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(54) Foldable handrail assembly of an exercise apparatus

(57) A bendable handrail assembly 30 of an exercise apparatus wherein the handrail assembly 30 is divided into a fixed portion 31 and a bent portion 32. The fixed portion 31 is coupled with a tube 33 and positioned at an inclined angle relative to the handrail support 20 of the exercise apparatus. The bent portion 32 includes at one end thereof an inclined shaft 34 fitting into the tube 33, and the bent portion 32 is positioned by means of an elastic element 35 and a positioning element 36 in a pivotable state. At that time, the bent portion 32 can be brought in a nearly horizontal position relative to the ground 40. When the handrail assembly 30 is bent, the bent portion 32 can rotate on the inclined shaft along the inclined angle (Z-axis of space) in a vertical position relative to the ground 40.

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Description

BACKGROUND OF THE INVENTION

1. Fields of the Invention

[0001] The invention relates to a bendable handrail assembly of an exercise apparatus, and more particularly, to a structure that may avoid an unexpected false action and permit a constant and tight attachment of a bent portion. Moreover, the transport and the storage of the electric treadmill may be facilitated to a great extent.

2. Description of the Related Art

[0002] Not long ago, the U.S. administration bureau for safety control on the exercise apparatuses announced the requirements on the length of the handrails of the exercise apparatuses. The length of the handrail has to fulfill a certain criterion to achieve a basic safety protection during the exercise sessions. As a result, the packaging, the assembly, and the transport of the exercise apparatuses are affected to some extent. Regarding the impact on the packaging and the transport of the exercise apparatuses, the handrail and the handrail support have to be disassembled. Otherwise, the volume of the product will be substantially increased, thereby raising the transportation costs. At the same time, the self-assembly steps and their difficulty will be increased. Therefore, how to design the handrails without affecting the structural strength and under considerations on use safety, will become the serious issue for the manufacturing industry.

[0003] According to the general principles of mechanical design, it is the easiest and the most economical way to the resolve the above-mentioned issue when the handrail can be freely bent. Most of the improved designs, as far as we observed, employ a structure capable of horizontally or vertically bending. In other words, the handrail includes a joint for bending in a horizontal direction (in X-axis of space) or in a vertical direction (in Y-axis of space).

[0004] The above-mentioned improvement may fulfill the requirements on reduction of the volume and simplification of the assembly steps. However, the bending joint produces visible segments after the bending process. In addition to unsightliness, the inevitable defects on weakening the strength will also be created at the connection portions. Meanwhile, it is most likely to cause an unexpected false action in view of the holding and force-acting way. In other words, the handrail is easily rotated or moved by a lateral thrust or a longitudinal rotational force when the operator holds on the handrail. Therefore, the safety of the operator tends to be affected considerably. As a result, further improvements are required.

SUMMARY OF THE INVENTION

[0005] A primary object of the invention is to provide a bendable handrail assembly 30 of an exercise apparatus. The handrail is divided into a fixed portion 31 and a bent portion 32 both of which are pivotably installed at an inclination on a handrail support 20 of the exercise apparatus such that the bent portion is bendable along an inclined path in a vertical storage position. As a result, the bendable handrail assembly 30 of the invention may avoid an unexpected false action and permit a constant and tight attachment of a bent portion. Moreover, the transport and the storage of the electric treadmill 10 may be facilitated to a great extent.

[0006] According to the invention, the handrail assembly 30 is divided into a fixed portion 31 and a bent portion 32. The fixed portion 31is coupled with a tube 33 and positioned at an inclined angle relative to the handrail support 20 of the exercise apparatus. The bent portion 32 includes at one end thereof an inclined shaft 34 fitting into the tube 33, and the bent portion 32 is positioned by means of an elastic element 35 and a positioning element 36 in a pivotable state. At that time, the bent portion 32 can be brought in a nearly horizontal position relative to the ground 40. When the handrail assembly 30 is bent, the bent portion 32 can rotate on the inclined shaft 34 along the inclined angle (Z-axis of space) in a vertical position relative to the ground 40.

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 side view of a preferred embodiment of the invention;

FIG. 2 is a side view of the embodiment of the invention according to FIG. 1 wherein the bent portion is bent in a vertical position;

FIG. 3 is a an enlarged view of the encircled portion of FIG. 1;

FIG. 4 is a path diagram in bending the bent portion in a storage position; and

FIG. 5 is a side view of the exercise apparatus of FIG. 1 that is folded-up in a storage position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] The present invention will now be described in more detail hereinafter with reference to the accompanying drawings that show various embodiments of the invention.

[0009] First of all, the invention can be applied to all exercise apparatuses such as treadmills, elliptical cross trainers, fitness bikes, steppers, etc. The treadmill is taken as an example for the following description.

[0010] Referring to FIGS. 1 through 3, an electric treadmill 10 includes a treadmill's deck 11 with a handrail support 20 at both sides thereof, a front support 12, and a rear ground-touching element 13. Moreover, a secondary ground-touching element 14 for supporting the treadmill in a vertical position is disposed at the front end of the deck 11.

[0011] The handrail assembly 30 is divided into a fixed portion 31 and a bent portion 32. The fixed portion 31 is coupled via a tube 33 to the top of the handrail support 20 of the electric treadmill 10 at an inclined angle. The bent portion 32 includes at one end thereof an inclined shaft 34 fitting into the tube 33. The bent portion 32 is positioned by means of an elastic element 35 and a positioning element 36 in a pivotable state. In this way, the bent portion 32 can be brought in a nearly horizontal position relative to the ground 40.

[0012] Based on the assembly of the above-mentioned components, as shown in FIG. 4, the bent portion 32 can rotate on the inclined shaft 34 along the inclined angle (Z-axis of space) in a vertical position relative to the ground 40 when the handrail assembly 30 is bent.

[0013] Likewise, the bent portion 32 can be bent along the reverse path from a vertical position into a horizontal position.

[0014] The bent portion 32 and the tube 33 are closely secured by use of the force of the elastic element 35. Moreover, any parts of the bent portion 32 and the tube 33 won't be exposed to outside, thereby maintaining the overall appearance and the integrity at the interconnection section after the bending process.

[0015] The electronic control console 15 of the electric treadmill 10 can be installed at an extension part of the fixed portion 31 of the handrail assembly 30. In this way, the bending action of the bent portion 32 won't be affected at all.

[0016] The bent portion 32 is moved only at a certain angle along an inclination path in a storage position or in an operation position. As a result, the bent portion 32 is not easily shifted by a force in lateral or longitudinal direction. In this way, an unexpected false action can be avoided such that the safety of the operator in use may be fully ensured.

[0017] As shown in FIG. 5, the deck 11 of the electric treadmill 10 is folded upward in a vertical storage position. Meanwhile, the bent portion 32 of the handrail assembly 30 can be bent in a corresponding position. In this way, the total volume and the occupied space may be effectively reduced, thereby facilitating the transport and the storage of the electric treadmill 10 to a great extent.

[0018] Many changes and modifications in the above-described embodiment 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. A bendable handrail assembly (30) of an exercise apparatus, the handrail being divided into a fixed portion (31) and a bent portion (32) both of which are pivotably installed at an inclination on a handrail support (20) of the exercise apparatus such that the bent portion (32) is bendable along an inclined path in a vertical storage position.

2. A bendable handrail assembly according claim 1, wherein the fixed portion (31) is coupled with a tube (33) and positioned at an inclined angle relative to the handrail support (20) of the exercise apparatus;

3. A bendable handrail assembly according to one or more of the claims 1 and 2, wherein the bent portion (32) includes at one end thereof an inclined shaft (34) fitting into the tube (33), and the bent portion (32) is positioned by means of an elastic element (35) and a positioning element (36) in a pivotable state,

4. A bendable handrail assembly according to one or more of the claims 1 to 3, whereby the bent portion (32) can be brought in a nearly horizontal position relative to the ground (40), and, when the handrail assembly (30) is bent, the bent portion (32) can rotate on the inclined shaft (34) along the inclined angle in a vertical position relative to the ground (40).

5. A bendable handrail assembly according to one or more of the claims 1 to 4 , wherein the handrail assembly (30) is installed on a handrail support (20) of a electric treadmill (10),

6. A bendable handrail assembly according to claim 5 wherein the electric treadmill (10) includes a treadmill's deck (11) with a handrail support (20) at both sides thereof, a front support, and a rear ground-touching element.

7. A bendable handrail assembly according to claim 6 wherein a secondary ground-touching element (14) for supporting the treadmill in a vertical position is disposed at the front end of the deck (11).

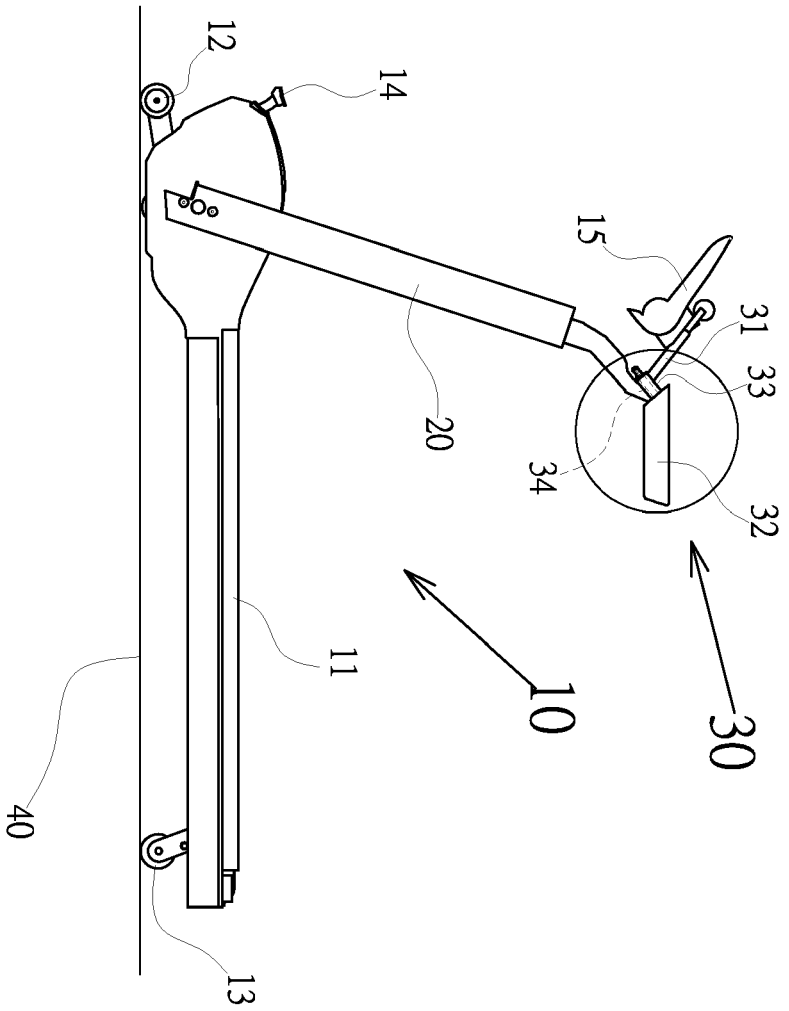


FIG.1

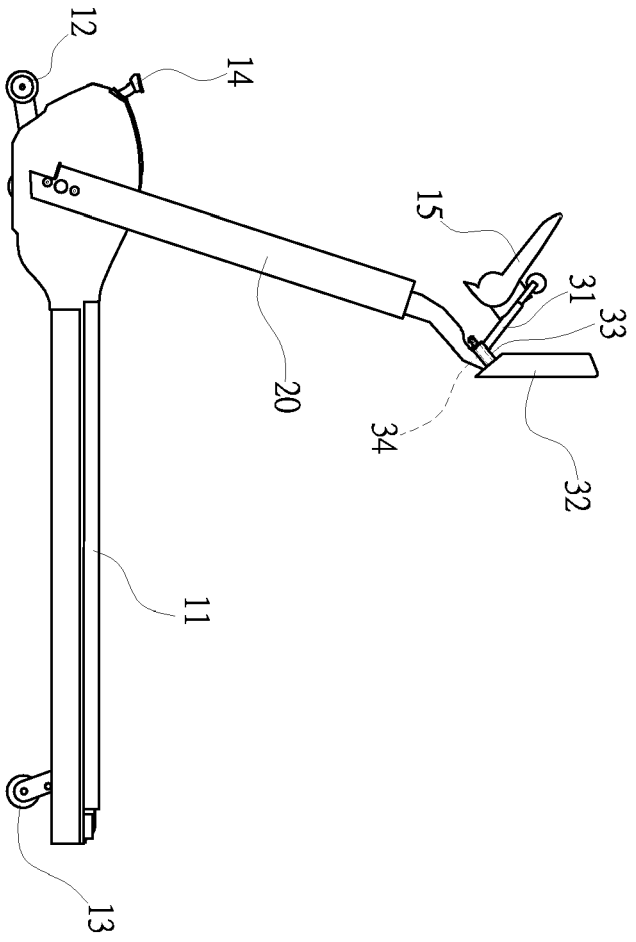


FIG.2

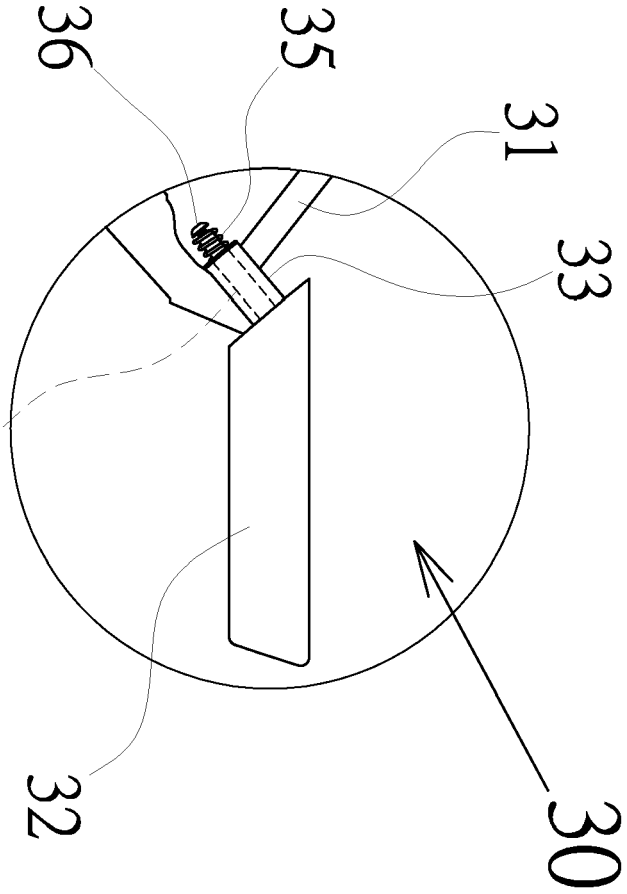
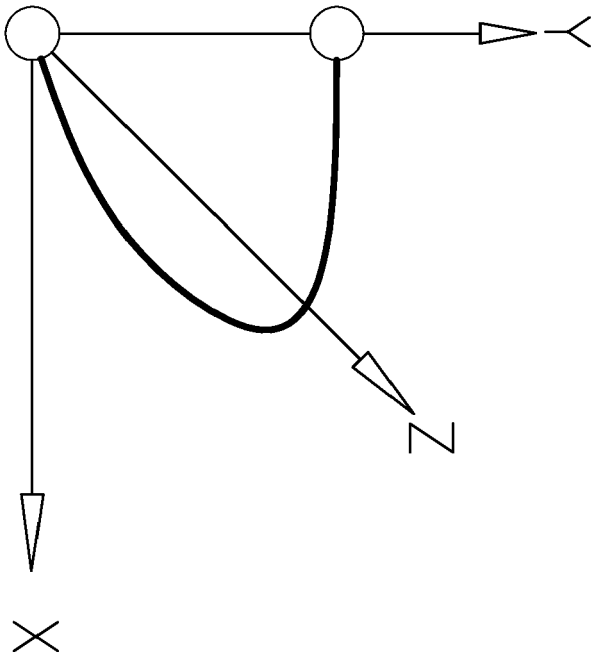


FIG.3

FIG.4



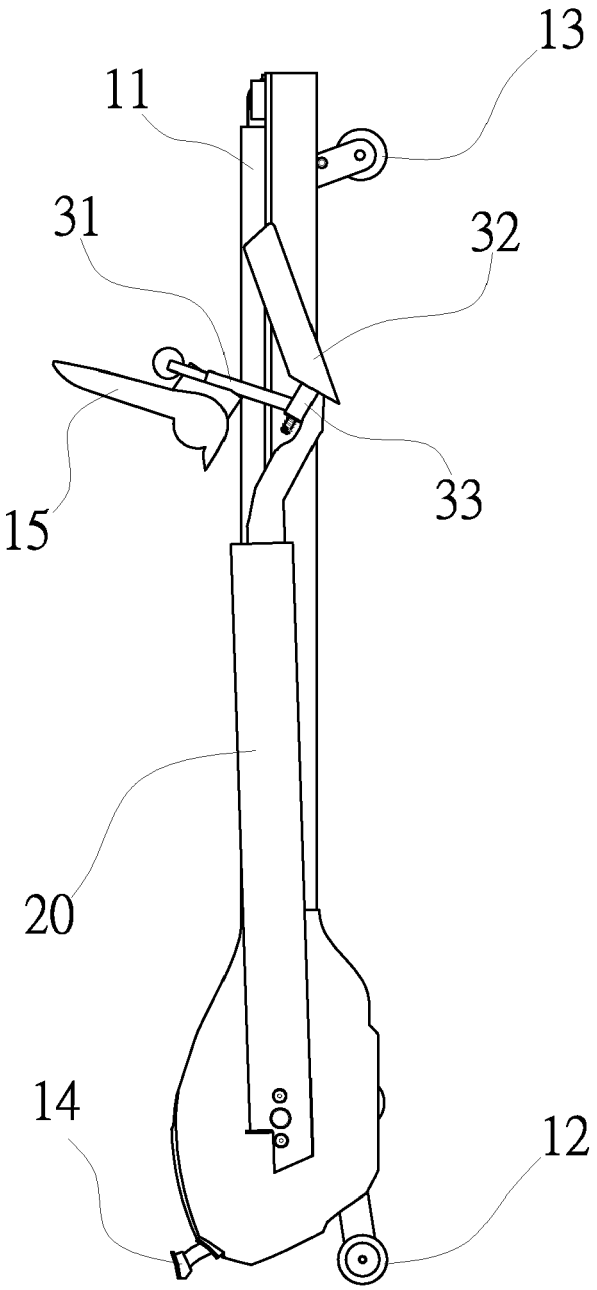


FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 11 15 4853

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/176627 A1 (WANG LEAO [TW]) 9 July 2009 (2009-07-09) * paragraph [0016] - paragraph [0018]; figures * * paragraph [0021] * -----	1,4-7	INV. A63B22/02
X	US 2009/111666 A1 (WANG LEAO [TW]) 30 April 2009 (2009-04-30) * paragraph [0020] - paragraph [0021]; figures * -----	1,4-7	
X	EP 2 277 605 A1 (STRENGTH MASTER FITNESS TECH CO LTD [TW]) 26 January 2011 (2011-01-26) * paragraph [0002] - paragraph [0008]; figures * * paragraph [0015] - paragraph [0017] * -----	1,4-7	
			TECHNICAL FIELDS SEARCHED (IPC) A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 July 2011	Lundblad, Hampus

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 15 4853

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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22-07-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009176627 A1	09-07-2009	NONE	
US 2009111666 A1	30-04-2009	NONE	
EP 2277605 A1	26-01-2011	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82