(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 508 257 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
10.07.2019 Bulletin 2019/28

(21) Application number: **17847072.0**

(22) Date of filing: **30.08.2017**

(51) Int Cl.:
A63B 21/055 *(2006.01)* ***A63B 22/12*** *(2006.01)*

(86) International application number:
PCT/MX2017/050011

(87) International publication number:
WO 2018/044149 (08.03.2018 Gazette 2018/10)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **30.08.2016 CN 201620993795 U**

(71) Applicant: **Mercenari Uribe, Fernando Humberto**
Ciudad de México 03910 (MX)

(72) Inventor: **ZHOU, Yuzhi**
Xiamen
Fujian 361100 (CN)

(74) Representative: **ABG Intellectual Property, S.L.**
Avenida de Burgos, 16D
Edificio Euromor
28036 Madrid (ES)

(54) ROCK-CLIMBING MACHINE COMPRISING AN ELASTIC CORD

(57) The presente invention refers to a rock climbing machine provided with elastic cords, comprising a bracket, a left grab rail, and a right grab rail, wherein the bracket comprises a front bracket, a rear bracket, and a guide bracket; the guide bracket is connected to an upper end of the front bracket. The rear bracket is connected to the guide bracket or the front bracket; which is provided by two parallel rails; one left and one right. The equipment also includes a left sliding member connected to the left guide rail, and to a left pedal; a traction rope is connected across the front pulley; one end of the traction rope is connected to the left sliding member, and the other end of the traction rope is connected to the right sliding member; a left elastic cord, that pass between, two left first guide wheels; one end of the left elastic cord is connected to the left grab rail, and the other end of the left elastic drag is connected to the bracket and; the right elastic cord passes through between the two right first guide wheels; and one end of the right elastic cord is connected to the right grab rail, and the other end of the right elastic cord is connected to the bracket. The equipment of the present invention can vary the magnitude of the force to be applied to the pedal, by changing the amount of stretch of the elastic cord, in order to adjust the intensity of the exercise

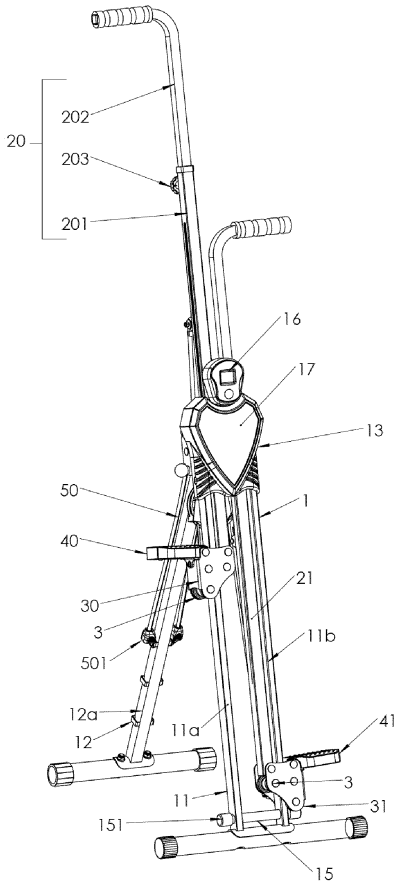

Fig. 1

EP 3 508 257 A1

Description

Technical Field

[0001] The present invention relates to sports equipment, and in particular to a rock climbing machine provided with elastic cords.

Related Art

[0002] At present, with the improvement of living standards of people, people pay more attention to fitness exercises, resulting in various sports equipment, where rock climbing analog machine is one of the sports equipment. The applicant disclosed a fitness equipment that simulates rock climbing in a specification with the Publication No. CN201394310Y, and entitled "ROCK CLIMBING ANALOG MACHINE". The rock climbing analog machine is mainly composed of a triangular-shaped bracket, left and right ducts, left and right guide rods, left and right guide blocks, left and right pedals, and a pulling rope. The left and right ducts are respectively connected onto a front bracket of the triangular-shaped bracket in a sliding manner by using the left and the right guide blocks, and may move up and down along both sides of the front bracket. One end of the left guide rod and one end of the right guide rod are respectively sleeved in the left and the right ducts. A pulley is installed at an upper portion of the front bracket of the triangular-shaped bracket, where an intermediate portion of the pulling rope is hitched in the pulley. Both ends of the pulling rope are respectively fixedly connected on the left and the right guide blocks, so that the left and the right guide blocks and the left and the right ducts that are fixedly connected on the left and the right guide blocks move reversely up and down along the two sides of the front bracket. Because an overall architecture of the rock climbing analog machine is a frame structure, and the structure is simple, arms and legs may be exercised through the left and the right pedals, so that actions of rock climbing are well simulated. When the rock climbing analog machine is not used, the triangular-shaped bracket may be folded by manipulating a support bracket in the triangular-shaped bracket, taking up a small area and being convenient for use. However, it is still difficult for such a rock climbing analog machine to adjust an amount of exercises through a self structure, and the rock climbing analog machine needs to be further improved to satisfy different requirements of different groups on exercise intensities.

SUMMARY

[0003] A problem resolved by the present invention is to provide a rock climbing machine provided with elastic cords that can adjust an amount of exercises and change an exercise intensity.

[0004] A technical solution of the present invention is: a rock climbing machine provided with elastic cords, including a bracket, a left grab rail, and a right grab rail, where the bracket includes a front bracket, a rear bracket, and a guide bracket; the guide bracket is connected to an upper end of the front bracket; the rear bracket is connected to the guide bracket or the front bracket; the front bracket is provided with a left guide rail and a right guide rail that are parallel; the left guide rail is connected to a left sliding member, and the left sliding member is connected to a left pedal; the left grab rail passes through the guide bracket, and a lower end of the left grab rail is connected to the left sliding member; the right guide rail is connected to a right sliding member, and the right sliding member is connected to a right pedal; the right grab rail also passes through the guide bracket, and a lower end of the right grab rail is connected to the right sliding member; a pulley is installed on the front bracket or the rear bracket; a traction rope is connected across the pulley; and one end of the traction rope is connected to the left sliding member, and the other end of the traction rope is connected to the right sliding member;

the rock climbing machine further includes a left elastic cord, a right elastic cord, two left first guide wheels, and two right first guide wheels, where the two left first guide wheels are close to each other and are installed at a rear upper portion of the bracket side by side; the two right first guide wheels are also close to each other and are installed at the rear upper portion of the bracket side by side; the left elastic cord passes through between the two left first guide wheels; one end of the left elastic cord is connected to the left grab rail, and the other end of the left elastic cord is connected to the bracket; the right elastic cord passes through between the two right first guide wheels; and one end of the right elastic cord is connected to the right grab rail, and the other end of the right elastic cord is connected to the bracket.

[0005] For a further improvement, the guide bracket is installed with three parallel second guide wheels, and the left grab rail and right grab rail respectively pass through two adjacent second guide wheels. In this way, frictions caused by that the left grab rail and the right grab rail move up and down may be reduced, and service lives of the left grab rail and the right grab rail may be prolonged.

[0006] For a further improvement, a rear portion of the guide bracket extends backward two side boards; an upper portion of the rear bracket is located between the two side boards; and the rear bracket is connected to the two side boards by means that a latch passes through the upper portion of the rear bracket and the two side boards.

[0007] As a further improvement, two support pin shafts whose axes are horizontally disposed are fixedly connected on the two side boards; one left first guide wheel and one right first guide wheel are both sleeved on one of the support pin shafts; and the other left first guide wheel and the other right first guide wheel are both sleeved on the other one of the support pin shafts.

[0008] Further, a center of each support pin shaft is provided with a through hole, and is further perforated

with a bolt; and the bolt further passes through the two side boards to fixedly connect each support pin shaft between the two side boards.

[0009] Further, the two support pin shafts are disposed in an up-and-down manner; an intermediate portion of an upper support pin shaft is further sleeved with a distance sleeve, where the distance sleeve separates the left first guide wheel from the right first guide wheel; and an intermediate portion of a lower support pin shaft further passes through the upper portion of the rear bracket.

[0010] As a further improvement, the upper portion of the rear bracket is provided with a U-shaped frame; the pulley is installed on the U-shaped frame; rear lower ends of the two side boards separately extend a limiting protrusion towards a side close to the rear bracket; both sides of the upper portion of the rear bracket are respectively provided with two limiting blocks; each limiting block cooperates with the limiting protrusion; and the latch passes through the two limiting blocks.

[0011] For a further improvement, the left sliding member is installed with multiple third guide wheels; the left sliding member is clamped on the left guide rail by using the multiple third guide wheels; the left pedal is hingedly connected to an upper portion of the left sliding member; the right sliding member is installed with multiple third guide wheels; the right sliding member is clamped on the left guide rail by using the multiple third guide wheels; and the right pedal is hingedly connected to an upper portion of the right sliding member. In this way, the left pedal and the right pedal may rotate with respect to the front bracket, being convenient to be accommodated.

[0012] For a further improvement, an intermediate rear portion of the left grab rail is installed with a left rotation wheel; one end of the left elastic cord is provided with a rope hitch that is sleeved on the left rotation wheel; an intermediate rear portion of the right grab rail is installed with a right rotation wheel; and one end of the left elastic cord is provided with a rope hitch that is sleeved on the right rotation wheel. Rope-end abrasions of the left elastic cord and the right elastic cord may be effectively reduced.

[0013] For a further improvement, one side of an intermediate lower portion of the rear bracket is provided with multiple left hooking portions from top to bottom; one end of the left elastic cord is fixedly connected to a left hook and is optionally connected to one left hooking portion; the other side of the intermediate lower portion of the rear bracket is provided with multiple right hooking portions from top to bottom; and one end of the right elastic cord is fixedly connected to a right hook and is optionally connected to one right hooking portion. In this way, drag forces of the left and the right elastic cords may be further changed, and an amount of exercises and an exercise intensity may be further adjusted.

[0014] Beneficial effects of the present invention are that: a left elastic cord, a right elastic cord, two left first guide wheels, and two right first guide wheels are added on the basis that the rock climbing machine has main structures such as a bracket, a left grab rail, a right grab rail, a left sliding member, a right sliding member, a left pedal, a right pedal, a pulley, and a traction rope; two ends of the left elastic cord are respectively connected to the left grab rail and the bracket, and pass through the two left first guide wheels that are installed at a rear upper portion of the bracket; and two ends of the right elastic cord are respectively connected to the right grab rail and the bracket, and pass through the two right first guide wheels that are installed at the rear upper portion of the bracket. In this way, when the left and the right grab rails are driven to move up and down by threading the left and the right pedals, by changing a threading amplitude, scaling magnitudes of the left and the right elastic cords may be changed to change elastic forces, so as to adjust an amount of exercises and change an exercise intensity.

[0015] The present invention is further provided with multiple left and right hooking portions at the rear bracket. When left and right hooks of the left and the right elastic cords are respectively connected to the left hooking portions and the right hooking portions at different positions, the amount of exercises may be adjusted in a larger range, and the exercise intensity may be changed in a larger range.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 is a three-dimensional diagram of the invention;

FIG. 2 is a left view of the invention;

FIG. 3 is a back view of the invention;

FIG. 4 is a partial three-dimensional exploded back view of the invention; and

FIG. 5 is an enlarged view of position A in FIG. 4.

DETAILED DESCRIPTION

[0017] The present invention is further described in detail with reference to the accompanying drawings and the specific implementations.

[0018] Referring to FIG. 1 to FIG. 5, a rock climbing machine provided with elastic cords is provided, including a bracket 1, a left grab rail 20, and a right grab rail 21. The bracket 1 includes a front bracket 11, a rear bracket 12, and a guide bracket 13. The guide bracket 13 is connected to an upper end of the front bracket 11. The rear bracket 12 is connected to the guide bracket 13, and this is specifically that: a rear portion of the guide bracket 13 extends backward two side boards 14; a reinforcing board 140 is fixedly connected between the two side boards 14; an upper portion of the rear bracket 12 is located between the two side boards 14; and the rear bracket 12 is connected to the two side boards 14 by

means that a latch 2 passes through the upper portion of the rear bracket 12 and the two side boards 14. Further, rear lower ends of the two side boards 14 separately extend a limiting protrusion 141 towards a side close to the rear bracket 12; both sides of the upper portion of the rear bracket 12 are respectively provided with two limiting blocks 121; each limiting block 121 cooperates with the limiting protrusion 141; and the latch 2 passes through the two limiting blocks 121. In the foregoing embodiment, an implementation that the rear bracket 12 is connected to the guide bracket 13 is specifically used. Certainly, a manner of connecting the rear bracket 12 to the front bracket 11 may alternatively be used.

[0019] The front bracket 11 is provided with a left guide rail 11a and a right guide rail 11b that are parallel. The left guide rail 11a is connected to a left sliding member 30, and the left sliding member 30 is connected to a left pedal 40. The left grab rail 20 passes through the guide bracket 13, and a lower end of the left grab rail 20 is hingedly connected to the left sliding member 30. The right guide rail 11b is connected to a right sliding member 31, and the right sliding member 31 is connected to a right pedal 41. The right grab rail 21 also passes through the guide bracket 13, and a lower end of the right grab rail 21 is hingedly connected to the right sliding member 31. To enable the left guide rail 11a and the right guide rail 11b to respectively form good sliding cooperation with the left sliding member 30 and the right sliding member 31, a cooperation form of a guide pulley is used, and this specifically is that: the left sliding member 30 is installed with multiple third guide wheels 3; the left sliding member 30 is clamped on the left guide rail 11a by using the multiple third guide wheels 3; the left pedal 40 is hingedly connected to an upper portion of the left sliding member 30; the right sliding member 31 is installed with multiple third guide wheels 3; the right sliding member 31 is clamped on the left guide rail 11b by using the multiple third guide wheels 3; and the right pedal 41 is hingedly connected to an upper portion of the right sliding member 31.

[0020] The left grab rail 20 and the right grab rail 21 may also pass through the guide bracket 13 by means of a guide pulley, and this specifically is that: the guide bracket 13 is installed with three parallel second guide wheels 4; axes of the three second guide wheels 4 are vertical to a length direction of the left guide rail 11a or the right guide rail I1b; and the left grab rail 20 and the right grab rail 21 respectively pass through two adjacent second guide wheels 4.

[0021] A pulley 5 is installed on the front bracket 11 or the rear bracket 12. An implementation that the pulley 5 is installed on the rear bracket 12 is used in the embodiments, and this is specifically that: the upper portion of the rear bracket 12 is provided with a U-shaped frame 6; the pulley 5 is installed on the U-shaped frame 6; a traction rope 7 is connected across the pulley 5; and one end of the traction rope 7 is connected to the left sliding member 30, and the other end is connected to the right sliding member 31.

[0022] The rock climbing machine further includes a left elastic cord 50, a right elastic cord 51, two left first guide wheels 60, and two right first guide wheels 61. The two left first guide wheels 60 are close to each other and are installed at a rear upper portion of the bracket 1 side by side. The two right first guide wheels 61 are also close to each other and are installed at the rear upper portion of the bracket 1 side by side. The left elastic cord 50 passes through between the two left first guide wheels 60. One end of the left elastic cord 50 is connected to the left grab rail 20, and the other end of the left elastic cord 50 is connected to the bracket 1. The right elastic cord 51 passes through between the two right first guide wheels 61. One end of the right elastic cord 51 is connected to the right grab rail 21, and the other end the right elastic cord 51 is connected to the bracket 1.

[0023] Installation manners of the two left first guide wheels 60 and the two right first guide wheels 61 specifically are that:

Two support pin shafts 8 whose axes are horizontally disposed are fixedly connected on the two side boards 14, where one left first guide wheel 60 and one right first guide wheel 61 are both sleeved on one of the support pin shafts 8, and the other left first guide wheel 60 and the other right first guide wheel 61 are both sleeved on the other one of the support pin shafts 8.

[0024] A center of each support pin shaft 8 is provided with a through hole, and is further perforated with a bolt 9. The bolt 9 further passes through the two side boards 14 to fixedly connect each support pin shaft 8 between the two side boards 14.

[0025] The two support pin shafts 8 are disposed in an up-and-down manner. An intermediate portion of an upper support pin shaft 8 is further sleeved with a distance sleeve 10, where the distance sleeve 10 separates the left first guide wheel 60 from the right first guide wheel 61. An intermediate portion of a lower support pin shaft 8 further passes through the upper portion of the rear bracket 12.

[0026] To ensure that not too many abrasions are generated when the left elastic rope and the right elastic rope are respectively connected to the left grab rail 20 and the right grab rail 21, an intermediate rear portion of the left grab rail 20 is installed with a left rotation wheel 70; one end of the left elastic cord 50 is provided with a rope hitch that is sleeved on the left rotation wheel 70; an intermediate rear portion of the right grab rail 21 is installed with a right rotation wheel 71; and one end of the left elastic cord 50 is provided with a rope hitch that is sleeved on the right rotation wheel 71.

[0027] One side of an intermediate lower portion of the rear bracket 12 is provided with three left hooking portions 12a from top to bottom, and one end of the left elastic cord 50 is fixedly connected to a left hook 501 and is optionally connected to one left hooking portion 12a. The other side of the intermediate lower portion of the rear bracket 12 is provided with three right hooking portions

12b from top to bottom, and one end of the right elastic cord 51 is fixedly connected to a right hook 511 and is optionally connected to one right hooking portion 12b. According to that the left hook 501 and the right hook 511 are connected to the left hooking portions 12a and the right hooking portions 12b at different positions, elastic forces of the left elastic cord 50 and the right elastic cord 51 may be changed in a larger range, so as to further adjust an amount of exercises.

[0028] In addition, to adapt to users of different heights and body types, both the left grab rail 20 and the right grab rail 21 are designed to be scalable. The left grab rail 20 includes a left outer rod 201 and a left inner rod 202, where the left inner rod 202 is sleeved at the left outer rod 201, and multiple adjustment screw holes are disposed in intervals on the left inner rod 202. A left locking knob 203 passes through the left outer rod 201 and is optionally screwed in one adjustment screw hole. The right grab rail 21 includes a right outer rod 211 and a right inner rod 212, where the right inner rod 212 is sleeved at the right outer rod 211, and multiple adjustment screw holes are disposed in intervals on the right inner rod 212. A right locking knob 213 passes through the right outer rod 211 and is optionally screwed in one adjustment screw hole. A length of the left grab rail 20 or the right grab rail 21 is changed by adjusting cooperation of the left locking knob 203 or the right locking knob 213 with the adjustment screw holes at different positions.

[0029] A lower portion of the front bracket 11 is installed with a gag lever post 15, where both ends of the gag lever post 15 are installed with limiting rubber sleeves 151. When the left sliding member 30 or the right sliding member 31 is trodden to the bottom portion, the limiting rubber sleeves 151 at both ends of the gag lever post 15 may withstand the left sliding member 30 or the right sliding member 31, so as to have a limiting function of preventing the left sliding member 30 or the right sliding member 31 from continuing going down.

[0030] An upper portion of the guide bracket 13 is installed with a counter 16, so that the user can make sense of the own amount of exercises. To make the appearance aesthetic, the guide bracket 13 is covered with a plastic housing 17.

[0031] When the rock climbing machine is used, feet of the user respectively tread on the left pedal 40 and the right pedal 41, and hands respectively grasp top portions of the left grab rail 20 and the right grab rail 21. The feet tread up and down alternatively, and the left grab rail 20 and the right grab rail 21 move up and down alternatively under pulling of the traction rope 7. The guide bracket 13, the left sliding member 30, and the right sliding member 31 play guiding roles in movement processes. When treading amplitudes of the user are different, a scaling magnitude of an elastic force of the left elastic cord 50 or the right elastic cord 51 is also different, elasticity also changes, and a size of a drag force is changed. Therefore, an objective of changing the amount of exercises and adjusting the exercise intensity is achieved.

[0032] The foregoing is merely a preferred embodiment of the present invention, and equivalent modifications made by a person skilled in the art according to the claims shall fall within the protection scope of this application.

Claims

1. A rock climbing machine provided with elastic cords, comprising a bracket, a left grab rail, and a right grab rail, wherein the bracket comprises a front bracket, a rear bracket, and a guide bracket; the guide bracket is connected to an upper end of the front bracket; the rear bracket is connected to the guide bracket or the front bracket; the front bracket is provided with a left guide rail and a right guide rail that are parallel; the left guide rail is connected to a left sliding member, and the left sliding member is connected to a left pedal; the left grab rail passes through the guide bracket, and a lower end of the left grab rail is connected to the left sliding member; the right guide rail is connected to a right sliding member, and the right sliding member is connected to a right pedal; the right grab rail also passes through the guide bracket, and a lower end of the right grab rail is connected to the right sliding member; a pulley is installed on the front bracket or the rear bracket; a traction rope is connected across the pulley; and one end of the traction rope is connected to the left sliding member, and the other end of the traction rope is connected to the right sliding member; and further comprising a left elastic cord, a right elastic cord, two left first guide wheels, and two right first guide wheels, wherein the two left first guide wheels are close to each other and are installed at a rear upper portion of the bracket side by side; the two right first guide wheels are also close to each other and are installed at the rear upper portion of the bracket side by side; the left elastic cord passes through between the two left first guide wheels; one end of the left elastic cord is connected to the left grab rail, and the other end of the left elastic drag is connected to the bracket; the right elastic cord passes through between the two right first guide wheels; and one end of the right elastic cord is connected to the right grab rail, and the other end of the right elastic cord is connected to the bracket.

2. The rock climbing machine provided with elastic cords according to claim 1, wherein the guide bracket is installed with three parallel second guide wheels, and the left grab rail and right grab rail respectively pass through two adjacent second guide wheels.

3. The rock climbing machine provided with elastic cords according to claim 1, wherein a rear portion of the guide bracket extends backward two side boards; an upper portion of the rear bracket is located

between the two side boards; and the rear bracket is connected to the two side boards by means that a latch passes through the upper portion of the rear bracket and the two side boards.

4. The rock climbing machine provided with elastic cords according to claim 3, wherein two support pin shafts whose axes are horizontally disposed are fixedly connected on the two side boards; one left first guide wheel and one right first guide wheel are both sleeved on one of the support pin shafts; and the other left first guide wheel and the other right first guide wheel are both sleeved on the other one of the support pin shafts.

5. The rock climbing machine provided with elastic cords according to claim 4, wherein a center of each support pin shaft is provided with a through hole, and is further perforated with a bolt; and the bolt further passes through the two side boards to fixedly connect each support pin shaft between the two side boards.

6. The rock climbing machine provided with elastic cords according to claim 4, wherein the two support pin shafts are disposed in an up-and-down manner; an intermediate portion of an upper support pin shaft is further sleeved with a distance sleeve, wherein the distance sleeve separates the left first guide wheel from the right first guide wheel; and an intermediate portion of a lower support pin shaft further passes through the upper portion of the rear bracket.

7. The rock climbing machine provided with elastic cords according to claim 3, wherein the upper portion of the rear bracket is provided with a U-shaped frame; the pulley is installed on the U-shaped frame; rear lower ends of the two side boards separately extend a limiting protrusion towards a side close to the rear bracket; both sides of the upper portion of the rear bracket are respectively provided with two limiting blocks; each limiting block cooperates with the limiting protrusion; and the latch passes through the two limiting blocks.

8. The rock climbing machine provided with elastic cords according to claim 1, wherein the left sliding member is installed with multiple third guide wheels; the left sliding member is clamped on the left guide rail by using the multiple third guide wheels; the left pedal is hingedly connected to an upper portion of the left sliding member; the right sliding member is installed with multiple third guide wheels; the right sliding member is clamped on the left guide rail by using the multiple third guide wheels; and the right pedal is hingedly connected to an upper portion of the right sliding member.

9. The rock climbing machine provided with elastic cords according to any one of claims 1 to 8, wherein an intermediate rear portion of the left grab rail is installed with a left rotation wheel; one end of the left elastic cord is provided with a rope hitch that is sleeved on the left rotation wheel; an intermediate rear portion of the right grab rail is installed with a right rotation wheel; and one end of the left elastic cord is provided with a rope hitch that is sleeved on the right rotation wheel.

10. The rock climbing machine provided with elastic cords according to any one of claims 1 to 8, wherein one side of an intermediate lower portion of the rear bracket is provided with multiple left hooking portions from top to bottom; one end of the left elastic cord is fixedly connected to a left hook and is optionally connected to one left hooking portion; the other side of the intermediate lower portion of the rear bracket is provided with multiple right hooking portions from top to bottom; and one end of the right elastic cord is fixedly connected to a right hook and is optionally connected to one right hooking portion.

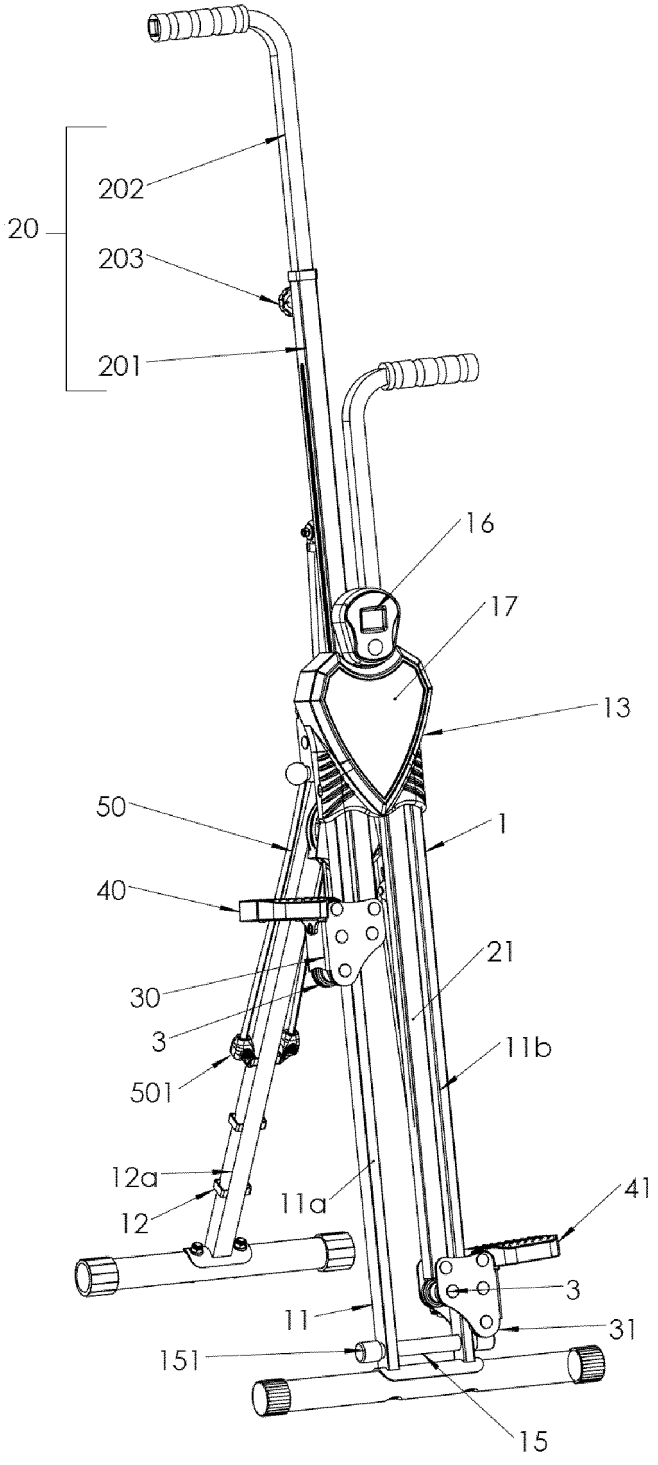
20
202
203
201
16
17
13
50
1
40
21
30
3
11b
501
12a
11a
41
12
3
11
31
151
15

Fig. 1

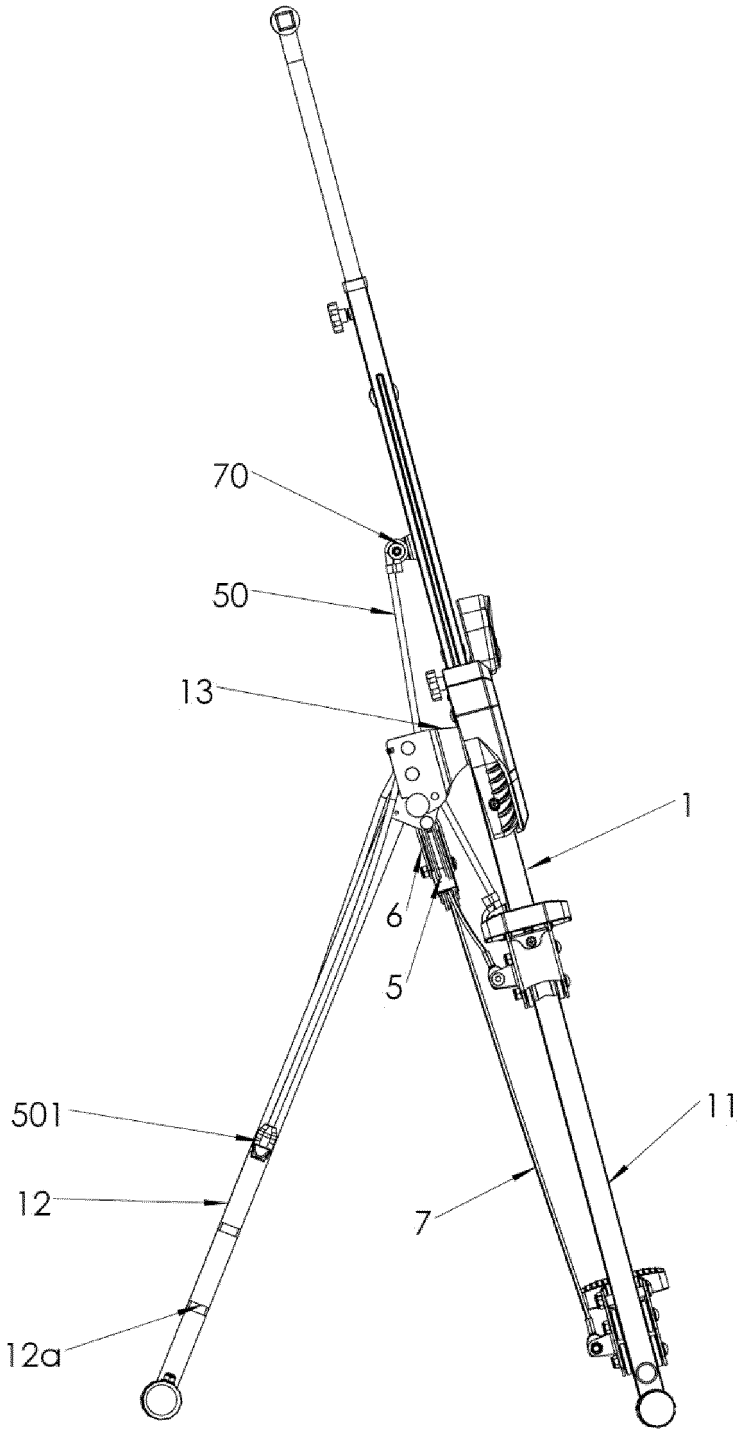

Fig. 2

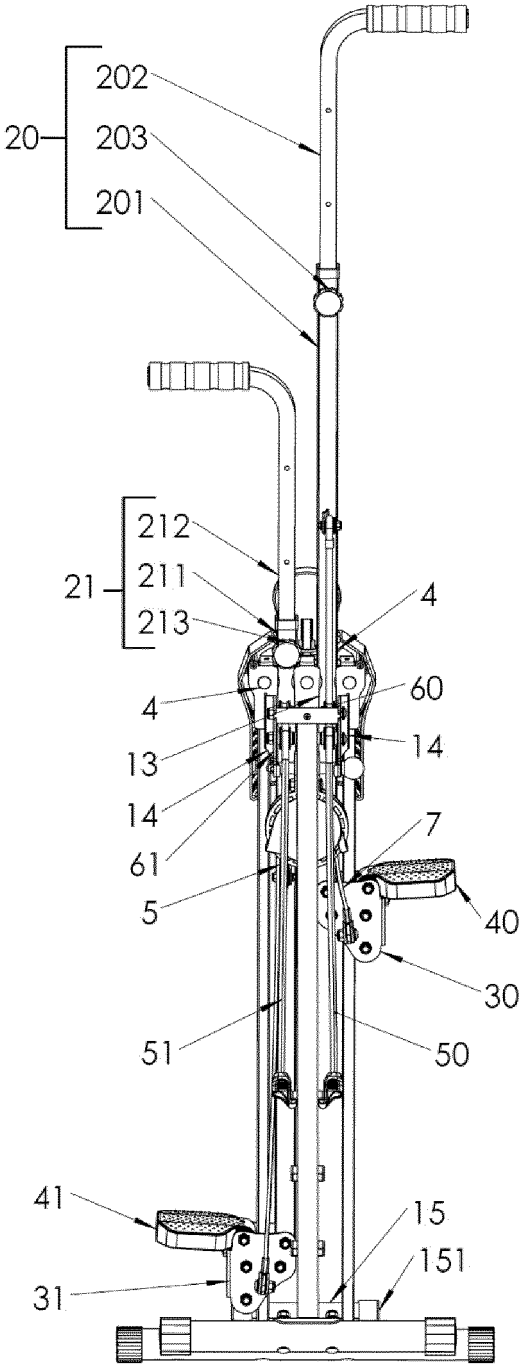
20
202
203
201
21
212
211
213
4
4
60
14
13
14
61
5
7
40
30
51
50
41
15
151
31

Fig. 3

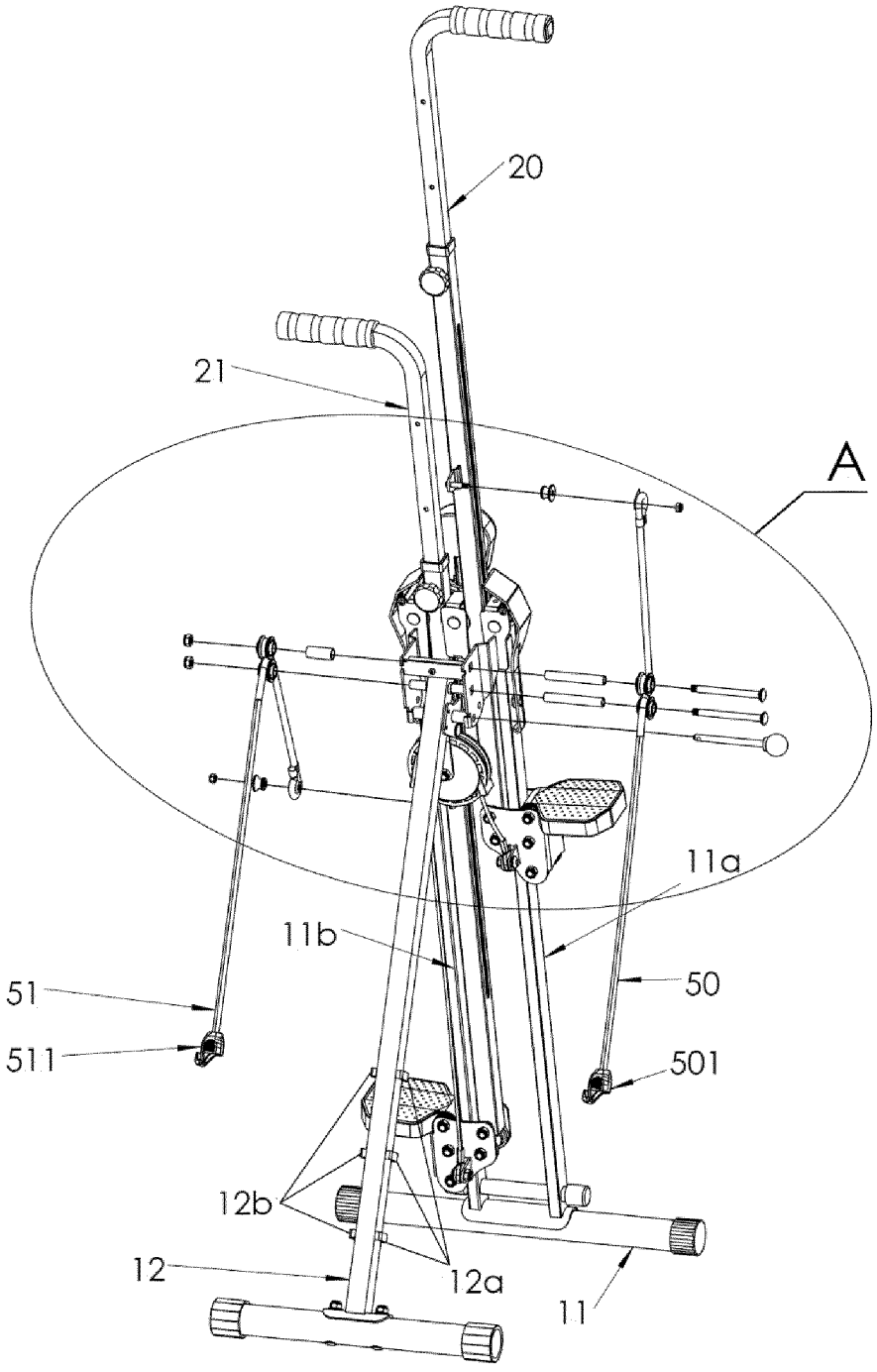

Fig. 4

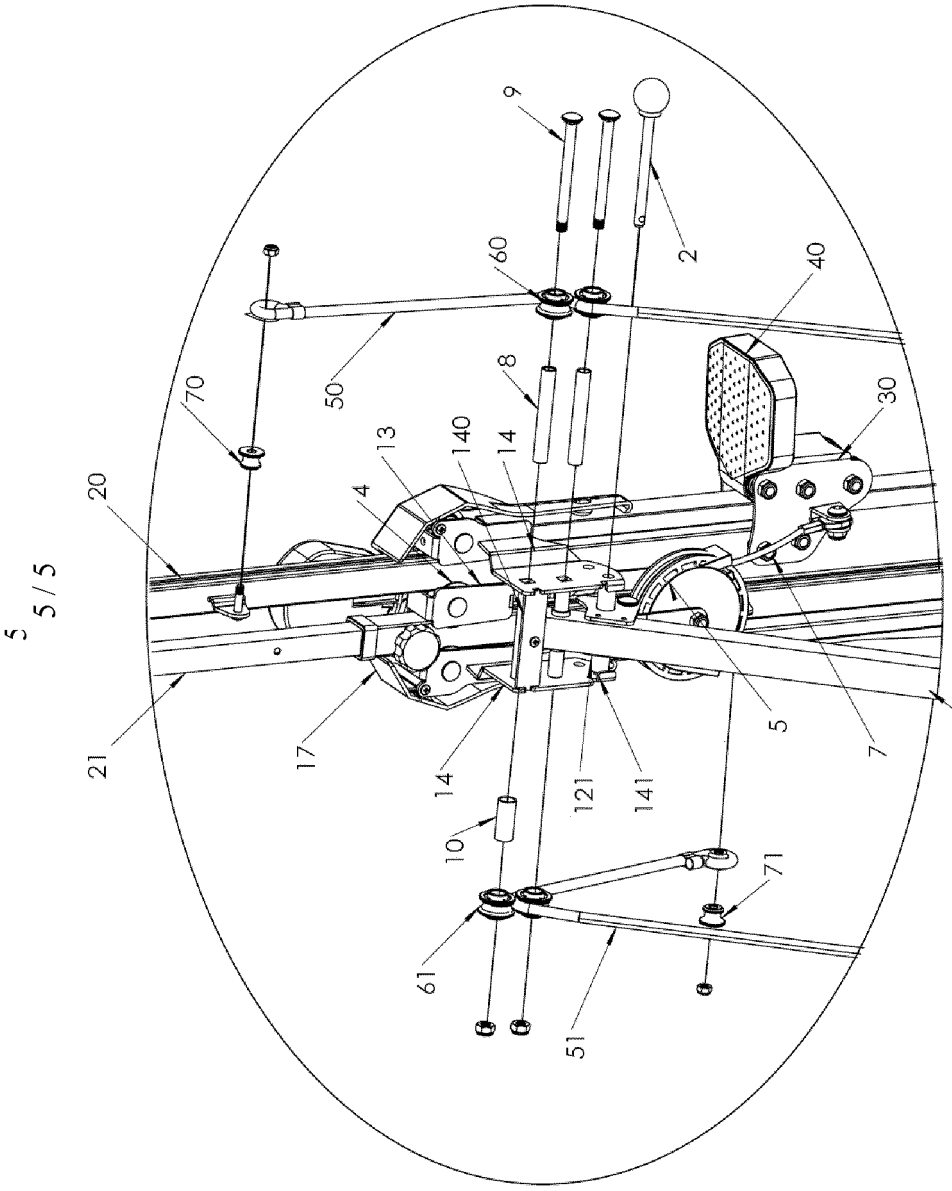

Fig .5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/MX2017/050011

A. CLASSIFICATION OF SUBJECT MATTER

A63B21/055 (2006.01)
A63B22/12 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5803880 A (ALLEN TEMPLE W) 08/09/1998, column 2, line 59 - column 3, line 63; figures 1 - 3.	1-10
Y	US 2006100070 A1 (ABDO JOHN S) 11/05/2006, paragraphs [51 - 54]; figure 1, 6, 10	1-10
Y	US 4982952 A (WANG SHUI-MU) 08/01/1991, column 1, line 52 - column 3, line 13; figures 1 - 2.	1-10
Y	US 5613924 A (LEE SUNNY) 25/03/1997, column 6, lines 5 - 56; figures 11 - 13.	1-10
A	US 2007238581 A1 (MALAZINSKY DENNIS M) 11/10/2007, paragraph [22]; figures 1 - 2.	1

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance.
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure use, exhibition, or other means.
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents , such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23/01/2018	**(24/01/2018)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer A. Fernández Pérez Telephone No. 91 3498539

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/MX2017/050011

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9928001 A1 (STAIRMASTER SPORTS MED PROD ET AL.) 10/06/1999, page 24, lines 19 - 29; figure 17, 19-22	1
A	US 5169361 A (HSU HSIEN-LONG) 08/12/1992, the whole document.	1

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/MX2017/050011

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US4982952 A	08.01.1991	NONE	
US5613924 A	25.03.1997	NONE	
US5169361 A	08.12.1992	NONE	
US5803880 A	08.09.1998	NONE	
US2007238581 A1	11.10.2007	NONE	
WO9928001 A1	10.06.1999	NONE	
US2006100070 A1	11.05.2006	NONE	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201394310 Y **[0002]**