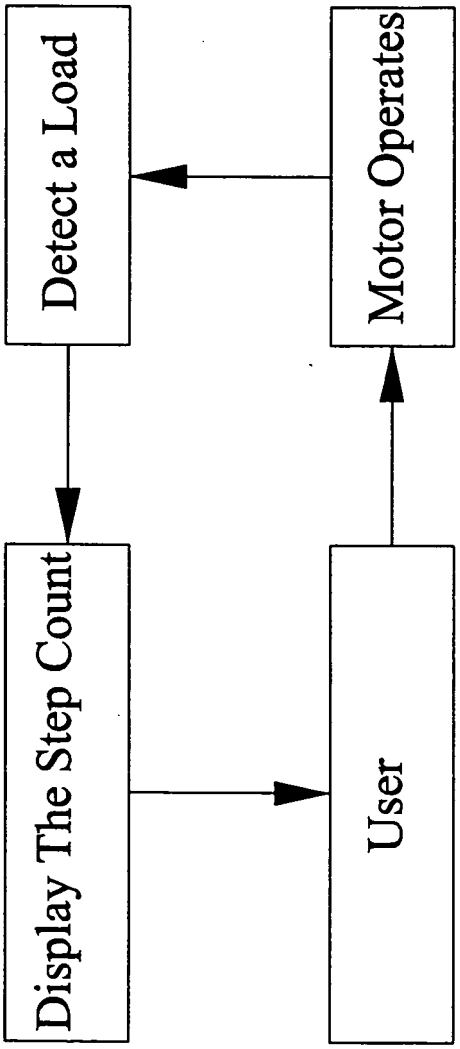

FIG. 1

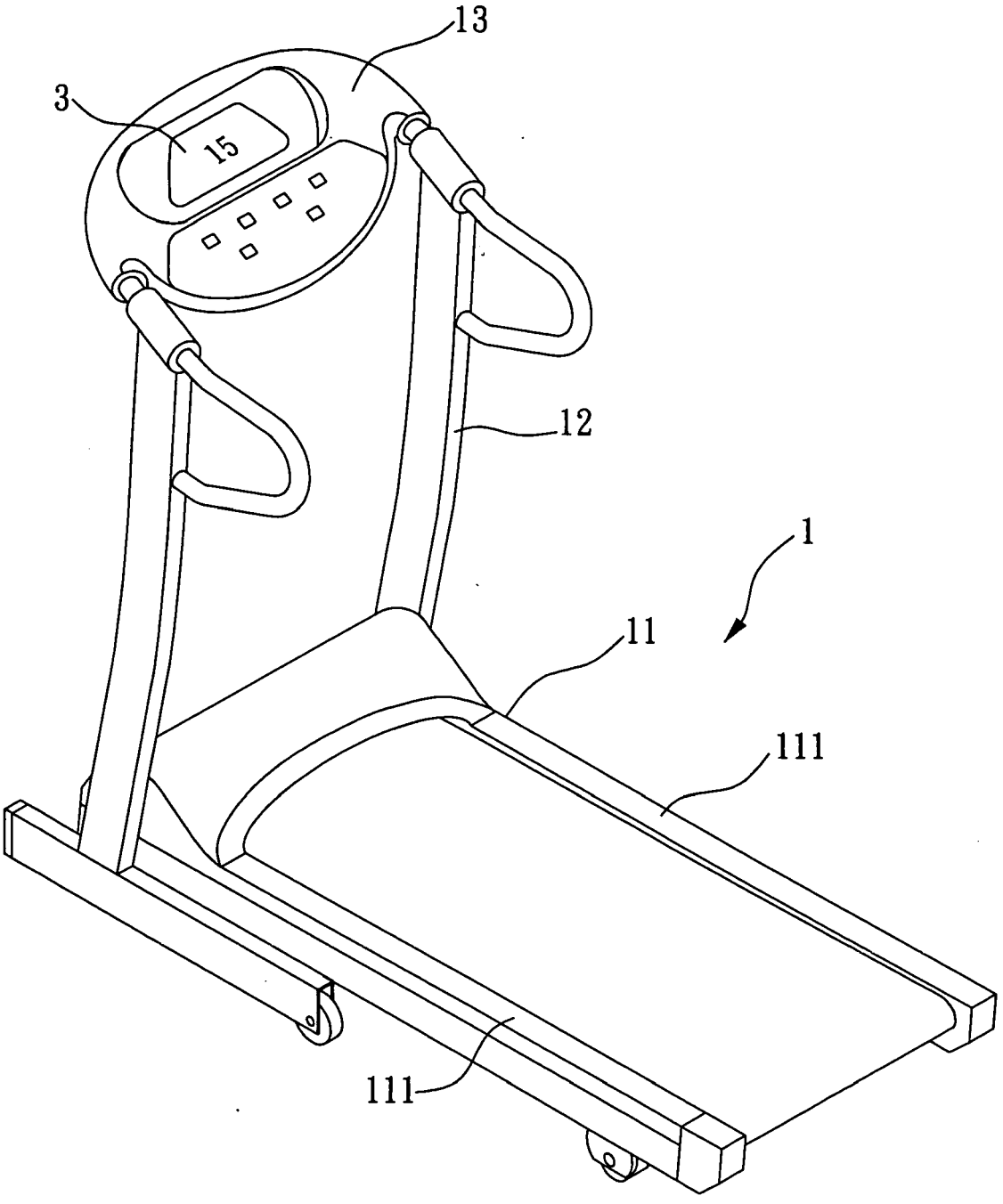

FIG. 2

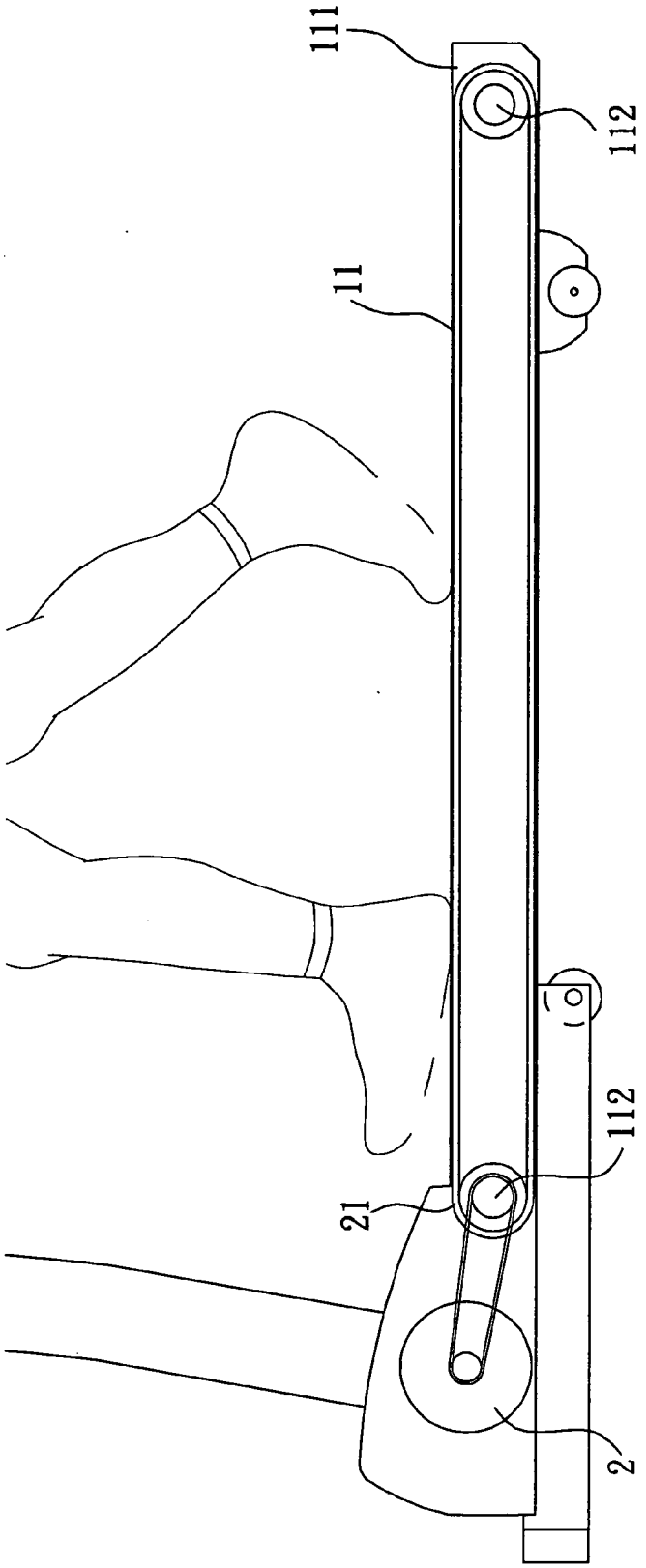

FIG. 3

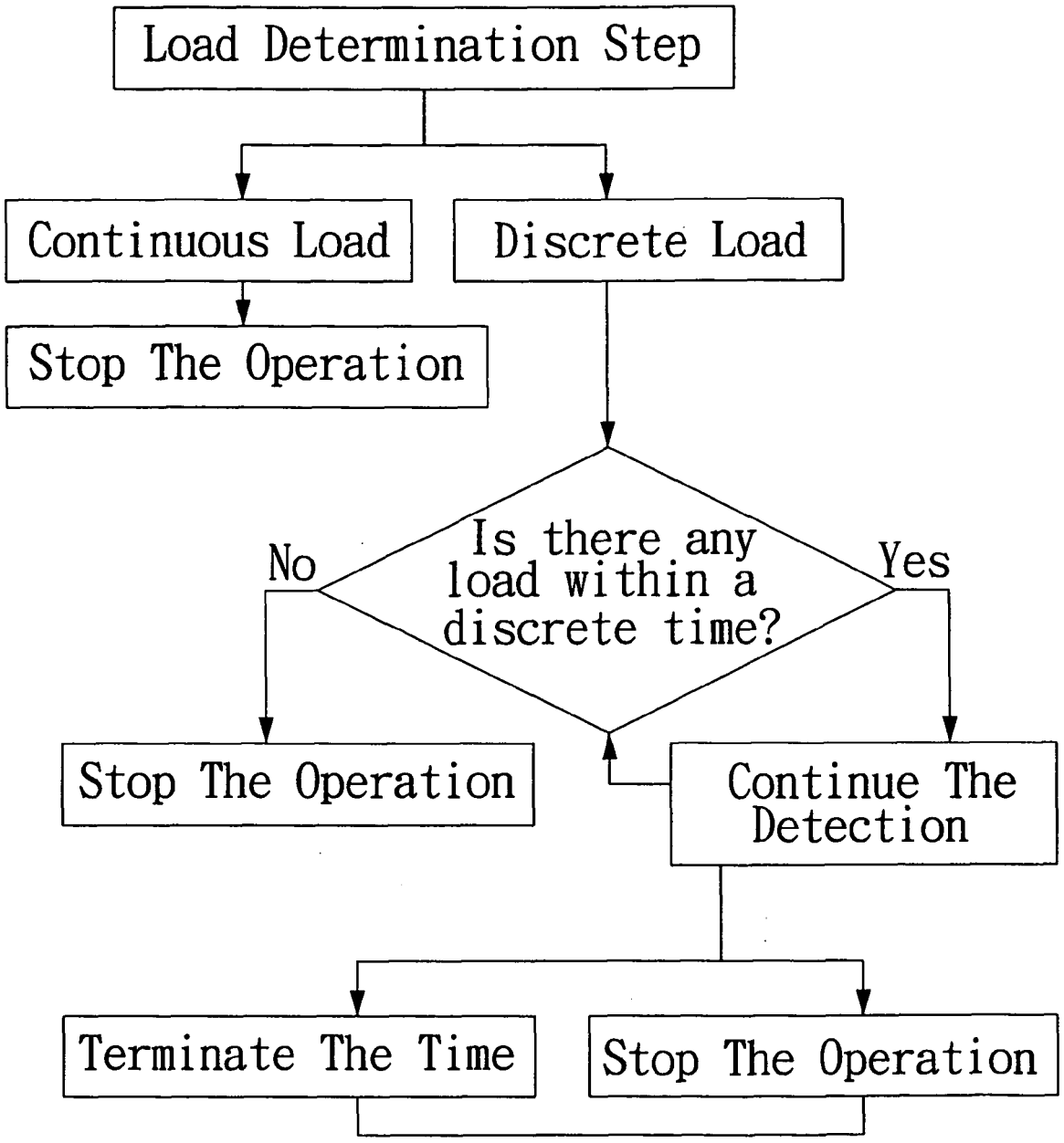
Load Determination Step
Continuous Load
Discrete Load
Stop The Operation
Is there any load within a discrete time?
No
Yes
Stop The Operation
Continue The Detection
Terminate The Time
Stop The Operation

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 01 6038

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			TECHNICAL FIELDS SEARCHED (IPC) A63B A61B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 March 2007	Oelschläger, Holger

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 01 6038

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