



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**07.01.2009 Bulletin 2009/02**

(51) Int Cl.:  
**A63B 21/22 (2006.01) A63B 23/02 (2006.01)**  
**A63B 26/00 (2006.01) A63B 69/04 (2006.01)**

(21) Application number: **07111757.6**

(22) Date of filing: **04.07.2007**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA HR MK RS**

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(54) **Balance training device**

(57) A balance training device includes a base (1) having a connection bar (12) which includes a transverse bar (13) and a tilt bar (14). A transmission unit (2) connected to the tilt bar (14) and includes a pedal frame (21), a crank (22), a link (23), a shaft (24), a driving wheel (25), a belt (26) and a fly wheel (27). The link unit (3) is connected to the transverse bar (13) and includes a driving plate (31), a first link (32), a second link (33), a third link (34), a fourth link (35) and a seat frame (36). The seat frame (36) includes a seat (37) with two handles (361) on two ends thereof and the link unit (3) moves the user back and forth, and up and down so that the user's upper body is exercised. The pedal frame (21) includes two pedals (213) so that the user's feet are rested on the pedals (213) and the user's body is moved like riding a horse.

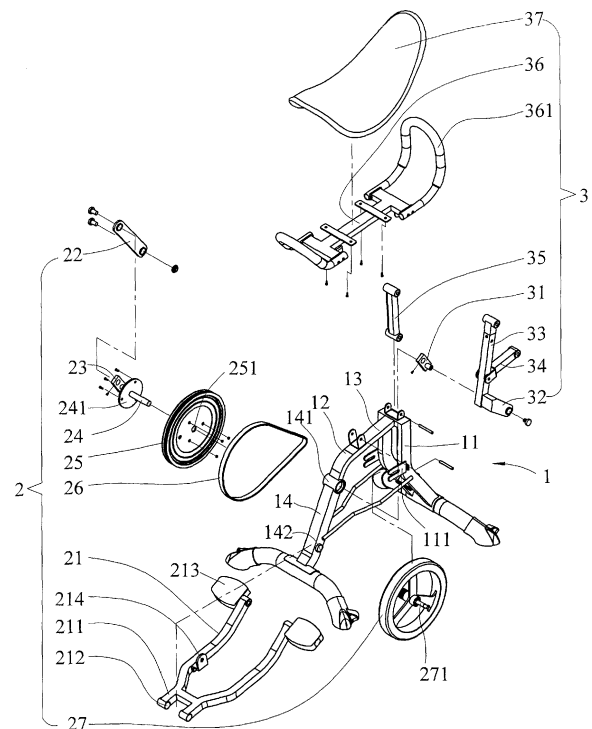


FIG. 1

## Description

### FIELD OF THE INVENTION

[0001] The present invention relates to a balance training device which does not need electric power and moves back and forth and up and down.

### BACKGROUND OF THE INVENTION

[0002] A conventional balance training device known to applicant is shown in Fig. 8 which includes base 61 with a head tube 62 in which a handlebar stem 63 is inserted, a seat bar 64 is connected to two U-shaped frames and a bottom bar 66 is located beneath the seat bar 64, a support bar 65 is connected between two respective ends of the seat bar 64 and the bottom bar 66, a seat is located on the seat bar 64, and a hydraulic cylinder 67 is connected between the support bar 66 and the rear end of the base 61 so as to move the seat up and down.

[0003] Another balance training device is shown in Figs. 9 and 10 and includes a base 7 on which a first fixing frame 71 and a second fixing frame 72 are connected, a bearing 83 is connected on the top of the first fixing frame 71 and a space 721 is defined in the second fixing frame 72 so that a fly wheel 86 is located in the space 721. A transmission mechanism 8 includes a crank 81 which includes two pedals 82 on two ends thereof and the bearing 83 is mounted to the crank 81. A chain wheel 84 and a belt wheel 85 are mounted on the crank 81, a belt driving the belt wheel 85 and the fly wheel 86. A seat assembly 9 includes a transverse bar 91 which has one end pivotably connected with a seat post 92 and the other end of the transverse bar 91 is connected with an upright tube 93 which includes a seat 94 connected thereon. A connection link 95 is connected between a protrusion 811 on the crank 81 and the transverse bar 91.

[0004] However, the device in Fig. 8 can only move up and down and cannot provide sufficient exercise to the users who quickly feel boring by the single mode of movement. The device disclosed in Figs. 9 and 10 is more close to stationary bicycle which exercises the users' feet rather than the upper body.

[0005] The present invention intends to provide a balance training device which moves the user back and forth, and up and down so that the users have fun and get exercise during using the device.

### SUMMARY OF THE INVENTION

[0006] The present invention relates to a balance training device which comprises a base having a first leg on which a frame is connected and a connection bar is connected between the frame and a second leg. The connection bar includes a transverse bar connected to the frame and a tilt bar connected to the second leg. A transmission unit has a pedal frame, a crank, a link, a shaft,

a driving wheel, a belt and a fly wheel. The pedal frame has a securing portion on a first end thereof and two pedals are connected on two ends of a Y-shaped second end of the pedal frame. The crank has a first end pivotably connected to the pedal frame and a second end of the crank is pivotably connected with a first end of the link. A second end of the link is fixed to a first end of the shaft and a second end of the shaft extends through the driving wheel and the tilt bar. The belt is engaged with the driving wheel and an output axle of the fly wheel.

[0007] A link unit includes a driving plate, a first link, a second link, a third link, a fourth link and a seat frame. The driving plate has a first end secured to the shaft and a second end of the driving plate is pivotably connected with a first end of the first link. A second end of the first link is secured to a first end of the second link. A second end of the second link is secured to a first end of the third link. A second end of the third link and a first end of the fourth link are respectively and pivotably connected to the transverse bar. The seat frame is pivotably connected with the second link and a second end of the fourth link.

[0008] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is an exploded view to show the balance training device of the present invention;

Fig. 2 is a perspective view to show the balance training device of the present invention;

Fig. 3 is a perspective view to show the balance training device with the case and dust covers;

Fig. 4 is a side view to show that a user just sits on the seat of the balance training device of the present invention;

Fig. 5 is another side view to show that a user just sits on the seat of the balance training device of the present invention;

Fig. 6 is a side view to show that a user sits on the seat of the balance training device of the present invention;

Fig. 7 shows the user operates the balance training device of the present invention;

Fig. 8 shows a conventional balance training device; Fig. 9 shows another conventional balance training device, and

Fig. 10 is a cross sectional view of the transmission mechanism of the conventional balance training device in Fig. 9.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0010]** Referring to Figs. 1 to 3, the balance training device of the present invention comprises a base 1 having a first leg on which a frame 11 is connected and a connection bar 12 is connected between the frame 11 and a second leg. The first and second legs are put on the floor and the connection bar 12 includes a transverse bar 13 connected to the frame 11 and a tilt bar 14 connected to the second leg.

**[0011]** A transmission unit 2 includes an H-shaped pedal frame 21, a crank 22, a link 23, a shaft 24, a driving wheel 25, a belt 26 and a fly wheel 27. The fly wheel 27 is located between two side parts of the frame 11 which includes two side plates 111 on two sides thereof and an output axle 271 of the fly wheel 27 is engaged with the two side plates 111. The pedal frame 21 includes a U-shaped securing portion 211 on a first end thereof and two pedals 213 are connected on two ends of a Y-shaped second end of the pedal frame 21. Two protrusions 142 extend from two sides of the tilt bar 14 and the U-shaped securing portion 211 includes two connection holes 212 with which the protrusions 142 on the tilt bar 14 are engaged.

**[0012]** The crank 22 has a first end pivotably connected to a connection plate 214 on a mediate portion of the pedal frame 21 and a second end of the crank 22 is pivotably connected with a first end of the link 23. A second end of the link 23 is fixed to a first end of the shaft 24 and a second end of the shaft 24 extends through the driving wheel 25 and a through hole 142 defined through the tilt bar 14. A disk 241 is fixed to the shaft 24 and connected to the driving wheel 25. The belt 26 is engaged with the driving wheel 25 and the output axle 271 of the fly wheel 27.

**[0013]** A link unit 3 has a driving plate 31, a first link 32, a second link 33, a third link 34, a fourth link 35 and a seat frame 36. The driving plate 31 has a first end secured to the shaft 24 and a second end of the driving plate 31 is pivotably connected with a first end of the first link 32. A second end of the first link 32 is secured to a first end of the second link 33. A second end of the second link 33 is secured to a first end of the third link 34. A second end of the third link 34 is pivotably connected to a rear end of the transverse bar 13 and a first end of the fourth link 35 is pivotably connected to a front end of the transverse bar 13. The seat frame 36 is pivotably connected with the second link 33 and a second end of the fourth link 35. The seat frame 36 includes a seat 37 and two handles 361 are located on two ends of the seat 37. A case 4 is mounted to the base 1 and two respective dust covers 5 are mounted to the second link 33 and the fourth link 35.

**[0014]** As shown in Figs. 4 to 6, when a user just sits on the seat 37, the seat frame 36, the second link 33, the third link 34 and the first link 32 are moved downward, and the pedals 213 are located at proper heights so that

the user's feet conveniently put on the pedals 213. The driving plate 31 rotates the shaft 24 which rotates the driving wheel 25 and the link 23. The user applies a downward force on the pedals 213 to move the pedal frame 21 and the crank 22 downward, so that the link 23 rotates the shaft 24 and the driving wheel 25, and the fly wheel 27 is rotated by the belt 26. The shaft 24 moves the driving plate 31 to move the first link 32, the second link 33 and the third link 34 move forward and upward.

**[0015]** As shown in Fig. 7, the user moves the rear end of the seat frame 36 backward and upward, the front end of the seat frame 36 moves with the fourth link 35 forward and downward. This is similar to horse riding. On the other hand, the fly wheel 27 has an initial force when rotating and drives the driving wheel 25 via the belt 26, the first link 32, the second link 33 and the third link 34 are moved backward and downward by the shaft 24 and the driving plate 31. Therefore, the rear end of the seat frame 36 moves backward and downward, and the front end of the seat frame 36 moves with the fourth link 35 backward and upward. The movement exercises the upper body of the user in different directions just like riding a horse.

**[0016]** While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

## Claims

1. A balance training device comprising:

a base (1) having a first leg on which a frame (11) is connected and a connection bar (12) connected between the frame (11) and a second leg, the connection bar (12) including a transverse bar (13) connected to the frame (11) and a tilt bar (14) connected to the second leg;  
a transmission unit (2) having a pedal frame (21), a crank (22), a link (23), a shaft (24), a driving wheel (25), a belt (26) and a fly wheel (27), the pedal frame (21) having a securing portion (211) on a first end thereof and two pedals (213) connected on two ends of a Y-shaped second end of the pedal frame (21), the crank (22) having a first end pivotably connected to the pedal frame (21) and a second end of the crank (22) pivotably connected with a first end of the link (23), a second end of the link (23) fixed to a first end of the shaft (24), a second end of the shaft (24) extending through the driving wheel (25) and the tilt bar (14), the belt (26) engaged with the driving wheel (25) and an output axle (271) of the fly wheel (27), and  
a link unit (3) having a driving plate (31), a first link (32), a second link (33), a third link (34), a

fourth link (35) and a seat frame (36), the driving plate (31) having a first end secured to the shaft (24) and a second end of the driving plate (31) pivotably connected with a first end of the first link (32), a second end of the first link (32) secured to a first end of the second link (33), a second end of the second link (33) secured to a first end of the third link (34), a second end of the third link (34) pivotably connected to the transverse bar (13), a first end of the fourth link (35) pivotably connected to the transverse bar (13), the seat frame (36) pivotably connected with the second link (33) and a second end of the fourth link (35).

2. The device as claimed in claim 1, wherein the link unit (3) is driven by the transmission unit (2) which drives the driving wheel (25) so as to drive the link unit (3).

3. The device as claimed in claim 1, wherein the seat frame (36) includes a seat (37) and two handles (361) are located on two ends of the seat (37), the seat frame (36), the second link (33), the third link (34) and the first link (32) are moved downward when a user sits on the seat (37) and the downward movement moves the driving plate (31) to rotate the shaft (24) which rotates the driving wheel (25) and the link (23).

4. The device as claimed in claim 1, wherein a case (4) is mounted to the base (1) and two respective dust covers (5) are mounted to the second link (33) and the fourth link (35).

5. The device as claimed in claim 1, wherein the frame (11) includes two side plates (111) on two sides thereof and the output axle (271) of the fly wheel (27) is engaged with the two side plates (111).

6. The device as claimed in claim 1, wherein a connection plate (214) is connected to the pedal frame (21) and the first end of the crank (22) is pivotably connected to the connection plate (214).

7. The device as claimed in claim 1, wherein a disk (241) is fixed to the shaft (24) and connected to the driving wheel (25).

8. The device as claimed in claim 1, wherein the second end of the third link (34) is pivotably connected to a rear end of the transverse bar (13) and the first end of the fourth link (35) is pivotably connected to a front end of the transverse bar (13).

9. The device as claimed in claim 1, wherein the tilt bar (14) includes a through hole (141) and the shaft (24) extends through the through hole (141), two protrusions (142) extending from two sides of the tilt bar (14).

sions (142) extending from two sides of the tilt bar (14).

10. The device as claimed in claim 9, wherein the pedal frame (21) is an H-shaped frame and the securing portion (211) is a U-shaped.

11. The device as claimed in claim 10, wherein the U-shaped securing portion (211) includes two connection holes (212) with which the protrusions (142) on the tilt bar (14) are engaged.

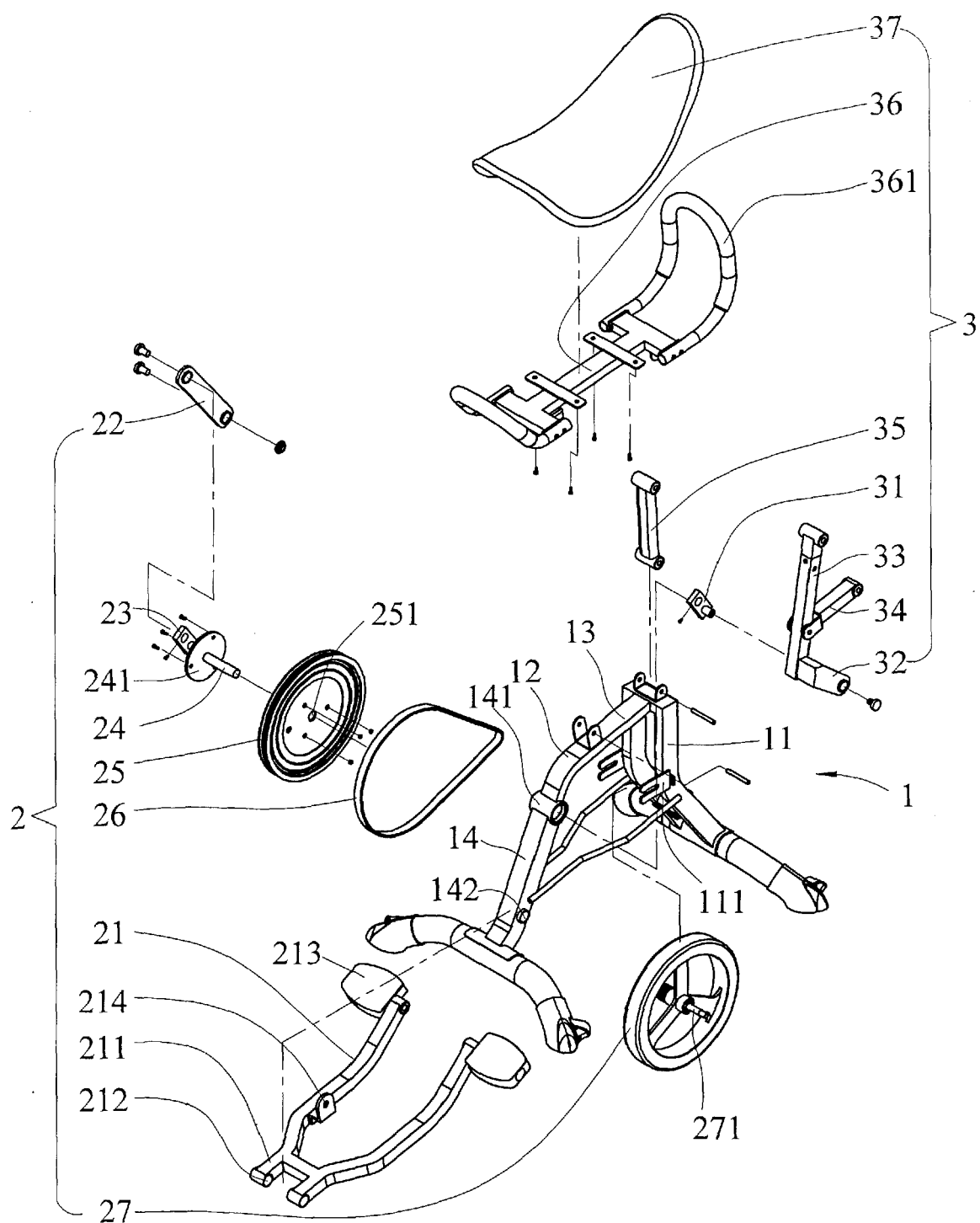


FIG. 1

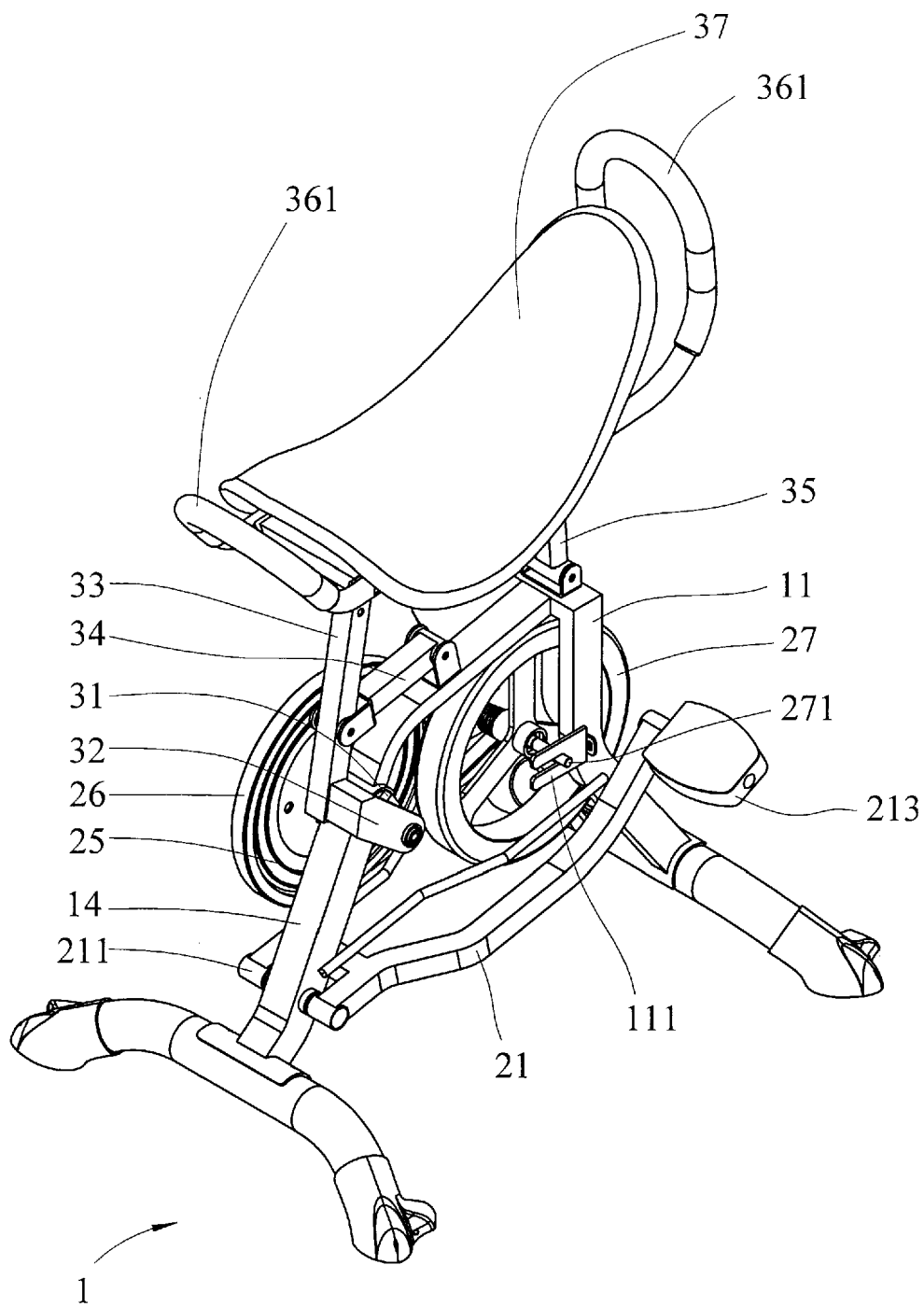


FIG. 2

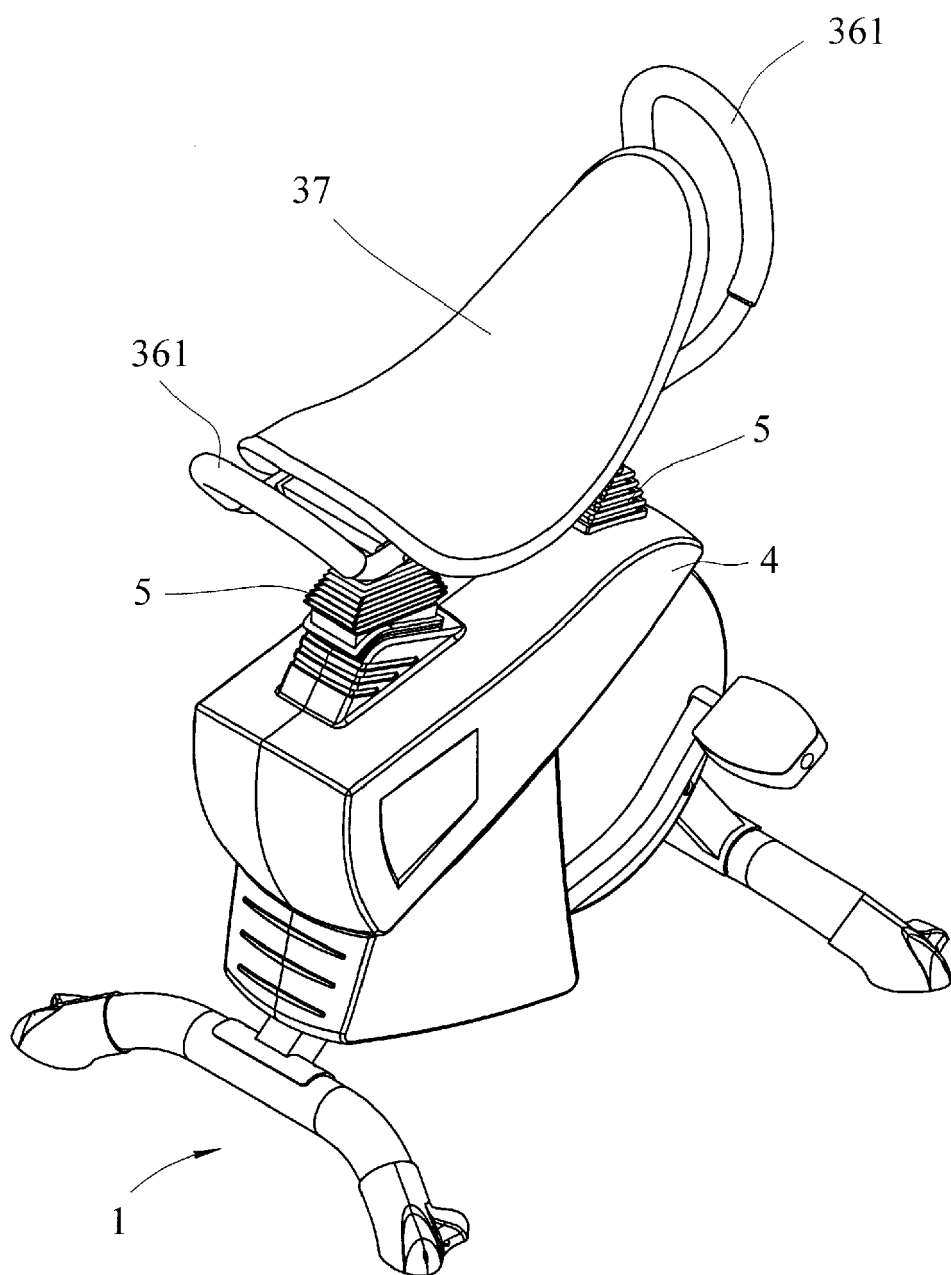


FIG. 3

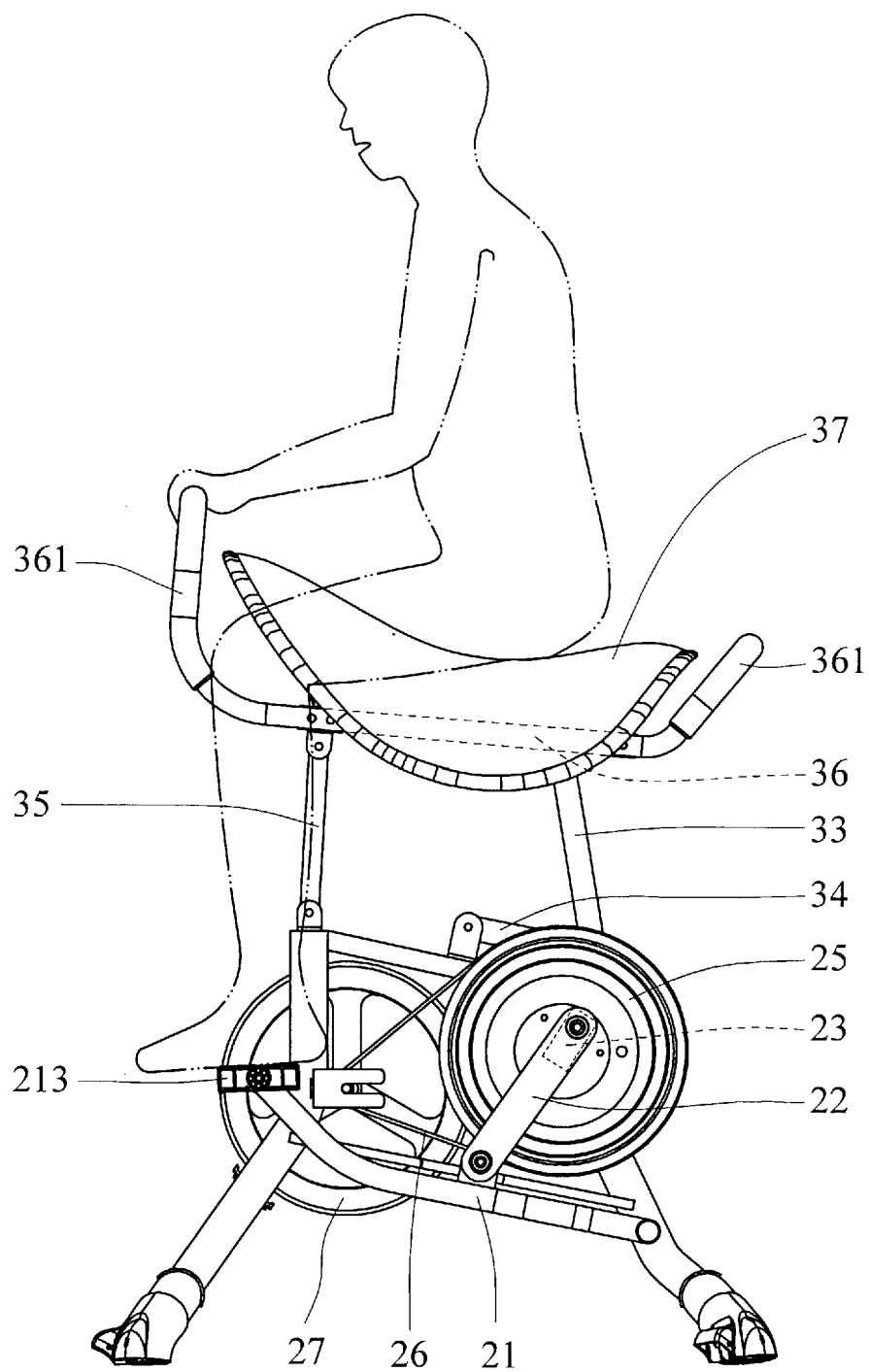


FIG. 4



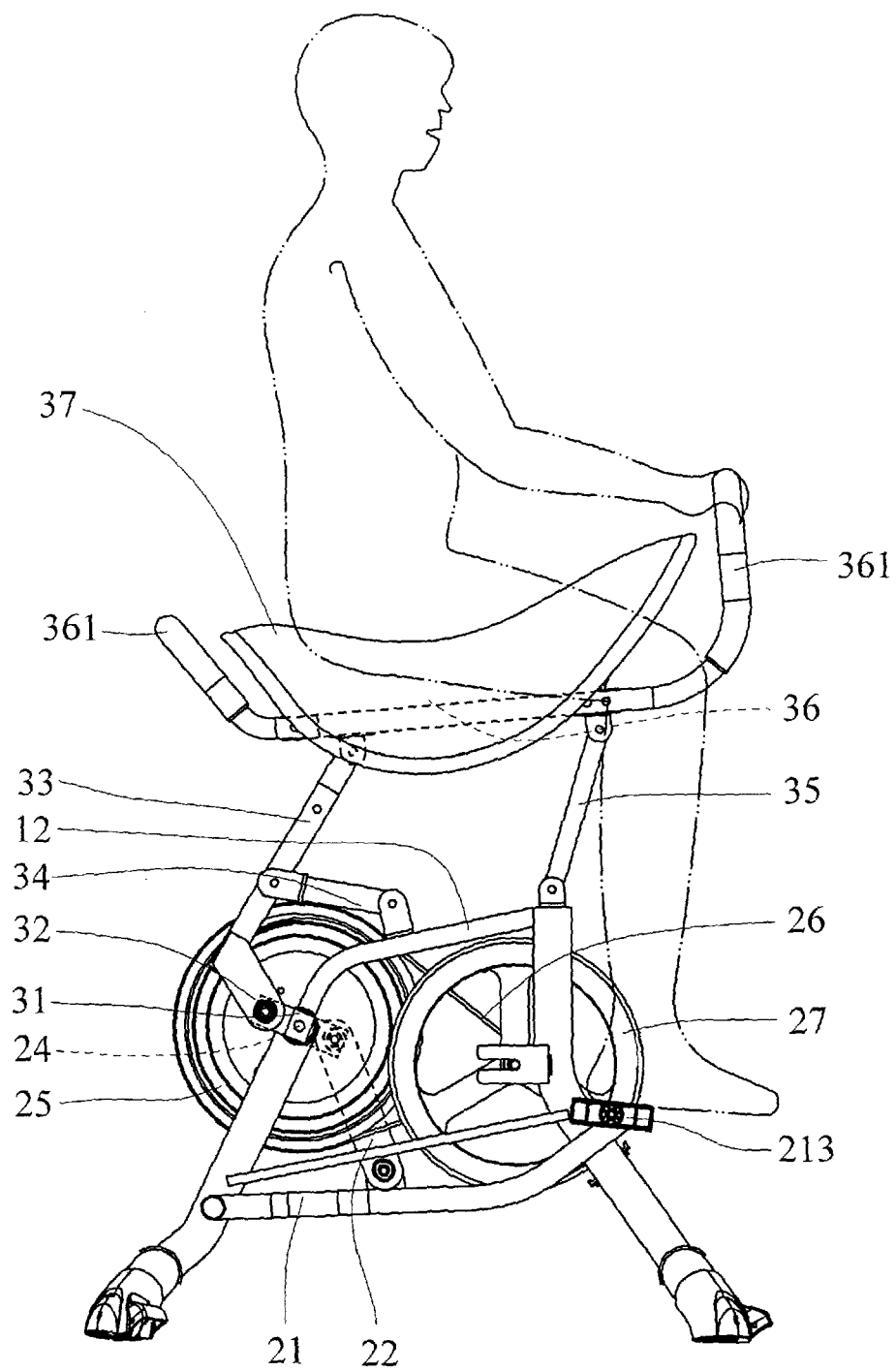


FIG. 5

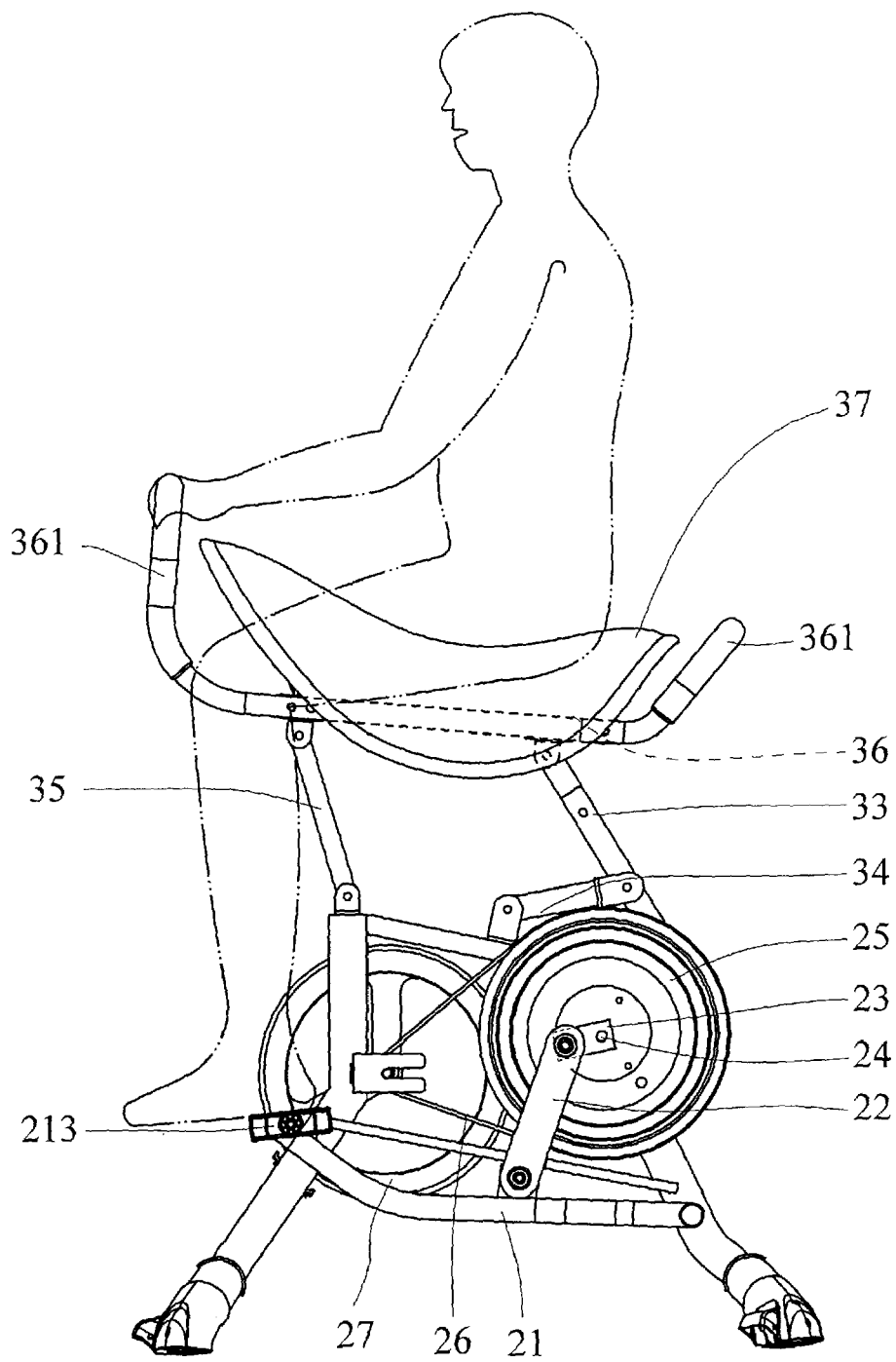


FIG. 6

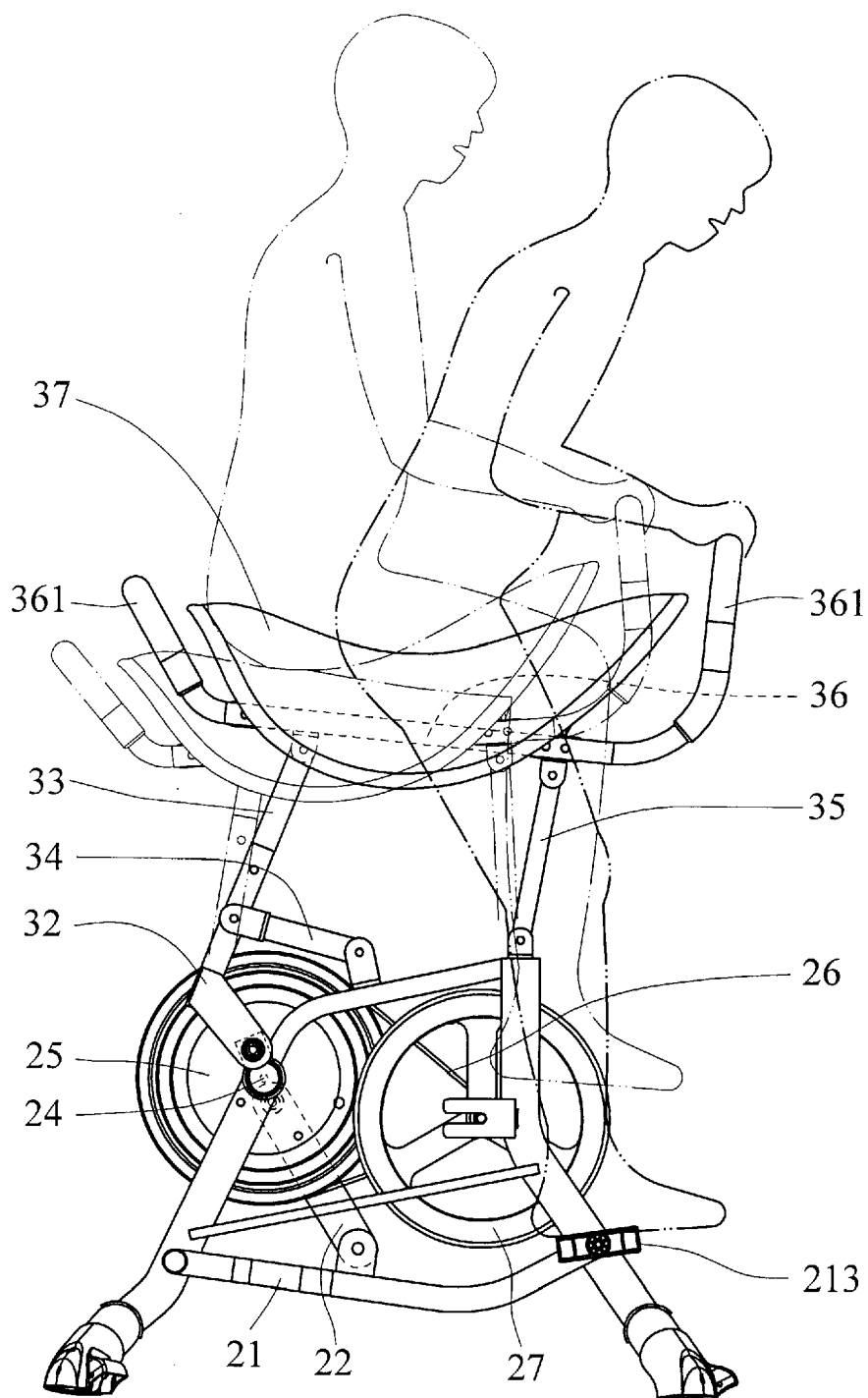


FIG. 7

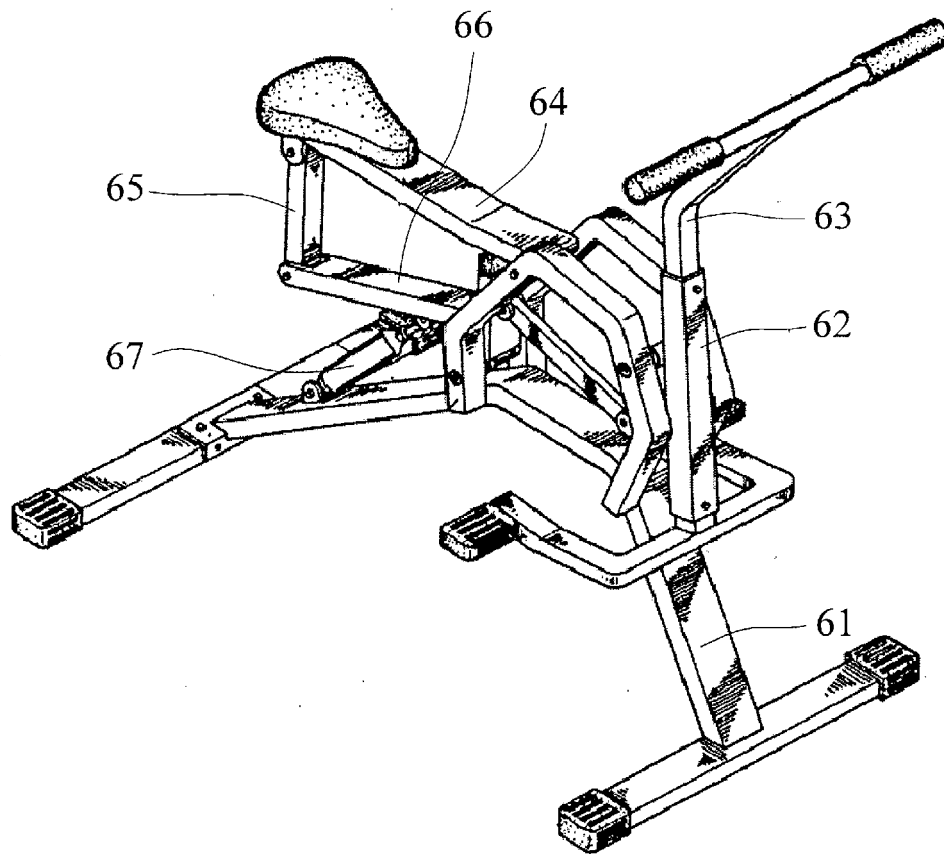


FIG. 8  
PRIOR ART

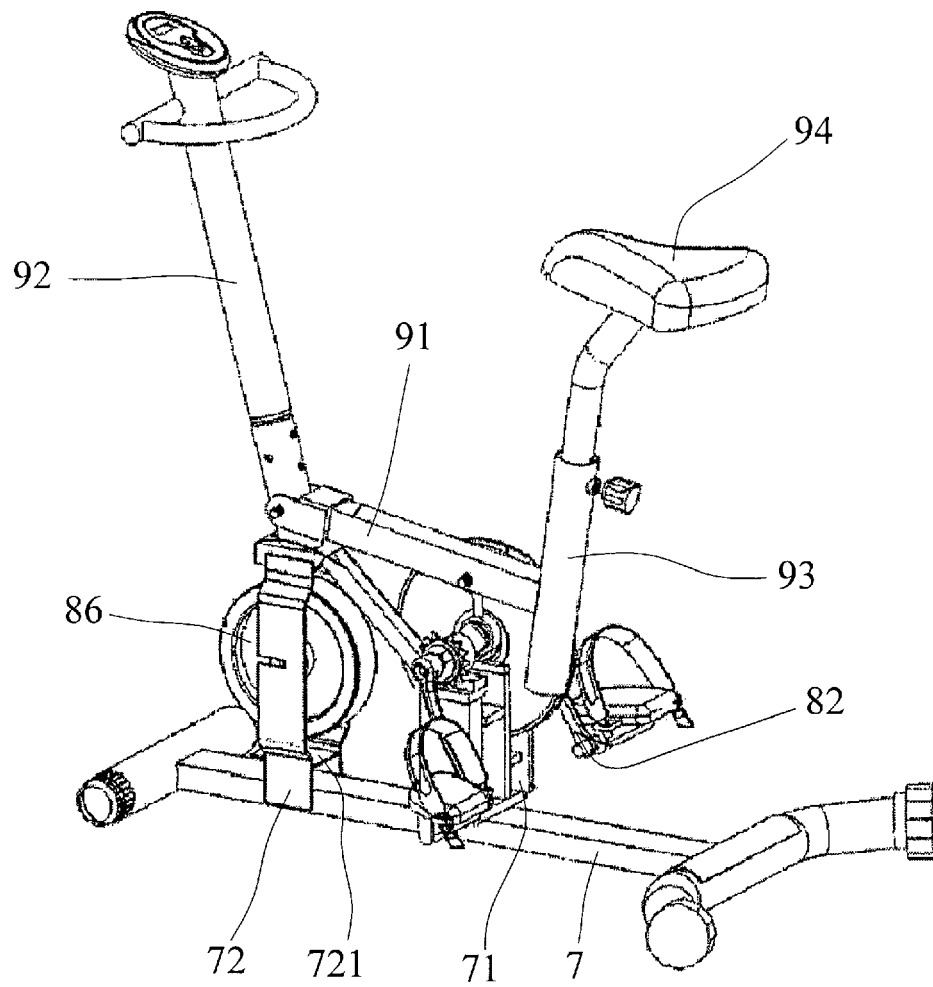


FIG. 9  
PRIOR ART

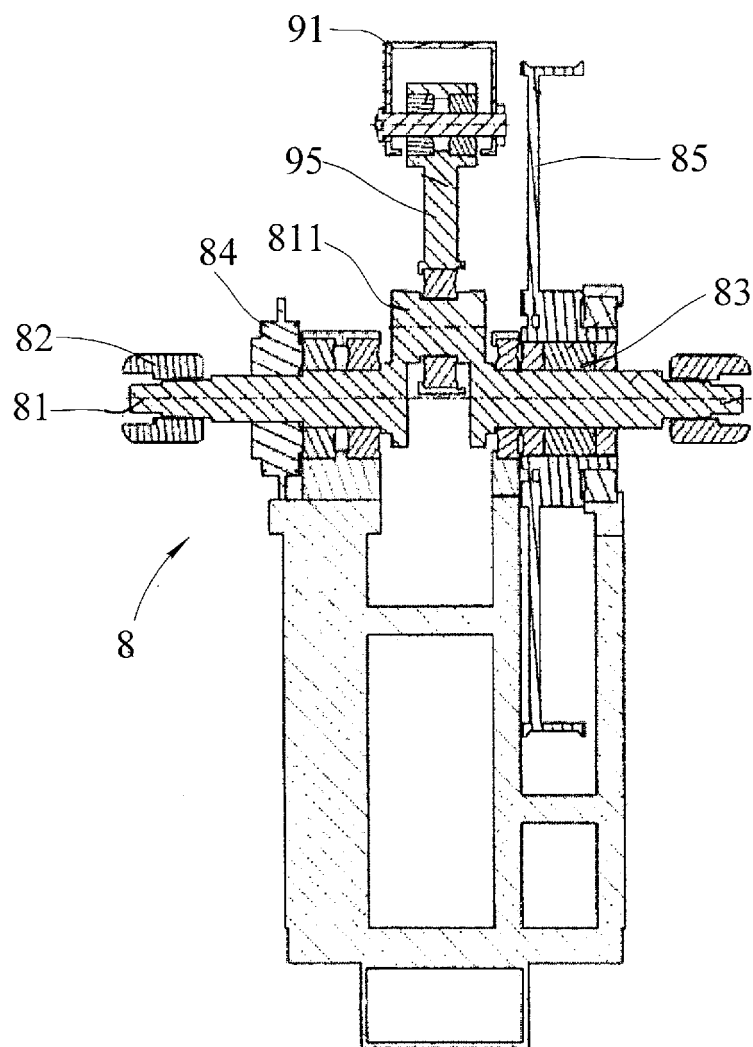


FIG. 10  
PRIOR ART



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 07 11 1757

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 December 2007	Examiner Teissier, Sara
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EPO FORM 1503 (03.02 (P04C01))

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

EP 07 11 1757

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