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(54) **Handlebar mechanism**

(57) An operator selectable mechanism for adjusting a moveable handle for use with an exercise apparatus is described. The handle can be selectively lowered or

the upper portion of the handle can be moved laterally with respect to the apparatus in order to vary the motion of the upper portion of the handle.

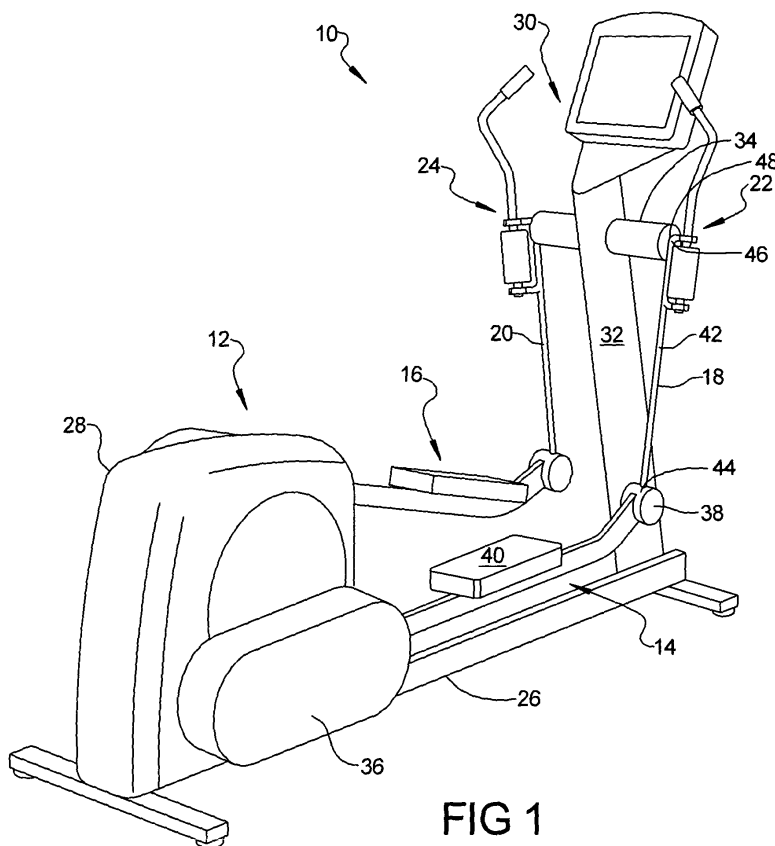


FIG 1

Description

FIELD

[0001] The present disclosure relates to handles for use with an exercise apparatus, and more particularly to handles that move with pedals.

BACKGROUND

[0002] The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

[0003] In certain elliptical step type exercise machines arm handles are connected to the machine's pedals such that the handles move in synchronism with the pedals to provide a total body workout. When connected for motion with the pedals, the handles generally travel back and forth along an arcuate path as the pedals move. However, in some cases this motion of the handles can be bothersome or distracting to a user when he does not desire to use the moving handles.

[0004] One approach to this problem has been to provide a mechanism to allow the user to selectively fix the handles to the frame of the apparatus to prevent movement of the handles. Examples of this approach are provided by the Star Trac Elite Cross Trainer and as shown in U.S. Patent No. 6,846,272.

DRAWINGS

[0005] Figure 1 is a perspective view of an elliptical type exercise machine showing one handle assembly described in this disclosure;

[0006] Figure 2 is a fragmentary rear plan view of a handle assembly of the exercise machine of Figure 1;

[0007] Figure 3 is an additional fragmentary rear plan view of the handle assembly of Figure 1;

[0008] Figure 4 is a fragmentary side plan view of another handle assembly described in the disclosure;

[0009] Figure 5 is an additional fragmentary side plan view of the handle assembly of Figure 4;

[0010] Figure 6 is a fragmentary side plan view of another handle assembly described in the disclosure; and

[0011] Figure 7 is an additional fragmentary side plan view of the handle assembly of Figure 6.

DETAILED DESCRIPTION

[0012] The following description is merely exemplary in nature and is not intended to limit the present disclosure, application, or uses. It should be understood that throughout the drawings, corresponding reference numerals indicate like or corresponding parts and features.

[0013] Figure 1 is an illustration of an elliptical type cross-trainer exercise apparatus 10 that is used as a representative environment for the handle mechanisms described in this disclosure. It will be appreciated that han-

dle mechanisms of the type described herein can be used in a wide variety of exercise machines such as climbing machines where the movement of arm handles is coordinated with foot pedals. In this example, which is the type of elliptical apparatus shown in U.S. Patent No. 6,846,272, the apparatus 10 includes a main body portion 12, a right and a left foot pedal assembly indicated respectively at 14 and 16, a pair of rocker members 18 and 20, and a pair of right and left handle assemblies 22 and 24. The main body portion 12 includes a base 26, a resistance mechanism 28 secure to a rear portion of the base 26, and a support assembly indicated generally at 30 secured to a front portion of the base 26. Here, the support assembly 30 includes a generally upright structure 32 having a horizontal portion 34 that serves as a pivot axel.

[0014] The right foot pedal assembly 14 and the handle assembly 22 will be described in detail with the understanding that the description applies equally to the left foot pedal assembly 16 and the handle assembly 24. The right foot pedal assembly 14 includes a first and a second end 36 and 38 and a foot pedal 40 located therebetween. The first end 36 is coupled to the resistance mechanism 28. In this case the right rocker 18 includes an elongate portion 42 having a first and a second end 44 and 46. The first end 44 of the rocker 18 is rotatably coupled to the second end 38 of the right foot pedal assembly 14 and the second end 46 is rotatably coupled to the pivot axel 34 at a point 48. In this type of machine 10 the foot pedal assemblies 14 and 16 will move in an elliptical path. For purposes of describing the handle assemblies, the term rocker is used herein to represent at least one mechanical link between a foot pedal and an arm handle and could apply, for example, to a member in climber mechanism that forms part of a mechanical link between a reciprocating pedal and an arm handle that pivots on a portion of the frame of the climber so as to move in synchronism with the foot pedal.

[0015] Figures 2 and 3 provide an illustration of a first embodiment 22 of a handle assembly for use with the apparatus 10. Here, the second end 46 of the rocker 18 can include a pair of mounting brackets 50 and 52. Each of the mounting brackets 50 and 52 preferably include a guide bushings 54 and 56 respectively. The handle assembly 22 is coupled to the rocker's second end 46 by mounting brackets 50 and 52 for rotation about pivot point 48.

[0016] The handle assembly 22 includes a handle member 58 and an actuator 60. In this arrangement, the handle member 58 includes a portion 62 that is substantially linear which is slidably engaged with the guide bushings 54 and 56 along with a handgrip 64 secured to its upper end. Preferably the actuator 60 is mounted between the mounting brackets 50 and 52 having the linear portion 62 of the handle member 58 passing there-through. As a result, the actuator 60 can be used to essentially retract the handle member 58 thus reducing the upward extent of the handle member 58 and handgrip

64 relative to pivot point 48. The actuator 60 can be a linear actuator or any one of a number of well known electrical, mechanical or hydraulic devices capable moving a linear member.

[0017] Figure 2 depicts the handle member 58 in an extended state and Figure 3 depicts the handle member 58 in a retracted state. Since the handle member 58 is coupled for rotation with the rocker 18, the handle member 58 will travel along a generally arcuate path toward and away from a user occupied area generally located between the front and rear portions of base 26. The height and length of the arcuate path traced by the upper end of the handle member 58 including the handgrip 64 is reduced when the handle member 58 is moved by the actuator 60 from the extended state (Figure 2) to the retracted state (Figure 3) due to the reduced radially outward or upward extension of the handle member 58.

[0018] Figures 4 and 5 provide an illustration of a second embodiment 122 of a handle assembly for use with the apparatus 10. This arrangement includes a rocker 118 that is rotatably coupled at a pivot point 148 and which is generally similar in operation to the rocker 18 described above. Also, the handle assembly 122 includes a handle member 158 along with an actuation mechanism generally indicated at 160.

[0019] The handle member 158 includes a substantially linear portion 162 and can include a handgrip 164 secured to the upper end of the portion 162. In this example of the preferred embodiment, the actuation mechanism 160 includes a handle receptacle 166, in this case configured as a cylindrical housing, along with a first actuator 168 and a second actuator 170. Here, the receptacle 166 has its first or upper end 172 pivotally coupled to the rocker 118 at the pivot point 148. A second or lower portion 174 of the receptacle 166 can be coupled to rocker 118 through the first actuator 168. In this embodiment, the first actuator 168 includes a first end portion 176 pivotally coupled to rocker 118 and a second end portion 178 pivotally coupled to the receptacle 166. Here, the first actuator 168 is linearly extendable and retractable, so as to cause lateral rotation of the receptacle 166 and hence the handle member 158 thereby effectively moving the upper portion of the handle member 158 containing the handgrip 164 laterally away from the body portion 12. Although the receptacle 166 is shown as an enclosed cylinder in the preferred embodiment, it need only provide enough structure to provide support for the first actuator 168 and need not be an enclosed housing.

[0020] In addition or alternatively, the portion 162 of the handle member 158 can be configured to be slidably disposed within the receptacle 166. The second actuator 170 can in one embodiment be located near the first or upper end 172 of the receptacle and can operate to advance and retract the handle member 158 thereby varying the radially outward extent of the handle member 158 in a similar manner to the arrangement shown in Figures 2 and 3. Various arrangements for the second actuator 170 can be used such as a mechanical locking arrange-

ment that includes a collar 171 secured to the first or upper end 172 of the receptacle 166 with a set screw 173 that can be used by a user to lock the handle member 158 in position with respect to the receptacle 166.

[0021] Figures 6 and 7 provide an illustration of an alternate handle assembly 222 for use with the apparatus 10. Handle assembly 222 may be generally similar to handle assembly 122 with the exception of a second actuator 270. As such, only the second actuator 270 will be discussed in detail with the understanding that the description of handle assembly 122 applies equally to the remainder of handle assembly 222.

[0022] A portion 262 of a handle member 258 can be configured to be slidably disposed within a receptacle 266. The second actuator 270 can be located on the receptacle 266 near a lower portion 274 and can operate to advance and retract the handle member 258 thereby varying the radially outward extent of the handle member 258 in a similar manner to the arrangement shown in Figures 2-5.

[0023] Figure 4 depicts the handle member 158 in an extended state and the receptacle 166 in a non-rotated state. Figure 5 depicts handle member 158 in a retracted state and receptacle 166 in a rotated state. Since in this embodiment, the handle member 158 is coupled for rotation with the rocker 118, the handle member 158 will travel along a generally arcuate path toward and away from the user occupied area generally located between the upright structure 32 and the resistance mechanism 28 portions of the exercise apparatus 10. In this example of a handle assembly 122, the length of the arcuate path traced by the handle member 158 and handgrip 164 can be reduced by moving the handle member 158 from the extended state as shown in Figure 4 to the retracted state as shown in Figure 5. Additionally, or alternatively, the inward extent of the handle member 158, and more specifically the handgrip 164, can be reduced utilizing the first actuator 168. Here extending the first actuator 168 will result in the handgrip 164 rotated outward relative to the user occupied area as shown in Figure 5.

[0024] It will be appreciated that the disclosure describes the preferred embodiment of two mechanisms 22 and 122 that allow for the physical adjustment of handles, but various modifications might be desirable based on various criteria including the nature, type and configuration of the exercise apparatus along with variations in components such as locking mechanisms and actuators.

Claims

1. An exercise apparatus comprising:

- a body structure including a mounting portion;
- a foot pedal assembly including a foot pedal;
- a rocker rotatably coupled to said foot pedal assembly and said mounting portion; and
- a handle assembly coupled to said rocker for

movement therewith, said handle assembly including a handle selectively movable between an extended position and a retracted position relative to said mounting portion.

2. The exercise apparatus of claim 1, including a guide bracket secured to said rocker wherein said handle is slidably coupled to said guide bracket.
3. The exercise apparatus of claim 1, wherein said handle assembly includes an actuator operatively coupled to said handle and adapted to selectively translate said handle between said extended and retracted positions.
4. The exercise apparatus of claim 3, wherein said rocker includes first and second guide brackets securing said actuator therebetween and wherein said handle is slidably coupled to said guide brackets.
5. The exercise apparatus of claim 1 wherein said handle assembly additionally includes a mechanism for selectively moving an upper portion of said handle laterally away from said body structure.
6. The exercise apparatus of claim 5, wherein said handle assembly includes a receptacle for receiving at least a portion of said handle and wherein said receptacle is pivotally connected to said rocker so as to permit said movement of said upper portion of said handle laterally away from said body structure.
7. The exercise apparatus of claim 6, wherein said handle assembly includes an actuator operatively connected between said rocker and said receptacle effective to selectively move a lower portion of said receptacle toward said body portion resulting in said movement of said upper portion of said handle laterally away from said body structure.
8. The exercise apparatus of claim 1, wherein said handle extends a first distance relative to a center of rotation of said rocker when in said extended position and extends a second distance relative to the center of rotation of said rocker when in said retracted position, said first distance being greater than said second distance.
9. The exercise apparatus of claim 1 wherein said foot pedal moves in an elliptical path.
10. An exercise apparatus comprising:
 - a body structure including a pivot coupling;
 - a foot pedal assembly including a foot pedal;
 - a rocker rotatably coupled to said pivot coupling and said foot pedal assembly; and
 - a handle assembly coupled to and for rotation

with said rocker, said handle assembly including a handle and a mechanism for selectively moving an upper portion of said handle laterally from a first position to a second position with respect to said body structure.

11. The exercise apparatus of claim 10, wherein said foot pedal moves longitudinally with respect to said body structure in an elliptical path.
12. The exercise apparatus of claim 10, wherein said handle assembly includes an actuator effective to selectively translate said upper portion of said handle between said first and second positions.
13. The exercise apparatus of claim 10, wherein said handle assembly includes a receptacle configured to receive at least a portion of said handle rotatably coupled to said pivot coupling at a first end, an actuation mechanism coupled to a second end of said receptacle and said rocker and configured to rotate said receptacle relative to said rocker about said pivot coupling thereby being effective to selectively translate said upper portion of said handle between said first and second positions.
14. An exercise apparatus comprising:
 - a body structure including a mounting portion;
 - a rocker member rotatably coupled to said mounting portion; and
 - a handle assembly coupled to said mounting portion and said rocker member said handle assembly including a handle, and an adjustment mechanism adapted to permit said handle to be selectively raised to an extended position or lowered to a retracted position with respect to said mounting portion.
15. The exercise apparatus of claim 14, wherein said adjustment mechanism includes an actuator operatively connected to said handle.
16. The exercise apparatus of claim 15, wherein said handle assembly includes at least one guide bracket secured to said rocker member wherein said handle is slidably coupled to said guide bracket.
17. The exercise apparatus of claim 16, wherein said adjustment mechanism includes a mechanical locking mechanism operatively connected to said handle.
18. The exercise apparatus of claim 17, wherein said mechanical locking mechanism includes a collar member secured to said body structure and encompassing said handle and a set screw effective to retain said handle in said extended or retracted position.

tions.

- 19.** The exercise apparatus of claim 14, wherein said rocker member is rotatable about a pivot point on said mounting portion, said handle being rotatable relative to said rocker member about said pivot point. 5
- 20.** The exercise apparatus of claim 19 including a foot pedal assembly having a foot pedal operatively connected to said rocker member wherein said foot pedal moves in an elliptical path. 10

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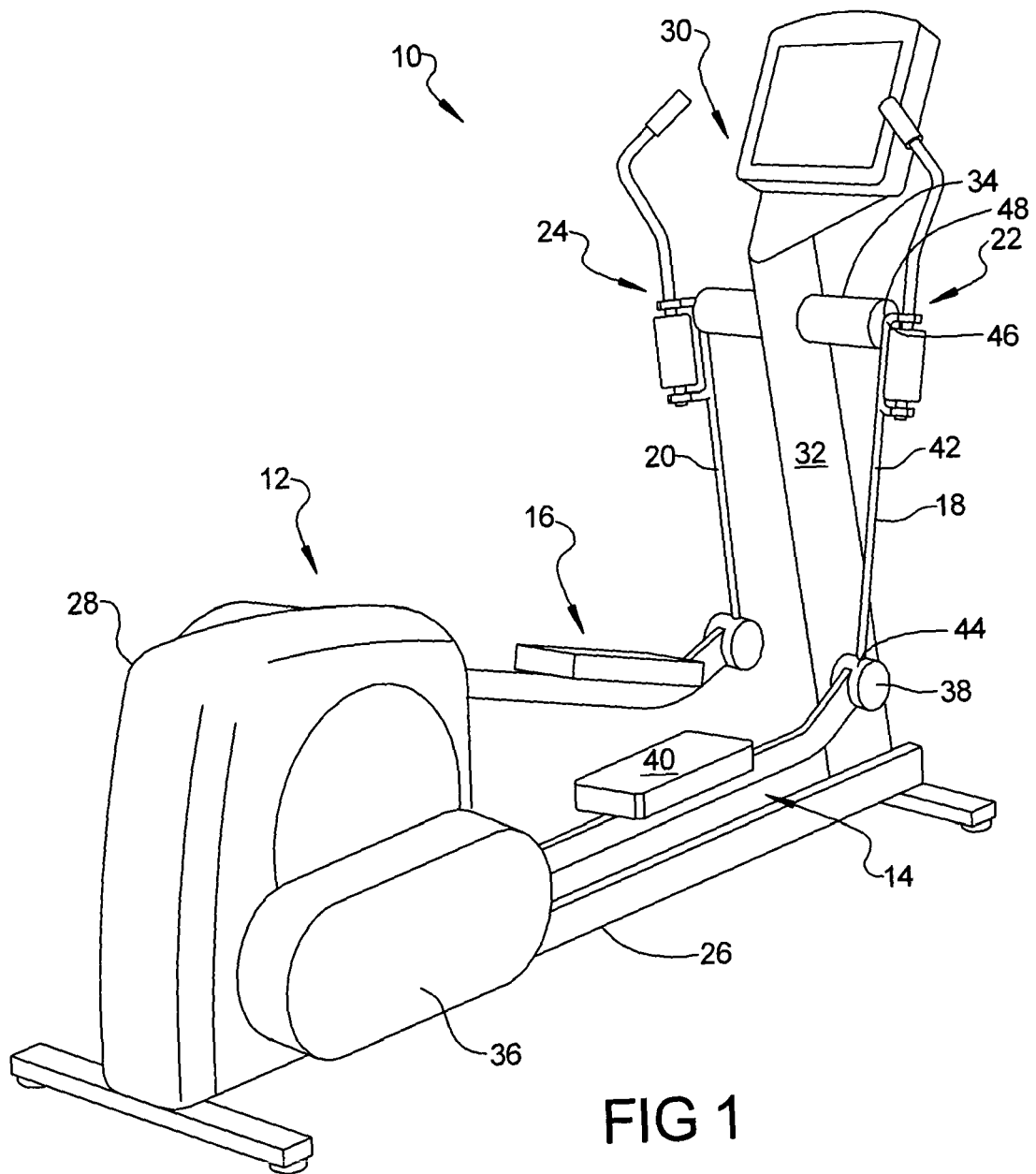
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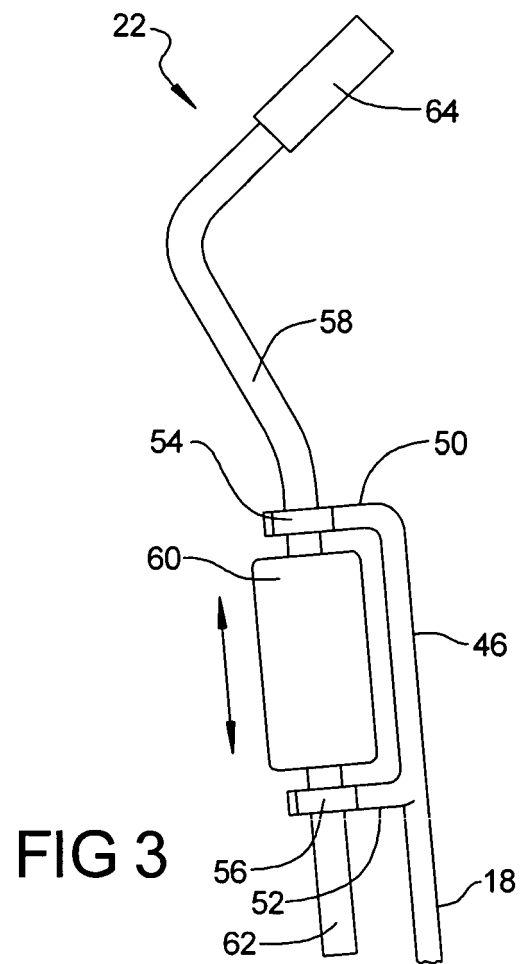
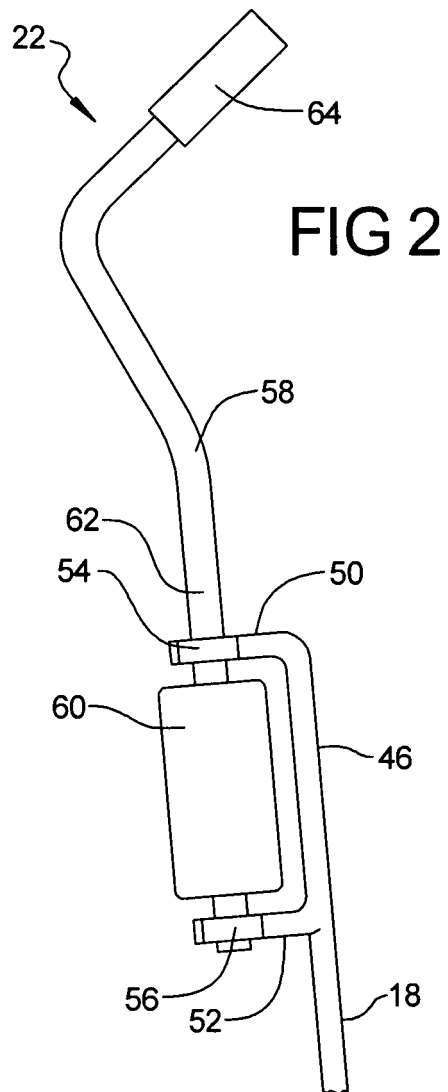
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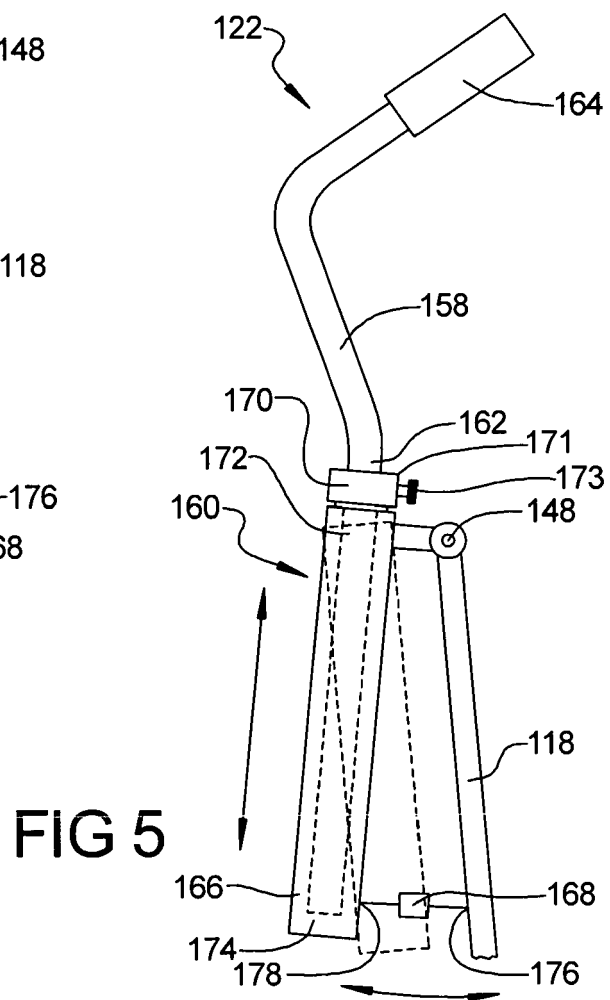
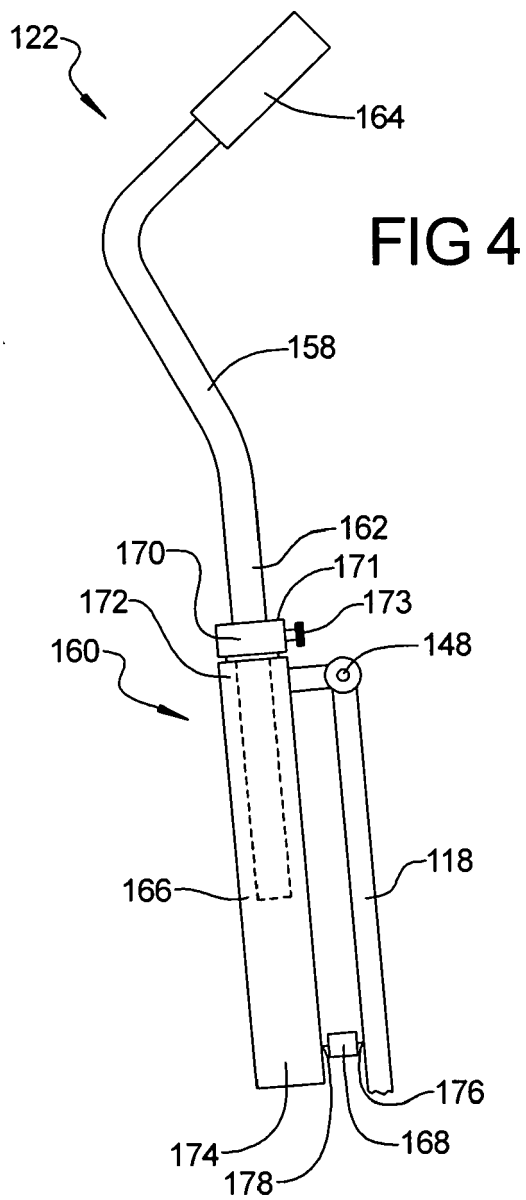
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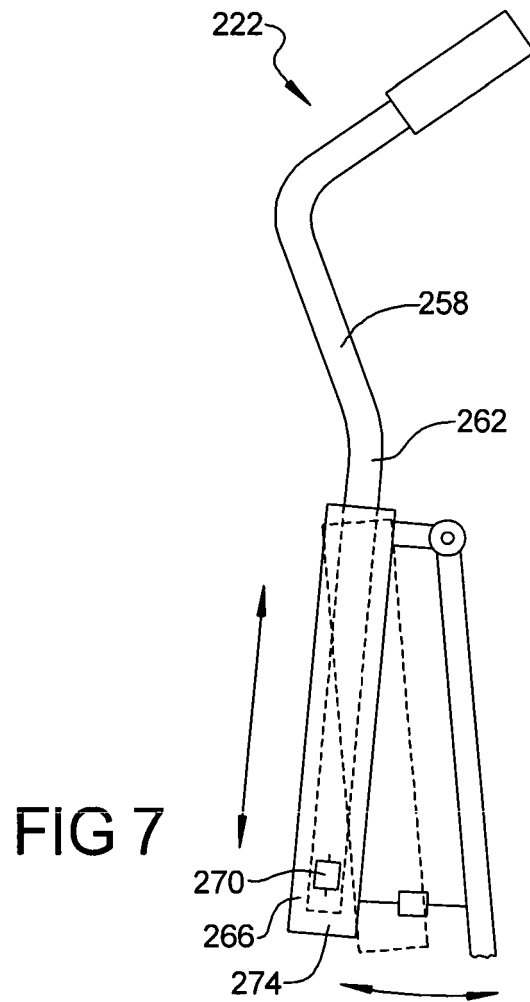
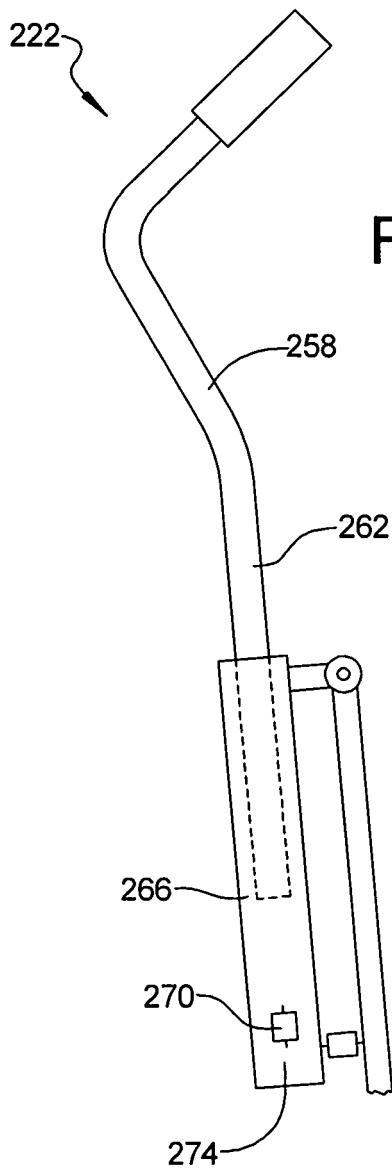
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EUROPEAN SEARCH REPORT

Application Number
EP 08 25 2712

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2002/119867 A1 (STEARNS KENNETH W [US] ET AL) 29 August 2002 (2002-08-29) * paragraph [0005] - paragraph [0040]; figures 1-10 *	1-20	INV. A63B23/035 A63B23/04
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A	* column 1, line 34 - column 4, line 4; figures 1-5 *	10-13	
X	US 2005/227824 A1 (WU PETER [TW] ET AL) 13 October 2005 (2005-10-13) * paragraph [0006] - paragraph [0025]; figures 1-5 *	1-20	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A63B
Place of search		Date of completion of the search	Examiner
The Hague		13 November 2008	Oelschläger, Holger
CATEGORY OF CITED DOCUMENTS 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 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			

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EPO FORM 1503 03.02 (P04C01)

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

EP 08 25 2712

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13-11-2008

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REFERENCES CITED IN THE DESCRIPTION

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