

(19)



(11)

EP 1 870 137 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

26.12.2007 Bulletin 2007/52

(51) Int Cl.:

A63B 22/02 (2006.01)

A63B 24/00 (2006.01)

(21) Application number: **06012728.9**

(22) Date of filing: **21.06.2006**

(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 NL PL PT RO SE SI SK TR

Designated Extension States:

AL BA HR MK YU

(72) Inventor: **Kuo, Hai-Pin**

Tainan City (TW)

(74) Representative: **Casalonga, Axel et al**

Bureau Casalonga & Josse

Bayerstrasse 71/73

80335 München (DE)

(71) Applicant: **Kuo, Hai-Pin**

Tainan City (TW)

(54) **Foldable treadmill**

(57) A foldable treadmill includes a seat, and a two-part tread base having a front carriage pivotally attached to the seat with a pivot axle for allowing the carriage to be rotated relative to the seat, and a rear treadmill frame pivotally secured to the carriage for allowing the treadmill frame to be rotated and folded relative to the carriage,

and the carriage is foldable and engageable with the seat for lowering a center of gravity of the treadmill and for preventing the treadmill from falling down when the treadmill frame is rotated and folded relative to the carriage and the seat. A spring biased latch may selectively latch the treadmill frame to the carriage at an upwardly erecting position.

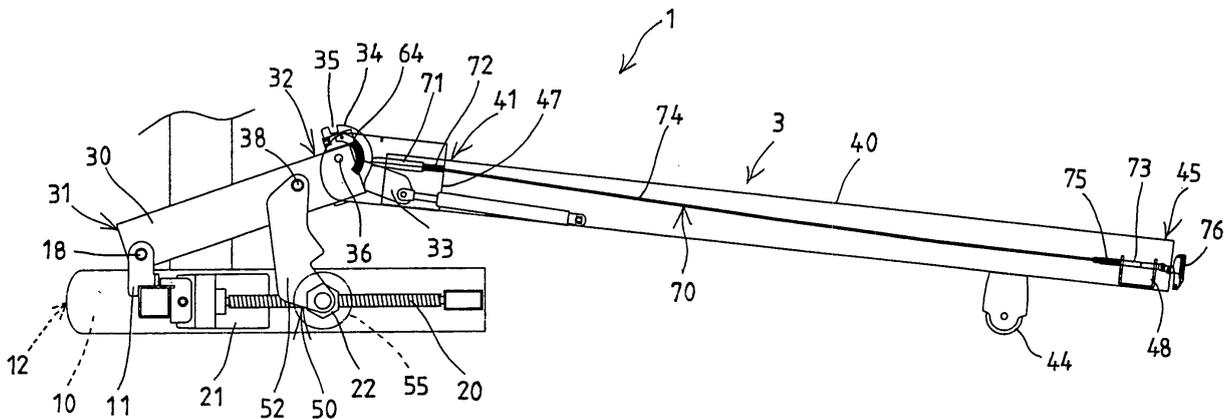


FIG. 3

EP 1 870 137 A1

Description

[0001] The present invention relates to a foldable treadmill, and more particularly to a foldable treadmill having an improved structure for allowing the treadmill to be easily folded to an upwardly erecting or folding position and to be easily folded to a downwardly horizontal working position.

[0002] Typical foldable treadmills comprise a handle device extended upwardly from a seat or vertically supported on the seat, and a tread base having a front portion pivotally attached to the seat or the handle device for allowing the tread base to be rotated or folded relative to the seat or the handle device between an upwardly erecting or folding position and a downwardly horizontal working position.

[0003] For example, U.S. Patent No. 6,015,368 to Clem et al. discloses one of the typical foldable treadmills also comprising a treadmill frame having a front portion pivotally or rotatably attached to a carriage, and a lifting and motorized structure coupled between the treadmill frame and the carriage for rotating or folding the treadmill frame relative to the carriage between an upwardly erecting or folding position and a downwardly horizontal working position.

[0004] However, the treadmill frame includes a long integral structure that the motorized lifting structure has to spend more or great energy to rotate or to fold the treadmill frame relative to the carriage. In addition, when the treadmill frame is rotated or folded relative to the carriage, the center of gravity of the treadmill will be offset from the carriage such that the treadmill will be unstable and may have a good chance to fall down.

[0005] U.S. Patent No. 6,811,518 to Lin discloses another typical foldable treadmill also comprising a tread base having a front portion pivotally or rotatably attached to a seat, and a power driving device coupled between the tread base and the seat for rotating or folding the tread base relative to the seat.

[0006] However, similarly, the tread base also includes a long integral structure that the power driving device also have to spend more or great energy to rotate or to fold the tread base relative to the seat. In addition, when the tread base is rotated or folded relative to the seat, the center of gravity of the treadmill will be offset from the seat such that the treadmill will be unstable and may have a good chance to fall down.

[0007] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional foldable treadmills.

[0008] The primary objective of the present invention is to provide a foldable treadmill including a structure for allowing the treadmill to be easily folded to an upwardly erecting or folding position and to be easily folded to a downwardly horizontal working position.

[0009] The other objective of the present invention is to provide a foldable treadmill including a foldable two-part tread base for preventing the center of gravity of the

treadmill from being offset from the seat and for allowing the treadmill to be retained or maintained in a stable structure and to be prevented from falling down when the tread base is rotated or folded relative to the seat.

[0010] In accordance with one aspect of the invention, there is provided a foldable treadmill comprising a seat, and a two-part tread base including a front carriage pivotally attached to the seat with a pivot axle for allowing the carriage to be rotated relative to the seat with the pivot axle, and including a rear treadmill frame pivotally secured to the carriage for allowing the treadmill frame to be rotated and folded relative to the carriage, and the carriage is foldable and engageable with the seat for lowering a center of gravity of the treadmill and for preventing the treadmill from falling down when the treadmill frame is rotated relative to the carriage and the seat.

[0011] A spring biased latch may further be provided for selectively latching the treadmill frame to the carriage and for stably supporting the treadmill frame to the carriage at an upwardly erecting and folding position. The spring biased latch is disposed in the treadmill frame and biased to selectively engage with the carriage.

[0012] The treadmill frame includes a beam having a hollow space to receive the spring biased latch. The treadmill frame includes a bracket disposed in the beam, the spring biased latch is disposed in the bracket. The treadmill frame includes a hand grip coupled to the spring biased latch for disengaging the spring biased latch from the carriage.

[0013] The two-part tread base includes at least one supporting device coupled between the treadmill frame and the carriage for supporting the treadmill frame at an upwardly erecting and folding position relative to the carriage.

[0014] A rotating device may further be provided for rotating the carriage relative to the seat. The rotating device includes a motorized threaded member rotatably disposed in the seat, a follower threaded onto the threaded member and movable and adjustable along the threaded member when the threaded member is rotated relative to the seat, and a stand coupled between the carriage and the follower.

[0015] The stand includes at least one roller slidably engaged with the seat for guiding the stand to move relative to the seat. The seat includes at least one tube having a bore for slidably receiving the roller of the stand.

[0016] The seat includes a channel formed in the tube and communicating with the bore of the tube, the stand includes a panel, the roller is pivotally attached to the panel with a pivot pin and the pivot pin is slidably engaged in the channel of the tube.

[0017] The two-part tread base includes a. detecting device for detecting a relative angular position between the carriage and the treadmill frame. The detecting device is attached to the carriage, and an actuating device is attached to the treadmill frame and moved in concert with the treadmill frame, and the actuating device is rotatable relative to the carriage and the detecting device

by rotating the treadmill frame relative to the carriage.

[0018] A threaded member is rotatably disposed in the seat, a follower is threaded onto the threaded member and coupled to the carriage, the follower is movable and adjustable along the threaded member when the threaded member is rotated relative to the seat, and a motor is coupled to the threaded member for rotating the threaded member, and the actuating device is coupled to the motor for actuating the motor.

[0019] Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

FIG. 1 is a partial exploded view of a foldable treadmill in accordance with the present invention;

FIG. 2 is a partial side plan schematic view of the foldable treadmill;

FIGS. 3, 4, 5 are partial side plan schematic views similar to FIG. 2, illustrating the folding operation of the foldable treadmill;

FIG. 6 is an enlarged partial side plan schematic view illustrating a sensing or detecting device of the foldable treadmill; and

FIG. 7 is a further enlarged partial side plan schematic view illustrating the sensing or detecting device of the foldable treadmill.

[0020] Referring to the drawings, and initially to FIGS. 1 and 2, a foldable treadmill 1 in accordance with the present invention comprises a seat 10 including one or more, such as two ears 11 extended upwardly from the front portion 12 of the seat 10, and including two side tubes 13, and a rear link 14 coupled or secured between the rear portions of the side tubes 13, in which each of the side tubes 13 includes a bore 15 formed therein, and a channel 16 is formed in the inner portion of each of the side tubes 13 and communicating with the bore 15 of the respective side tubes 13 (FIG. 1).

[0021] A bolt or threaded member 20 is rotatably disposed or supported or engaged in the middle portion of the seat 10 and disposed between the side tubes 13 and parallel to the side tubes 13, and a motor 21 is also attached to the seat 10 and coupled to the threaded member 20 with various typical coupling mechanisms (not shown), such as pulley-and-belt, sprocket-and-chain, gear coupling, or other coupling mechanisms for allowing the threaded member 20 to be rotated or driven by the motor 21. A nut or follower 22 is threaded onto the threaded member 20 and movable or adjustable along the threaded member 20 when the threaded member 20 is rotated or driven by the motor 21.

[0022] A two-part tread base 3 includes a front carriage 30 and a rear treadmill frame 40 to be pivotally or foldably secured together for allowing the carriage 30 and the treadmill frame 40 to be pivoted or rotated or folded relative to each other (FIGS. 3-5). The carriage 30 includes

a front portion 31 pivotally or rotatably attached or coupled to the front portion 12 or the ears 11 of the seat 10 with such as a pivot axle 18 for allowing the carriage 30 to be rotated relative to the seat 10 with the pivot axle 18, best shown in FIGS. 2-5. The carriage 30 includes one or more, such as two bars 33 extended downwardly and rearwardly from the rear portion 32 of the carriage 30.

[0023] The treadmill frame 40 includes a front portion 41 pivotally or rotatably attached or coupled to the rear portion 32 of the carriage 30 with such as a pivot shaft 36 for allowing the treadmill frame 40 to be rotated relative to the carriage 30 with the pivot shaft 36, for allowing the treadmill frame 40 to be rotated relative to the carriage 30 between an upwardly folding position (FIG. 5) and a downwardly working position (FIG. 2) and for allowing the treadmill frame 40 to be rotated or adjusted relative to the carriage 30 to different angular positions (FIGS. 3-4).

[0024] The treadmill frame 40 includes two side beams 42, in which one of the side beams 42 includes a hollow space 43 formed therein (FIG. 1) for receiving a control device 70 therein. The treadmill frame 40 further includes a typical deck and a typical endless belt (not shown) provided thereon for supporting the user on the treadmill frame 40. The carriage 30 further includes a flap 34 extended from or attached to one side of the rear portion 32 of the carriage 30, and a notch 35 formed in the flap 34 for anchoring or positioning purposes which will be discussed hereinafter.

[0025] A pivotal stand 50 is pivotally or rotatably attached or coupled to the rear portion 32 of the carriage 30 with such as a pivot rod 38 for allowing the stand 50 to be rotated relative to the carriage 30 with the pivot rod 38. For example, the stand 50 includes an arm 51 having two side panels 52 for pivotally or rotatably attaching to the rear portion 32 of the carriage 30 with the pivot rod 38, and includes one or more, such as two limbs 53 extended from the middle portion for pivotally or rotatably attaching to the follower 22 with one or more fasteners 54, for allowing the carriage 30 and thus the treadmill frame 40 to be rotated or adjusted relative to the seat 10 to different angular positions by the motor driven threaded member 20 and the follower 22 (FIGS. 2-3).

[0026] In operation, as shown in FIGS. 2-5, the follower 22 may be moved or adjusted relative to or along the threaded member 20 when the threaded member 20 is rotated or driven by the motor 21, and the carriage 30 and the treadmill frame 40 may be rotated or adjusted relative to the seat 10 to different angular positions by the stand 50 and the follower 22 when the follower 22 is moved or adjusted relative to or along the threaded member 20, to allow the treadmill frame 40 to be rotated or adjusted relative to the seat 10 to different angular positions according to the users' need. The threaded member 20 and the motor 21 and/or the stand 50 may thus be used or acted as a rotating means for rotating the carriage 30 relative to the seat 10.

[0027] It is preferable that the treadmill frame 40 in-

cludes one or more wheels 44 attached to the rear portion 45 for facilitating the movement or adjustment of the treadmill frame 40 relative to the seat 10. It is also preferable that the stand 50 includes one or more, such as two wheels or rollers 55 pivotally or rotatably attached to the side panels 52 respectively with such as pivot pins 56 and rotatably or slidably received or engaged in the bores 15 of the respective side tubes 13 of the seat 10 for guiding the stand 50 to move relative to the seat 10 and for facilitating the sliding movement of the stand 50 relative to the seat 10. The pivot pins 56 are slidably engaged in the channels 16 of the side tubes 13 respectively.

[0028] As shown in FIGS. 1 and 6-7, a circuit board 60 is attached or secured to the flap 34 or the rear portion 32 of the carriage 30 with one or more fasteners 61, and a sensing or detecting device or detector 62 is attached to the circuit board 60 and coupled to the motor 21 and/or to the typical processor or control device (not shown) of the treadmill 1 with such as electric wires or cables 63 for controlling or actuating the motor 21. The sensing or detecting device 62 may be selected from the typical infrared ray detecting device 62 or the like for generating and/or for receiving such as infrared rays, and for detecting the relative angular position between the carriage 30 and the treadmill frame 40.

[0029] An actuating device 64 is attached or secured to the front portion 41 of the treadmill frame 40 and moved in concert with the treadmill frame 40, such that the actuating device 64 is rotatable or movable relative to the flap 34 and the carriage 30 and the sensing or detecting device 62 and the circuit board 60. The actuating device 64 includes a reflective or non-marked area 65 for such as reflecting the infrared ray generated by the detecting device 62, and for preventing the motor 21 from being actuated, for example. The actuating device 64 further includes a non-reflective or marked area 66 for such as absorbing or dissipating the infrared ray generated by the detecting device 62, and for allowing the motor 21 to be actuated or operated, for example.

[0030] The non-reflective or marked area 66 of the actuating device 64 may be rotated or moved relative to the sensing or detecting device 62 by the treadmill frame 40 in order to shield or to block the detecting device 62 (FIG. 6), and so as to actuate or operate the motor 21 which may then move or adjust the follower 22 along the threaded member 20 in order to rotate or to adjust the carriage 30 relative to the seat 10 to different angular positions. For example, after the carriage 30 and the treadmill frame 40 have been rotated or adjusted relative to the seat 10 to the inclined position as shown in FIG. 3, the treadmill frame 40 may be elevated or folded or rotated relative to the carriage 30 by the user.

[0031] In operation, when it is required to fold the treadmill 1, the treadmill frame 40 may be elevated or folded or rotated relative to the carriage 30 by the user from the position as shown in FIG. 3 to FIG. 4, and the non-reflective or marked area 66 of the actuating device 64 may

be rotated or moved to shield or to block the sensing or detecting device 62 (FIGS. 4, 6) by the treadmill frame 40, to allow the motor 21 to be operated to actuate or to move or adjust the follower 22 along the threaded member 20 in order to rotate or to adjust the carriage 30 downwardly toward the seat 10 from the position as shown in FIG. 4 to FIG. 5, for example, and for allowing the treadmill frame 40 to be further upwardly folded or rotated relative to the carriage 30 by the user to the erected folding position as shown in FIG. 5.

[0032] One or more, such as two supporting devices 46, and such as pneumatic or hydraulic actuators or cylinders 46 may further be provided and attached or coupled between the treadmill frame 40 and the carriage 30 for supporting the treadmill frame 40 at the erected folding position relative to the carriage 30. It is preferable that the supporting devices or actuators or cylinders 46 may be arranged to allow the treadmill frame 40 to be easily folded or rotated relative to the carriage 30 by the user, or to prevent the upwardly folding or rotating movement of the treadmill frame 40 relative to the carriage 30 from being interfered by the supporting devices 46, and to allow the supporting devices 46 to support the treadmill frame 40 at the erected folding position relative to the carriage 30.

[0033] The control device 70 is engaged in the hollow space 43 of one of the side beams 42 and includes a latch or spring biased latch 71 slidably attached to or engaged in the side beam 42, such as slidably engaged in a bracket 47 that is disposed or engaged in the front portion 41 of the side beam 42, and a spring member 72 may be engaged between the latch 71 and the bracket 47 or the side beam 42 for biasing the latch 71 to selectively engage into the notch 35 of the flap 34 or of the carriage 30 (FIG. 5), and for further firmly or stably supporting or locking or latching the treadmill frame 40 to the carriage 30 at the erected folding position.

[0034] The control device 70 further includes a pole 73 slidably attached to or engaged in the side beam 42, such as slidably engaged in another bracket 48 that is disposed or engaged in the rear portion 45 of the side beam 42, and the pole 72 is coupled to the latch 71 with a coupling cable or member 74, and a further spring member 72 may be engaged between the pole 72 and the bracket 48 or the side beam 42 for further biasing the latch 71 to selectively engage into the notch 35 of the flap 34 or of the carriage 30. A knob or hand grip 76 may be pivotally coupled to an outer end of the pole 72 that is extended out of the side beam 42, for selectively pulling and disengaging the latch 71 from the notch 35 of the flap 34 or of the carriage 30 and for allowing the treadmill frame 40 to be rotated or folded downwardly toward the downwardly horizontal working position relative to the carriage 30 by the user.

[0035] It is to be noted that the two-part tread base 3 includes the rear treadmill frame 40 pivotally or foldably secured to the front carriage 30 for allowing the treadmill frame 40 to be pivoted or rotated or folded relative to the

carriage 30 and for avoiding the carriage 30 from rotating or folding relative to the seat 10. It is not required to rotate or fold the whole two-part tread base 3 relative to the seat 10. The engagement of the carriage 30 with the seat 10 (FIG. 5) may lower the center of gravity of the treadmill 1 or may prevent the center of gravity of the treadmill 1 from being offset from the seat 10 and may thus prevent the treadmill 1 from falling down when the treadmill frame 40 is rotated or folded relative to the carriage 30 and the seat 10.

[0036] Accordingly, the foldable treadmill includes a structure for allowing the treadmill to be easily folded to an upwardly erecting position and to be easily folded to a downwardly horizontal working position, and includes a two-part tread base foldable relative to each other for preventing the center of gravity of the treadmill from being offset from the seat and for allowing the treadmill to be retained or maintained in a stable structure and to be prevented from falling down when the tread base is rotated or folded relative to the seat.

Claims

1. A foldable treadmill comprising:

a seat, and
a two-part tread base including a front carriage pivotally attached to said seat with a pivot axle for allowing said carriage to be rotated relative to said seat with said pivot axle, and including a rear treadmill frame pivotally secured to said carriage for allowing said treadmill frame to be rotated and folded relative to said carriage, and a spring biased latch for selectively latching said treadmill frame to said carriage and for stably supporting said treadmill frame to said carriage at an upwardly erecting and folding position, and said carriage being foldable and engageable with said seat for lowering a center of gravity of said treadmill and for preventing said treadmill from falling down when said treadmill frame is rotated and folded relative to said carriage and said seat.

2. The foldable treadmill as claimed in claim 1, wherein said spring biased latch is disposed in said treadmill frame and biased to selectively engage with said carriage, said treadmill frame includes a beam having a hollow space to receive said spring biased latch, said treadmill frame includes a bracket disposed in said beam, said spring biased latch is disposed in said bracket, said treadmill frame includes a hand grip coupled to said spring biased latch for disengaging said spring biased latch from said carriage.

3. The foldable treadmill as claimed in claim 1, wherein said two-part tread base includes at least one sup-

porting device coupled between said treadmill frame and said carriage for supporting said treadmill frame at an upwardly erecting and folding position relative to said carriage.

4. The foldable treadmill as claimed in claim 1 further comprising means for rotating said carriage relative to said seat.

5. The foldable treadmill as claimed in claim 4, wherein said rotating means includes a motorized threaded member rotatably disposed in said seat, a follower threaded onto said threaded member and movable and adjustable along said threaded member when said threaded member is rotated relative to said seat, and a stand coupled between said carriage and said follower, said stand includes at least one roller slidably engaged with said seat for guiding said stand to move relative to said seat, said seat includes at least one tube having a bore for slidably receiving said at least one roller of said stand, said seat includes a channel formed in said at least one tube and communicating with said bore of said at least one tube, said stand includes a panel, said at least one roller is pivotally attached to said panel with a pivot pin and said pivot pin is slidably engaged in said channel of said at least one tube.

6. The foldable treadmill as claimed in claim 1, wherein said two-part tread base includes a detecting device for detecting a relative angular position between said carriage and said treadmill frame.

7. The foldable treadmill as claimed in claim 6, wherein said detecting device is attached to said carriage, and an actuating device is attached to said treadmill frame and moved in concert with said treadmill frame, and said actuating device is rotatable relative to said carriage and said detecting device by rotating said treadmill frame relative to said carriage.

8. The foldable treadmill as claimed in claim 6, wherein a threaded member is rotatably disposed in said seat, a follower is threaded onto said threaded member and coupled to said carriage, said follower is movable and adjustable along said threaded member when said threaded member is rotated relative to said seat, and a motor is coupled to said threaded member for rotating said threaded member, and said actuating device is coupled to said motor for actuating said motor.

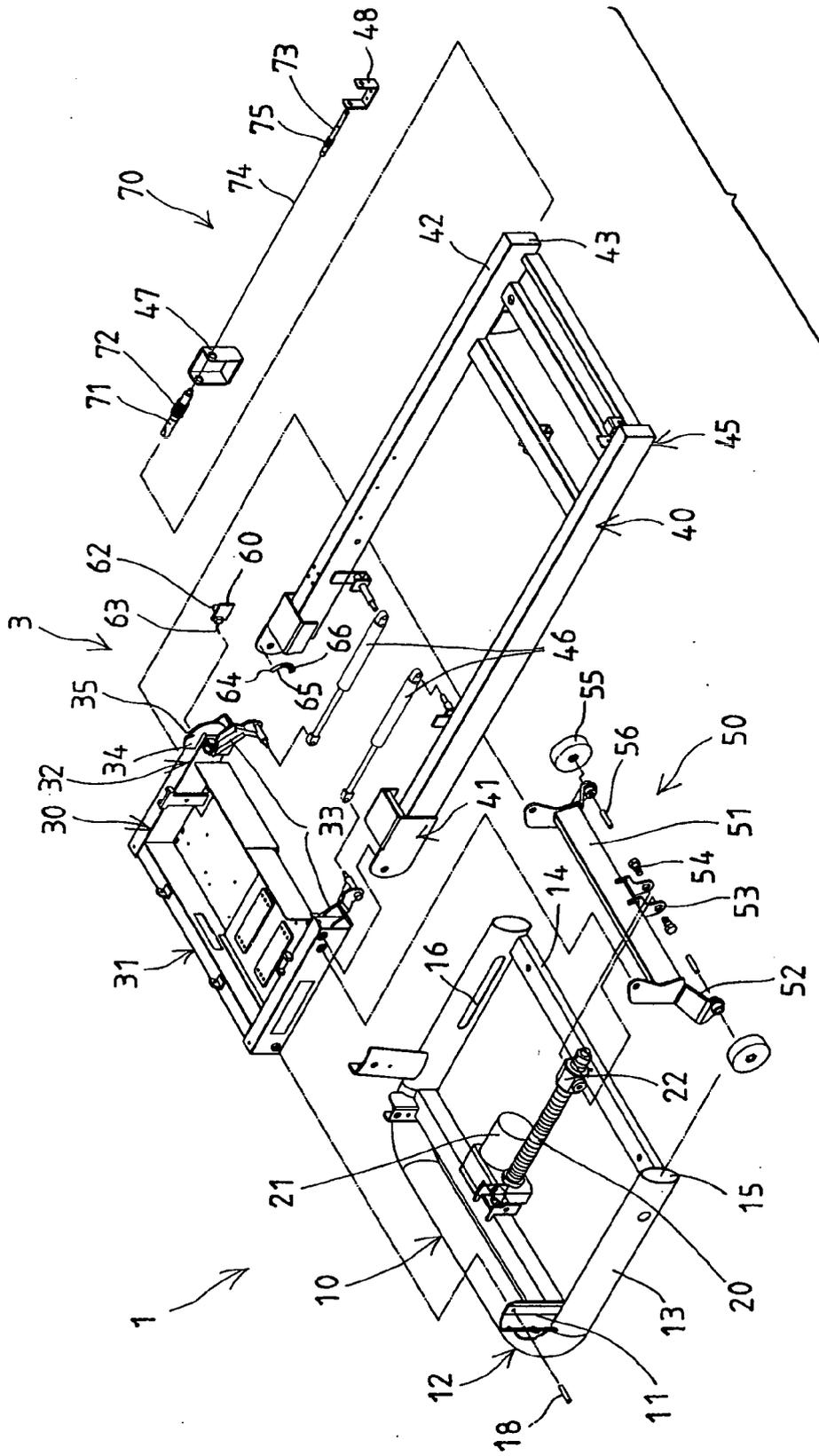


FIG. 1

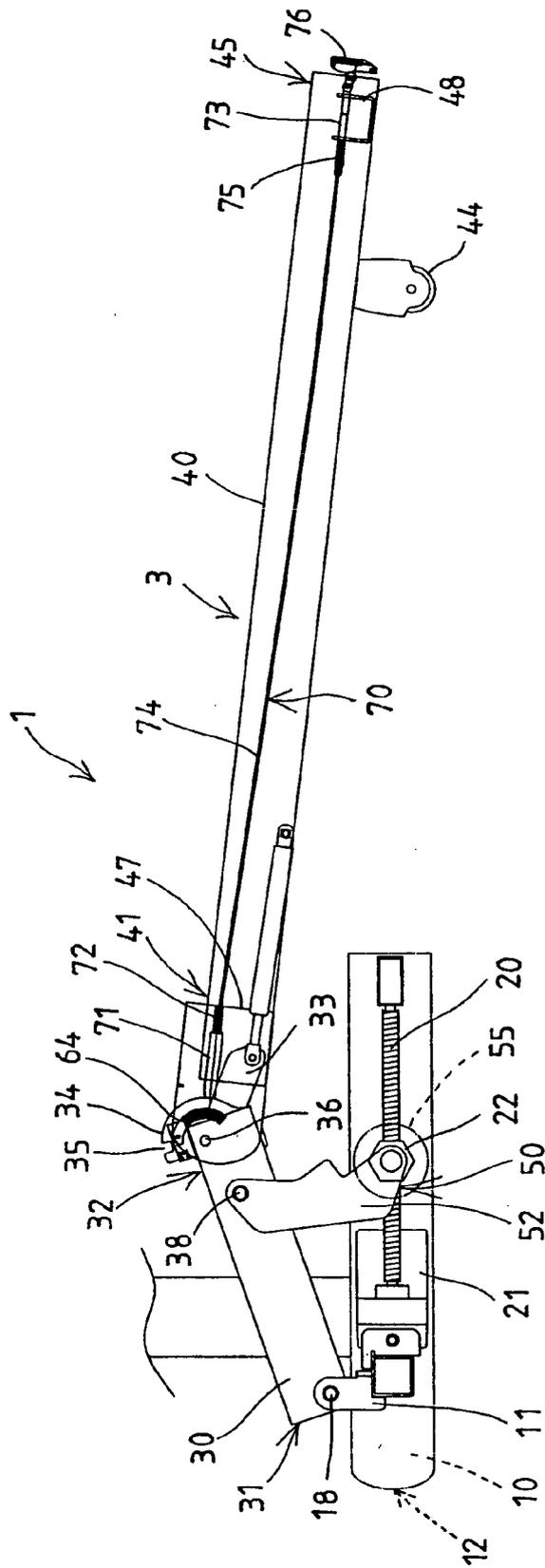


FIG. 3

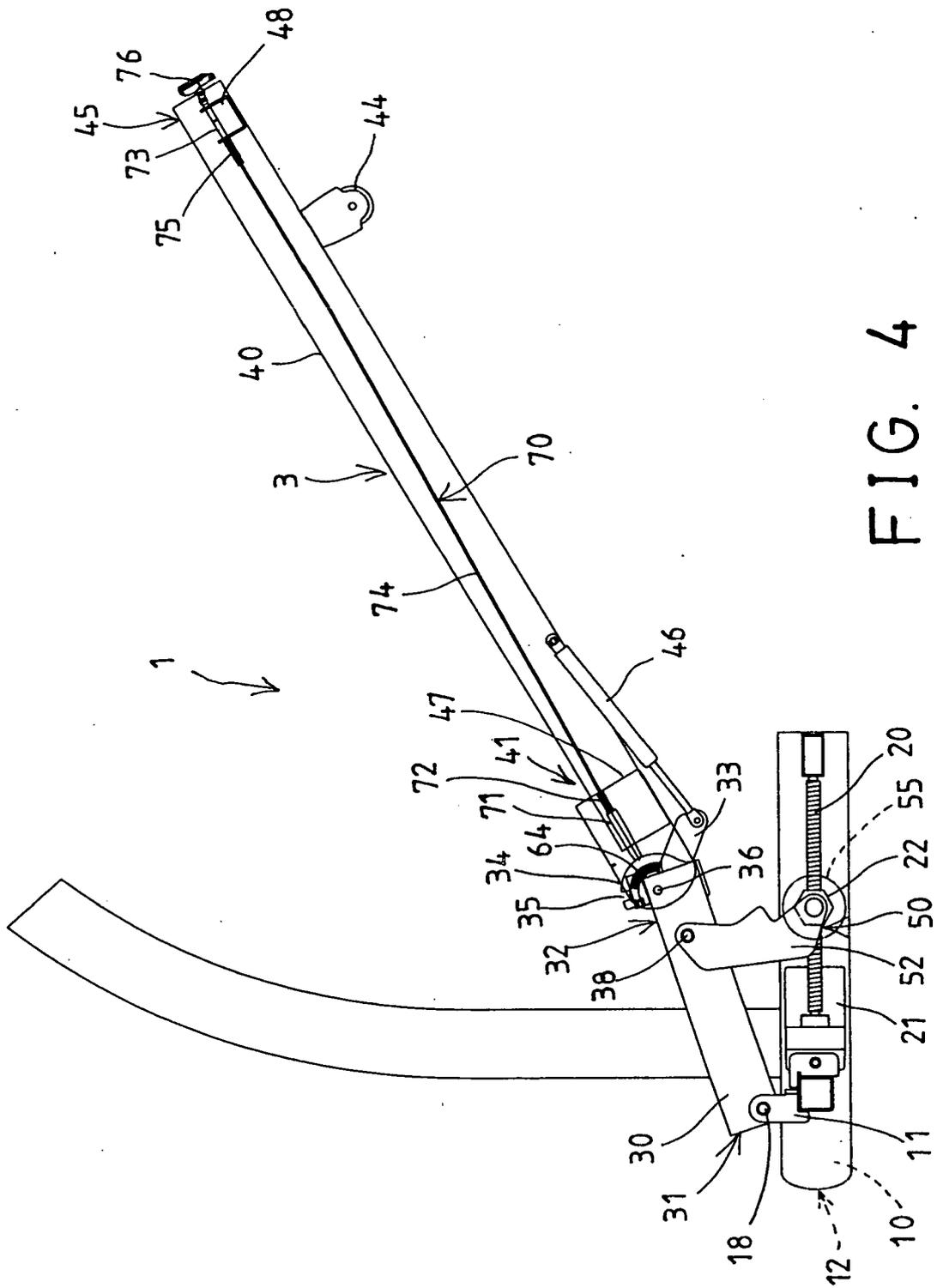


FIG. 4

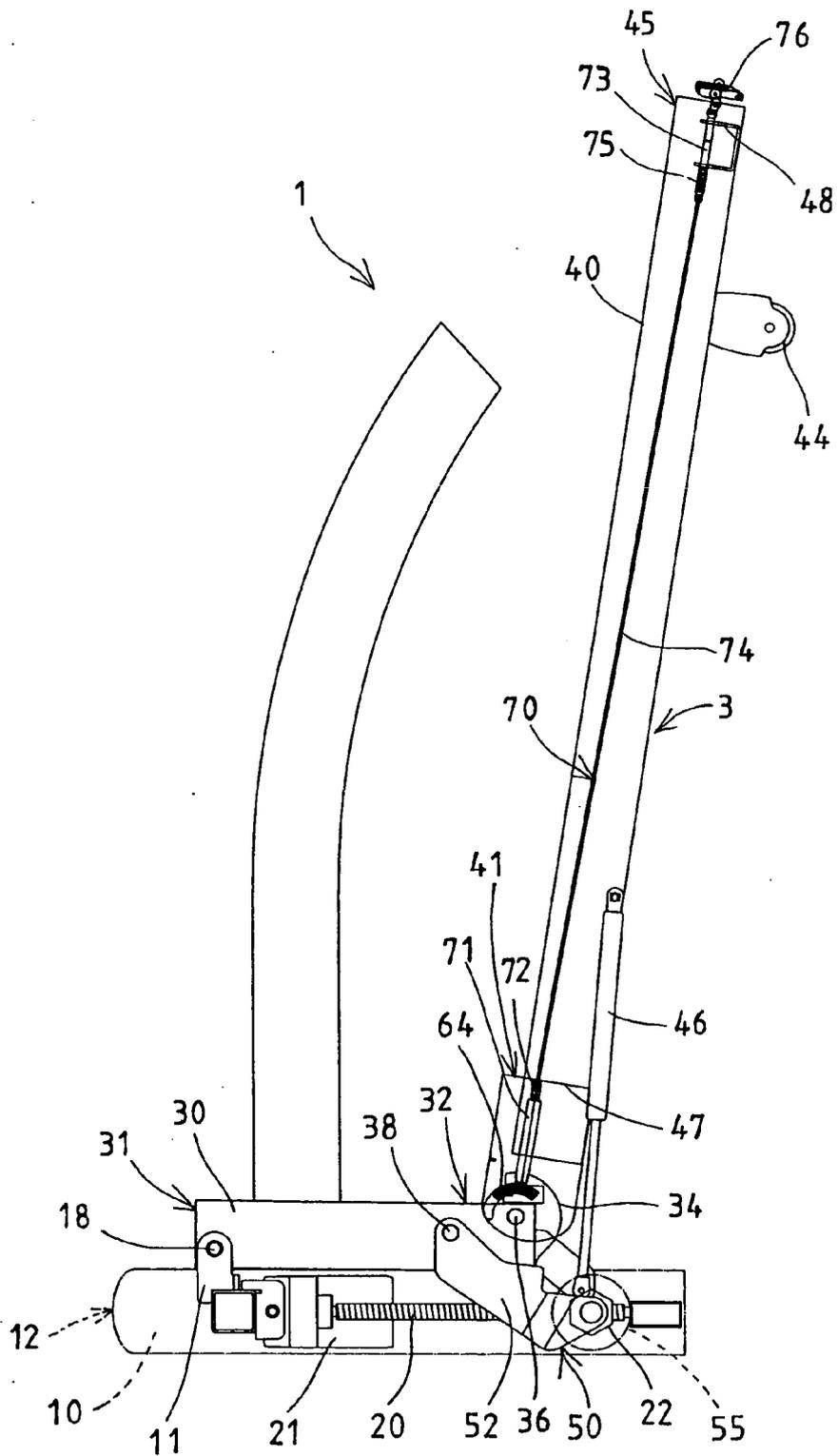


FIG. 5

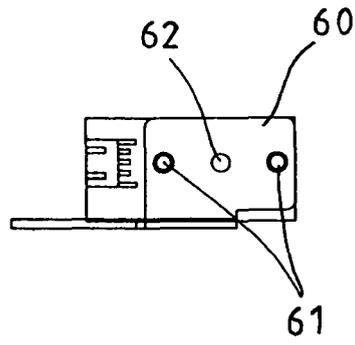


FIG. 7

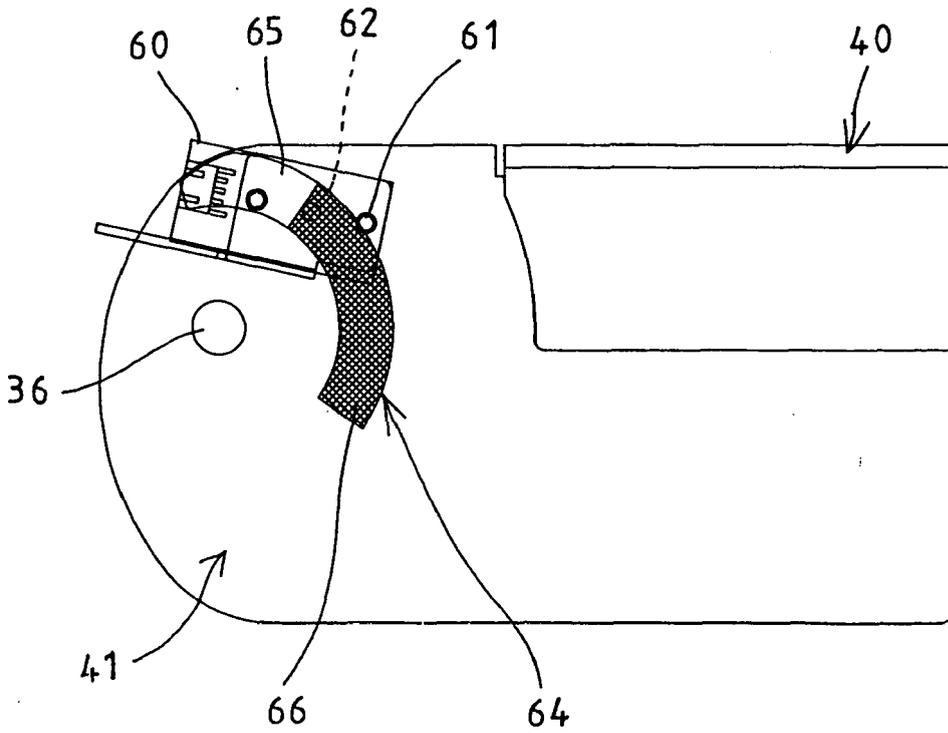


FIG. 6

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

EP 06 01 2728

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-01-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003125165 A1	03-07-2003	NONE	
US 2006040798 A1	23-02-2006	WO 2006023596 A2	02-03-2006
US 5860893 A	19-01-1999	US 5704879 A	06-01-1998
US 6923747 B1	02-08-2005	CN 2778333 Y TW 271592 Y	10-05-2006 01-08-2005
US 2006058160 A1	16-03-2006	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- US 6015368 A, Clem [0003]
- US 6811518 B, Lin [0005]