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(54) **ELLIPTICAL EXERCISER**

(57) An elliptical exerciser includes a frame, first and second magnetic control wheel units, first and second swing levers, first and second transmission rods, first and second guiding mechanisms, first and second pedal rods, and a magnetic mechanism. When the first and second swing levers and the first and second transmis-

sion rods are swung forward and rearward synchronously and the first and second pedal rods are pedaled up and down to slide forward and rearward, the first and second pedal rods pivotally connected with bottom ends of the first and second swing levers are to do a tread motion of an elliptical trajectory.

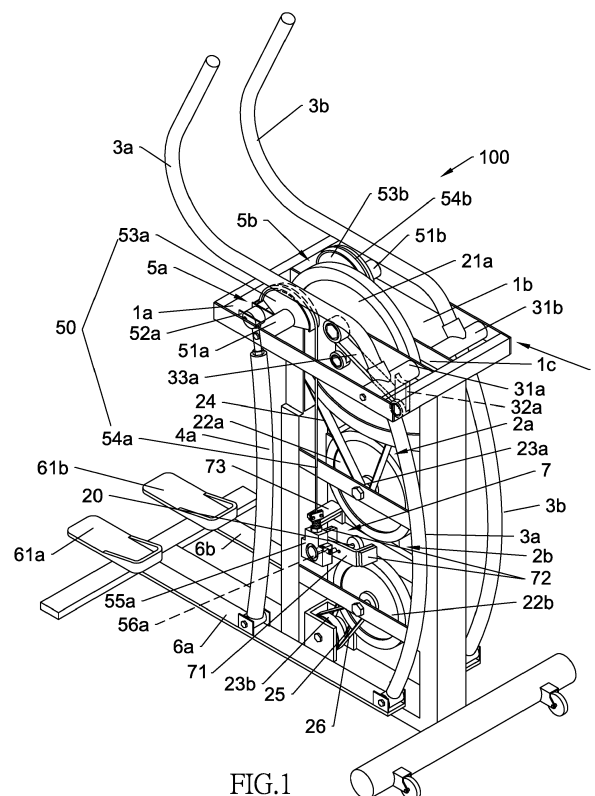


FIG.1

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an elliptical exerciser, and more particularly to an elliptical exerciser which is able to control the resistance of the elliptical exerciser separately when swung or pedaled or both.

2. Description of the Prior Art

[0002] In the field of exercise machines, an elliptical exerciser is a common machine. The use is simple. Both hands and both feet do exercise like running. The tread motion is in the way of elliptical trajectory, so it is called as an elliptical machine or an elliptical exerciser. However, the magnetic control of a conventional elliptical machine is focused on the resistance control of swing levers that swing forward and backward. Because the up and down tread resistance of pedal rods is linked by connecting rods, the structure is extremely complex. As a result, the entire elliptical machine is large in size to increase the transportation cost and occupy space.

[0003] Another shortcoming is that the resistance of both hands and the resistance of both feet are different. If the resistances of both hands and both feet are the same, it is unable to get the deserved exercise effect. The motion of both feet must accommodate to the motion of both hands. Under only one control, it cannot obtain the deserved exercise and fitness effect.

[0004] Accordingly, the inventor of the present invention has devoted himself based on his many years of practical experiences to solve these problems.

SUMMARY OF THE INVENTION

[0005] The primary object of the present invention is to provide an elliptical exerciser. The elliptical exerciser comprises a frame, first and second magnetic control wheel units, first and second swing levers, first and second transmission rods, first and second guiding mechanisms, first and second pedal rods, and a magnetic mechanism which are respectively disposed in a first frame portion, a second frame portion, and a central frame portion of the frame. When the first and second swing levers and the first and second transmission rods are swung forward and rearward synchronously and the first and second pedal rods are pedaled up and down to slide forward and rearward, the first and second pedal rods pivotally connected with bottom ends of the first and second swing levers are to do a tread motion of an elliptical trajectory.

[0006] The first and second magnetic control wheel units comprise first and second transmission wheels, first and second magnetic control wheels, first and second belt pulleys, and first, second and third transmission

belts. The first belt wheel is disposed on the pivot of the first magnetic control wheel. Through the first transmission belt, the first transmission wheel brings the first magnetic control wheel to rotate. The first magnetic control wheel and the first belt pulley are coaxially disposed at a middle section of the central frame portion and located under the first transmission wheel. The second magnetic control wheel unit is disposed under the first magnetic control wheel unit. The second transmission wheel is pivoted to a lower section of the first frame portion. The second magnetic control wheel is disposed under the second transmission wheel. The second magnetic control wheel is disposed at the lower section of the first frame portion. The second belt pulley is disposed under the second magnetic control wheel. Through the second transmission belt and the third transmission belt, the second belt pulley links the second transmission wheel and the second magnetic control wheel to rotate, respectively.

[0007] The first and second swing levers are located two sides of the first and second magnetic control wheel units, respectively. Central sections of the first and second swing levers are connected to first and second swing shafts located at front ends of the first and second frame portions, respectively. The bottoms of the first and second swing shafts are pivotally connected to front ends of the first and second pedal rods. First ends of the first and second connecting rods are pivotally connected to first and second fixing seats of the first and second swing shafts, respectively. Second ends of the first and second connecting rods are pivotally connected to two sides of the pivot of the first transmission wheel respectively, enabling the first and second swing levers to swing, such that the first and second connecting rods drive the first transmission wheel by turns to rotate.

[0008] The first and second transmission rods are pivotally connected to central sections of the first and second pedal rods, respectively. Upper ends of the first and second transmission rods are pivotally connected to first and second pivotal seats. The first and second pivotal seats are fixed to first and second pivotal shafts, respectively. The first and second pivotal shafts are fixed to the first and second guiding mechanisms, respectively.

[0009] Front and rear ends of the first and second pivotal shafts are connected with the first and second pivotal seats of the first and second transmission rods and a guiding portion of the first and second guiding mechanisms, respectively. The first and second guiding mechanisms are connected with first and second eccentric shafts, respectively. The first and second eccentric shafts are provided with first and second cranks and a main shaft. The first and second cranks and the main shaft are coaxial. The main shaft penetrates the second transmission wheel.

[0010] The magnetic mechanism comprises a magnetic turning seat, first magnetic members, and second magnetic members. The magnetic turning seat is fixed to one side of the main shaft. The magnetic turning seat and the

first and second cranks are coaxial. The magnetic turning seat is provided with the first magnetic members. Because the second transmission wheel, or the first and second guiding members, or the first and second transmission rods link first and second ropes synchronously, the first magnetic members bring the first and second eccentric shafts to drive the magnetic turning seat to turn synchronously. The position that the first magnetic members pass through is at the overlapping position of the zero moment of the first and second eccentric shafts where the second magnetic members are fixed at a lower section of the central frame portion. The first and second magnetic members have the same polarity to provide a repulsive force. By means of the repulsive force of the first and second magnetic members of the magnetic turning seat, the first and second eccentric shafts are pushed away from the overlapping position of the zero moment so as to get out of jamming and provide a smooth turning.

[0011] Accordingly, the first magnetic control wheel is able to control the swing resistance of the first and second swing levers independently, enabling the first magnetic control wheel to control the resistance of the back and forth slide movement of the first and second pedal rods only. The second magnetic control wheel is able to control the resistance of the up and down tread motion of the first and second pedal rods independently. The first and second swing levers and the first and second pedal rods are swung and pedaled by turns to constitute a tread motion of an elliptical trajectory, such that the mixed resistances of both hands and both feet can control the resistance, respectively.

[0012] Preferably, the guiding portion of the first and second guiding mechanisms comprises first and second guiding members. The first and second ropes are fixed to front ends of the first and second guiding members, respectively. The first and second ropes are connected with the first and second eccentric shafts, respectively.

[0013] Preferably, the guiding portion the first and second guiding mechanisms comprises third and fourth pivotal seats and first and second guiding rods. The third and fourth pivotal seats are secured on the first and second pivotal shafts, respectively. The third and fourth pivotal seats are pivotally connected with the first and second guiding rods, respectively. The first and second guiding rods are connected with the first and second eccentric shafts.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 is a perspective view showing the right of the elliptical exerciser according to a first embodiment of the present invention;

FIG. 2 is a perspective view showing the left of the elliptical exerciser according to a first embodiment of the present invention;

FIG. 3 is a side planar view showing the right of the elliptical exerciser according to the first embodiment of the present invention;

FIG. 4 is a side planar view showing the left of the elliptical exerciser according to the first embodiment of the present invention;

FIG. 5 is an enlarged view showing the magnetic mechanism of the elliptical exerciser according to the first embodiment of the present invention;

FIG. 6 is an enlarged view showing the guiding mechanism of the elliptical exerciser according to the first embodiment of the present invention;

FIG. 7 is a schematic view showing that the elliptical exerciser of the first embodiment of the present invention is pedaled up and down;

FIG. 8 is a schematic view showing that the elliptical exerciser of the first embodiment of the present invention is pedaled in the way of elliptical trajectory;

FIG. 9 is a perspective view showing the right of the elliptical exerciser according to a second embodiment of the present invention;

FIG. 10 is a perspective view showing the left of the elliptical exerciser according to the second embodiment of the present invention;

FIG. 11 is a schematic view showing that the elliptical exerciser of the second embodiment of the present invention is pedaled up and down; and

FIG. 12 is a schematic view showing that the elliptical exerciser of the second embodiment of the present invention is pedaled in the way of elliptical trajectory.

FIG. 13 is depended on FIG.1 ~8 showing that second swing rods were set on the second pivotal seats of the present invention is pedaled in the way of elliptical trajectory.

FIG. 14 is depended on FIG.9~12 showing that second swing rods were set on the second pivotal seats of the present invention is pedaled in the way of elliptical trajectory.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings.

[0016] As shown in FIG. 1 through FIG. 13, an elliptical exerciser 100, 100' of the present invention comprises a

frame 1, first and second magnetic control wheel units 2a, 2b, first and second swing levers 3a, 3b, first and second transmission rods 4a, 4b, first and second guiding mechanisms 5a, 5b, first and second pedal rods 6a, 6b, and a magnetic mechanism 7.

[0017] The frame 1 has a first frame portion 1 a, a second frame portion 1 b, and a central frame portion 1c. Left and right sides of the central frame portion 1c are connected with the first frame portion 1 a and the second frame portion 1 b, respectively.

[0018] The first and second magnetic control wheel units 2a, 2b are disposed in the central frame portion 1c of the frame 1 in a top-down way. The first and second magnetic control wheel units 2a, 2b comprises first and second transmission wheels 21 a, 21 b, first and second magnetic control wheels 22a, 22b, and a first belt pulley 23. The first belt wheel 23a is disposed on the pivot of the first magnetic control wheel 21 a. Through a first transmission belt 24, the first transmission wheel 21 a brings the first magnetic control wheel 22a to rotate. The first transmission wheel 21 a is pivoted on the upper end of the central frame portion 1c. The first magnetic control wheel 22a and the first belt pulley 23 are coaxially disposed at the middle section of the central frame portion 1c and located under the first transmission wheel 21 a. The second magnetic control wheel unit 2b is disposed under the first magnetic control wheel unit 2a. The second transmission wheel 21 b is pivoted to the lower section of the first frame portion 1a. The second magnetic control wheel 22b is disposed under the second transmission wheel 21 b. The second magnetic control wheel 22b is disposed at the lower section of the first frame portion 1 a. A second belt pulley 23b is disposed under the second magnetic control wheel 22b. Through a second transmission belt 25 and a third transmission belt 26, the second belt pulley 23b links the second transmission wheel 21 b and the second magnetic control wheel 22b to rotate, respectively.

[0019] The first and second swing levers 3a, 3b are located two sides of the first and second magnetic control wheel units 2a, 2b, respectively. Central sections of the first and second swing levers 3a, 3b are connected to first and second swing shafts 31 a, 31 b located at front ends of the first and second frame portions 1 a, 1b, respectively. The bottoms of the first and second swing shafts 31 a, 31 b are pivotally connected to the front ends of the first and second pedal rods 6a, 6b. First ends of first and second connecting rods 33a, 33b are pivotally connected to first and second fixing seats 32a, 32b of the first and second swing shafts 31 a, 31 b, respectively. Second ends of the first and second connecting rods 33a, 33b are pivotally connected to two sides of the pivot of the first transmission wheel 21 a, respectively, enabling the first and second swing levers 3a, 3b to swing, such that the first and second connecting rods 33a, 33b drive the first transmission wheel 21 a by turns to rotate.

[0020] The first and second transmission rods 4a, 4b are pivotally connected to central sections of the first and

second pedal rods 6a, 6b, respectively. Upper ends of the first and second transmission rods 4a, 4b are pivotally connected to first and second pivotal seats 52a, 52b. The first and second pivotal seats 52a, 52b are fixed to first and second pivotal shafts 51 a, 51 b, respectively. The first and second pivotal shafts 51 a, 51 b are fixed to the first and second guiding mechanisms 5a, 5b, respectively. As shown in FIG. 1 through FIG. 8, the first and second guiding mechanisms 5a, 5b comprise the first and second pivotal shafts 51 a, 51 b, a guiding portion 50, first and second guiding members 53a, 53b, first and second ropes 54a, 54b, first and second eccentric shafts 55a, 55b, first and second cranks 56a, 56b, and a main shaft 20. The first and second pivotal seats 52a, 52b and the first and second guiding members 53a, 53b of the guiding portion 50 are located on the first and second pivotal shafts 51 a, 51 b. First ends of the first and second ropes 54a, 54b are fixed to rear ends of the first and second guiding members 53a, 53b, respectively. The first and second ropes 54a, 54b pass around the first and second guiding members 53a, 53b to be connected to the first and second eccentric shafts 55a, 55b, respectively. The axles of the eccentric shafts 55a, 55b are connected to first ends of the first and second cranks 56a, 56b. Second ends of the first and second cranks 56a, 56b function as the axle centers and are connected to the main shaft 20. The main shaft 20 passes through the second transmission wheel 21 b. The first and second cranks 56a, 56b and the first and second eccentric shafts 55a, 55b are located at two sides of the second transmission wheel 21 b, respectively.

[0021] Another embodiment of the elliptical exerciser 100' is shown in FIG. 9 to FIG. 12 (in cooperation with FIG. 1 to FIG. 8). The first magnetic control wheel 22a of the first magnetic control wheel unit 2a controls the resistance of the first and second swing levers 3a, 3b. The second magnetic control wheel 22b of the second magnetic control wheel unit 2b controls the resistance of the first and second pedal rods 6a, 6b. The first and second pedal rods 6a, 6b are pedaled by turns to bring the first and second transmission rods 4a, 4b, respectively, to guide the first and second guiding mechanisms 5a, 5b by turns. A guiding portion 50' of first and second guiding mechanisms 5a', 5b' is disposed on the first and second pivotal shafts 51 a, 51 b. The foresaid first and second pivotal seats 52a, 52b are kept. The first and second guiding members 53a, 53b of the first embodiment are replaced with third and fourth pivotal seats 53a', 53b', and the first and second ropes 54a, 54b are replaced with first and second guiding rods 54a', 54b', with the equivalent replacement to constitute another embodiment of the present invention. Thus, the first and second transmission rods 4a, 4b are to push and pull the first and second guiding rods 54a', 54b' by turns for the first and second guiding mechanisms 5a', 5b' to bring the first and second eccentric shafts 55a, 55b to turn. The first and second eccentric shafts 55a, 55b are pivotally connected to the first and second cranks 56a, 56b respec-

tively, enabling the first and second eccentric shafts 55a, 55b to turn at different positions so as to drive the second magnetic control wheel 22b and control the resistance of the first and second pedal rods 6a, 6b. The operation and function of both embodiments are the same.

[0022] As shown in FIG. 1 through FIG. 8, the magnetic mechanism 7 comprises a magnetic turning seat 71, first magnetic members 72, and second magnetic members 73. The magnetic turning seat 71 is fixed to one side of the main shaft 20. The magnetic turning seat 71 and the first and second cranks 56a, 56b are axial. The magnetic turning seat 71 is provided with the first magnetic members 72. Because the second transmission wheel 21 b, the first and second guiding members 53a, 53b, and the first and second transmission rods 4a, 4b link the first and second ropes 54a, 54b, the first magnetic members 72 bring the first and second eccentric shafts 55a, 55b to drive the magnetic turning seat 71 to turn synchronously. The position that the first magnetic members 72 pass therethrough is just located at the overlapping position of the zero moment of the first and second eccentric shafts 55a, 55b where the second magnetic members are fixed at the lower end of the central frame portion 1 c. The first and second magnetic members 72, 73 have the same polarity to provide a repulsive force. By means of the repulsive force of the first and second magnetic members 72, 73 of the magnetic turning seat 71, the first and second eccentric shafts 55a, 55b are pushed away from the overlapping position of the zero moment so as to get out of jamming and provide a smooth turning.

[0023] As shown in FIG. 9 through FIG. 12, the magnetic mechanism 7 comprises a magnetic turning seat 71, first magnetic members 72, and second magnetic members 73. The magnetic turning seat 71 is fixed to one side of the main shaft 20. The magnetic turning seat 71 and the first and second cranks 56a, 56b are axial. The magnetic turning seat 71 is provided with the first magnetic members 72. Because the second transmission wheel 21 b, the third and fourth pivotal seats 53a', 53b', and the first and second transmission rods 4a, 4b link the first and second guiding rods 54a', 54b', the first magnetic members 72 bring the first and second eccentric shafts 55a, 55b to drive the magnetic turning seat 71 to turn synchronously. The position that the first magnetic members 72 pass therethrough is just located at the overlapping position of the zero moment of the first and second eccentric shafts 55a, 55b where the second magnetic members 73 are fixed at the lower end of the central frame portion 1 c. The first and second magnetic members 72, 73 have the same polarity to provide a repulsive force. By means of the repulsive force of the first and second magnetic members 72, 73 of the magnetic turning seat 71, the first and second eccentric shafts 55a, 55b are pushed away from the overlapping position of the zero moment so as to get out of jamming and provide a smooth turning.

[0024] As shown in FIG. 1 through FIG. 12, the first and second pedal rods 6a, 6b comprise first and second

pedals 61 a, 61 b fixed at rear ends thereof. The bottom ends of the first and second transmission rods 4a, 4b are pivotally connected to the middle sections of the first and second pedal rods 6a, 6b. The bottom ends of the first and second swing rods 3a, 3b are pivotally connected to the front sections of the first and second pedal rods 6a, 6b. Through the first and second swing rods 3a, 3b to swing by turns, the first and second pedal rods 6a, 6b slide back and forth. The first and second pedal rods 6a, 6b are pedaled up and down to guide the first and second transmission rods 4a, 4b to link the first and second pivotal seats 52a, 52b respectively, such that the first and second pivotal shafts 51 a, 51 b are reciprocated clockwise and counterclockwise to bring the first and second guiding members 53a, 53b (as shown in FIG. 1 to FIG. 8) or the third and fourth pivotal seats 53a', 53b' (as shown in FIG. 9 to FIG. 12) to turn synchronously, enabling the first and second ropes 54a, 54b (as shown in FIG. 1 to FIG. 8) secured on the first and second guiding members 53a, 53b or the first and second guiding rods 54a', 54b' (as shown in FIG. 9 to FIG. 12) on the third and fourth pivotal seats 53a', 53b' to reciprocate the first and second eccentric shafts 55a, 55b with the first and second cranks 56a, 56b as the axles for pulling by turns so as to turn left or right. This won't influence the first and second pedal rods 6a, 6b to move forward or rearward.

[0025] As shown in FIG. 13 is depended on FIG. 1~8 showing, the second swing rods 3a, 3b were set on the second pivotal seats 52a, 52b respectively. When the user grasps the first and second swing rods 3a, 3b swing back and forth to control second pivotal seats 52a, 52b curved swing up and down and pedals the first and second pedals 61 a, 61 b of the first and second pedal rods 6a, 6b up and down.

[0026] As shown in FIG. 14 is depended on FIG. 9~12 showing, the second swing rods 3a, 3b were set on the second pivotal seats 52a, 52b respectively. When the user grasps the first and second swing rods 3a, 3b swing back and forth to control second pivotal seats 52a, 52b curved swing up and down and pedals the first and second pedals 61 a, 61 b of the first and second pedal rods 6a, 6b up and down.

[0027] Furthermore, as shown in FIG. 1 to FIG. 14, when in use, the user grasps the first and second swing levers 3a, 3b to swing back and forth and pedals the first and second pedals 61 a, 61 b of the first and second pedal rods 6a, 6b up and down. The aforesaid independent swing and the tread motion can be carried out simultaneously by means of the first and second swing levers 3a, 3b to swing and the first and second pedal rods 6a, 6b pivotally connected with the bottom ends of the first and second swing levers 3a, 3b to move up and down, such that the user can pedal on the first and second pedals 61 a, 61 b of the first and second pedal rods 6a, 6b respectively to do tread exercise of elliptical trajectory up and down as well as back and forth.

[0028] Accordingly, the first magnetic control wheel 22a is able to control the swing resistance of the first and

second swing levers 3a, 3b independently, enabling the first magnetic control wheel 22a to control the resistance of the back and forth slide movement of the first and second pedal rods 6a, 6b only. The second magnetic control wheel 22b is able to control the resistance of the up and down tread movement of the first and second pedal rods 6a, 6b independently. The first and second swing levers 3a, 3b and the first and second pedal rods 6a, 6b are swung and pedaled by turns to constitute a tread motion of an elliptical trajectory, such that the mixed resistances of both hands and both feet can control the resistance respectively. The structure is simple, the size is small, the cost is lower, and is a great benefit to use.

[0029] Although particular embodiments of the present invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the present invention. Accordingly, the present invention is not to be limited except as by the appended claims.

Claims

1. An elliptical exerciser, comprising a frame, first and second magnetic control wheel units, first and second swing levers, first and second transmission rods, first and second guiding mechanisms, first and second pedal rods, and a magnetic mechanism which are respectively disposed in a first frame portion, a second frame portion, and a central frame portion of the frame, wherein when the first and second swing levers and the first and second transmission rods are swung forward and rearward synchronously and the first and second pedal rods are pedaled up and down to slide forward and rearward, the first and second pedal rods pivotally connected with bottom ends of the first and second swing levers are to do a tread motion of an elliptical trajectory, **characterized by:**

the first and second magnetic control wheel units comprising first and second transmission wheels, first and second magnetic control wheels, first and second belt pulleys, and first, second and third transmission belts, the first belt wheel being disposed on a pivot of the first magnetic control wheel, through the first transmission belt, the first transmission wheel bringing the first magnetic control wheel to rotate, the first magnetic control wheel and the first belt pulley being coaxially disposed at a middle section of the central frame portion and located under the first transmission wheel; the second magnetic control wheel unit being disposed under the first magnetic control wheel unit, the second transmission wheel being pivoted to a lower section of the first frame portion, the second magnetic control wheel being disposed under the second transmission wheel, the second magnetic con-

trol wheel being disposed at the lower section of the first frame portion, the second belt pulley being disposed under the second magnetic control wheel, through the second transmission belt and the third transmission belt, the second belt pulley linking the second transmission wheel and the second magnetic control wheel to rotate respectively;

the first and second swing levers being located two sides of the first and second magnetic control wheel units respectively, central sections of the first and second swing levers being connected to first and second swing shafts located at front ends of the first and second frame portions respectively, bottoms of the first and second swing shafts being pivotally connected to front ends of the first and second pedal rods; first ends of the first and second connecting rods being pivotally connected to first and second fixing seats of the first and second swing shafts respectively, second ends of the first and second connecting rods being pivotally connected to two sides of a pivot of the first transmission wheel respectively, enabling the first and second swing levers to swing, such that the first and second connecting rods drive the first transmission wheel by turns to rotate;

the first and second transmission rods being pivotally connected to central sections of the first and second pedal rods respectively, upper ends of the first and second transmission rods being pivotally connected to first and second pivotal seats, the first and second pivotal seats being fixed to first and second pivotal shafts respectively, the first and second pivotal shafts being fixed to the first and second guiding mechanisms respectively;

front and rear ends of the first and second pivotal shafts being connected with the first and second pivotal seats of the first and second transmission rods and a guiding portion respectively, the first and second guiding mechanisms being connected with first and second eccentric shafts respectively, the first and second eccentric shafts being provided with first and second cranks and a main shaft, the first and second cranks and the main shaft being coaxial, the main shaft penetrating the second transmission wheel;

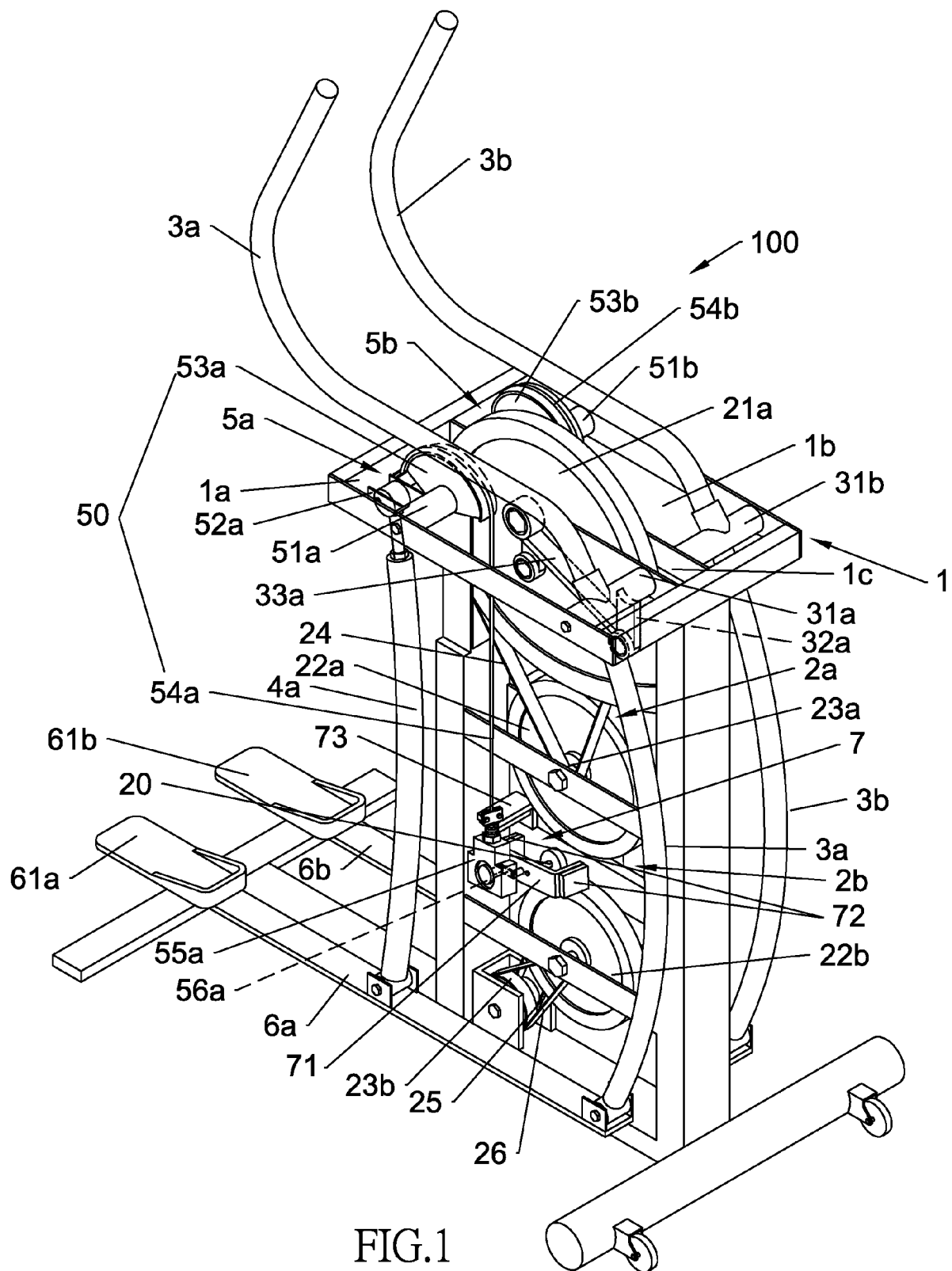
the magnetic mechanism comprising a magnetic turning seat, first magnetic members, and second magnetic members, the magnetic turning seat being fixed to one side of the main shaft, the magnetic turning seat and the first and second cranks being coaxial, the magnetic turning seat being provided with the first magnetic members, because the second transmission wheel, or the first and second guiding members, or the first and second transmission rods link first and

second ropes synchronously, the first magnetic members bringing the first and second eccentric shafts to drive the magnetic turning seat to turn synchronously, a position that the first magnetic members pass therethrough being at an overlapping position of a zero moment of the first and second eccentric shafts where the second magnetic members are fixed at a lower section of the central frame portion, the first and second magnetic members having the same polarity to provide a repulsive force, by means of the repulsive force of the first and second magnetic members of the magnetic turning seat, the first and second eccentric shafts being pushed away from the overlapping position of the zero moment so as to get out of jamming and provide a smooth turning.

2. The elliptical exerciser as claimed in claim 1, wherein the guiding portion of the first and second guiding mechanisms comprises first and second guiding members and the first and second ropes, the first and second guiding members are secured on the first and second pivotal shafts respectively, the first and second ropes are fixed to front ends of the first and second guiding members respectively, and the first and second ropes pass around the first and second guiding members to be located at rear ends of the first and second guiding members and connected with the first and second eccentric shafts, respectively.
3. The elliptical exerciser as claimed in claim 1, wherein the guiding portion the first and second guiding mechanisms comprises third and fourth pivotal seats and first and second guiding rods, the third and fourth pivotal seats are secured on the first and second pivotal shafts respectively, upper ends of the first and second guiding rods are pivotally connected to the third and fourth pivotal seats respectively, and the upper ends of the first and second guiding rods are connected with the first and second eccentric shafts.
4. The elliptical exerciser as claimed in claim 1, wherein the second swing rods could be set on the second pivotal seats respectively.

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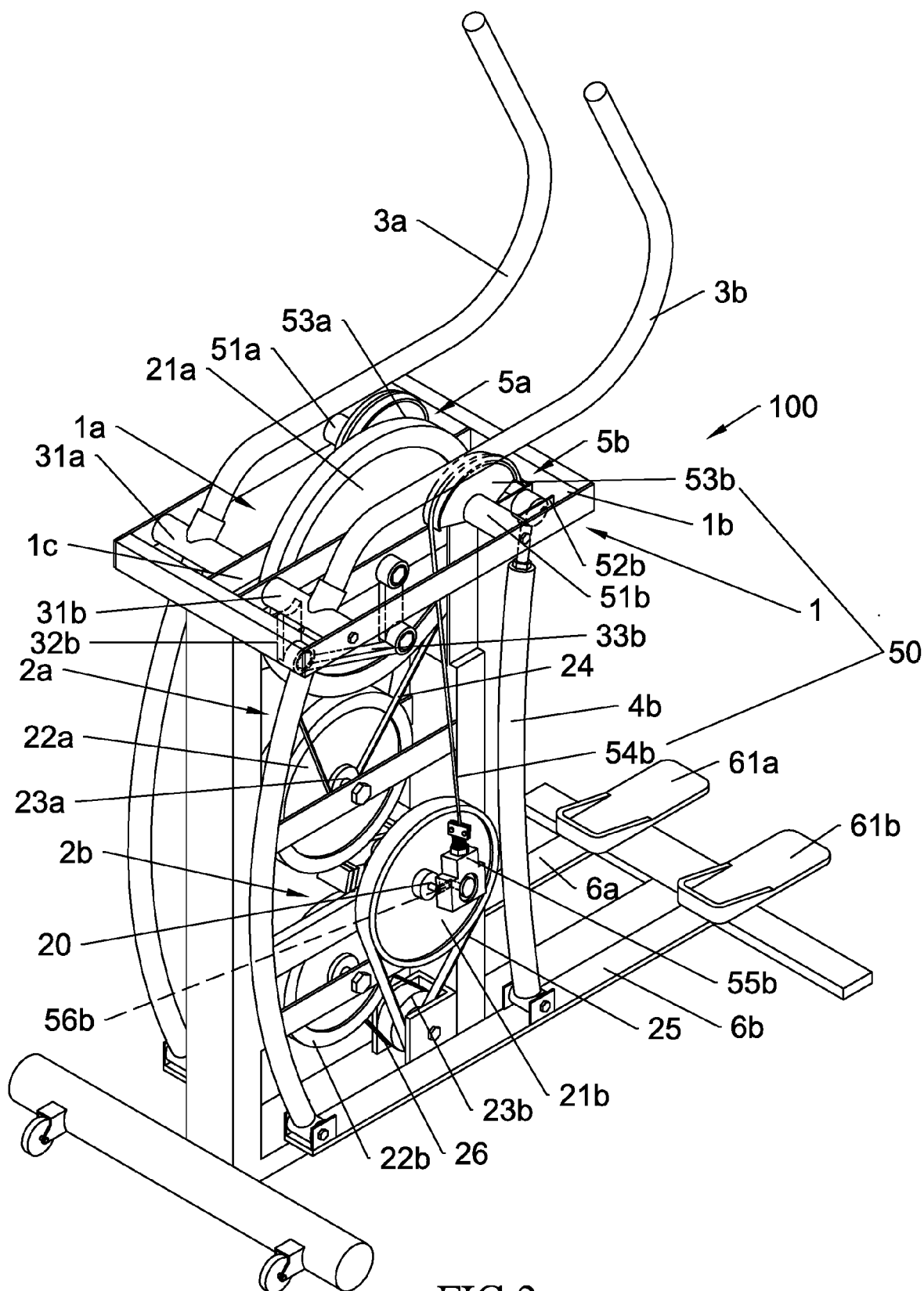


FIG.2

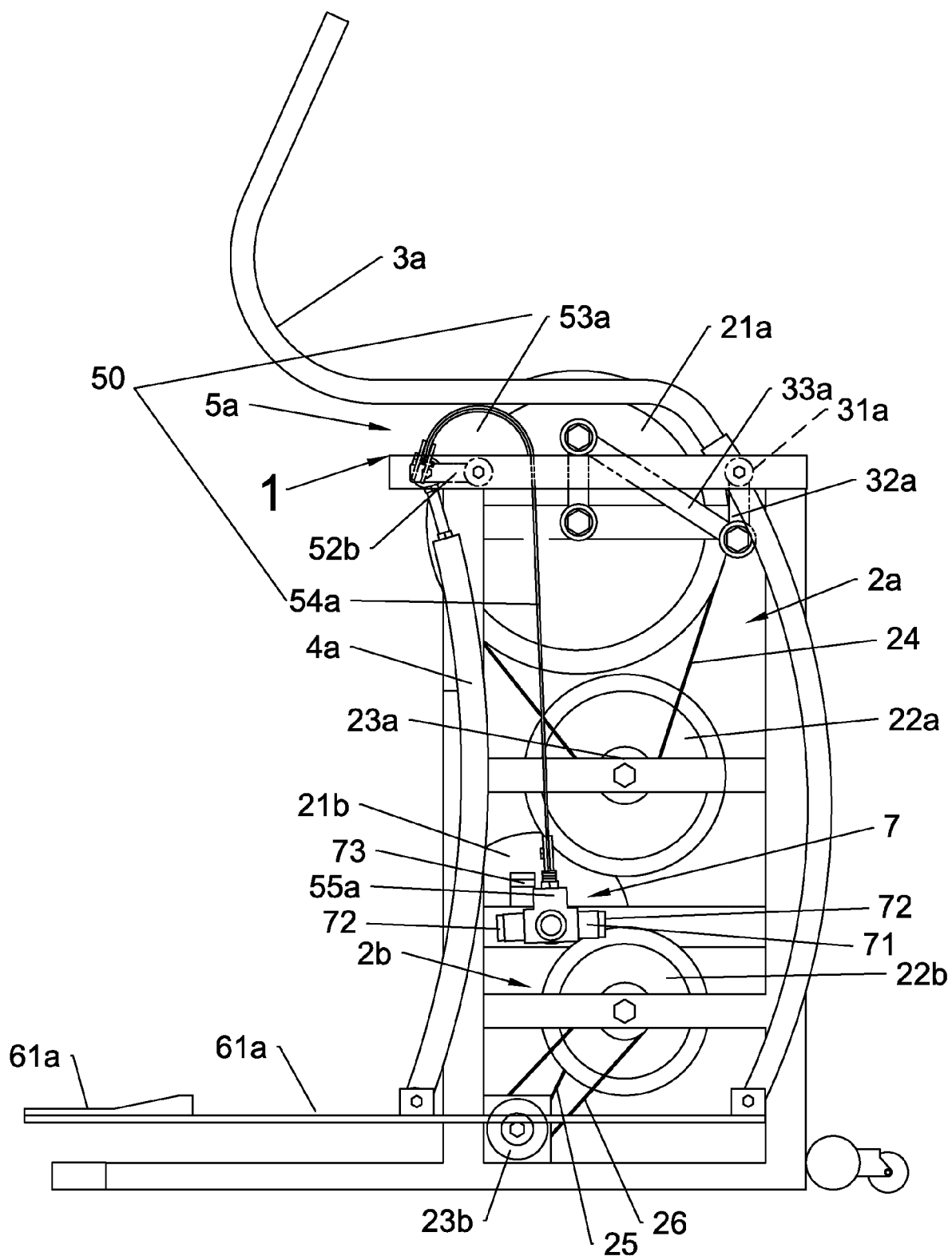


FIG.3

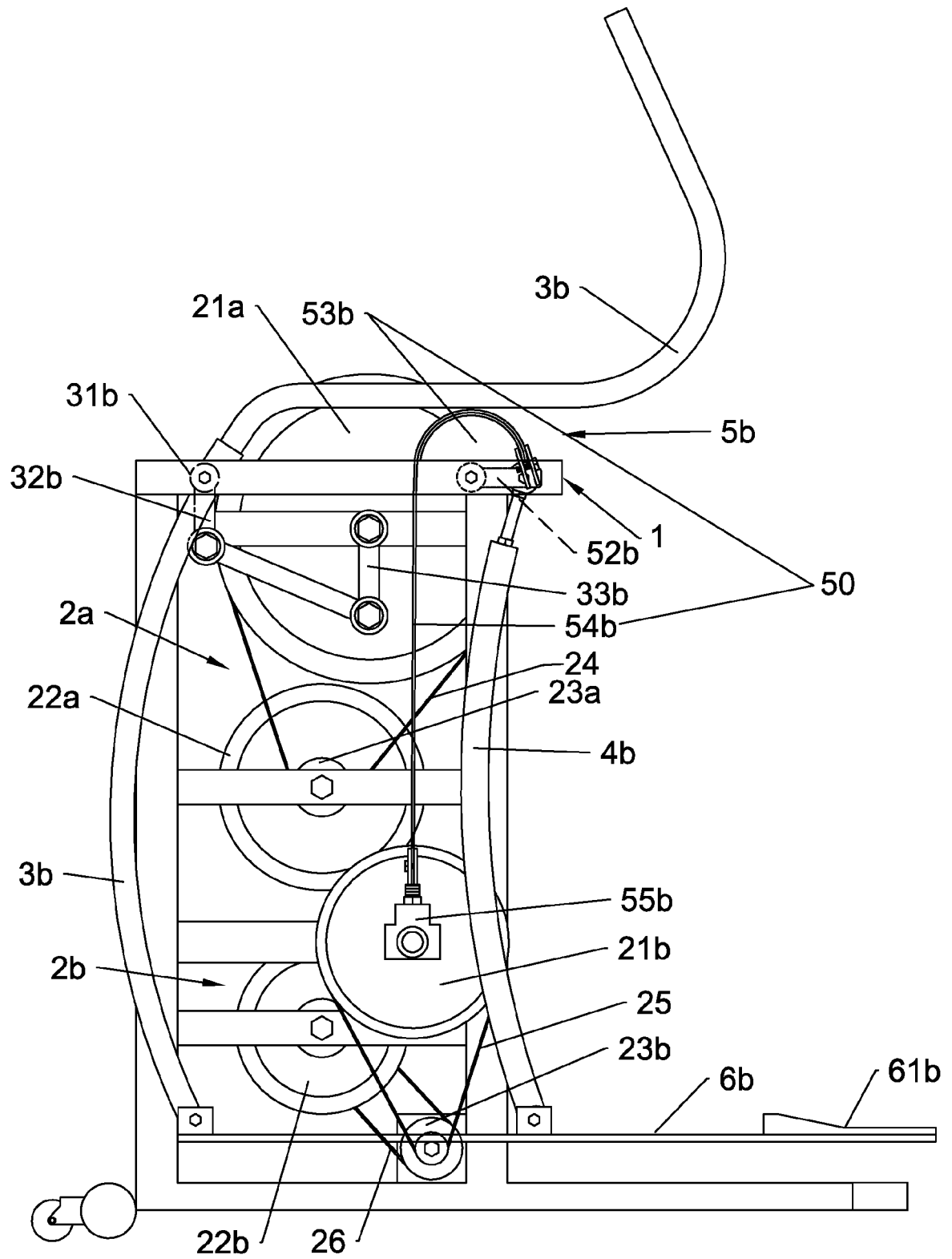


FIG.4

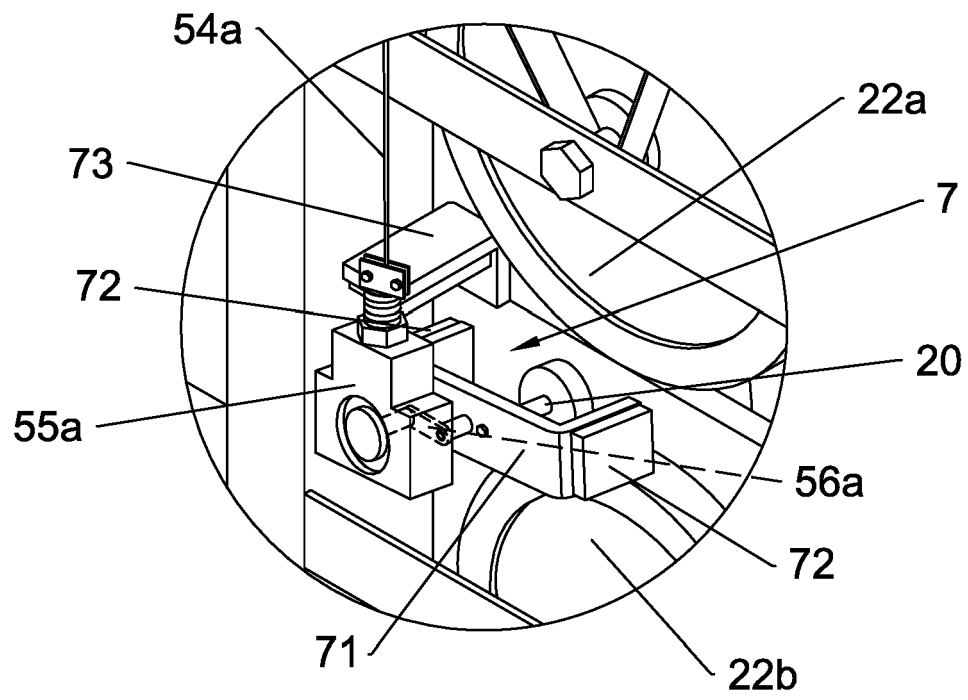


FIG.5

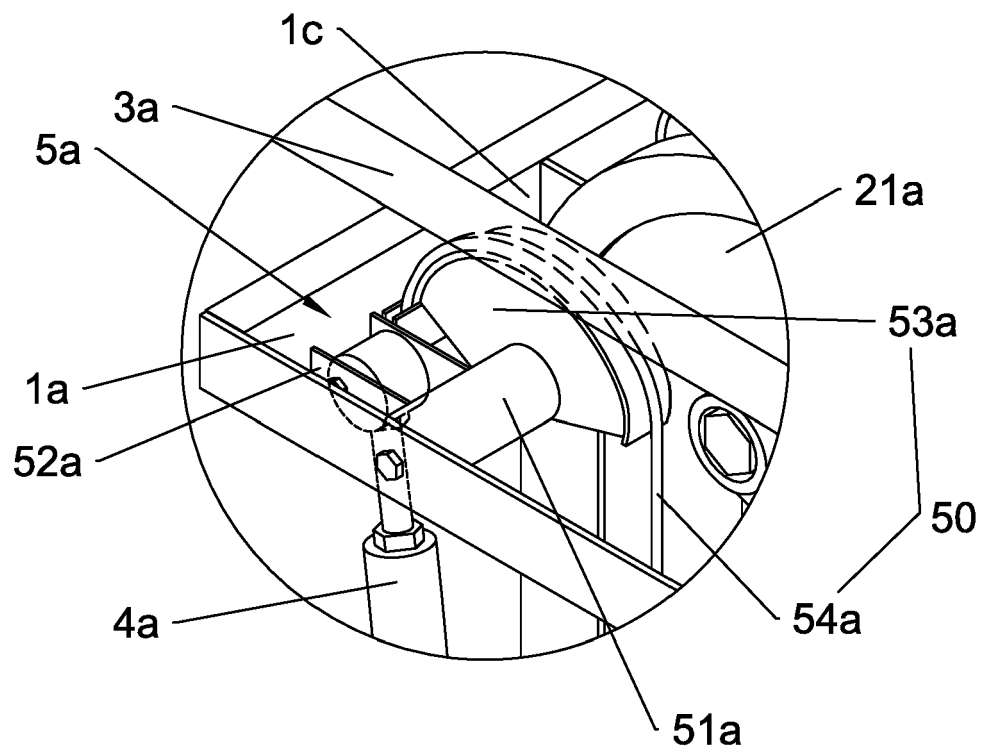


FIG.6

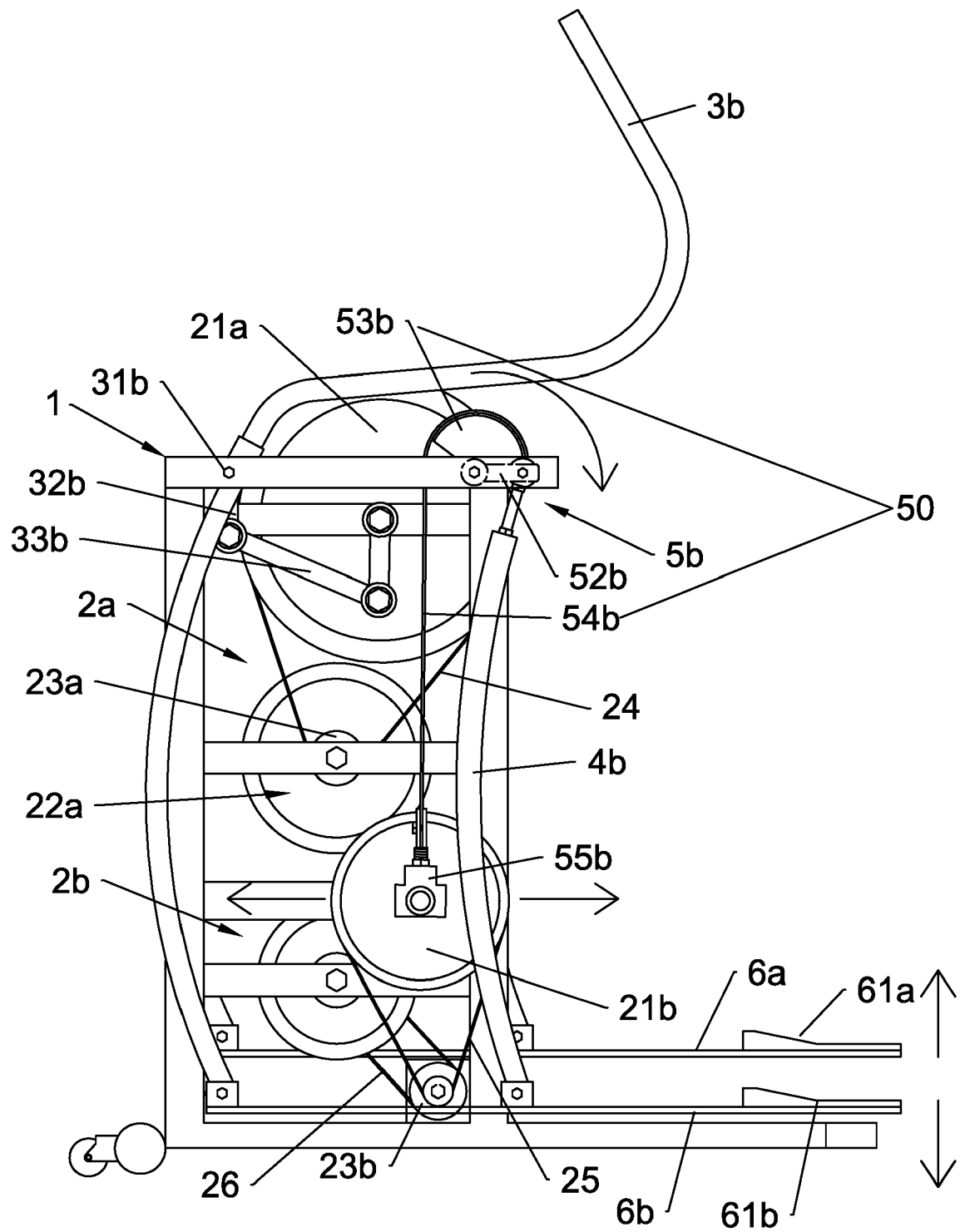


FIG.7

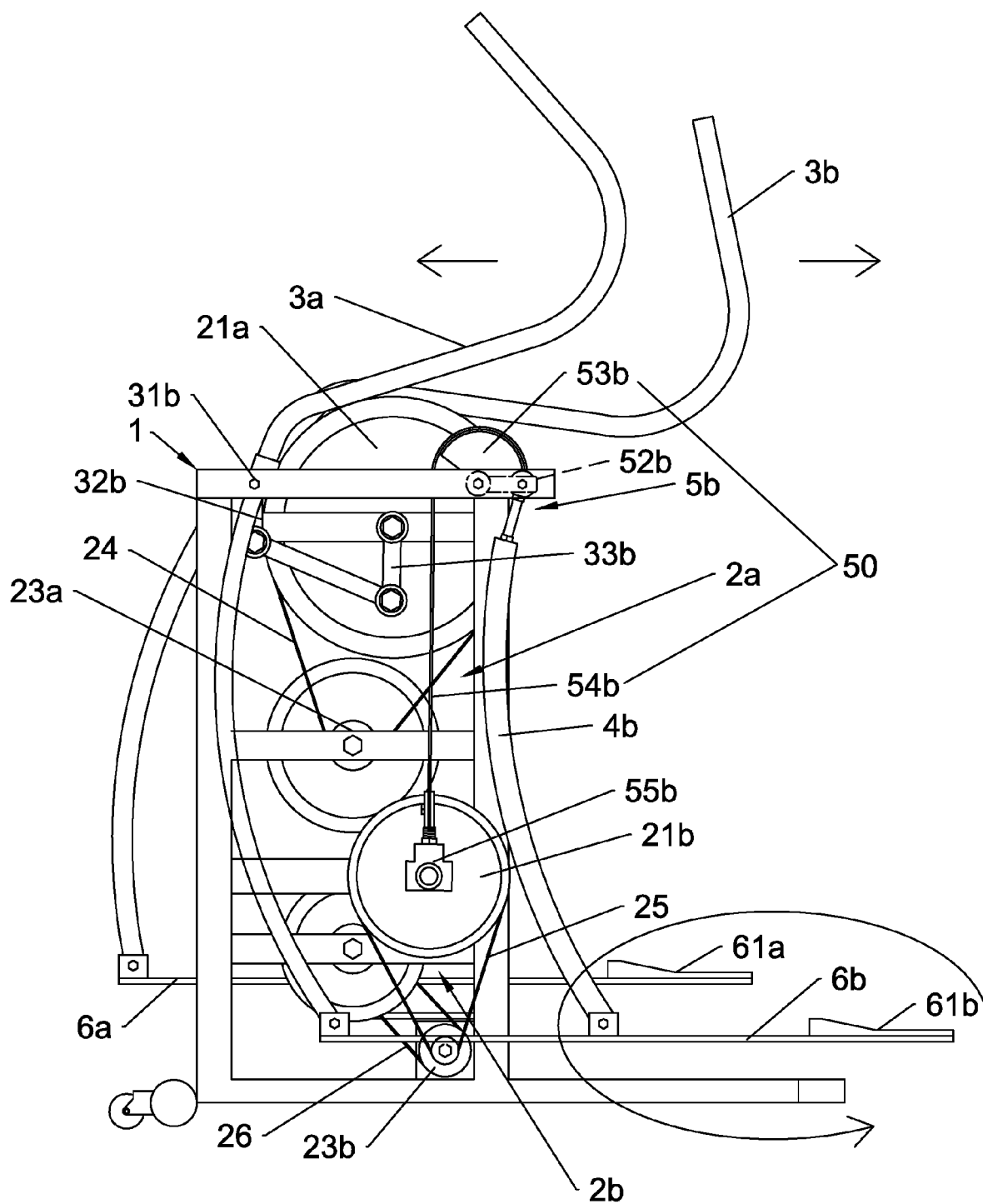


FIG.8

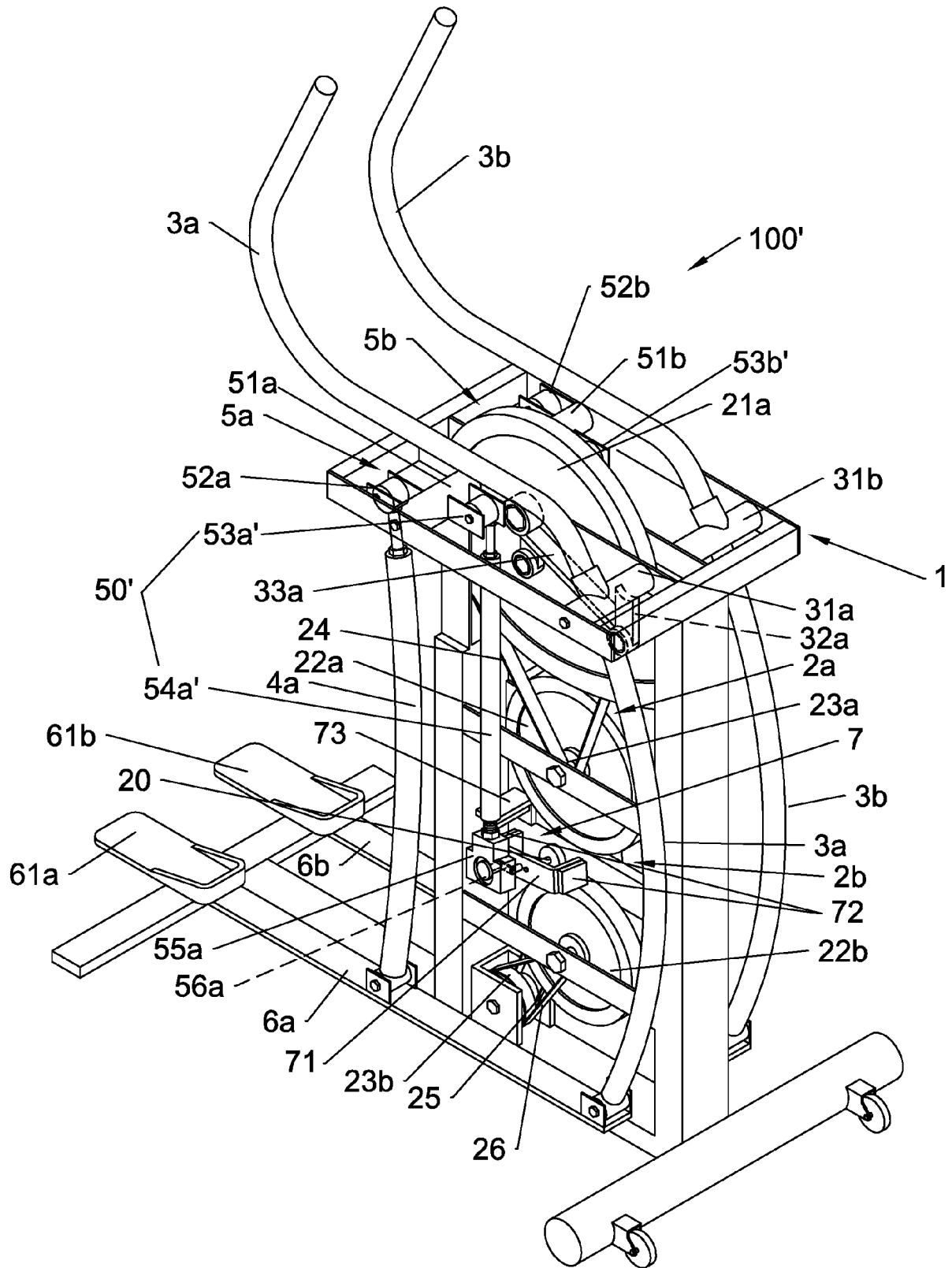


FIG.9

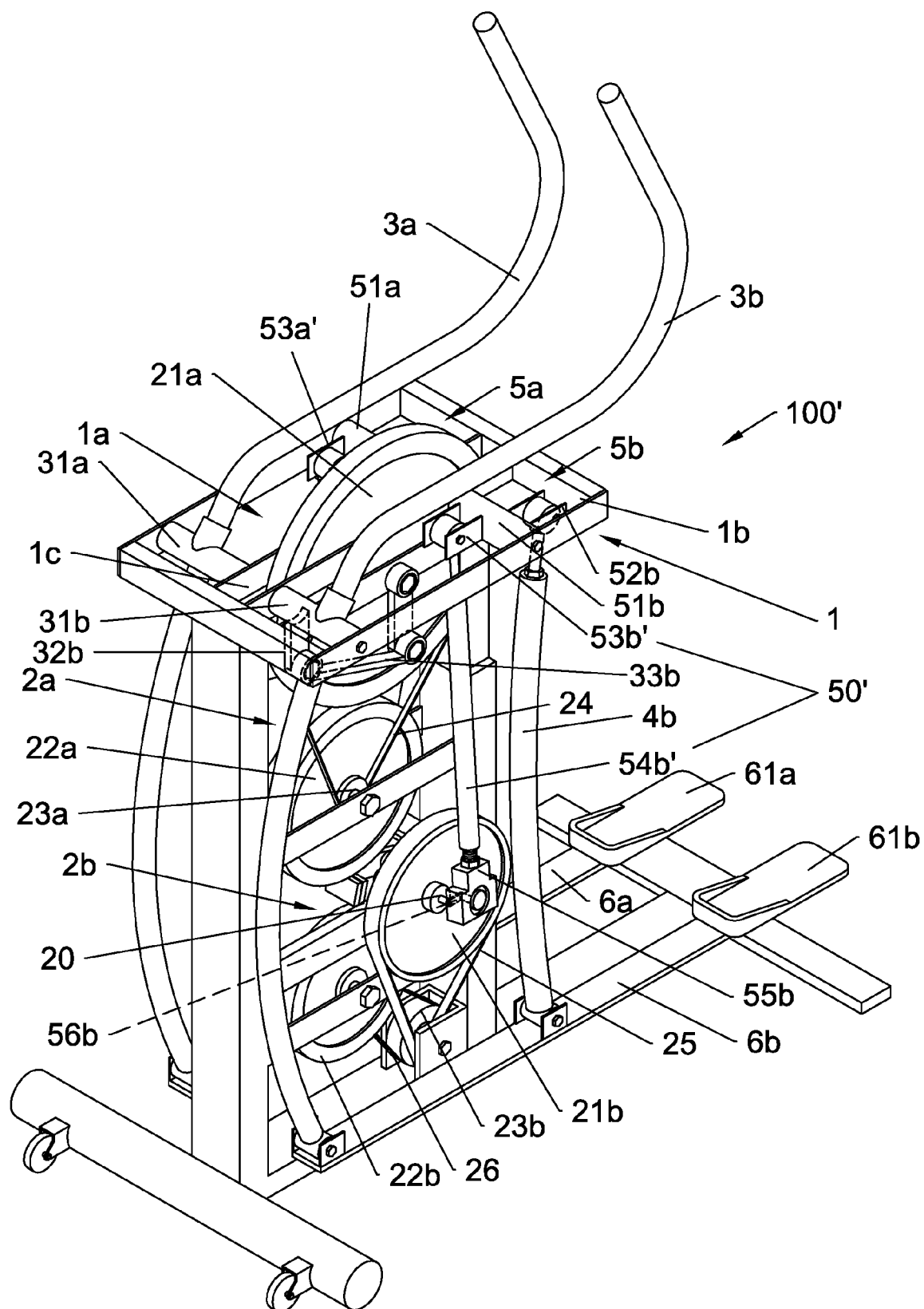


FIG.10

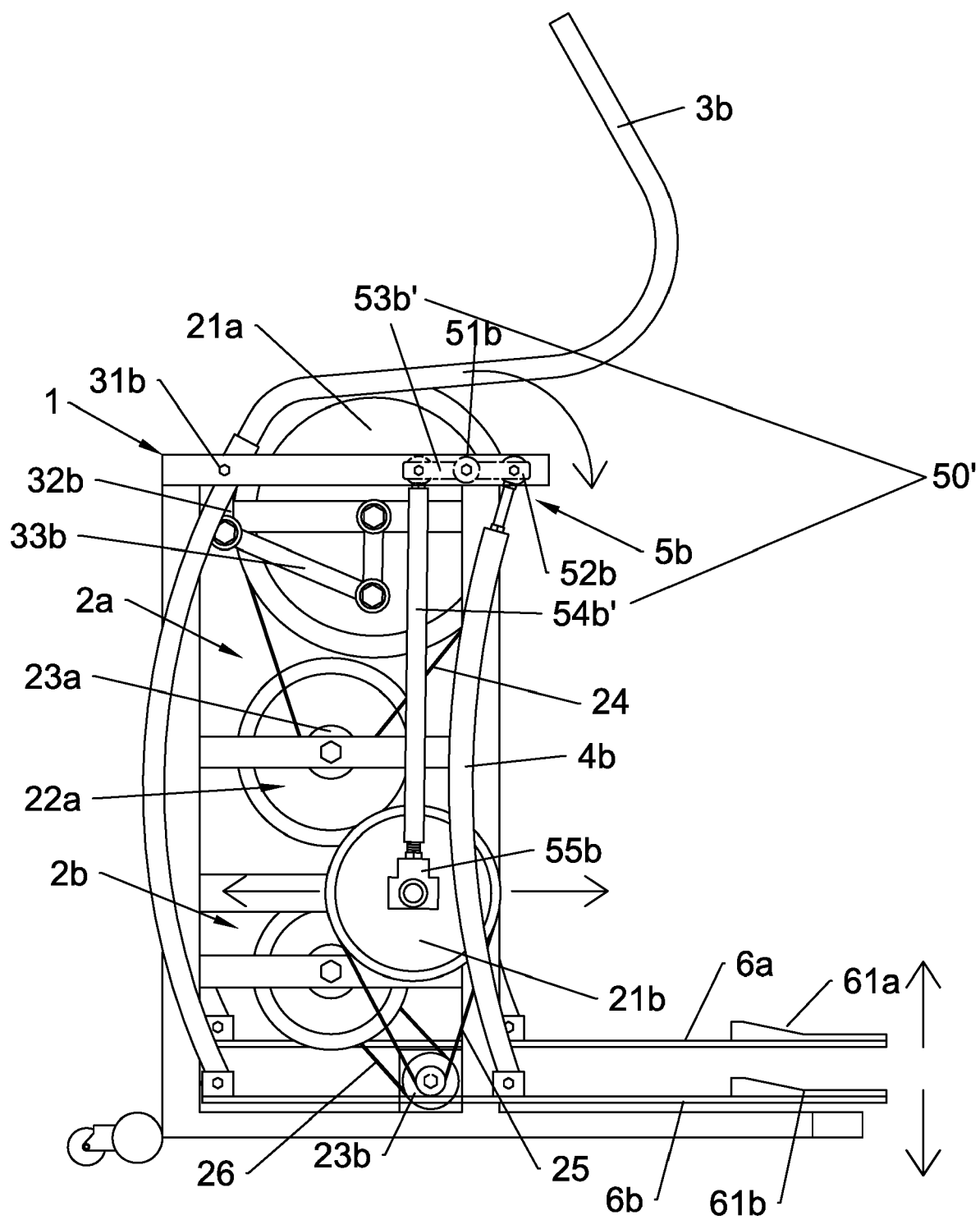


FIG.11

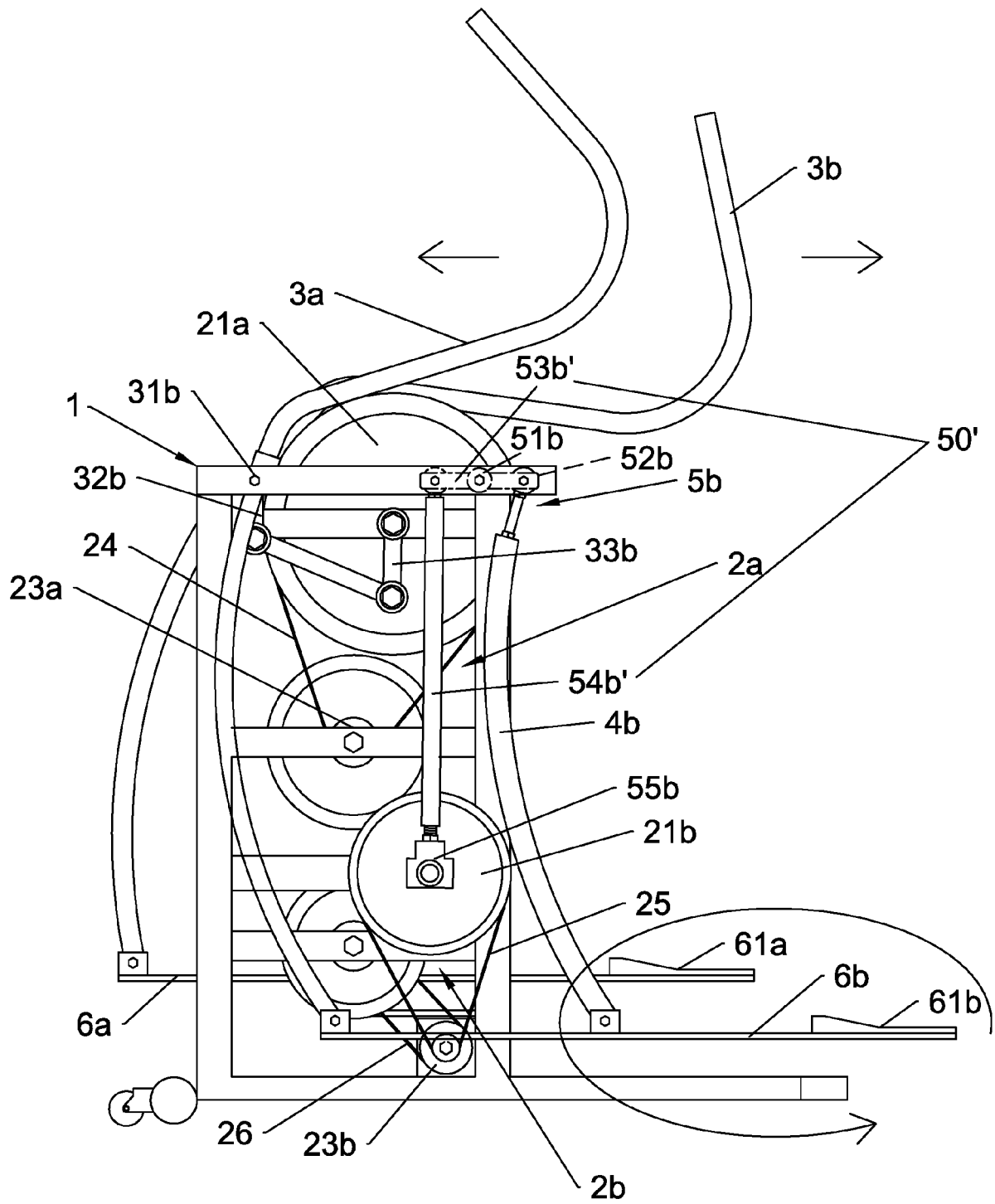


FIG.12

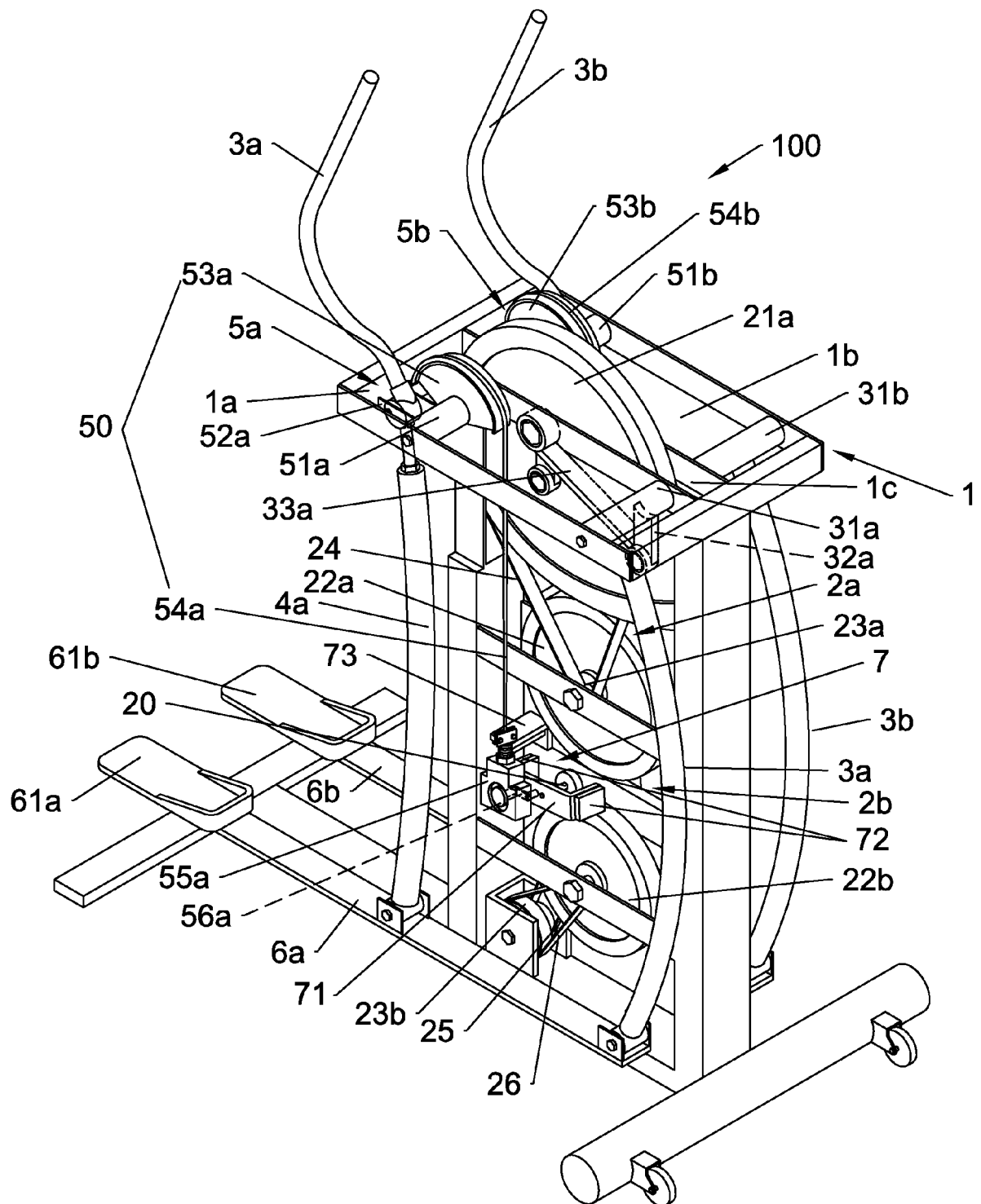


FIG.13

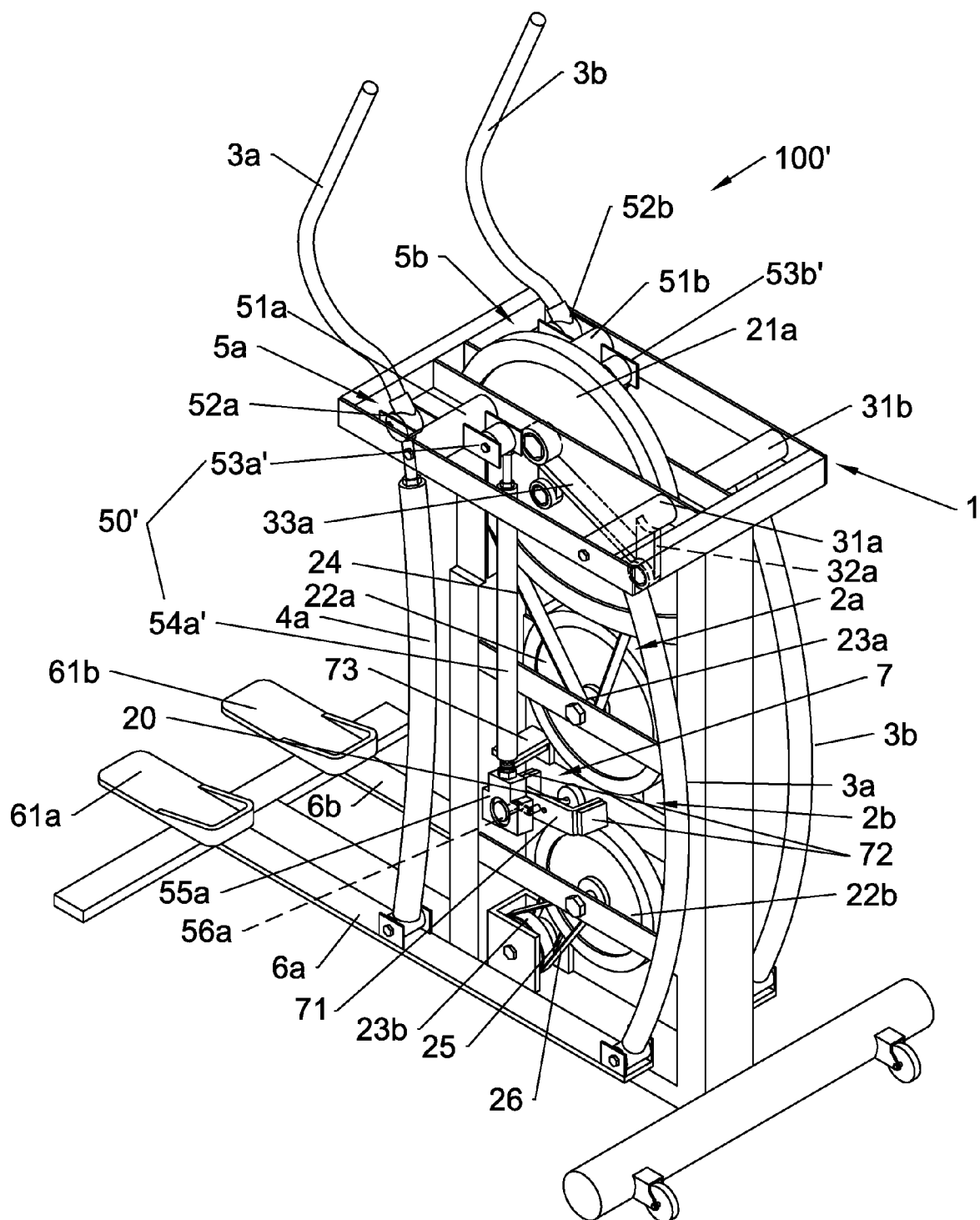


FIG.14



EUROPEAN SEARCH REPORT

Application Number
EP 16 18 6911

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2014/194256 A1 (HUANG HSUAN-FU [TW] ET AL) 10 July 2014 (2014-07-10) * abstract; figures *	1	INV. A63B21/005 A63B22/00 A63B22/06
A	US 2008/287265 A1 (GIANNELLI RAYMOND [US] ET AL) 20 November 2008 (2008-11-20) * abstract; figures *	1	
A	US 2008/161164 A1 (STEWART JONATHAN M [US] ET AL) 3 July 2008 (2008-07-03) * abstract; figures *	1	
A	US 2008/261778 A1 (CHUANG JIN CHEN [TW] ET AL) 23 October 2008 (2008-10-23) * abstract; figures *	1	
A	US 2014/248999 A1 (LU ZHI [US] ET AL) 4 September 2014 (2014-09-04) * abstract; figures *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 March 2017	Examiner Borrás González, E
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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