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(71) Applicants:
- **Ho, Wei-Teh**
  Taipei (TW)
- **Ho, Willy Wei Yu**
  Taipei (TW)

(72) Inventors:
- **Ho, Wei-Teh**
  Taipei (TW)
- **Ho, Willy Wei Yu**
  Taipei (TW)

(74) Representative: **Karakatsanis, Georgios**
Haft Karakatsanis Patentanwaltskanzlei
Dietlindenstrasse 18
80802 München (DE)

(54) CHEST-DEVELOPING EXERCISER

(57) An exercise machine includes a main shaft having a bottom end and a top end along a longitudinal direction is described. A rotatable element may be provided at the bottom end of the main shaft. A torsion resilient assembly can include a fixed torsion structure, a pivotable structure and an elastic element. The pivotable structure can pivot to deform the elastic element to induce a resilient torque force. An engagement frame may be rotatably mounted to the pivotable structure. User force may cause the rolling of the main shaft to change an angular relationship between the engagement frame and the main shaft to cause the pivotable structure to induce a resilient torque force for user exercising.

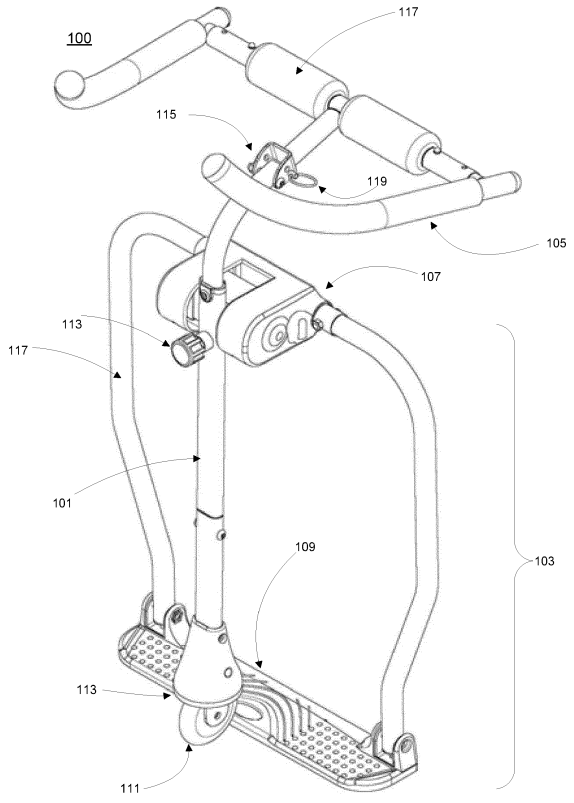

Fig. 1

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Description

FIELD OF INVENTION

[0001] The present invention relates generally to an exercising machine, and in particular, to a chest-developing exerciser for training the muscles of the chest.

BACKGROUND

[0002] With the growing awareness of health problems caused by lack of exercise, the popularity of exercise machines has steadily increased. These machines may be designed with resilient components to provide counter forces against movements exerted by users for exercising purposes. There are chest developing machines provided with resilient components based on spring elements. However, these machines may be limited by the sprint elements which are complicated in structure, costly to construct, hard to maintain, and heavy in weight.

[0003] Therefore, there is a need to provide better chest developing machines.

SUMMARY OF THE DESCRIPTION

[0004] An exercise machine can include a main shaft having a bottom end and a top end along a longitudinal direction. A rotatable element may be provided at the bottom end of the main shaft. The rotatable element may be rotatable around an axis substantially transverse to the longitudinal direction. In one embodiment, the rotatable element may be positioned to roll forward and backward across a surface. Handlebars may be affixed to the main shaft at the top end.

[0005] In one embodiment, the exercise machine can include a torsion resilient assembly having a fixed torsion structure, a pivotable structure and an elastic element. The pivotable structure may be pivotable relative to the fixed torsion structure around a torsion axis. The elastic element may be arranged longitudinally along the torsion axis substantially transverse to the longitudinal direction of the main shaft. The fixed torsion structure may be fixated to the main shaft. The pivotable structure can pivot to deform the elastic element to induce a resilient torque force.

[0006] In one embodiment, the exercise machine can include an engagement frame having a high end and a low end. The engagement frame may be rotatably mounted to the pivotable structure of the torsion resilient assembly via the high end. Additionally or optionally, the engagement frame may be defined with an angular relationship with the main shaft around the torsion axis. A footrest may be rotatably affixed to the engagement frame at the low end. User force applied via the handlebar and the footrest may cause the rolling of the main shaft to change the angular relationship between the engagement frame and the main shaft. The change of the angular relationship can cause the pivotable structure to pivot to induce the resilient torque force for user exercising.

[0007] Other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention is illustrated by way of examples and not limitations in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

Figure 1 is a perspective diagram illustrating an embodiment of an chest-developing machine;
Figure 2 is a component diagram illustrating an embodiment of a chest-developing machine;
Figures 3A-3C illustrate exemplary configurations of a chest-developing machine according to one embodiment of the present invention;
Figures 4-5 are perspective diagrams illustrating alternative embodiments of a chest-developing machine;
Figures 6A-6B show examples of an application of a chest-developing machine according to one embodiment of the present invention.

DETAILED DESCRIPTION

[0009] In the following description, numerous specific details are set forth, such as examples of external surfaces, named components, connections between components, etc., in order to provide a thorough understanding of the present invention. It will be apparent, however, to one skilled in the art that the present invention may be practiced without these specific details. In other instances, well known components or methods have not been described in detail but rather in a block diagram in order to avoid unnecessarily obscuring the present invention. Further, specific numeric references such as first, second, third, etc., may be made. However, the specific numeric references should not be interpreted as a literal sequential order but rather interpreted as references to different objects. Thus, the specific details set forth herein are merely exemplary. The specific details may be varied from and still be contemplated to be within the spirit and scope of the present invention.

[0010] Reference in the specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification do not necessarily all refer to the same embodiment.

[0011] Figure 1 is a perspective diagram illustrating an embodiment of a chest-developing machine. Device 100 may include main shaft 101 having bottom end 113 and a top end along a longitudinal direction. The length of main shaft 101 (or height of device 100) may be adjustable via knob 113.

[0012] In one embodiment, rotatable element 111, such as a wheel, a ball or other applicable rotatable mechanism, may be configured at bottom end 113 of main shaft 101 to provide rollable ground support for device 100. For example, rotatable element 111 may be positioned to roll forwardly or backwardly across a surface along a direction between the front and back sides of device 100. Rotatable element 111 may be rotatably coupled to main shaft 111 via an axis substantially transverse to the longitudinal direction of main shaft 111 and/or the direction between the front and back sides of device 100.

[0013] Handlebars 105 may be affixed to the top end of main shaft 101 on two sides of device 100 via coupling structure 115. A lateral direction between the two sides(e.g. left and right sides) of device 100 may define a sideway direction substantially transverse to the longitudinal direction of main shaft 101. The axis of rotation of rotatable element 111 may be configured to be substantially parallel to sideway direction of device 100. Chest support 117 may be affixed to handlebars 105. Pin insert 119 may allow various angular configurations between handlebars 105 and main shaft 101, for example, to accommodate different heights of users or modes of operations of device 100. In some embodiments, coupling structure 115 may be defined with multiple insert holes for different angular configurations. Pin insert 119 may be placed through one of the insert holes to select one of the angular configurations (or relationships) between main shaft 101 and handlebars 105.

[0014] Torsion resilient assembly 107 may be affixed to main shaft 101 between a top end of main shaft 101 and bottom end 113 to provide resilient torque force around a torsion axis via a pivotable structure (not shown) for exercising movements. Torsion resilient assembly 107 may be configured with an elastic element (not shown) substantially defining the torsion axis. The torque force may be induced as a result of deforming the elastic element caused by pivoting movements of the pivotable structure.

[0015] In one embodiment, device 100 can include engagement frame 103 arranged with a high end and a low end. Engagement frame 103 can be rotatably mounted to the pivotable structure of torsion resilient assembly 107 via the high end to allow engagement frame 103 to pivot relative to main shaft 101 around the torsion axis of torsion resilient assembly 107. When at rest (e.g. without a user exerting forces), engagement frame 103 and main shaft 101 may be defined with an angular relationship around the torsion axis of torsion resilient assembly 107.

[0016] Engagement frame 103 may include two (or at least one) support bars 117 provided longitudinally between the high end and the low end. Support bar 117 may be rotatably coupled with the pivotable structure of torsion resilient assembly 107 at the high end. Footrest 109 may be rotatably affixed with each support bar 117 at the low end of engagement frame 103 to provide user foot rest (or engagement). For example, user force applied via handlebar 105 and footrest 109 may cause main shaft 101 to roll back and forth to change the angular relationship with engagement frame 103. The change of the angular relationship (e.g. rolling forward to increase the relative angle or backward to reduce the relative angle) can cause the pivotable structure of torsion resilient assembly 107 to pivot, hence inducing the resilient torque force for user exercising.

[0017] Figure 2 is a component diagram illustrating an embodiment of a chest-developing machine. For example, view 200 may be based on device 100 of Figure 1. In one embodiment, main shaft 101 may be retractably configured with multiple sections including upper section 201, middle section 203 and lower section 205. Main shaft 101 may be lengthened or shortened via knob 113 selectively inserted to one of multiple coupling positions defined along upper section 201.

[0018] Torsion resilient assembly 107 may include pivotable structure 211, fixed torsion structure 217 and elastic element 209. Pivotable structure 211 may be pivotably coupled to fixed torsion structure 217 around a torsion axis substantially aligned longitudinally with elastic element 209. Fixed pivot structure 217 may be affixed to middle section 203 of main shaft. Elastic element 209 may be configured longitudinally with a middle portion and two end portions.

[0019] Elastic element 209 may be housed within housing elements of fixed pivot structure 217 and pivotable structure 211. For example, fixed pivot structure 217 can include a sleeve element to house the middle portion of elastic element 209. Pivotable structure 211 can include two (or at least one) cap elements separately housing the end portions of elastic element 209. Each end portion of elastic element 209 may be fittingly enclosed via a cap element of pivotable structure 211.

[0020] The sleeve element and cap elements may be shaped to grip (or match) outer surfaces of elastic element 209. For example, cross section of outer surfaces of elastic element 209 may be non-smoothly shaped (e.g. squarely, angularly or based on other applicable shapes with resistivity). The sleeve element and cap elements may be defined substantially conforming the non-smoothly shaped outer surface of elastic element 209 to facilitate twisting the elastic element for the resilient torque force.

[0021] According to some embodiments, a central passage may be defined longitudinally through elastic element 209. Pivot rod 213 may be housed within the central passage of elastic element 209 for guiding the deformation of elastic element 209. The torsion axis of torsion resilient assembly may be defined along pivot rod 213.

[0022] In one embodiment, strength of the resilient torque force induced via elastic element 209 may depend on a level of compression applied. For example, elastic element 209 may be compressed longitudinally to increase the strength of the torque force induced with the same amount of angular movement between pivotable structure 211 relative to fixed torsion structure 217. Torsion resilient assembly may include resilient adjustment control, such as coupling screw 215 to configure the level of compression applied to elastic element 209 to allow varying of the strength of the resilient torque force.

[0023] Figures 3A-3C illustrate exemplary configurations of a chest-developing machine according to one embodiment of the present invention, such as device 100 of Figure 1. As shown in Figure 3A, coupling structure 115 may define multiple insert holes 301, 303 to affix handlebar 105 and upper section 201 of main shaft 101 with different angular relationships. Figure 3A may illustrate a configuration with pin insert 119 placed through insert hole 303. Figure 3B may illustrate an alternative configuration with pin insert 119 placed through insert hole 301. Handle bar 105 may be configured to tilt upwards, e.g. 30 degrees relative to the support floor in Figure 3A. Alternatively or optionally, handle bar 105 in Figure 3B may be attached to main shaft 101 in a manner substantially parallel to the support floor. Figure 3C shows upper section 201 and handlebar 105 detached from each other.

[0024] Figures 4-5 are perspective diagrams illustrating alternative embodiments of a chest-developing machine. For example, view 400 of Figure 4 may be based on an alternative configuration of device 100 of Figure 1. Handlebar 105 in view 400 may be angularly configured with a larger angle with main shaft 101 compared with view 100 of Figure 1.

[0025] Turning now to Figure 5, device 500 may be similarly structured with device 100 of Figure 1. For example, device 500 can include engagement frame 503, main shaft 501 and torsion resilient assembly 507. Handlebar 505 may be configurably coupled at the top end of main shaft 501. Upper section of main shaft 501 may be arranged with an angular shape different from upper section 201 of Figure 2 to allow the bottom end of main shaft 501 to tilt away from footrest 509 at a rest state (or at rest without a user exerting forces).

[0026] Figures 6A-6B show examples of an application of a chest-developing machine according to one embodiment of the present invention, such as device 100 of Figure 1. Turning now to Figure 6A, view 600A may illustrate a user sitting on a chair forward facing with two hands resting on handlebars 105 and two feet resting on (or engaged with) footrest 109. View 600A may indicate an angle 601 between main shaft 101 and support bar 207 (or engagement frame) when the user is resting without exerting forward pushing force via handlebars 105. Alternatively, angle 601 may represent an angle which is closing between main shaft 101 and support bar 207 while handlebar 105 is being lifted up (and/or with footrest 109 pushed forward) by the user to cause the bottom end of main shaft 101 to roll backwards. Resilient torque force via torsion resilient assembly 107 may be generated to reset back (e.g. opening up) the pivoting position between main shaft 101 and support bar 207.

[0027] Turning now to Figure 6B, view 600B may illustrate a user pushing downward (or forwardly) via handlebars 105 and/or pulling backwards via footrest 109 to cause the bottom end of main shaft 101 to roll forward. The pivoting position between main shaft 101 and support bar 207 may be opened up with angle 606. Resilient torque force via torsion resilient assembly 107 may be generated to reset back (e.g. closing down) the pivoting position between main shaft 101 and support bar 207, for example, to roll main shaft 101 backwards.

[0028] Many modifications and other embodiments of the invention set forth herein will come to mind to one skilled in the art to which the invention pertains to having the benefit of the teachings presented in the foregoing description and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

Claims

1. An exercise machine comprising:

a main shaft having a bottom end and a top end along a longitudinal direction;

a rotatable element provided at the bottom end of the main shaft, the rotatable element rotatable around an axis substantially transverse to the longitudinal direction, the rotatable element positioned to roll forward and backward across a surface;

handlebars affixed to the main shaft at the top end;

a torsion resilient assembly having a fixed torsion structure, a pivotable structure and an elastic element, the pivotable structure rotatable relative to the fixed torsion structure around a torsion axis, the elastic element arranged longitudinally along the torsion axis substantially transverse to the longitudinal direction of the main shaft, the fixed torsion structure fixated to the main shaft, wherein the pivotable structure pivots to deform the elastic element to induce a resilient torque force;

an engagement frame having a high end and a low end, the engagement frame rotatably mounted to the pivotable structure of the torsion resilient assembly via the high end, the engage-

ment frame defined with an angular relationship with the main shaft around the torsion axis; and a footrest rotatably affixed to the engagement frame at the low end, wherein user force applied via the handlebar and the footrest causes the rolling of the main shaft to change the angular relationship between the engagement frame and the main shaft, the change of the angular relationship to cause the pivotable structure to pivot to induce the resilient torque force for user exercising.

2. The exercise machine of claim 1, wherein the two handlebars are affixed on two sides of the main shaft via the top end, the two sides defining a transverse direction to the longitudinal direction, the transverse direction substantially parallel to the axis of the rotatable element.

3. The exercise machine of claim 1, wherein the engagement frame comprises:

at least one support bar provided longitudinally between the high end and the low end, wherein each support bar rotatably coupled with the pivotable structure at the high end and wherein each support bar is rotatably coupled with the footrest at the low end.

4. The assembly of claim 1, wherein the elastic element has a middle portion and two end portions longitudinally, wherein the fixed torsion structure has a sleeve element to house the middle portion of the elastic element and wherein the pivotable structure includes two cap elements separately housing the end portions of the elastic element.

5. The assembly of claim 4, wherein cross section of outer surface of the elastic element is non-smoothly shaped, and wherein the sleeve element and the cap elements are shaped substantially conforming the non-smoothly shaped outer surface of the elastic element to facilitate twisting the elastic element for the resilience torque force.

6. The assembly of claim 5, wherein the cross section is squarely shaped.

7. The assembly of claim 1, wherein a central passage is defined longitudinally through the elastic element, wherein the torsion resilience assembly further comprises a pivot rod housed within the central passage, and wherein the torsion axis is defined along the pivot rod.

8. The assembly of claim 1, wherein strength of the resilient torque force depends on a level of compression applied on the elastic element, the torsion resilience assembly further comprises:

an adjustment control to configure the level of compression applied to the elastic element to allow varying of the strength of the resilient torque force.

9. The assembly of claim 1, further comprising:

a coupling structure to configurably affix the handlebars and the main shaft, wherein the coupling structure includes a pin insert to select one of a plurality of angular relationships between the handlebars and the main shaft.

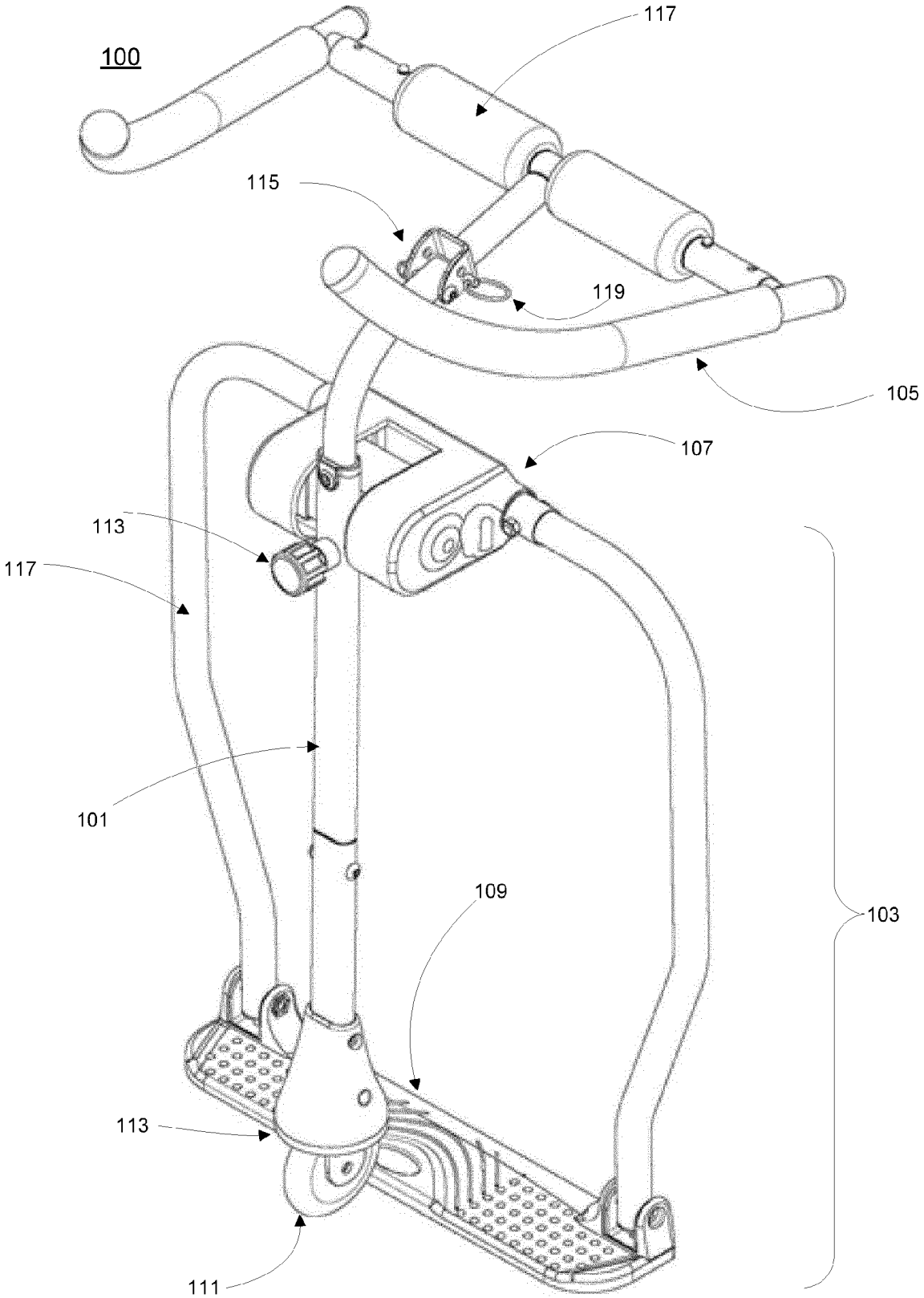

Fig. 1

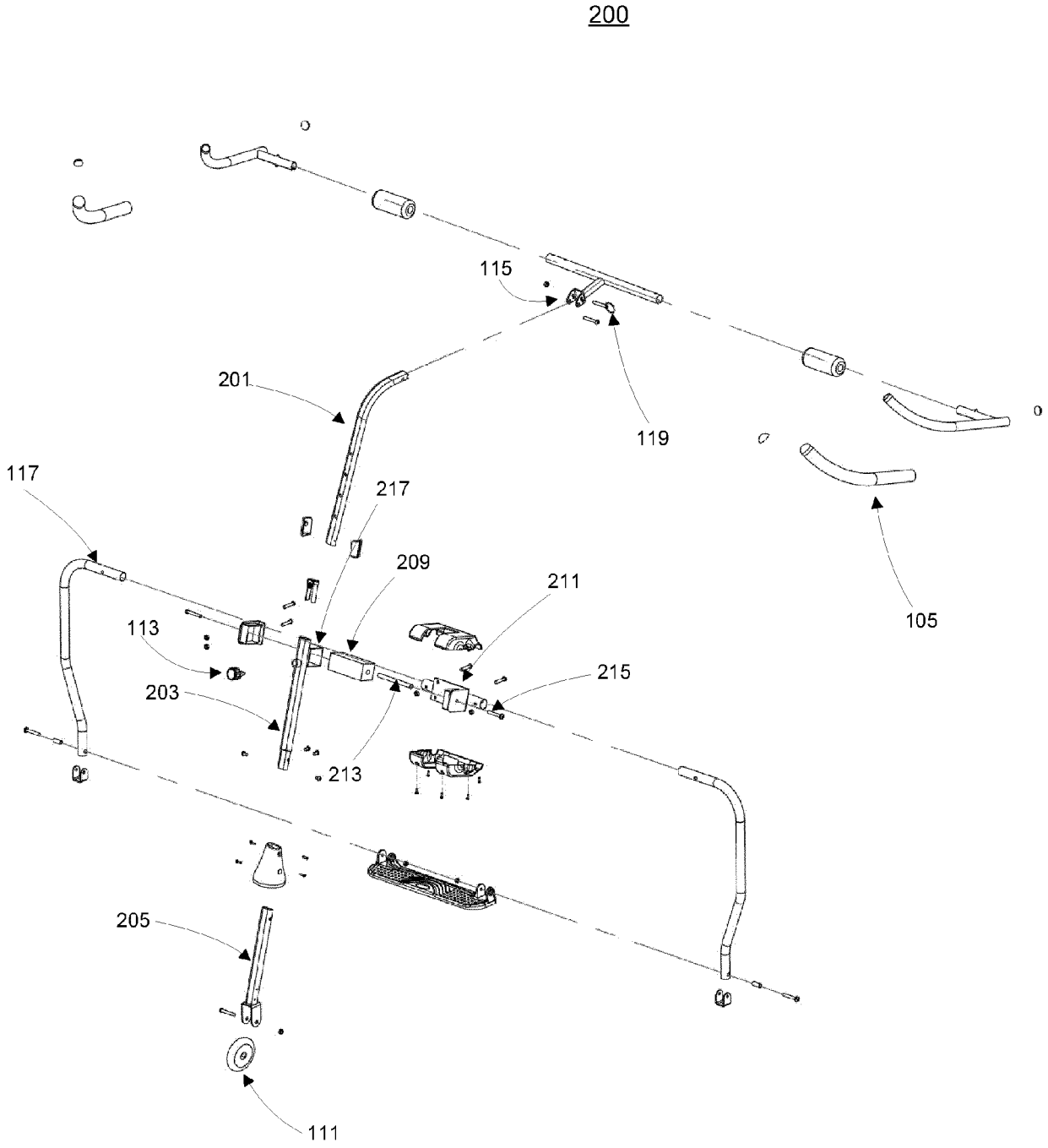

Fig. 2

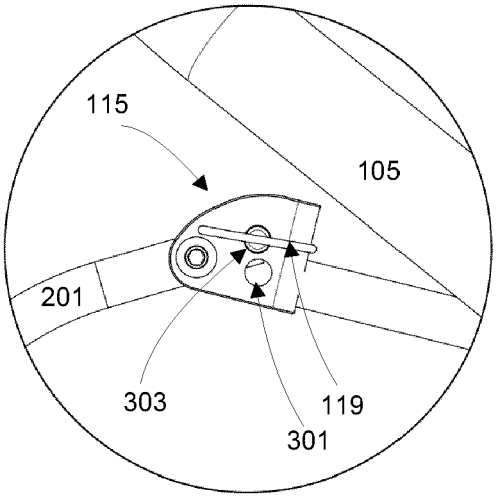

Fig. 3A

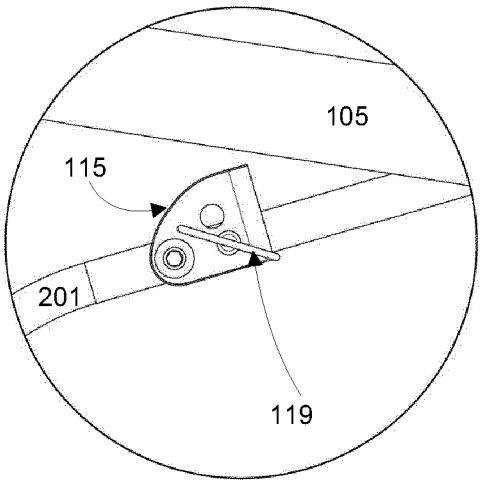

Fig. 3B

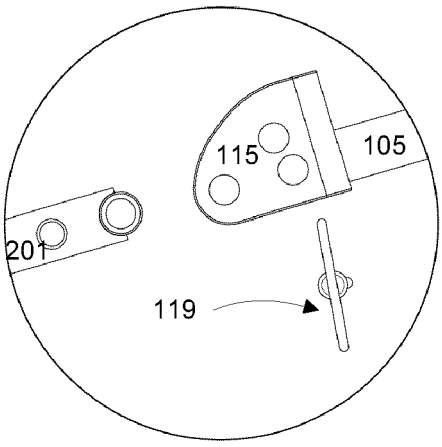

Fig. 3C

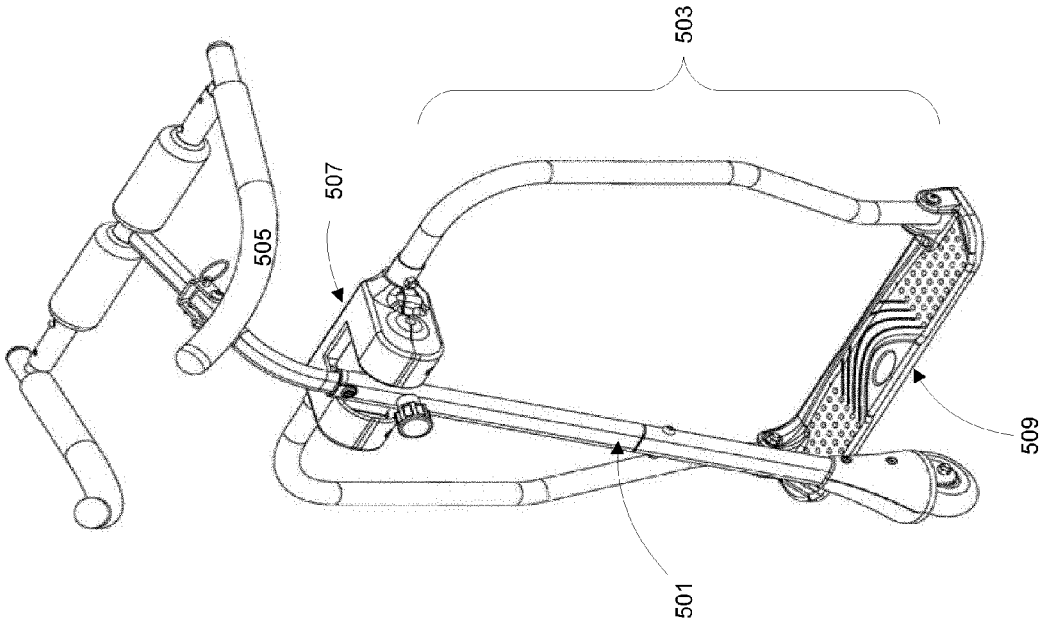

Fig. 5

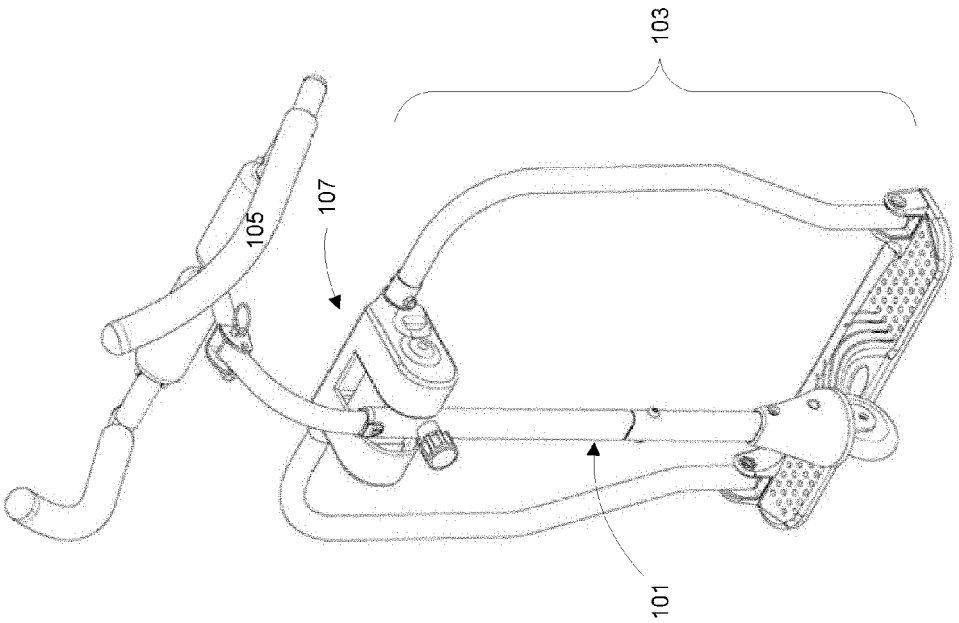

Fig. 4

600B

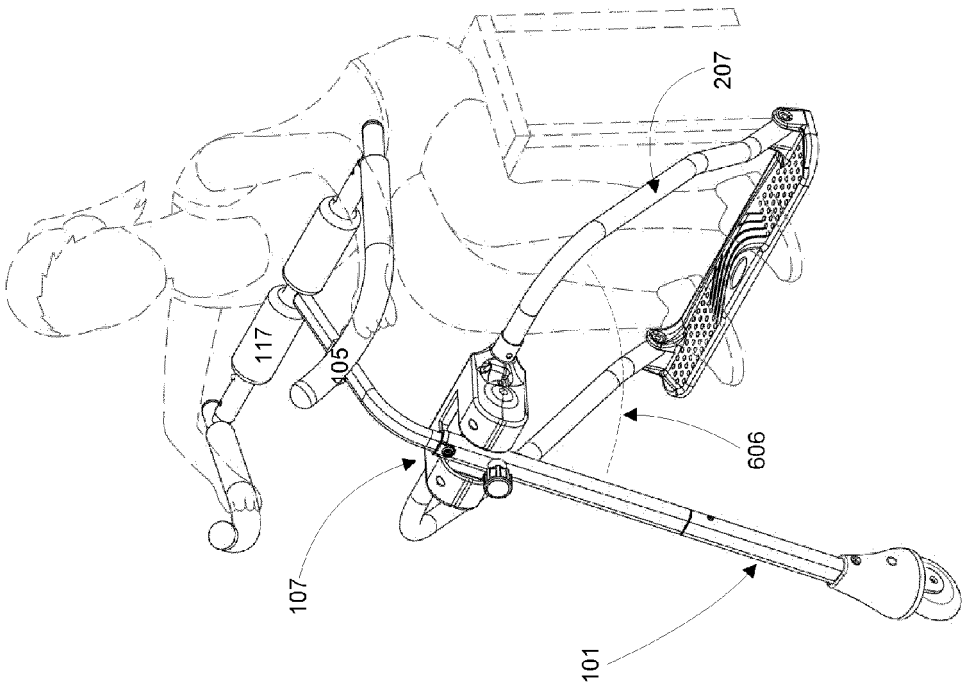

Fig. 6B

600A

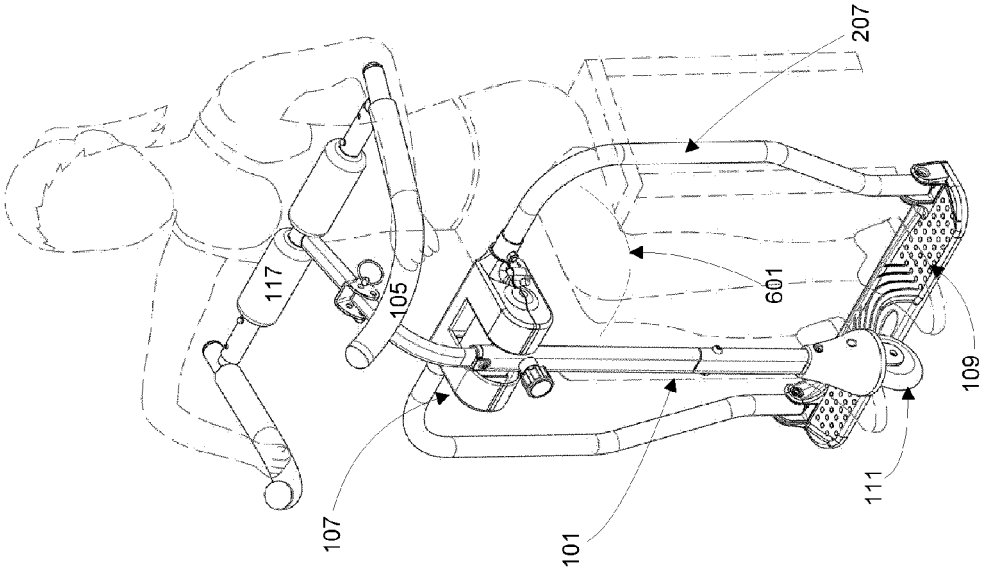

Fig. 6A

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 9264

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 November 2016	Jekabsons, Armands

CATEGORY OF CITED DOCUMENTS

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