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(54) **Pace-adjusting mechanism of an elliptical cross trainer**

Tempoverstellvorrichtung eines Ellipsen- und Crosstrainers

Mécanisme de réglage de cadence d'un appareil d'exercice elliptique et au cross

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(56) References cited:
EP-A- 0 966 990
EP-A2- 1 568 399
US-A- 6 090 014
US-A1- 2005 181 910

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Description

1. Fields of the Invention

[0001] The invention relates to a pace-adjusting mechanism of an elliptical cross trainer, and more particularly, to a mechanism that can rapidly adjust the movement pace at will.

2. Description of the Related Art

[0002] The elliptical cross trainer is so used that the operator's feet can make an elliptical movement path, thereby simulating the real running and walking path. Moreover, the horizontal pace (simulating the movement on a flat ground) and the inclined pace (simulating the uphill and downhill movement) can be changed when the vertical position of the treadles of the elliptical cross trainer changes. This is the main intention of the invention.

[0003] US 6090013 discloses such a mechanism that employs a plurality of selection holes in treadle planks. By selecting a desired hole in the treadle plank for connection, the coupling angle of the treadle plank can be changed to achieve the above-mentioned pace-adjusting effect.

[0004] In fact, the manual adjustment of the aforementioned prior art is not a practical solution. This is because the operator has to stop the exercise for adjustment of the movement pace, thereby reducing the desire of using the elliptical cross trainer. Meanwhile, this adjustment way must affect the exercise rhythm. Thus, it is hardly possible to use the pace-adjusting mechanism during the exercise sessions so that this kind of the pace-adjusting mechanism is not so practical and valuable as expected.

SUMMARY OF THE INVENTION

[0005] It is an object of the invention to provide a pace-adjusting mechanism of an elliptical cross trainer that employs an electric adjusting mechanism instead of a manual adjusting mechanism. In this way, the operator can easily perform a desired adjustment during the exercise session without stopping the exercise and affecting the movement rhythm. Accordingly, the pace-adjusting mechanism of an elliptical cross trainer can be easily and practically used.

[0006] The closest prior art is US 2005/0181910 A1

[0007] According to the preamble of claim 1, US 2005/0181910 A1 relates to a pace-adjusting mechanism of an elliptical cross trainer comprising a frame unit having a bottom support frame and an electric adjusting mechanism, the electric adjusting mechanism having a motor, a guide spindle sleeve and a telescopic spindle.

[0008] The pace adjusting mechanism includes a pair of positioning rods. Each positioning rod has a first arm and a second arm, wherein an end of the first arm is connected to an end of the second arm at an angle of 90 degrees. The positioning rod is connected to an upright frame of the frame unit at the interconnection point of the two arms. The other end of the first arm is connected to a treadle plank. The other end of the second arm is connected to an adjustment mechanism. The two arms act as levers. Both levers cause an opposite torque equalizing each other.

[0009] Disadvantageously, such a lever construction results in an increased force impacting on the upright frame.

[0010] The object underlying the present invention is to provide an improved pace-adjusting mechanism for an elliptical cross trainer.

[0011] In order to achieve the above-mentioned object, an electric adjusting mechanism is employed to ensure a change of the supporting angle of a U-frame relative to a frame unit pivotally coupled thereto. Meanwhile, connecting rods are pivotally connected to treadle planks, respectively, thereby adjusting the position of the treadles and changing the movement pace.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The accomplishment of this and other objects of the invention will become apparent from the following description and its accompanying drawings of which:

FIG. 1 is a perspective view of a preferred embodiment of the invention;
FIG. 2 is a side view of the embodiment according to FIG. 1;
FIG. 3 is a schematic drawing of the adjustment of the invention;
FIG. 4 is a perspective view of another preferred embodiment of the invention; and
FIG. 5 is a perspective view of a further preferred embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring to FIGS. 1 through 3, a preferred embodiment of the invention includes a frame unit 10 and an electric adjusting mechanism 30.

[0014] The frame unit 10 of the elliptical cross trainer has a bottom support frame 18 at the front end thereof and a flywheel transmission unit at the rear end thereof. The flywheel transmission unit is covered by a protection hood 11 so that it is hidden in the figures. The flywheel transmission unit works in cooperation with two treadle planks 12 on which a treadle 21 is disposed for taking a treading exercise. Two movable handle rods 15 are interposed between two upright posts and pivotally mounted on a first crossbar 14. The bottom of the movable handle rods 15 is pivotally attached to a connecting rod 16. The other end of the connecting rod 16 is pivotally connected to the front section of the treadle plank 12, thereby creating a coupling action. Moreover, the top of the frame unit 10 is provided with a fixed handle rod 17.

[0015] The electric adjusting mechanism 30 is installed at the bottom of a front side of the frame unit 10. The electric adjusting mechanism 30 includes a motor 31, a guide spindle sleeve 32, and a telescopic spindle 33. A U-shaped coupling rod 19 is pivotally and laterally disposed on the bottom support frame 18. The electric adjusting mechanism 30 is interposed between the U-shaped coupling rod 19 and the frame unit 10.

[0016] As shown in FIGS. 2 and 3, when the guide spindle sleeve 32 is driven by the motor 31 to create a reciprocating in-place displacement of the telescopic spindle 33, it results in the adjustment of the relative angle of the U-shaped coupling rod 19. Besides, an L-shaped connecting rod 20 is pivotally coupled to each top side of the U-shaped coupling rod 19. The other end of the L-shaped connecting rod 20 is pivotally attached to the treadle plank 12. Therefore, the vertical position of the treadle planks 12 is adjustable by changing the angle of the U-shaped coupling rod 19. In this way, the adjustment of the exercise pace is achieved.

[0017] As shown in FIG. 4, the electric adjusting mechanism 30 can be alternatively installed at the middle section of the frame unit 10. In this way, a direct connection to the top of the U-shaped coupling rod 19 is ensured to achieve the same effect. Moreover, as shown in FIG. 5, an assembly allowance (or assembly gap) is existing when a pivoting element or a sliding element is installed. Therefore, the vibration is created between the pivoting and the sliding elements. In order to efficiently avoid the vibration, a telescopic support element 21 is interposed between the treadle plank 13 and the U-shaped coupling rod 19 for constantly support the U-shaped coupling rod 19 in place and protecting from vibration. The telescopic support element 21 can be a spring hydraulic cylinder, a pneumatic cylinder, or the like.

[0018] Many changes and modifications in the above-described embodiment of the invention can, of course, be carried out without departing from the scope thereof. Accordingly, to promote the progress in science and the useful arts, the invention is disclosed and is intended to be limited only by the scope of the appended claim.

Claims

1. A pace-adjusting mechanism of an elliptical cross trainer comprising a frame unit (10) having a bottom support frame (18) and an electric adjusting mechanism (30), the electric adjusting mechanism (30) having a motor (31), a guide spindle sleeve (32) and a telescopic spindle (33),
   characterized in that a U-shaped coupling rod (19) is pivotally and laterally disposed on the bottom support frame (18), the electric adjusting mechanism (30) being interposed between the U-shaped coupling rod (19) and the frame unit (10), wherein, when the telescopic spindle (33) is driven to be moved, it results in the adjustment of the relative angle of the U-shaped coupling rod (19), and wherein an L-shaped connecting rod (20) is pivotally coupled to each top side of the U-shaped coupling rod (19) while the end of the L-shaped connecting rod (20) is pivotally attached to a treadle plank (12) so that the vertical position of the treadle planks (12) is adjustable by changing the angle of the U-shaped coupling rod (19) and, therefore, the adjustment of the exercise pace is achieved.

2. The pace-adjusting mechanism of an elliptical cross trainer as claimed in claim 1,
   characterized in that a telescopic support element (21) is provided for supporting the U-shaped coupling rod (19).

Patentansprüche

1. Tempoverstellvorrichtung eines Ellipsen- und Crosstrainers, die eine Rahmeneinheit (10) aufweist, die einen Bodenhalterungsrahmen (18) und einen elektrischen Einstellmechanismus (30) hat, wobei der elektrische Einstellmechanismus (30) einen Motor (31), eine Führungsspindelhülse (32) und eine Teleskopspindel (33) aufweist,
   dadurch gekennzeichnet,
   dass eine U-förmige Kupplungsstange (19) drehbar und seitlich versetzt an dem Bodenhalterungsrahmen (18) angebracht ist, dass der elektrische Einstellmechanismus (30) zwischen der U-förmigen Kupplungsstange (19) und der Rahmeneinheit (10) angebracht ist, wobei bei Antrieb der Teleskopspindel (33) für ihre Bewegung es zu einer Einstellung des relativen Winkels der U-förmigen Kupplungsstange (19) kommt und wobei eine L-förmige Verbindungsstange (20) drehbar mit jedem oberen Ende der U-förmigen Kupplungsstange (19) verbunden ist, während das Ende der L-förmigen Kupplungsstange (20) drehbar an einer Pedalstange (12) angebracht ist, so dass die vertikale Stellung der Pedalstangen (12) dadurch einstellbar ist, dass der Winkel der U-förmigen Kupplungsstange (19) geändert wird und damit das Übungstempo einstellbar ist.

2. Tempoverstellvorrichtung eines Ellipsen- und Crosstrainers nach Anspruch 1,
   dadurch gekennzeichnet,
   dass ein teleskopisches Stützelement (20) vorgesehen ist, das die U-förmige Kupplungsstange (19) unterstützt.

Revendications

1. Mécanisme de réglage de cadence d'un exerciseur elliptique, comprenant une unité de cadre (10) ayant un cadre de support inférieur (18) et un mécanisme

de réglage électrique (30), le mécanisme de réglage électrique (30) comprenant un moteur (31), un manchon de tige de guidage (32) et une tige télescopique (33),

caractérisé par le fait

qu'une barre de couplage en forme de U (19) est disposée de manière pivotante et latéralement sur le cadre de support inférieur (18), le mécanisme de réglage électrique (30) étant interposé entre la barre de couplage en forme de U (19) et l'unité de cadre (10), dans lequel, lorsque la tige télescopique (33) est entraînée pour être déplacée, cela conduit au réglage de l'angle relatif de la barre de couplage en forme de U (19), et dans lequel une barre de liaison en forme de L (20) est couplée de manière pivotante à chaque côté supérieur de la barre de couplage en forme de U (19) tandis que l'extrémité de la barre de liaison en forme de L (20) est fixée de manière pivotante à une planche de pédale (12), de telle sorte que la position verticale des planches de pédale (12) est réglable par changement de l'angle de la barre de couplage en forme de U (19) et, par conséquent, le réglage de la cadence d'exercice est obtenu.

2. Mécanisme de réglage de cadence d'un exerciseur elliptique selon la revendication 1,

caractérisé par le fait

qu'un élément de support télescopique (21) est disposé pour supporter la barre de couplage en forme de U (19).

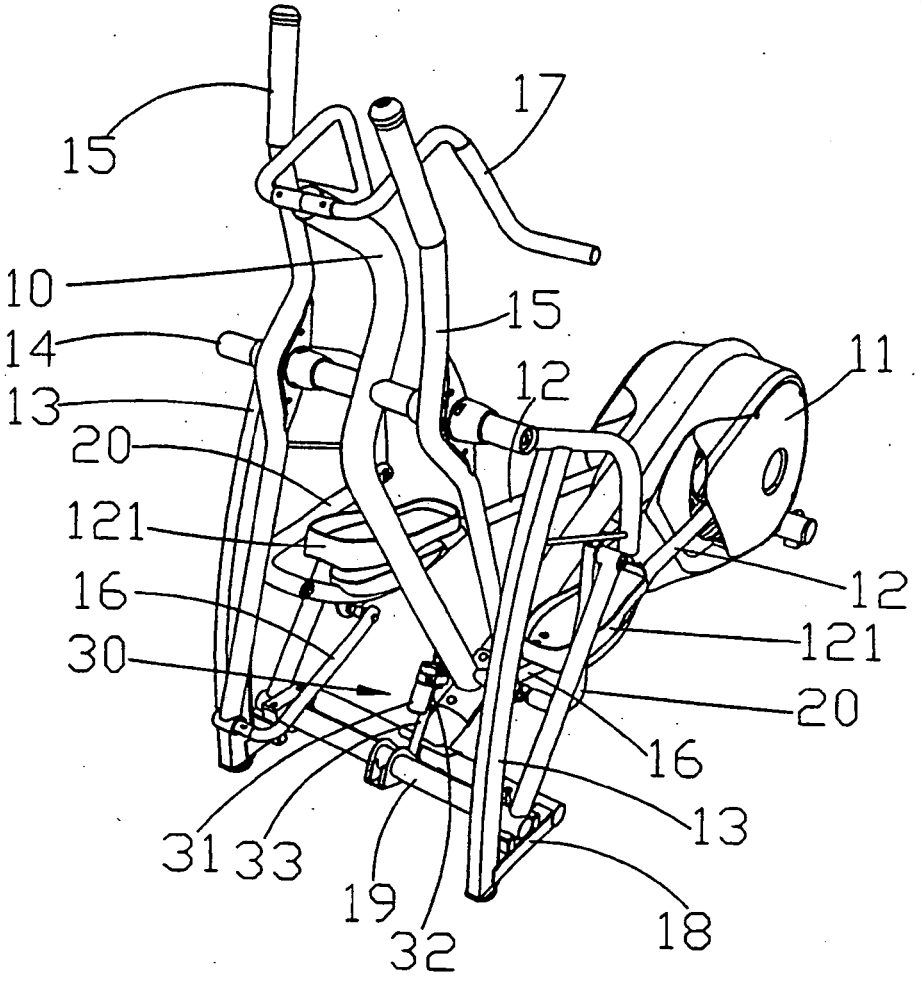

FIG.1

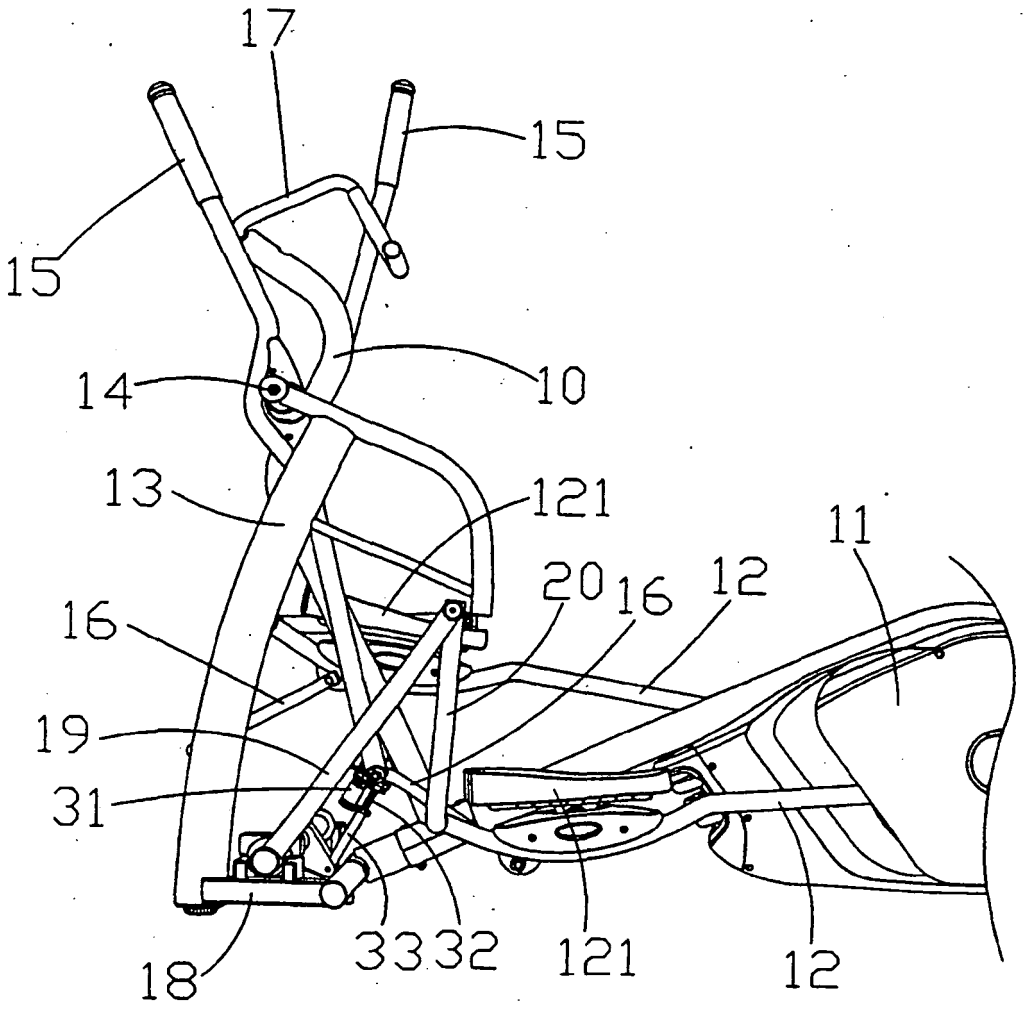

FIG.2

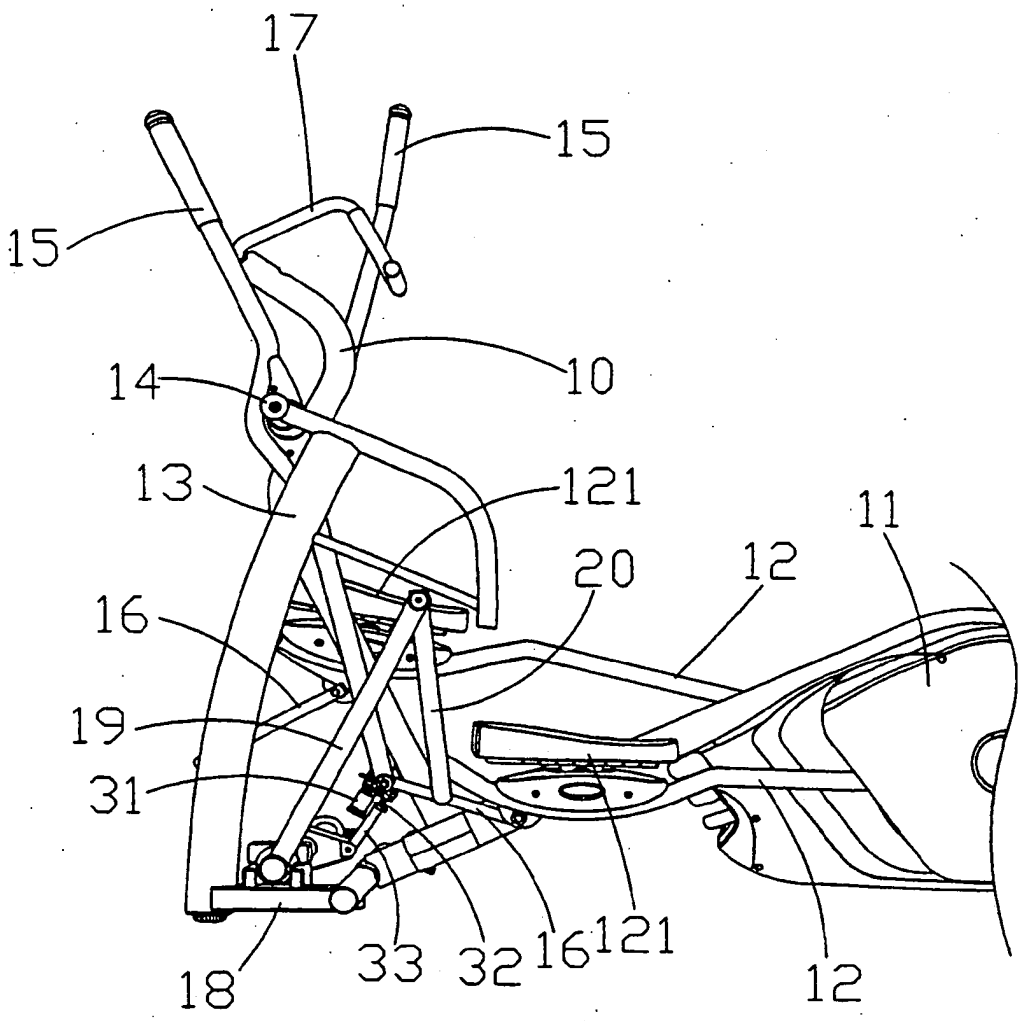

FIG.3

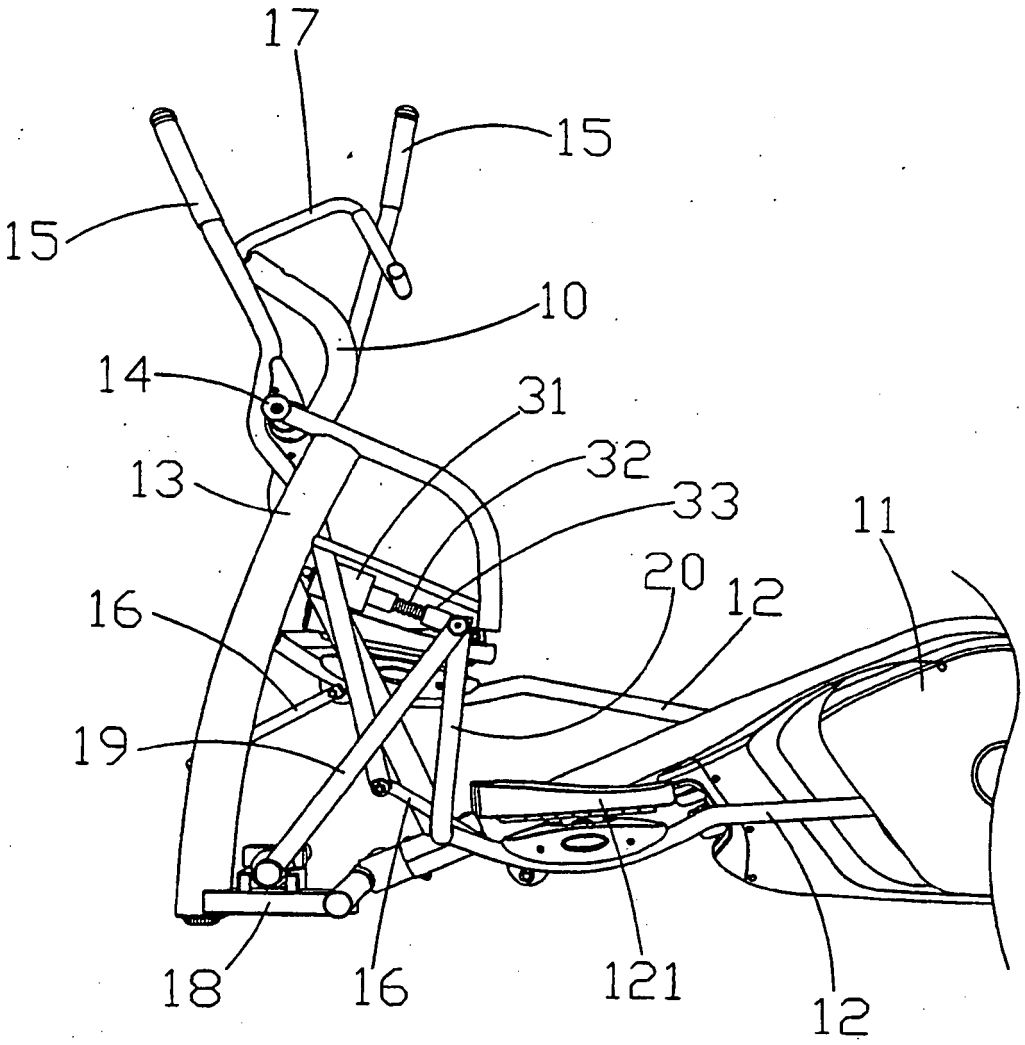

FIG.4

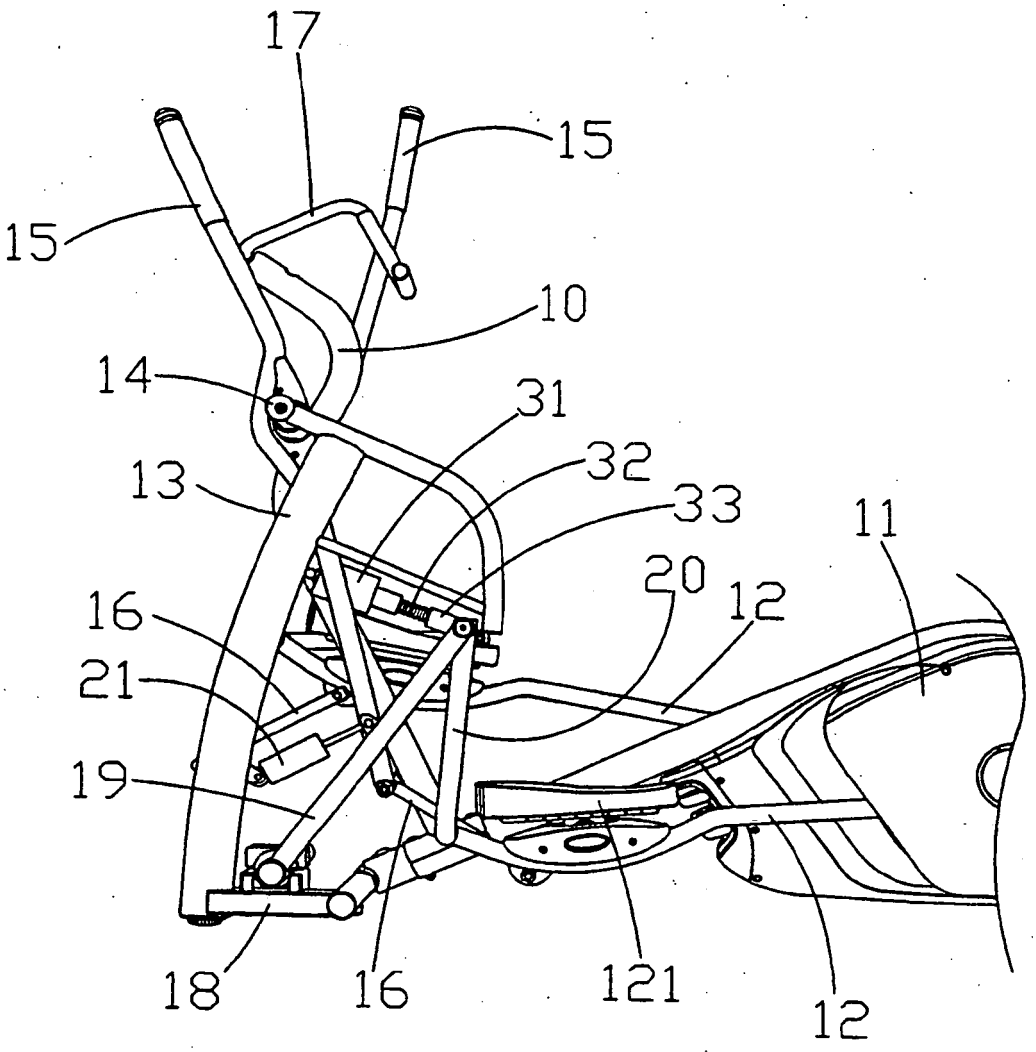

FIG.5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6090013 A **[0003]**
- US 20050181910 A1 **[0006] [0007]**