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(54) **Athletic apparatus with non-linear sliding track**

Sportvorrichtung mit nichtlinearer Gleitschiene

Appareil athlétique avec couloir coulissant non linéaire

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(56) References cited:
EP-A- 1 834 674
DE-U1-202007 004 837
DE-U1-202008 001 590

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Description

FIELD OF THE PRESENT INVENTION

[0001] The present invention relates to athletic apparatus, and particular to an athletic apparatus with a non-linear sliding track and provides complicated exercise for user's hands and feet.

DESCRIPTION OF THE PRIOR ART

[0002] A plenty of athletic apparatuss are developed for the purposes of body fitness or rehabilitation. Athletic apparatuss such as a stair climber can provide an exercise for a user's feet by treading up and down on pedals only. Athletic apparatuss such as an elliptical trainer can provide an exercise for both hands and feet. Pedals of the elliptical trainer fixed to a linking rod can not be moved alone. Although the stair climber and the elliptical trainer are well developed and improved, the exercise style of the stair climber is still an upwards and downwards exercise and the style of the elliptical trainer is still an elliptical movement and the pedals still can not be slid on the supporting linking rod.

[0003] European patent application EP 183 674 describes an exercise apparatus to simulate climbing that includes such features as arm handles that move in synchronism with the motion of foot pedals to provide a total body workout; side handrails; a mounting step; linear foot movement at a simulated climbing angle; a three point support structure using a vertical support column; pedal track covers; a mechanism to provide constant resistance to pedal motion; and pedal impact absorption.

SUMMARY OF THE PRESENT INVENTION

[0004] Accordingly, the present invention provides a non-straight track which means an athletic apparatus with curved tracks according to claim 1. The athletic apparatus provides exercise for a user's hands and feet, especially a curved slide of good athletic effect for the user's feet.

[0005] To achieve above object, the present invention provides an athletic apparatus comprising: a frame placed on a level ground; a pair of left and right tracks of the same structure fixed to the frame at a predetermined angle to the ground; the tracks being formed curved but not straight; a pair of left and right pedal mechanisms of the same structure including pedals for treading by a user's feet and being installed to the left and right tracks respectively; the pedal mechanisms further being moved up and down along the curved tracks; a pair of left and right rocker arm mechanisms of the same structure being movably installed to the frame and the left and right pedal mechanisms so as to be moved identically with the pedal mechanisms; wherein by the curved tracks, the users experiences the most natural feet exercise and an ergonomic design capable of protecting user's heels from being hurt.

[0006] The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

Fig. 1 is a pictorial drawing of an embodiment of an athletic apparatus of the present invention.
Fig. 2 is a pictorial drawing of the embodiment of the present invention viewing from a side.
Fig. 3 is a pictorial drawing of the embodiment of the present invention viewing from another side to the Fig. 2.
Fig. 4 is a top view showing pedal mechanisms at a back and front positions of tracks.
Fig. 5 is a front view showing the pedal mechanisms at the back and front positions of the tracks.
Fig. 6 shows drawing of the Fig. 5 from a side.
Fig. 7 shows the curved tracks oppositely installed to a center line.
Fig. 8 is a pictorial drawing of the athletic apparatus viewing from a back side.

DETAILED DESCRIPTION OF THE IVENTION

[0008] In order that those skilled in the art can further understand the present invention, a description will be provided in the following in details. However, these descriptions and the appended drawings are only used to cause those skilled in the art to understand the objects, features, and characteristics of the present invention, but not to be used to confine the scope of the present invention defined in the appended claims.

[0009] With reference to Figs. 1, 2, 3, and 8, an athletic apparatus 1 according to the present invention is illustrated. The athletic apparatus 1 includes a frame 10, a pair of separated tracks 3 and 4, a pair of pedal mechanisms, a pair of separated rocker arm mechanisms, two transmitting mechanisms, and a damping mechanism.

[0010] The frame 10 has a base 18 which includes a front bottom rod 11 and a rear bottom rod 13 separated from each other. The front bottom rod 11 is formed as a standing rod 12, a control panel 121 is installed to a top of the standing rod 12. The users can operate the athletic apparatus 1 through the control panel 121. An axle rod 14 is formed near an upper end of the standing rod 12, handles 15 for holding by the users are formed respectively between two ends of the axle rod 14 and a middle bottom rod 19 of the base 18. Installation portions 131 and 132 are formed separately to the rear bottom rod 13.

[0011] The tracks 3 and 4 of the same structure are arranged to a left and right side of the athletic apparatus 1 respectively. Bottom ends of track 3 and 4 are fixed to the installation portions 131 and 132 respectively, while

upper ends of the tracks 3 and 4 are fixed to an inclined supporting rod 16 of the frame 10 so that the left and right tracks are at an predetermined angle to the ground. A main characteristic of the tracks is that the tracks are made as curved but not straight. The design of the tracks will have the users experienced the most natural exercise for feet, it is also an ergonomic design capable of protecting user's heels from being hurt.

[0012] The left and right pedal mechanisms of the same structure have pedal bases 5 and 6, supporters 51 and 61 linked to the pedal bases 5 and 6, and pedals 52 and 62 for treading by the users respectively. The pedal bases 5 and 6 are slidably installed to the inclined tracks 3 and 4 respectively and capable of being slid up and down along the tracks.

[0013] The left and right rocker arm mechanisms of the same structure have rocker arms 7 and 8 respectively. Upper ends 71 and 81 of the rocker arms 7 and 8 respectively are pivoted to the axle rod 14, and handles 70 and 80 are arranged to the rocker arms 7 and 8 respectively for holding by the users. Lower ends 72 and 82 of the rocker arms 7 and 8 are pivoted to linking rods 73 and 83 through universal connectors 74 and 84 (which are capable of rotating in Y and Z axes) respectively. Another ends of the linking rods 73 and 83 are also pivoted to the pedal bases 5 and 6 through universal connectors 75 and 85. Therefore, the left and right rocker arm mechanisms and the left and right pedal mechanisms can be moved identically.

[0014] A first transmitting mechanism has a pulley 91 which is rotatably installed to the inclined supporting rod 16, said pulley 91 is positioned near to the upper ends of the tracks below. Said first transmitting mechanism further comprises a steel rope 92 which is wound on said pulley 91. Two ends of the steel rope 92 are connected to the left and right pedal bases 5 and 6 respectively so that the pedal bases 5 and 6 can be slid back and forth, up and down against each other alternately.

[0015] Referring to Figs. 1 to 3, a second transmitting mechanism is illustrated. The second transmitting mechanism has two timing belts 21, 22 and an elastic belt 23 linking the two timing belts 21, 22. Outer ends of the timing belts 21, 22 are connected to the lower ends 72, 82 of the rocker arms 7 and 8 respectively so that the left and right rocker arm mechanisms can be swung back and forth alternately with an axle center of the axle rod 14. A shaft rod 24 is installed to the frame 10. A belt wheel 25 is installed to a middle position of the shaft rod 24, and two gear wheels 26, 27 are installed to two ends of the shaft rod 24. The gear wheels 26, 27 have single direction bearing. The timing belts 21, 22 clench the teeth of the gear wheels 26 and 27 respectively. Two wheels 28, 29 are pivoted to two ends of the front bottom rod 11. The elastic belt 23 linking the timing belts 21, 22 also winds the wheels 28 and 29. By the second transmitting mechanism, the left and right rocker arms 7 and 8 can be moved back and forth against each other alternately.

[0016] The damping mechanism includes a load wheel 101 and an electro-magnetic brake 102. By the link of a transmitting belt 103, the load wheel 101 is linked to the belt wheel 25. When the handles 70 and 80 are swung back and forth alternately, the damping mechanism can provide a resistance. The resistance can be pre-selected on the control panel 121.

[0017] With reference to Figs. 4 to 6, the main characteristic of the left and right tracks 3 and 4 is made of at least one curved track. The tracks 3 and 4 of the embodiment of the present invention are made of two parallel curved pipes 31, 32 and 41, 42 and combined by linking bodies 33, 43 respectively. The upper ends of the curved pipes are all fixed to a common linking unit 161 which is fixed to an upper end of the inclined supporting rod 16. The linking bodies 33 and 43 and the lower ends of the tracks are fixed to the installation portions 131 and 132 so that the tracks are installed to the frame 10 at an angle B to the ground as shown in Fig. 6.

[0018] Referring to Fig. 7, a center line 17 illustrated between the oppositely installed tracks 3 and 4 indicates a longitudinal direction of the base 18 of the present invention. A first track, which is the left track 3 is an arc of a length L1 based on a virtual radius r1 and a center of circuit O1 The second track 4 is an arc of a length L2 based on a virtual radius r2 and a center of circuit 02. The radii and lengths of the arcs of the two tracks 3 and 4 are equal. The two curved tracks installed between the rear bottom rod 13 and the inclined supporting rod 16 are gradually away from each other from the upper ends to the lower ends thereof. That is, the upper ends 30 and 40 of the tracks 3 and 4 are near to the center line 17 and the lower ends 39 and 49 of the tracks 3 and 4 are away from the center line 17 so that the concaves of the arcs of the tracks face outwards respectively.

[0019] When operating the athletic apparatus 1 according to the present invention, a user (not illustrated) stands on the pedals 52 and 62 with both feet respectively and holds the handles 70 and 80 with both hands respectively. While the user overcomes the resistance of the load wheel 101, the rocker arm mechanisms are pulled back and forth and the pedals mechanisms are moved back and forth, up and down against each other alternately in the same time.

[0020] The athletic apparatus 1 according to the present invention can provide a composite body exercise for hands and feet of the users. Also, by the design of the curved tracks 3 and 4, the pedals bases 5 and 6 will be moved along the curved tracks so that feet of the user can exercise smoothly by moving outwards and downwards together and moving forth and upwards together.

[0021] The pedals 52 and 62 are parallel to the ground on the tracks 3 and 4 at a static status. For the balance of the users operating the athletic apparatus 1, as shown in Fig. 5, the pedals 52 and 62 can tilt towards each other with a small angle A so that the upwards and downwards movement along the arcs are smooth and safe.

[0022] The athletic apparatus 1 according to the present invention has a simple structure and provides a

physical training on muscles of user's arms and feet. Especially to the design of the tracks 3 and 4, the users can exercise inwards and outwards curved slides. Moreover, the rocker arm mechanisms can drive the load wheel 101 through the belt wheel 25 by the link of two timing belts on the same axis to the belt wheel 25. On the other hand, the rocker arm mechanisms can drive the corresponding pedal mechanisms on the left and right tracks 3, 4 synchronously by the link of linking rods 73 and 83 so that the athletic apparatus 1 can archive an anticipated purpose and effect.

Claims

1. An athletic apparatus (1) comprising:

a frame (10) placed on a level ground;
a pair of left and right tracks (3; 4) of the same structure fixed to the frame (10) at a predetermined angle to the ground; the tracks (3; 4) being formed curved but not straight;
a pair of left and right pedal mechanisms of the same structure including pedals (52;62) for treading by a user's feet and being installed to the left and right tracks (3;4) respectively; the pedal mechanisms further being moved up and down along the curved tracks (3;4);
a pair of left and right rocker arm mechanisms of the same structure being movably installed to the frame (10) and the left and right pedal mechanisms so as to be moved identically with the pedal mechanisms;
wherein by the curved tracks (3;4), the users experiences the most natural feet exercise and an ergonomic design capable of protecting user's heels from being hurt and

wherein the pedal bases (5;6) are moved along the curved tracks (3;4) so that the feet of the user can exercise smoothly by moving outwards and downwards together and moving forth and upwards together.

2. The athletic apparatus as claimed in claim 1, wherein the frame has a base (18) which includes a front bottom rod (11) and a rear bottom rod (13) separated from each other; the front bottom rod (11) is formed as a standing rod (12), a control panel (121) is installed to a top of the standing rod (12); the users can operate the athletic apparatus (1) through the control panel (121); an axle rod (14) is formed near an upper end of the standing rod (12), handles (15) for holding by the user's hands are formed respectively between two ends of the axle rod (14) and a middle bottom rod (19) of the base; installation portions (131;132) are formed separately to the rear bottom rod (13).

3. The athletic apparatus as claimed in claim 1, wherein the left and right rocker arm mechanisms have rocker arms (7;8) with upper ends thereof pivoted to the axle rod (14), and handles (70,80) arranged to the rocker arms (7;8) respectively for holding by the user; lower ends (72;82) of the rocker arms (7;8) are pivoted to linking rods (73;83) through universal connectors (74;84) respectively; another ends of the linking rods (73;83) are pivoted to the left and right pedal mechanisms through universal connectors (75,89); therefore, the left and right rocker arm mechanisms and the left and right pedal mechanisms can be moved identically.

4. The athletic apparatus (1) as claimed in claim 1, wherein the left and right pedal mechanisms have pedal bases (5;6), supporters (51;61) installed on the pedal bases (5;6), and pedals (52;62) for treading by the user's feet respectively; the pedal bases are slidably installed to the curved tracks (3;4) respectively and capable of being slid up and down along the tracks.

5. The athletic apparatus (1) as claimed in claim 1, wherein bottom ends of the tracks (3;4) are fixed to the installation portions of (131;132) the rear bottom rods respectively, while upper ends of the tracks (3; 4) are fixed to an inclined supporting rod (16) of the frame (10) so that the left and right tracks (3;4) are at an predetermined angle to the ground.

6. The athletic apparatus as claimed in claim 1 including a first transmitting mechanism and a second transmitting mechanism, said first transmitting mechanism has a pulley (91) which is rotatably installed to the inclined supporting rod (16), said pulley (91) is positioned near to the upper ends of the tracks below; said first transmitting mechanism further comprises a steel rope (92) which is wound on said pulley (91); two ends of said steel rope (92) are connected to the left and right pedals (5;6) respectively so that the pedals can be slid back and forth, up and down against each other alternately; said second transmitting mechanism has two timing belts (21;22) and an elastic belt (23) linking the two timing belts (21;22); outer ends of the timing belts (21;22) are connected to the lower ends (72,82) of the rocker arms (7;8) respectively so that the left and right rocker arm mechanisms can be swung back and forth alternately with an axle center of the axle rod (14); a shaft rod (24) is installed to the frame (10); a belt wheel (25) is installed to a middle position of the shaft rod (24), and two gear wheels are (26;27) installed to two ends of the shaft rod (24); the gear wheels (26;27) have single direction bearing; the timing belts (21;22) clench the teeth of the gear wheels (26;27) respectively; two wheels (28;29) are pivoted to two ends of the front bottom rod (11), and the elastic belt

(23) linking the timing belts (21;22) winds the wheels; (28;29) by the linking of the second transmitting mechanism, the left and right rocker arm mechanisms can be moved back and forth against each other alternately.

7. The athletic apparatus (1) as claimed in claim 1 further including a damping mechanism which is installed to the frame; said damping mechanism includes a load wheel (101) and an electro-magnetic brake (102); by the link of a transmitting belt (103), the load wheel (101) is linked to the belt wheel (25); when the handles (70;80) are swung back and forth alternately, the damping mechanism can provide a resistance.

8. The athletic apparatus (1) as claimed in claim 1, wherein the left and right tracks (3;4) are respectively made of two combined curved pipes of the (31;32; 41,42) same radian.

9. The athletic apparatus (1) as claimed in claim 2 or 9, wherein a center line (17) of a longitudinal direction of the base (18) is defined as a center line and the left and right tracks (3; 4) are oppositely installed beside the line; a first track, which is the left track (3) is an arc of a length L1 based on a virtual radius r1 and a center of circuit O1; the second track (4) is an arc of a length L2 based on a virtual radius r2 and a center of circuit 02; the radii and lengths of the arcs of the two tracks (3;4) are equal; the two curved tracks (3;4) installed between the rear bottom rod (13) and the inclined supporting rod (16) are gradually away from each other from the upper ends to the lower ends thereof; that is, the upper ends (30; 40) of the tracks (3;4) are near to the center line (17) and the lower ends (39;49) of the tracks (3;4) are away from the center line (17) so that the concaves of arcs of the tracks face outwards respectively.

10. The athletic apparatus (1) as claimed in claim 1 or 4, wherein the pedals (52;62) are parallel to the ground on the tracks (3;4) at a static status; the pedals (52;62) can tilt towards each other with a predetermined angle so that the upwards and downwards movements of the pedals along the arcs are smooth and safe.

Patentansprüche

1. Sportgerät (1), das umfasst:

einen Rahmen (10), der auf einem ebenen Boden angeordnet ist;
ein Paar aus einer linken und einer rechten Schiene (3; 4) derselben Struktur, die am Rahmen (10) in einem vorbestimmten Winkel zum Boden befestigt sind; wobei die Schienen (3; 4) gekrümmt, aber nicht gerade ausgebildet sind;
ein Paar aus einem linken und einem rechten Pedalmechanismus derselben Struktur mit Pedalen (52; 62) zum Treten mittels der Füße eines Benutzers, die an der linken bzw. der rechten Schiene (3; 4) installiert sind; wobei die Pedalmechanismen ferner entlang der gekrümmten Schienen (3; 4) nach oben und unten bewegt werden;
ein Paar aus einem linken und einem rechten Kipphebelmechanismus derselben Struktur, die an dem Rahmen (10) und an dem linken bzw. dem rechten Pedalmechanismus beweglich installiert sind, so dass sie identisch mit den Pedalmechanismen bewegt werden;
wobei durch die gekrümmten Schienen (3; 4) der Benutzer das natürlichste Fußtraining und eine ergonomische Konstruktion erfährt, die in der Lage ist, die Fersen des Benutzers vor einer Verletzung zu schützen, und
wobei die Pedalbasen (5; 6) entlang der gekrümmten Schienen (3; 4) so bewegt werden, dass die Füße des Benutzers sanft trainieren können, indem sie sich zusammen auswärts und abwärts bewegen und zusammen vorwärts und aufwärts bewegen.

2. Sportgerät nach Anspruch 1, wobei der Rahmen eine Basis (18) aufweist, die eine vordere Bodenstange (11) und eine hintere Bodenstange (13) umfasst, die voneinander getrennt sind; die vordere Bodenstange (11) als stehende Stange (12) ausgebildet ist, ein Bedienfeld (121) an einer Oberseite der stehenden Stange (12) installiert ist; die Benutzer das Sportgerät (1) durch das Bedienfeld (121) bedienen können; eine Achsstange (14) nahe einem oberen Ende der stehenden Stange (12) ausgebildet ist, Griffe (15) zum Halten durch die Hände des Benutzers jeweils zwischen zwei Enden der Achsstange (14) und einer mittleren Bodenstange (19) der Basis ausgebildet sind; und Installationsabschnitte (131; 132) separat an der hinteren Bodenstange (13) ausgebildet sind.

3. Sportgerät nach Anspruch 1, wobei der linke und der rechte Kipphebelmechanismus Kipphebel (7; 8) aufweisen, wobei deren obere Enden an der Achsstange (14) drehbar gelagert sind, und Griffe (70, 80) an den Kipphebeln (7; 8) jeweils zum Halten durch den Benutzer angeordnet sind; untere Enden (72; 82) der Kipphebel (7; 8) an Verbindungsstangen (73; 83) jeweils durch Universalverbindungselemente (74; 84) drehbar gelagert sind; weitere Enden der Verbindungsstangen (73; 83) am linken bzw. am rechten Pedalmechanismus durch Universalverbindungselemente (75, 85) drehbar gelagert sind; wodurch der linke und der rechte Kipphebelmechanismus und

der linke und der rechte Pedalmechanismus identisch bewegt werden können.

4. Sportgerät (1) nach Anspruch 1, wobei der linke und der rechte Pedalmechanismus jeweils Pedalbasen (5; 6), Träger (51; 61), die an den Pedalbasen (5; 6) installiert sind, und Pedale (52; 62) zum Treten durch die Füße des Benutzers aufweisen; die Pedalbasen (5; 6) jeweils an den gekrümmten Schienen (3; 4) verschiebbar installiert sind und entlang der Schienen nach oben und nach unten geschoben werden können.

5. Sportgerät (1) nach Anspruch 1, wobei die unteren Enden der Schienen (3; 4) jeweils an den Installationsabschnitten (131; 132) der hinteren Bodenstangen befestigt sind, während die oberen Enden der Schienen (3; 4) an einer geneigten Stützstange (16) des Rahmens (-10) befestigt sind, so dass die linke und die rechte Schiene (3; 4) in einem vorbestimmten Winkel zum Boden liegen.

6. Sportgerät nach Anspruch 1 mit einem ersten Übertragungsmechanismus und einem zweiten Übertragungsmechanismus, wobei der erste Übertragungsmechanismus eine Seilscheibe (91) aufweist, die an der geneigten Stützstange (16) drehbar installiert ist, die Seilscheibe (91) nahe den oberen Enden der Schienen darunter angeordnet ist; der erste Übertragungsmechanismus ferner ein Stahlseil (92) umfasst, das auf die Seilscheibe (91) gewickelt ist; zwei Enden des Stahlseils (92) mit dem linken bzw. dem rechten Pedal (5; 6) verbunden sind, so dass die Pedale abwechselnd gegeneinander rückwärts und vorwärts, aufwärts und abwärts geschoben werden können; der zweite Übertragungsmechanismus zwei Zahnriemen (21; 22) und einen elastischen Riemen (23) aufweist, der die zwei Zahnriemen (21; 22) verbindet; äußere Enden der Zahnriemen (21; 22) jeweils mit den unteren Enden (72, 82) der Kipphebel (7; 8) verbunden sind, so dass der linke und der rechte Kipphebelmechanismus abwechselnd mit einem Achszentrum der Achsstange (14) hin und her geschwenkt werden können; eine Wellenstange (24) am Rahmen (10) installiert ist; ein Riemenrad (25) in einer mittleren Position der Wellenstange (24) installiert ist, und zwei Zahnräder (26; 27) an zwei Enden der Wellenstange (24) installiert sind; wobei die Zahnräder (26; 27) ein Einzelrichtungslager aufweisen; die Zahnriemen (21; 22) jeweils die Zähne der Zahnräder (26; 27) umklammern; zwei Räder (28; 29) an zwei Enden der vorderen Bodenstange (11) drehbar gelagert sind, und der elastische Riemen (23), der die Zahnriemen (21; 22) verbindet, die Räder (28; 29) dreht; durch die Verbindung des zweiten Übertragungsmechanismus der linke und der rechte Kipphebelmechanismus abwechselnd gegeneinander hin und her bewegt werden können.

7. Sportgerät (1) nach Anspruch 1, das ferner einen Dämpfungsmechanismus umfasst, der am Rahmen installiert ist; wobei der Dämpfungsmechanismus ein Lastrad (101) und eine elektromagnetische Bremse (102) umfasst; durch die Verbindung eines Übertragungsriemens (103) das Lastrad (101) mit dem Riemenrad (25) verbunden ist; wenn die Griffe (70; 80) abwechselnd hin und her geschwenkt werden, der Dämpfungsmechanismus einen Widerstand bereitstellen kann.

8. Sportgerät (1) nach Anspruch 1, wobei die linke und die rechte Schiene (3; 4) jeweils aus zwei kombinierten gekrümmten Rohren (31; 32; 41, 42) mit demselben Bogenmaß bestehen.

9. Sportgerät (1) nach Anspruch 2 oder 9, wobei eine Mittellinie (17) einer Längsrichtung der Basis (18) als Mittellinie definiert ist und die linke und die rechte Schiene (3; 4) neben der Linie entgegengesetzt installiert sind; eine erste Schiene, die die linke Schiene (3) ist, ein Bogen mit einer Länge L1 auf der Basis eines virtuellen Radius r1 und eines Zentrums eines Kreises O1 ist; die zweite Schiene (4) ein Bogen mit einer Länge L2 auf der Basis eines virtuellen Radius r2 und eines Zentrums eines Kreises 02 ist; die Radien und Längen der Bögen der zwei Schienen (3; 4) gleich sind; die zwei gekrümmten Schienen (3; 4), die zwischen der hinteren Bodenstange (13) und der geneigten Stützstange (16) installiert sind, von den oberen Enden zu den unteren Enden davon allmählich voneinander weg liegen; das heißt, die oberen Enden (30; 40) der Schienen (3; 4) nahe der Mittellinie (17) liegen und die unteren Enden (39; 49) der Schienen (3; 4) von der Mittellinie (17) entfernt liegen, so dass die Höhlungen der Bögen der Schienen jeweils nach außen gewandt sind.

10. Sportgerät (1) nach Anspruch 1 oder 4, wobei die Pedale (52; 62) an den Schienen (3; 4) in einem statischen Zustand zum Boden parallel sind; die Pedale (52; 62) sich mit einem vorbestimmten Winkel zueinander hin neigen können, so dass die Aufwärts- und Abwärtsbewegungen der Pedale entlang der Bögen gleichmäßig und sicher sind.

Revendications

1. Appareil athlétique (1) comprenant :

un châssis (10) placé sur un sol plan ;
une paire de rails gauche et droit (3 ; 4) de même structure fixés au châssis (10) à un angle prédéterminé par rapport au sol ; les rails (3 ; 4) ayant une forme incurvée mais pas linéaire ;
une paire de mécanismes à pédale gauche et droit de même structure comprenant des péda-

les (52 ; 62) de marche pour les pieds d'un utilisateur et étant installés sur les rails gauche et droit (3 ; 4) respectivement ; les mécanismes à pédale se déplaçant en outre vers le haut et vers le bas le long des rails incurvés (3 ; 4) ;
une paire de mécanismes de bras oscillant gauche et droit de même structure étant installés de manière mobile sur le châssis (10) et les mécanismes à pédale gauche et droit afin de se déplacer de manière identique avec les mécanismes à pédale ;
dans lequel grâce aux rails incurvés (3 ; 4), l'utilisateur expérimente l'exercice le plus naturel pour les pieds et une conception ergonomique capable de protéger les talons de l'utilisateur contre une blessure et
dans lequel les bases des pédales (5 ; 6) se déplacent le long des rails incurvés (3 ; 4) de sorte que les pieds de l'utilisateur puissent s'exercer en douceur en se déplaçant vers l'extérieur et vers le bas conjointement et en se déplaçant vers l'avant et vers le haut conjointement.

2. Appareil athlétique selon la revendication 1, dans lequel le châssis possède une base (18) qui comprend une barre inférieure avant (11) et une barre inférieure arrière (13) séparées l'une de l'autre ; la barre inférieure avant (11) est formée en tant qu'une barre d'appui (12), un panneau de commande (121) est installé à une extrémité supérieure de la barre d'appui (12) ; les utilisateurs peuvent actionneur l'appareil athlétique (1) grâce au panneau de commande (121) ; une barre axiale (14) est formée à proximité d'une extrémité supérieure de la barre d'appui (12), des poignées (15) de maintien pour les mains de l'utilisateur sont formées respectivement entre deux extrémités de la barre axiale (14) et une barre inférieure médiane (19) de la base ; des parties d'installation (131 ; 132) sont formées séparément sur la barre inférieure arrière (13).

3. Appareil athlétique selon la revendication 1, dans lequel les mécanismes de bras oscillant gauche et droit possèdent des bras oscillants (7 ; 8) avec leurs extrémités supérieures qui pivotent par rapport à la barre axiale (14), et des poignées (70, 80) agencées sur les bras oscillants (7 ; 8) respectivement pour être serrées par l'utilisateur ; des extrémités inférieures (72 ; 82) des bras oscillants (7 ; 8) pivotent par rapport aux barres de liaison (73 ; 83) grâce à des connecteurs universels (74 ; 84) respectivement ; d'autres extrémités des barres de liaison (73 ; 83) pivotent par rapport aux mécanismes à pédale gauche et droit grâce à des connecteurs universels (75 ; 85) ; par conséquent, les mécanismes de bras oscillant gauche et droit et les mécanismes à pédale gauche et droit peuvent se déplacer de manière identique.

4. Appareil athlétique (1) selon la revendication 1, dans lequel les mécanismes à pédale gauche et droit possèdent des bases de pédales (5 ; 6), des supports (51 ; 61) installés sur les bases de pédales (5 ; 6), et des pédales (52 ; 62) de marche pour les pieds de l'utilisateur respectivement ; les bases de pédales (5 ; 6) sont installées à coulissement sur les rails incurvés (3 ; 4) respectivement et peuvent coulisser vers le haut et vers le bas le long des rails.

5. Appareil athlétique (1) selon la revendication 1, dans lequel des extrémités inférieures des rails (3 ; 4) sont fixées aux parties d'installation (131 ; 132) des barres inférieures arrières respectivement, tandis que des extrémités supérieures des rails (3 ; 4) sont fixées à une barre de support inclinée (16) du châssis (10) de sorte que les rails gauche et droit (3 ; 4) sont à un angle prédéterminé par rapport au sol.

6. Appareil athlétique selon la revendication 1 comprenant un premier mécanisme de transmission et un deuxième mécanisme de transmission, ledit premier mécanisme de transmission possède une poulie (91) qui est installée à rotation sur la barre de support inclinée (16), ladite poulie (91) est positionnée à proximité des extrémités supérieures des rails situés dessous ; ledit premier mécanisme de transmission comprend en outre un câble d'acier (92) qui est enroulé sur ladite poulie (91) ; deux extrémités dudit câble d'acier (92) sont reliées aux pédales gauche et droite (5 ; 6) respectivement de sorte que les pédales puissent coulisser d'avant en arrière, de haut en bas l'une contre l'autre alternativement ; ledit deuxième mécanisme de transmission possède deux courroies crantées (21 ; 22) et une courroie élastique (23) reliant les deux courroies crantées (21 ; 22) ; des extrémités extérieures des courroies crantées (21 ; 22) sont reliées aux extrémités inférieures (72, 82) des bras oscillants (7 ; 8) respectivement de telle sorte que les mécanismes de bras oscillant gauche et droit peuvent osciller d'arrière en avant alternativement avec un axe central de la barre axiale (14) ; une barre d'arbre (24) est installée sur le châssis (10) ; une roue de courroie (25) est installée à une position médiane de la barre d'arbre (24), et deux roues dentées (26 ; 27) sont installées aux deux extrémités de la barre d'arbre (24) ; les roues dentées (26 ; 27) possèdent un palier un palier de direction unique ; les courroies crantées (21 ; 22) mettent en prise les dents des roues dentées (26 ; 27) respectivement ; deux roues (28 ; 29) pivotent aux deux extrémités de la barre inférieure avant (11), et la courroie élastique (23) reliant les courroies crantées (21 ; 22) fait tourner les roues (28 ; 29) ; par la liaison du deuxième mécanisme de transmission, les mécanismes de bras oscillant gauche et droit peuvent se déplacer en arrière et en avant l'un contre l'autre de manière alternée.

7. Appareil athlétique (1) selon la revendication 1 comprenant en outre un mécanisme d'amortissement qui est installé sur le châssis ; ledit mécanisme d'amortissement comprend une roue porteuse (101) et un frein électromagnétique (102) ; par la liaison d'une courroie de transmission (103), la roue porteuse (101) est reliée à la roue de courroie (25) ; quand les poignées (70 ; 80) oscillent en arrière et en avant de manière alternée, le mécanisme d'amortissement peut fournir une résistance.

8. Appareil athlétique (1) selon la revendication 1, dans lequel les rails gauche et droit (3 ; 4) sont respectivement faits de deux tuyaux incurvés combinés (31 ; 32 ; 41, 42) de rayon identique.

9. Appareil athlétique (1) selon la revendication 2 ou 9, dans lequel une ligne centrale (17) d'une direction longitudinale de la base (18) est définie comme une ligne centrale et les rails gauche et droit (3 ; 4) sont installés de manière opposée à côté de la ligne ; un premier rail, qui est le rail gauche (3) est un arc d'une longueur L1 selon un rayon virtuel r1 et un centre de circuit O1 ; le deuxième rail (4) est un arc d'une longueur L2 selon un rayon virtuel r2 et un centre de circuit 02 ; les rayons et les longueurs des arcs des deux rails (3 ; 4) sont égaux ; les deux rails incurvés (3 ; 4) installés entre la barre inférieure arrière (13) et la barre de support inclinée (16) sont éloignés graduellement l'un de l'autre à partir de leurs extrémités supérieures jusqu'à leurs extrémités inférieures ; c'est-à-dire, les extrémités supérieures (30 ; 40) des rails (3 ; 4) sont proches de la ligne centrale (17) et les extrémités inférieures (39 ; 49) des rails (3 ; 4) sont éloignées de la ligne centrale (17) de telle sorte que les parties concaves des arcs des rails font face vers l'extérieur respectivement.

10. Appareil athlétique (1) selon la revendication 1 ou 4, dans lequel les pédales (52 ; 62) sont parallèles au sol sur les rails (3 ; 4) dans un état statique ; les pédales (52 ; 62) peuvent basculer l'une vers l'autre avec un angle prédéterminé de sorte que les mouvements vers le haut et vers le bas des pédales le long des arcs sont doux et sûrs.

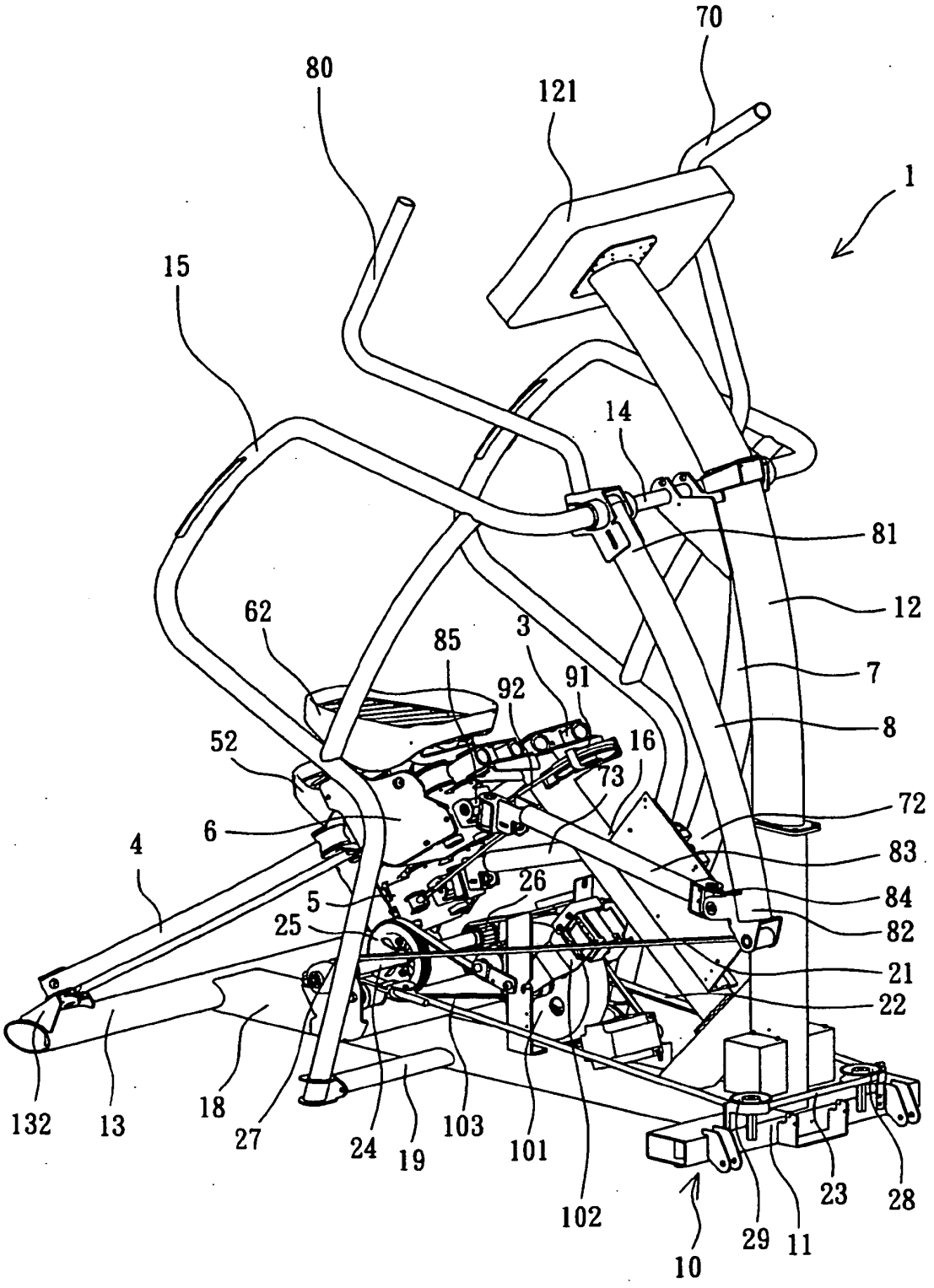

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Fig. 1

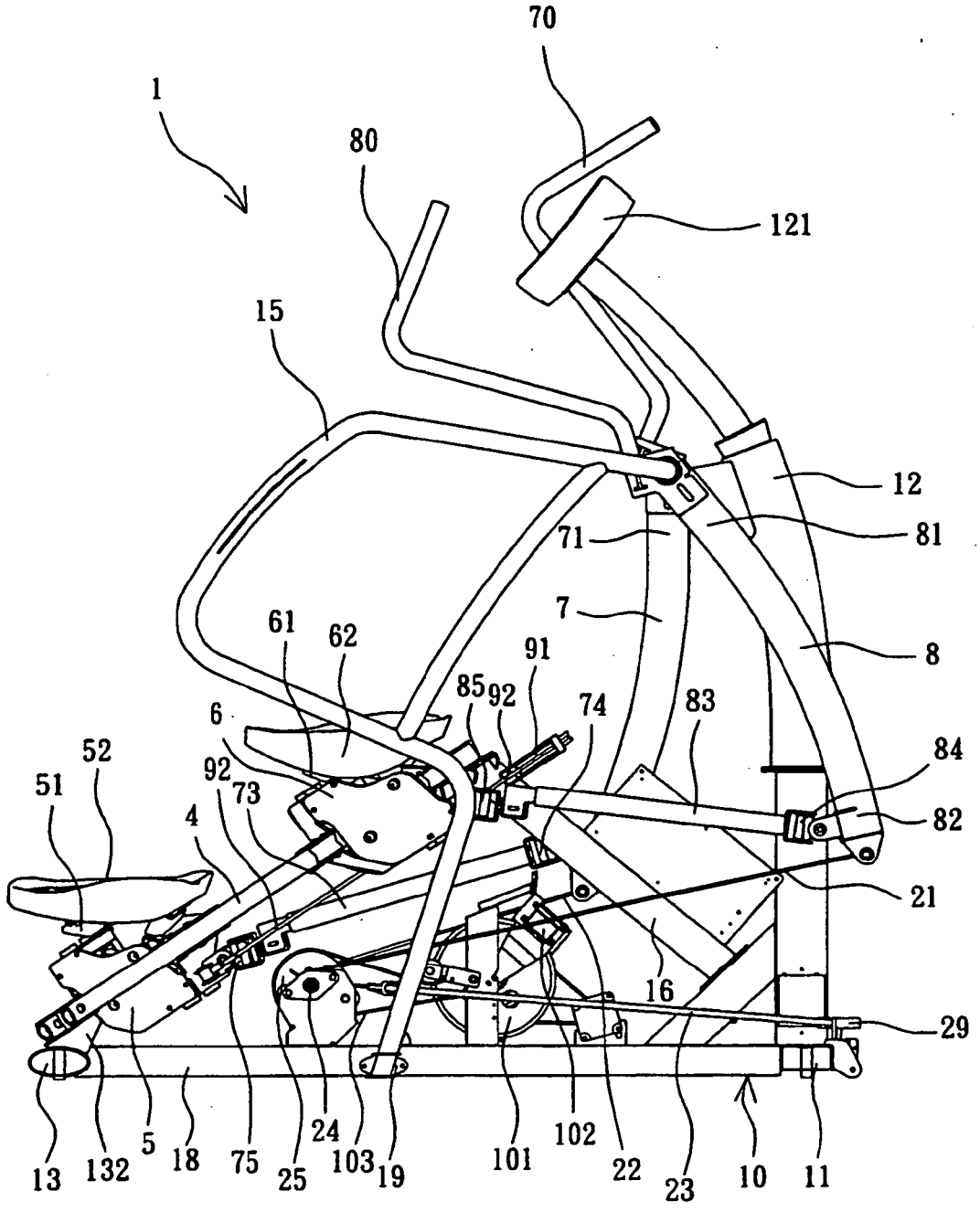

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Fig. 2

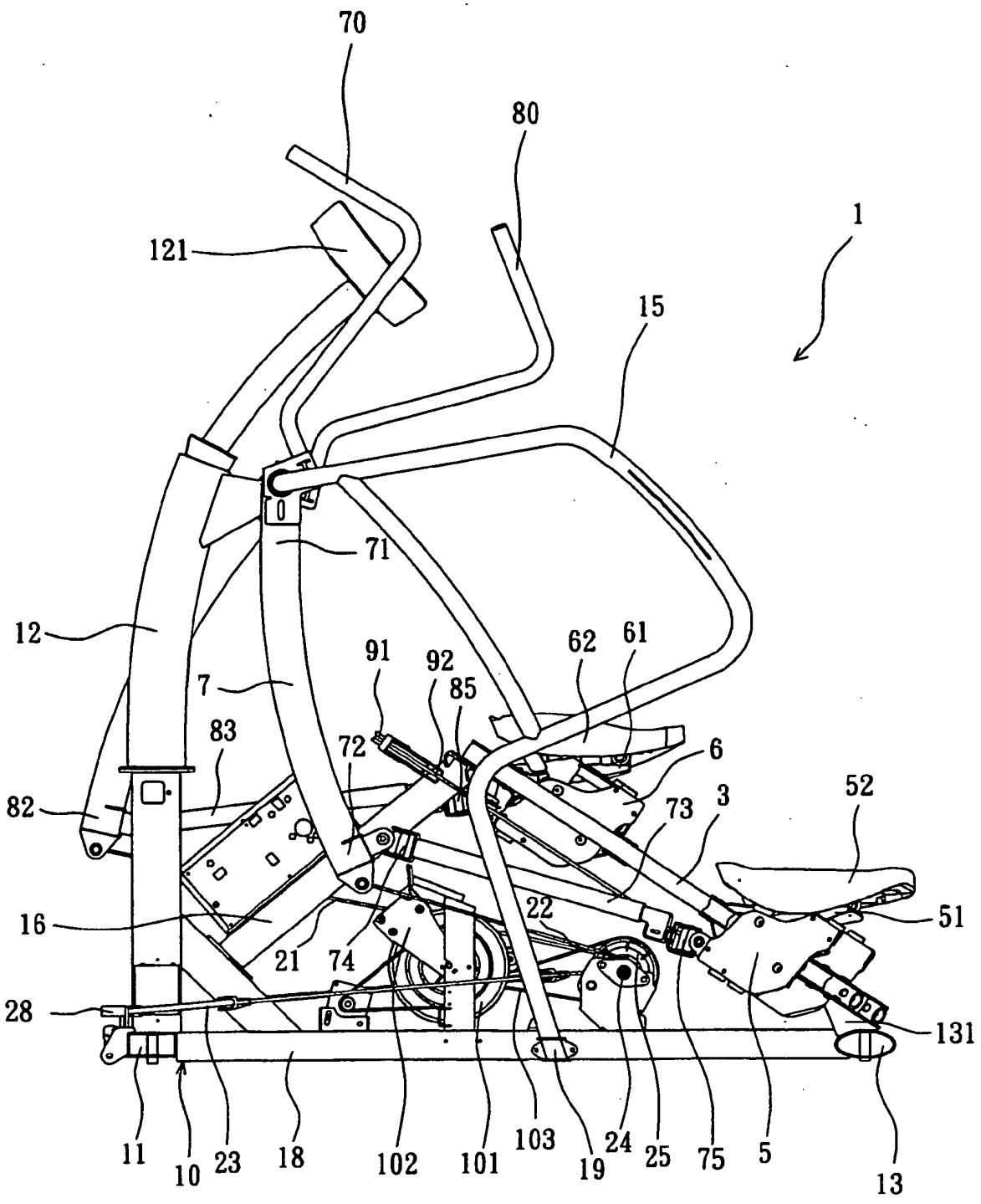

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Fig. 3

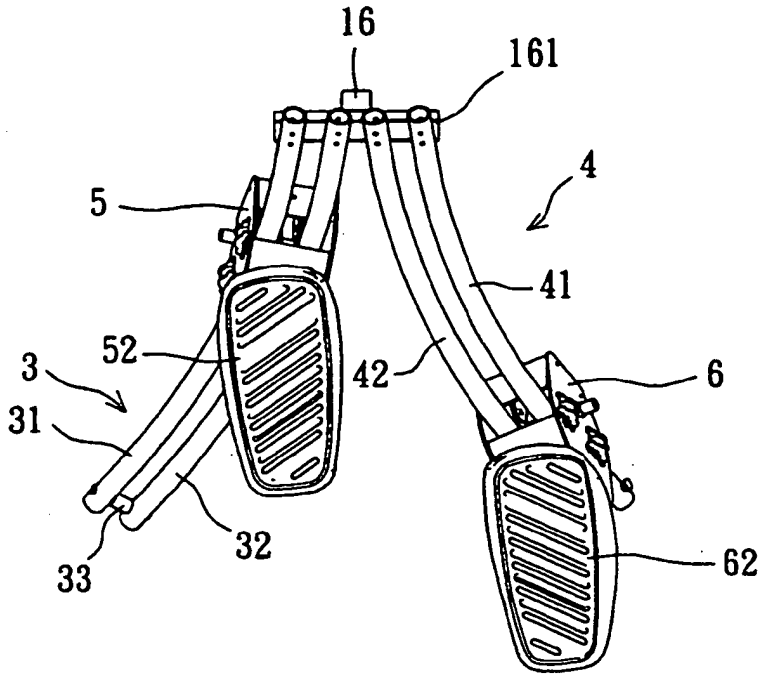

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Fig. 4

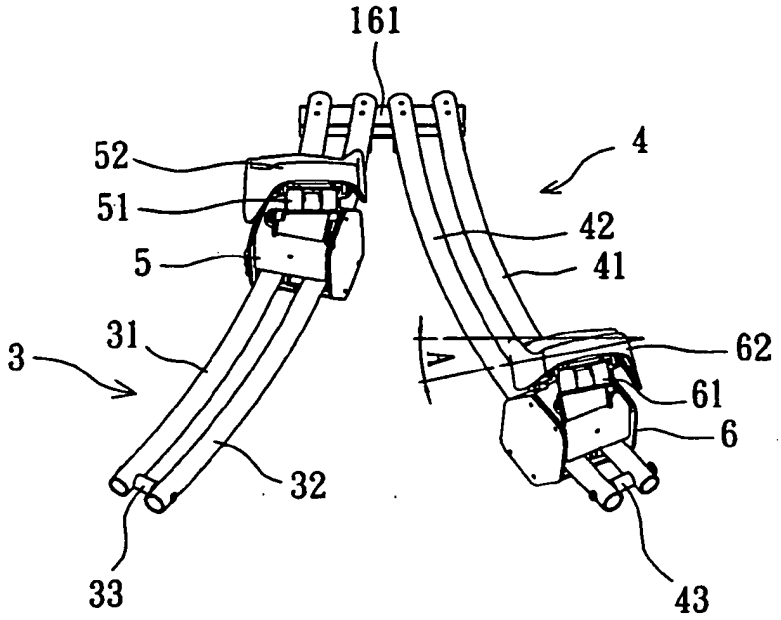

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Fig. 5

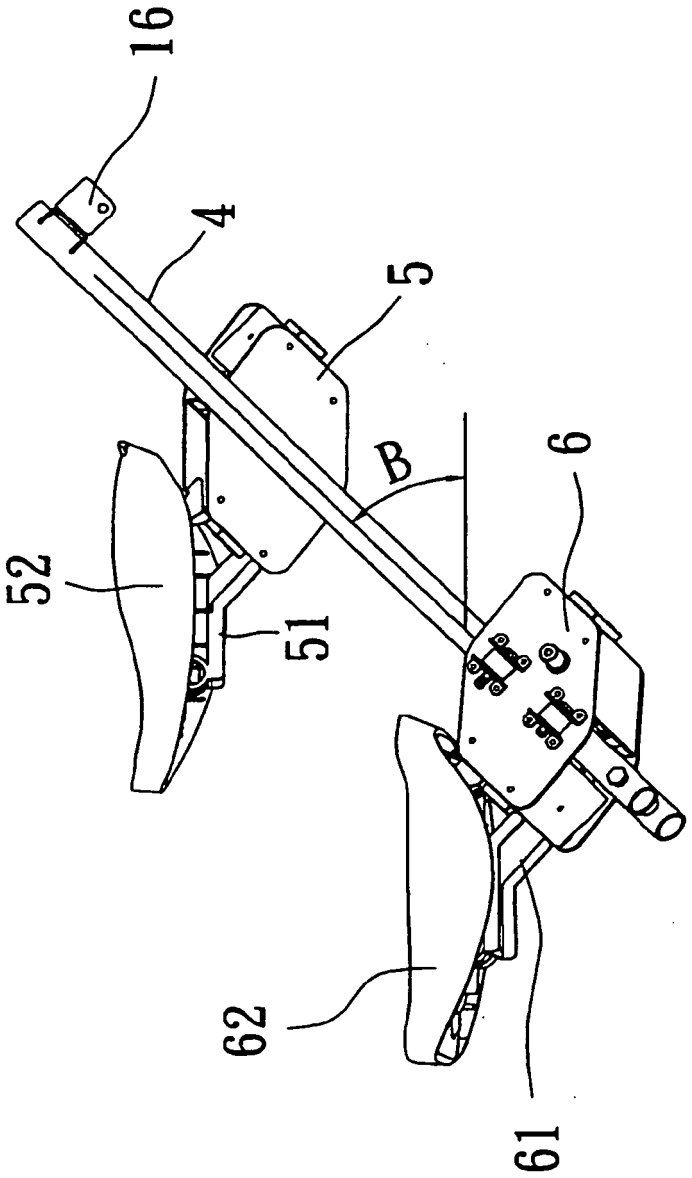


Fig. 6

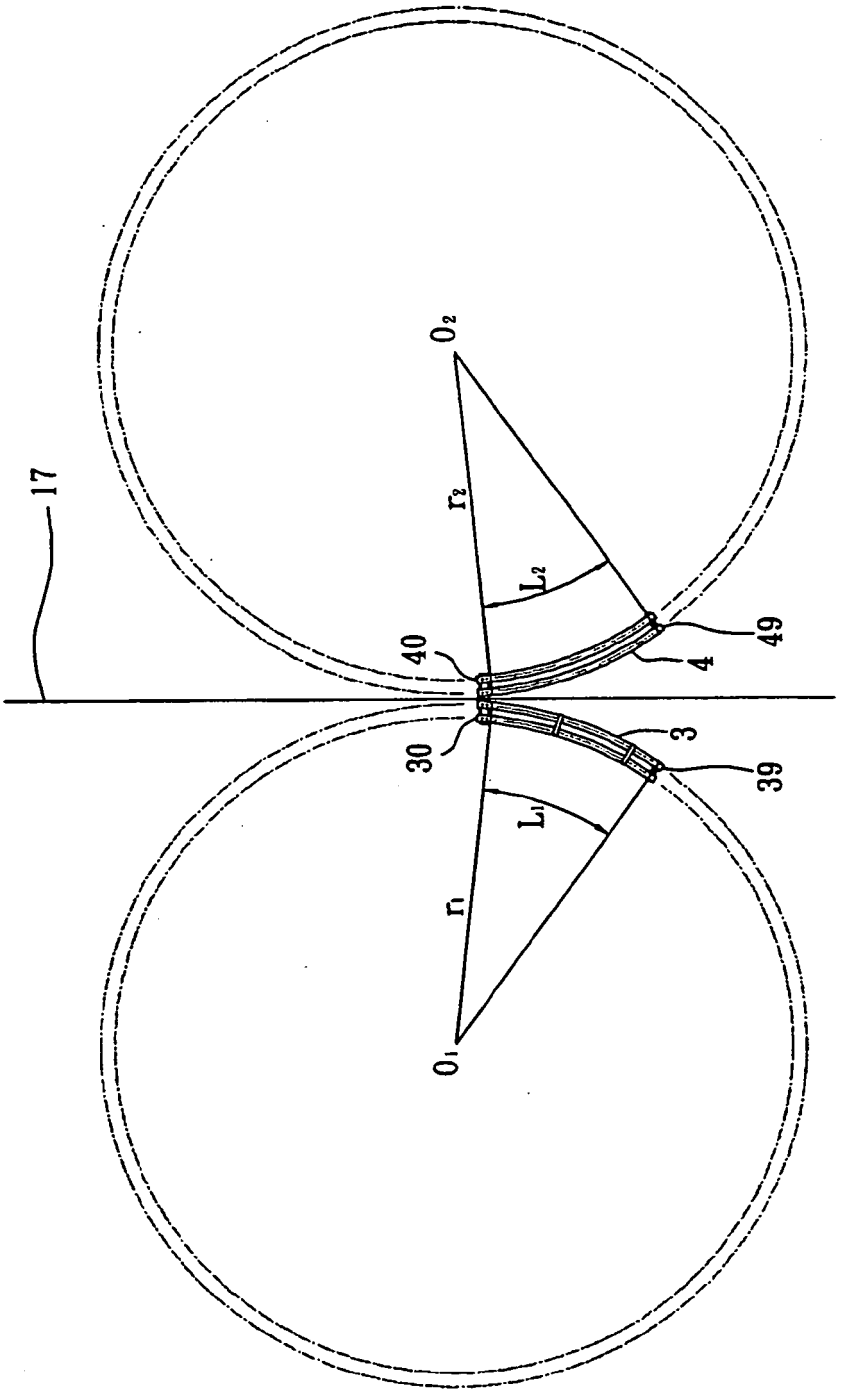


Fig. 7

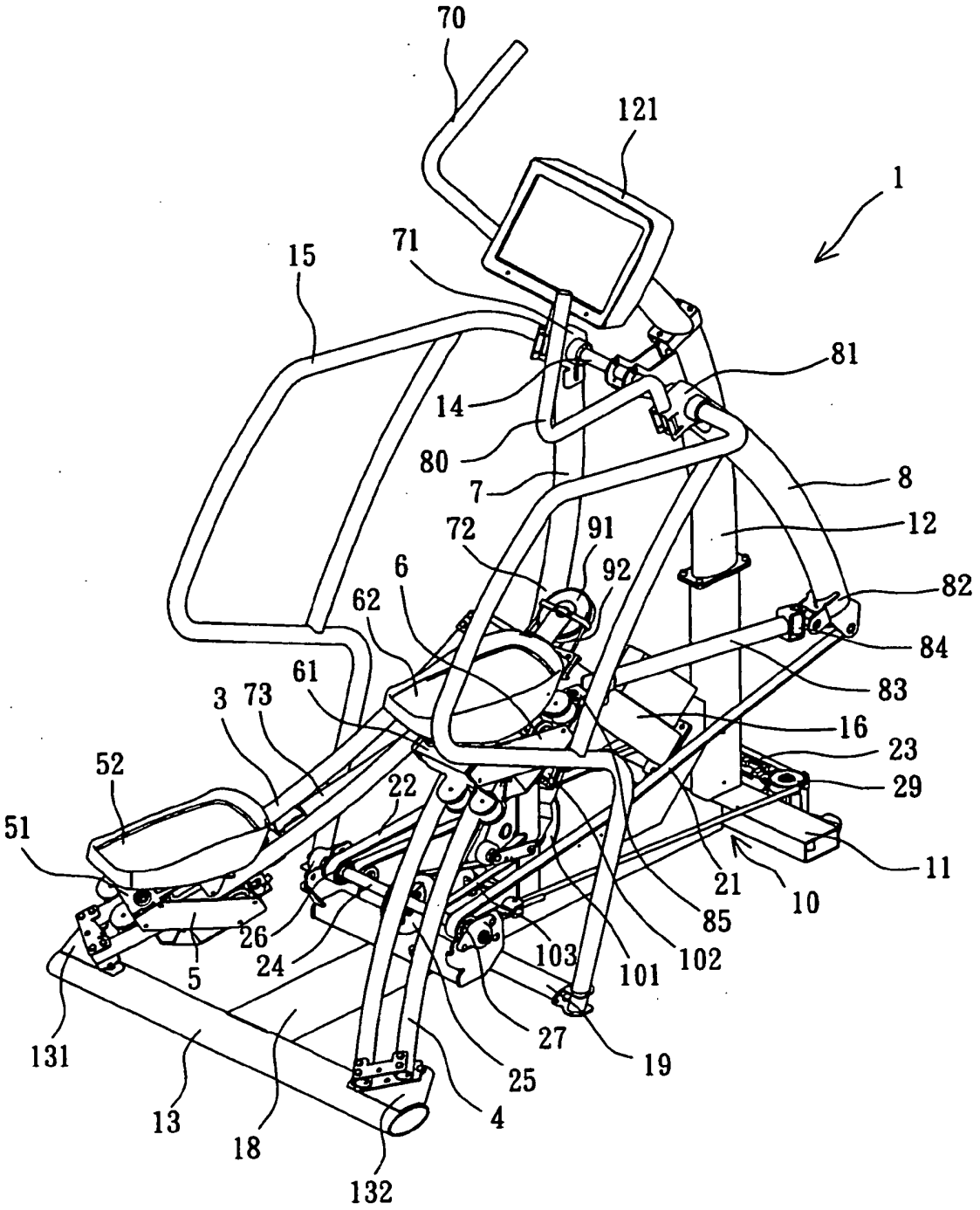

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Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 183674 A **[0003]**