US012390685B2

(12) **United States Patent**
Chuang

(10) **Patent No.: US 12,390,685 B2**
(45) **Date of Patent: Aug. 19, 2025**

(54) **MULTIFUNCTIONAL CORE TRAINING DEVICE**

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(72) Inventor: **Lung-Fei Chuang**, Taichung (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 95 days.

(21) Appl. No.: **18/419,578**

(22) Filed: **Jan. 23, 2024**

(65) **Prior Publication Data**

US 2024/0399200 A1 Dec. 5, 2024

(30) **Foreign Application Priority Data**

May 30, 2023 (CN) 202321340702.5

(51) **Int. Cl.**
A63B 23/02 (2006.01)
A63B 21/00 (2006.01)

(52) **U.S. Cl.**
CPC ***A63B 23/0216*** (2013.01); ***A63B 23/0211*** (2013.01); *A63B 21/00185* (2013.01); *A63B 21/4035* (2015.10); *A63B 2225/09* (2013.01)

(58) **Field of Classification Search**
CPC A63B 23/0216; A63B 23/0211; A63B 21/00185; A63B 21/4035; A63B 2225/09; A63B 2210/50; A63B 2210/58; A63B 21/00061; A63B 21/00065; A63B 21/0428; A63B 21/4031; A63B 21/4033; A63B 21/4039; A63B 22/205; A63B 23/03525; A63B 21/0552; A63B 23/0205; A63B 22/0076; A63B 2209/08
See application file for complete search history.

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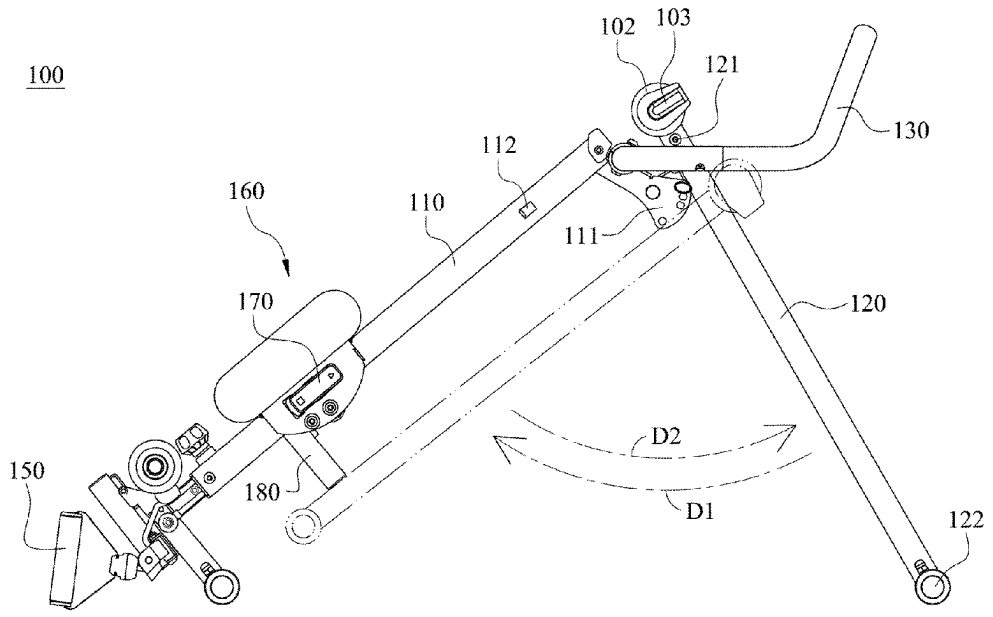
(74) *Attorney, Agent, or Firm* — CKC & Partners Co., LLC

(57) **ABSTRACT**

A multifunctional core training device includes a first frame body, a second frame body, a holding device, two elastic elements, two forcing elements, a sliding structure, and a switch. The second frame body is pivotally disposed on the first frame body. The holding device is disposed on the first frame body. The two elastic elements are disposed on the first frame body. The two forcing elements are respectively connected to the two elastic elements. The sliding structure is movably disposed on the first frame body. The switch is disposed on the sliding structure and is for positioning a position of the sliding structure relative to the first frame body. When the second frame body pivots relative to the first frame body, the relative position of the first frame body and the second frame body is changed.

16 Claims, 18 Drawing Sheets



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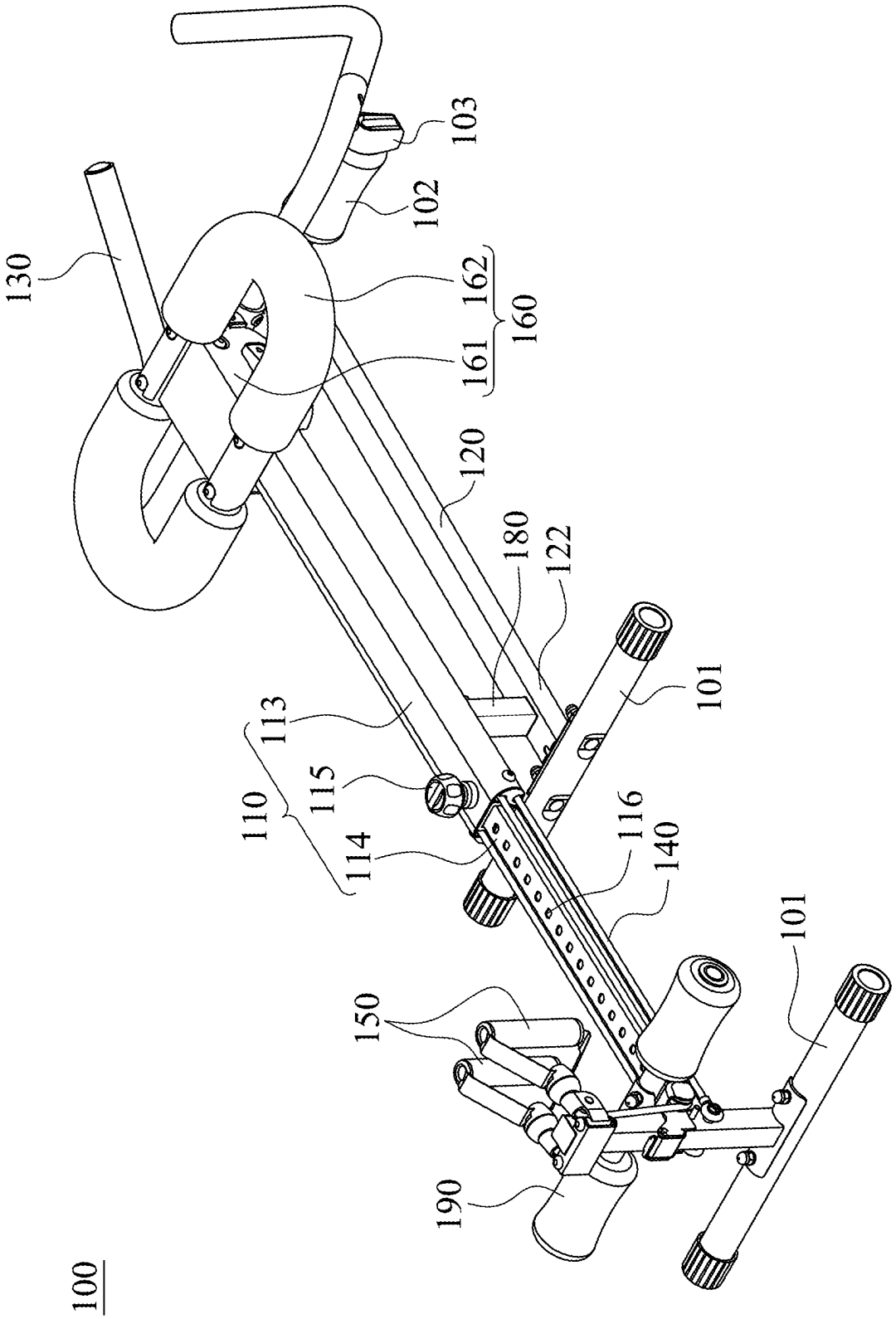
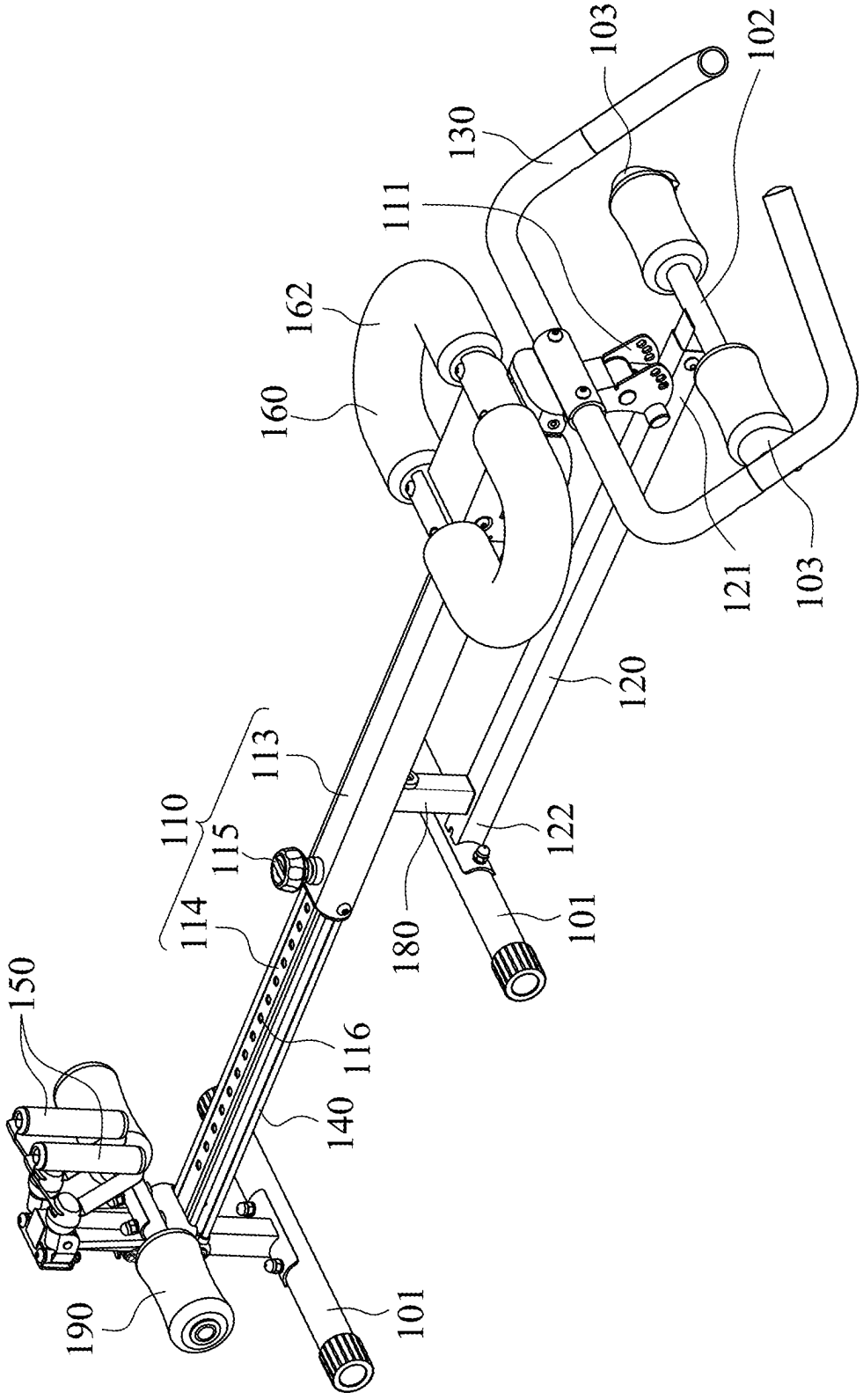

100
130
103
102
162
161
160
120
180
122
101
113
110
115
114
116
140
150
190

Fig. 1


103
102
130
111
162
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121
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110
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114
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140
190
101

Fig. 2

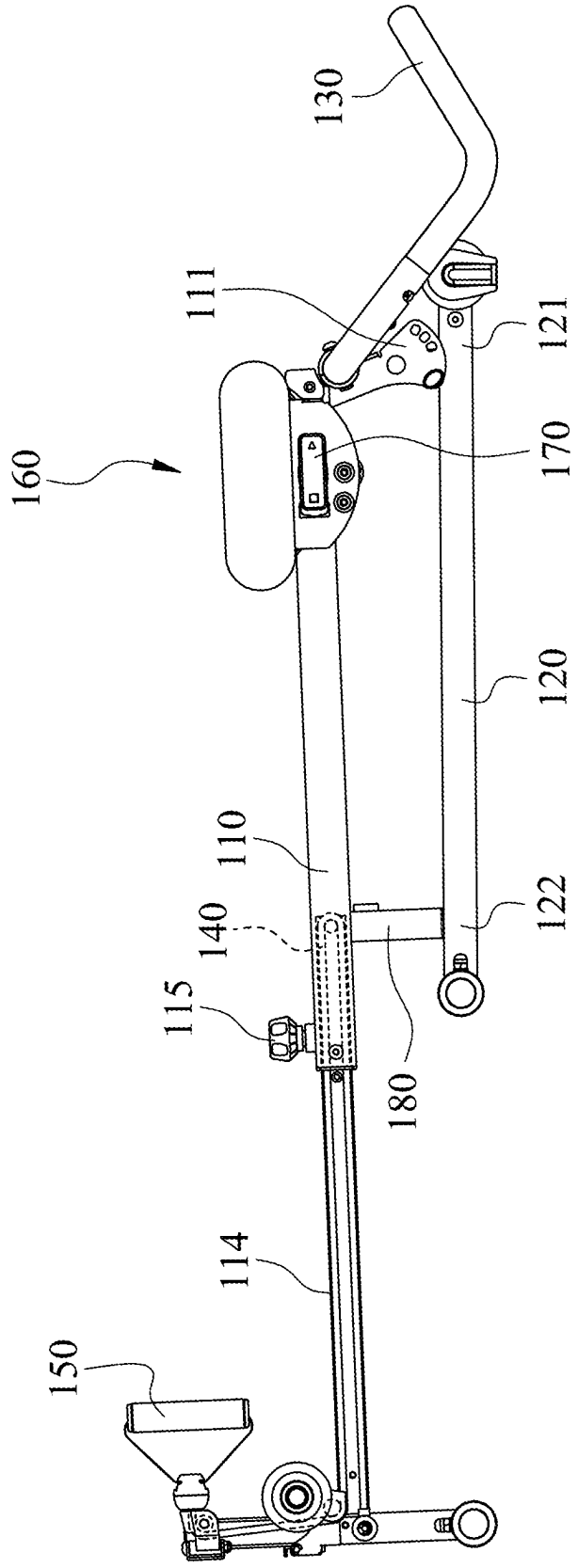

Fig. 3

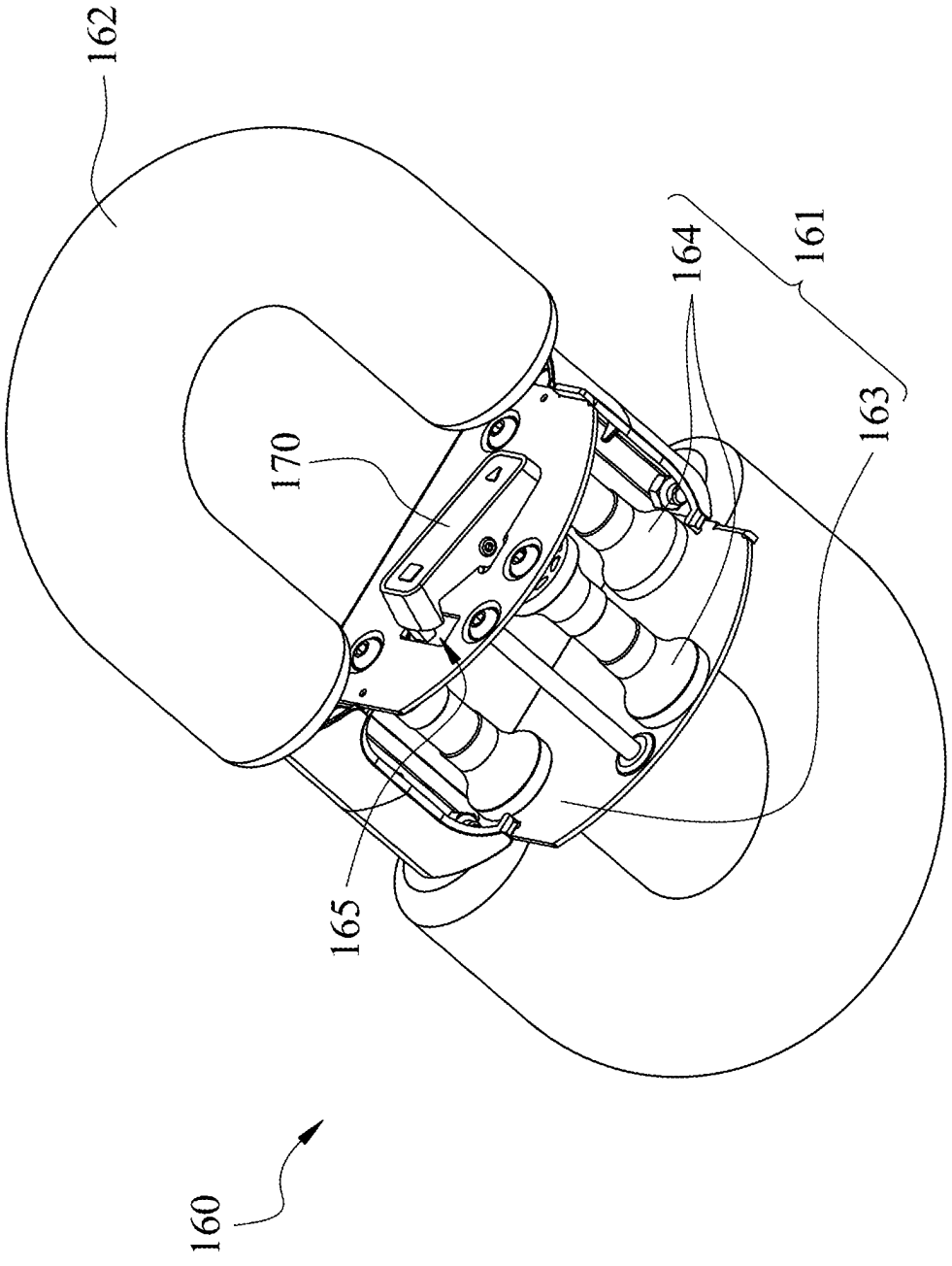

Fig. 4

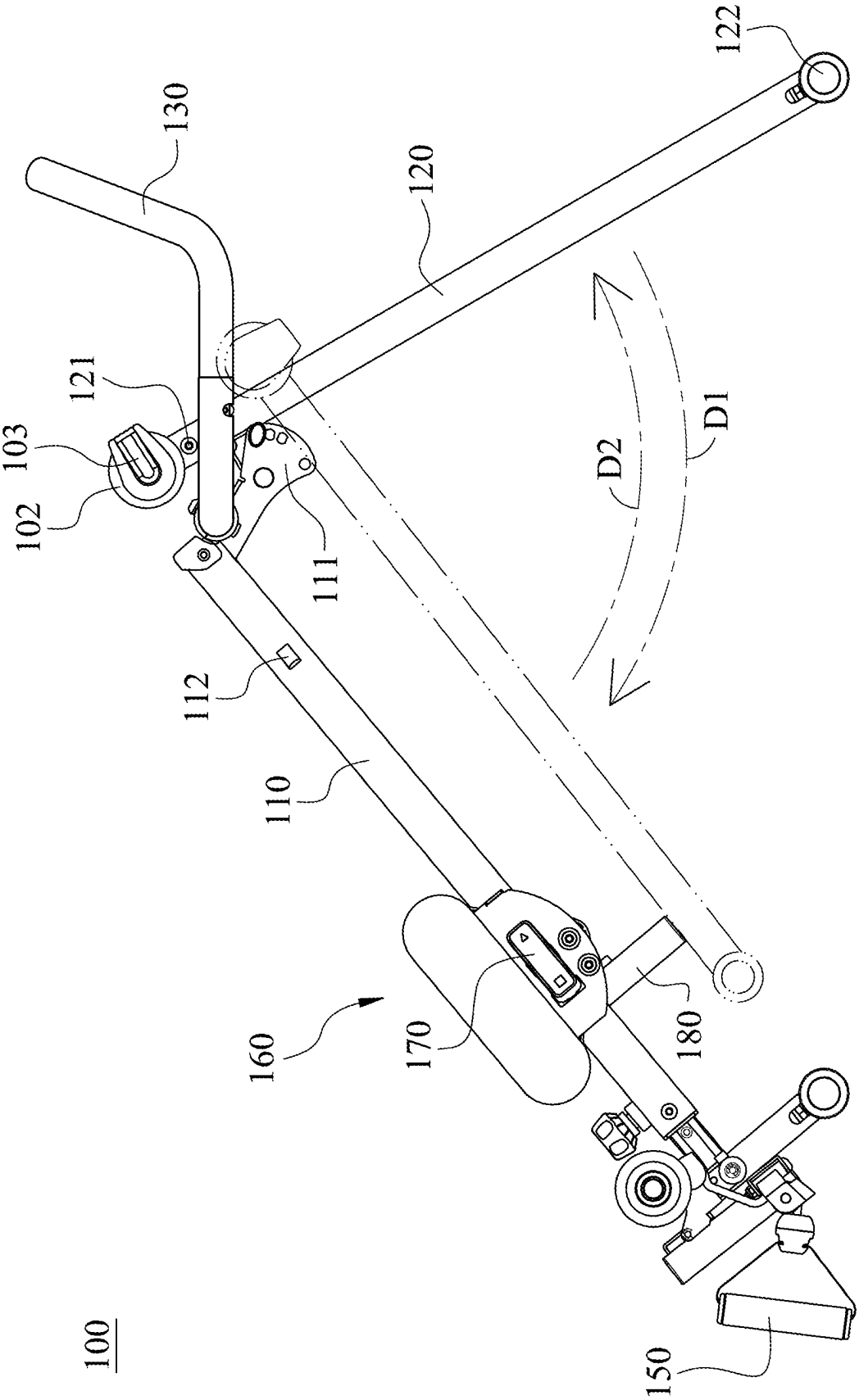

Fig. 5

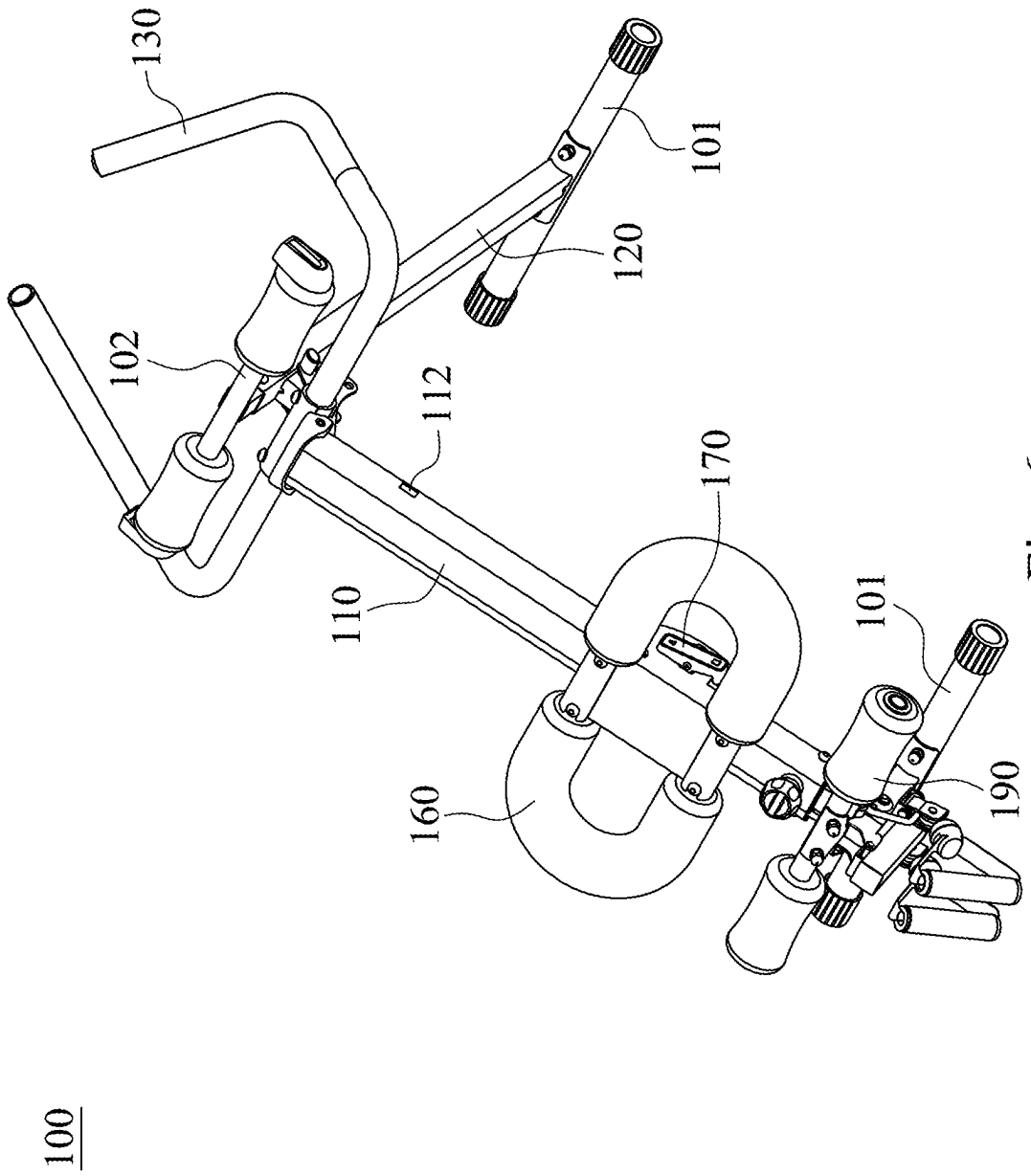

Fig. 6

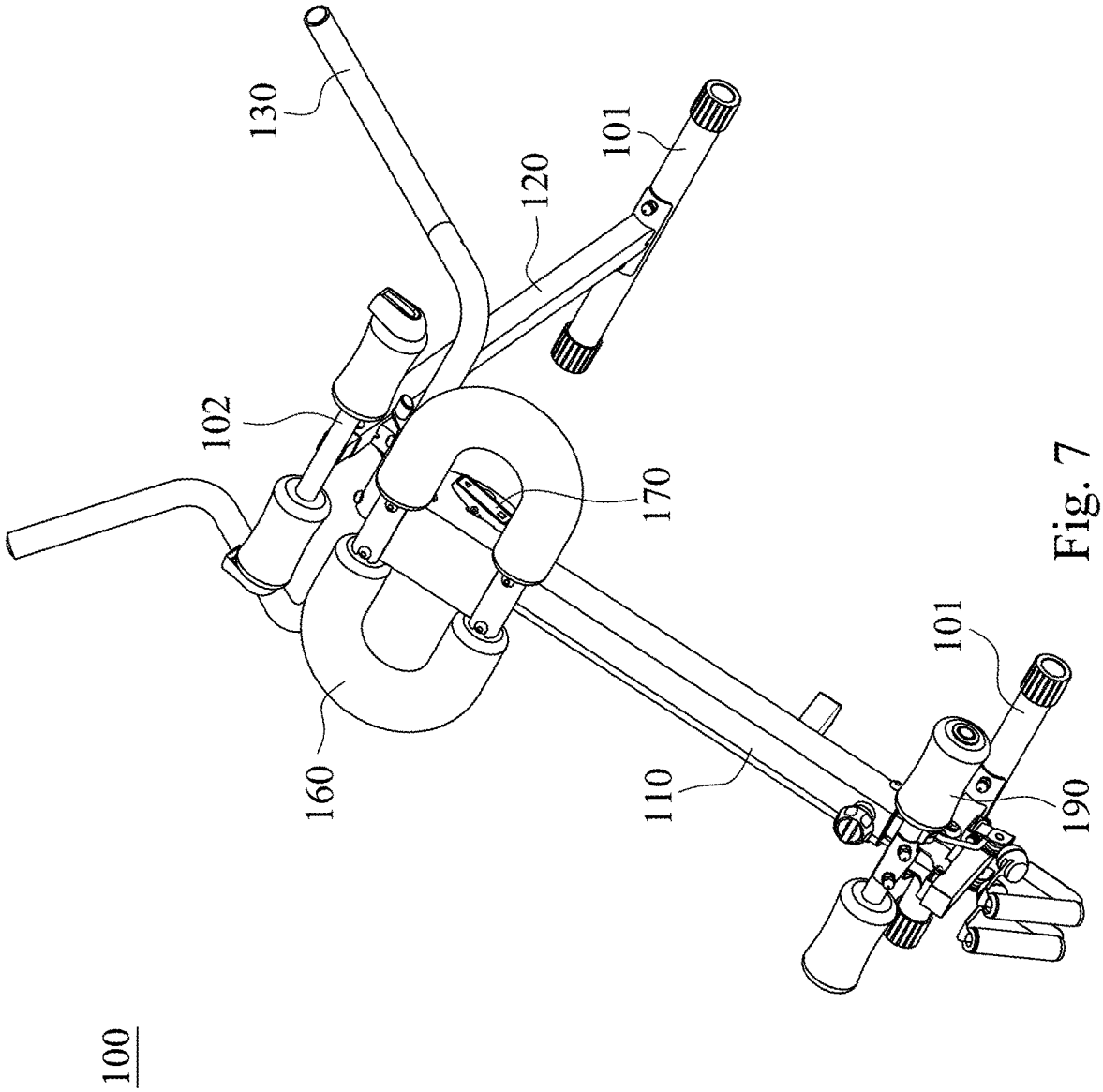

Fig. 7

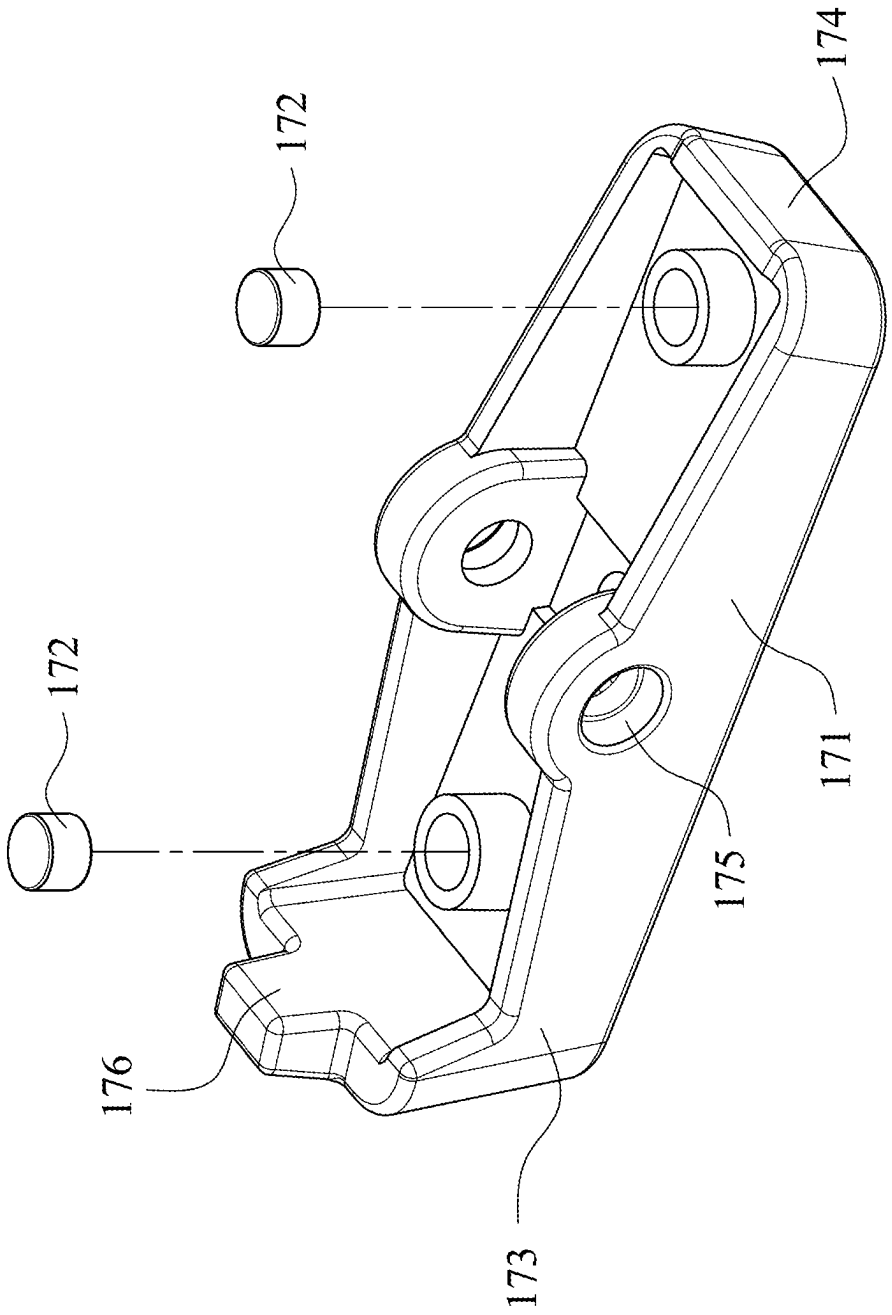

Fig. 8

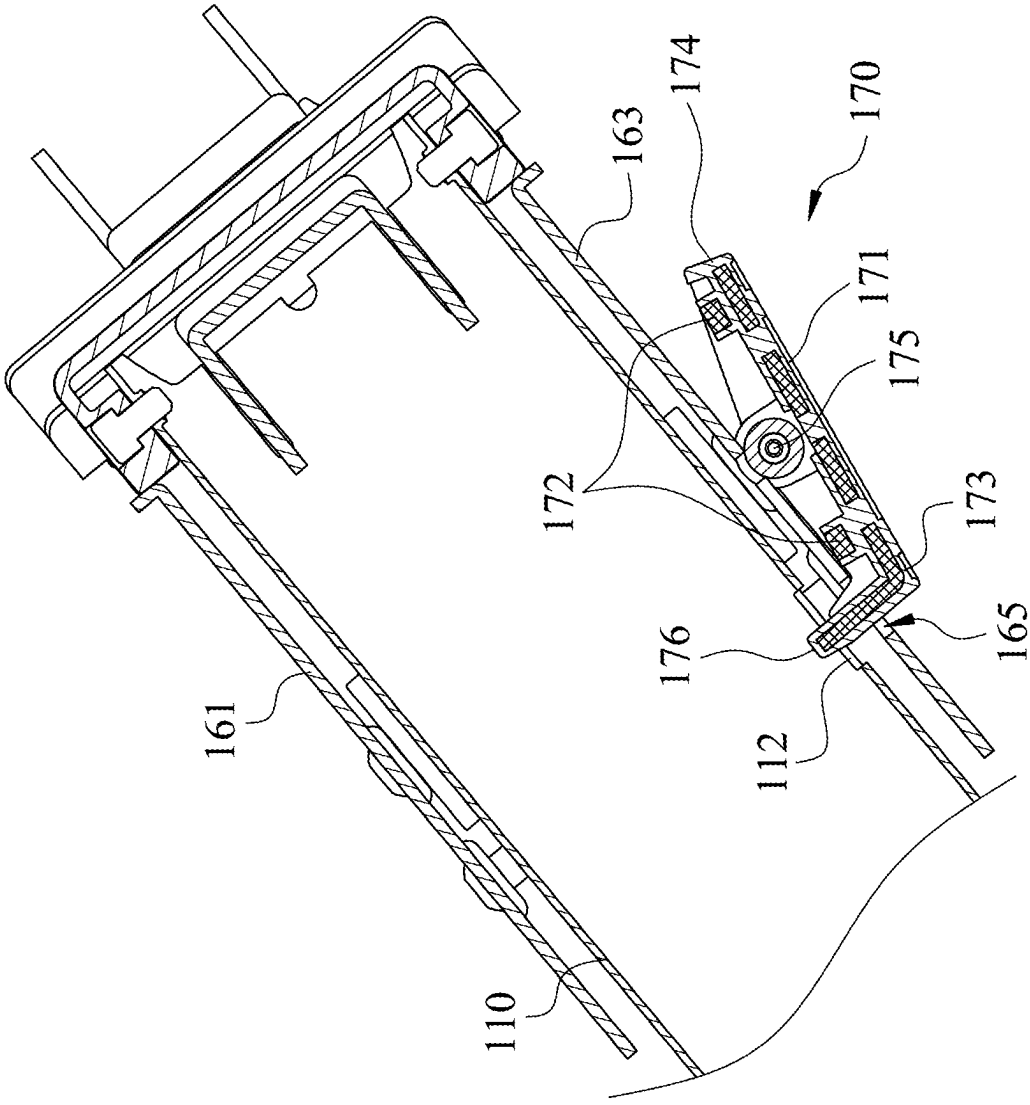

Fig. 9

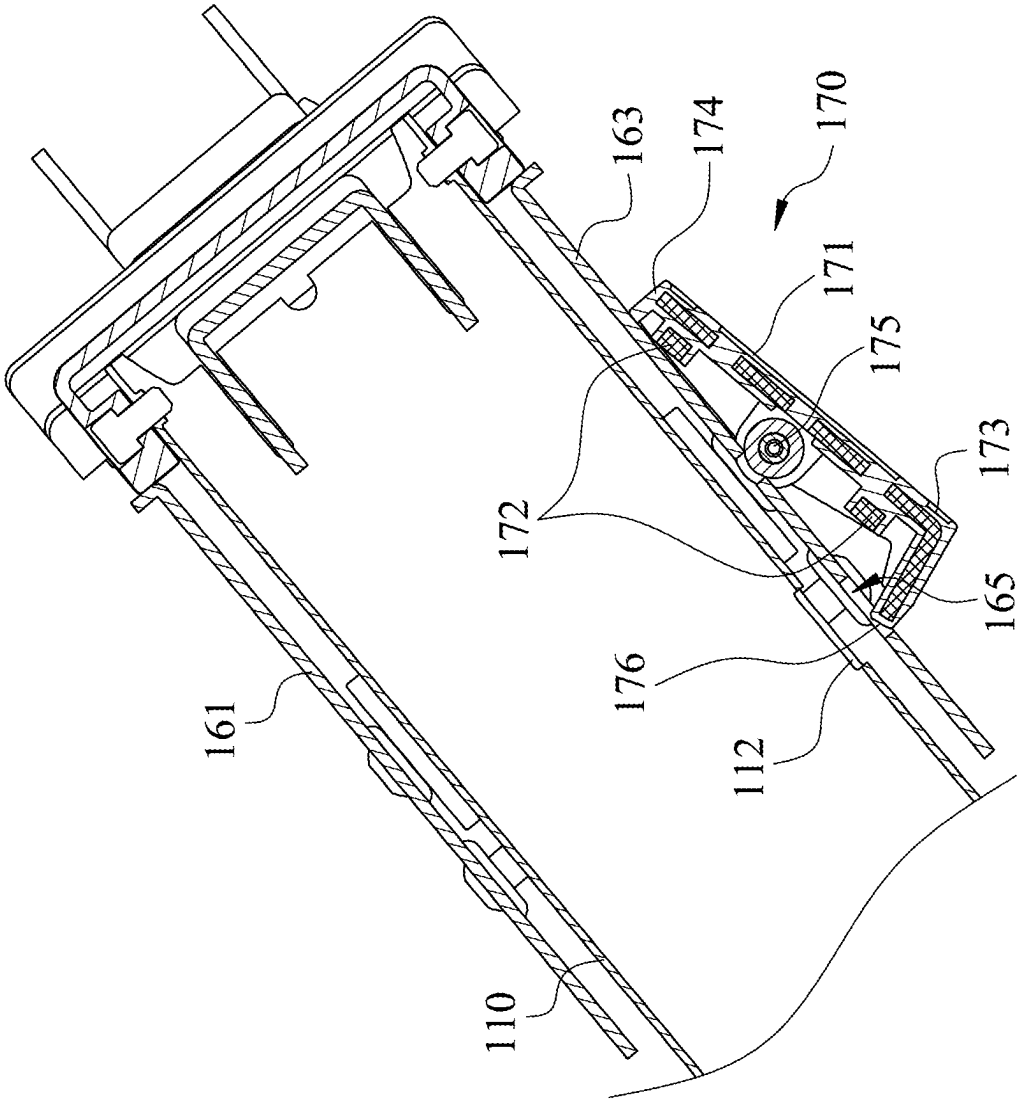

Fig. 10

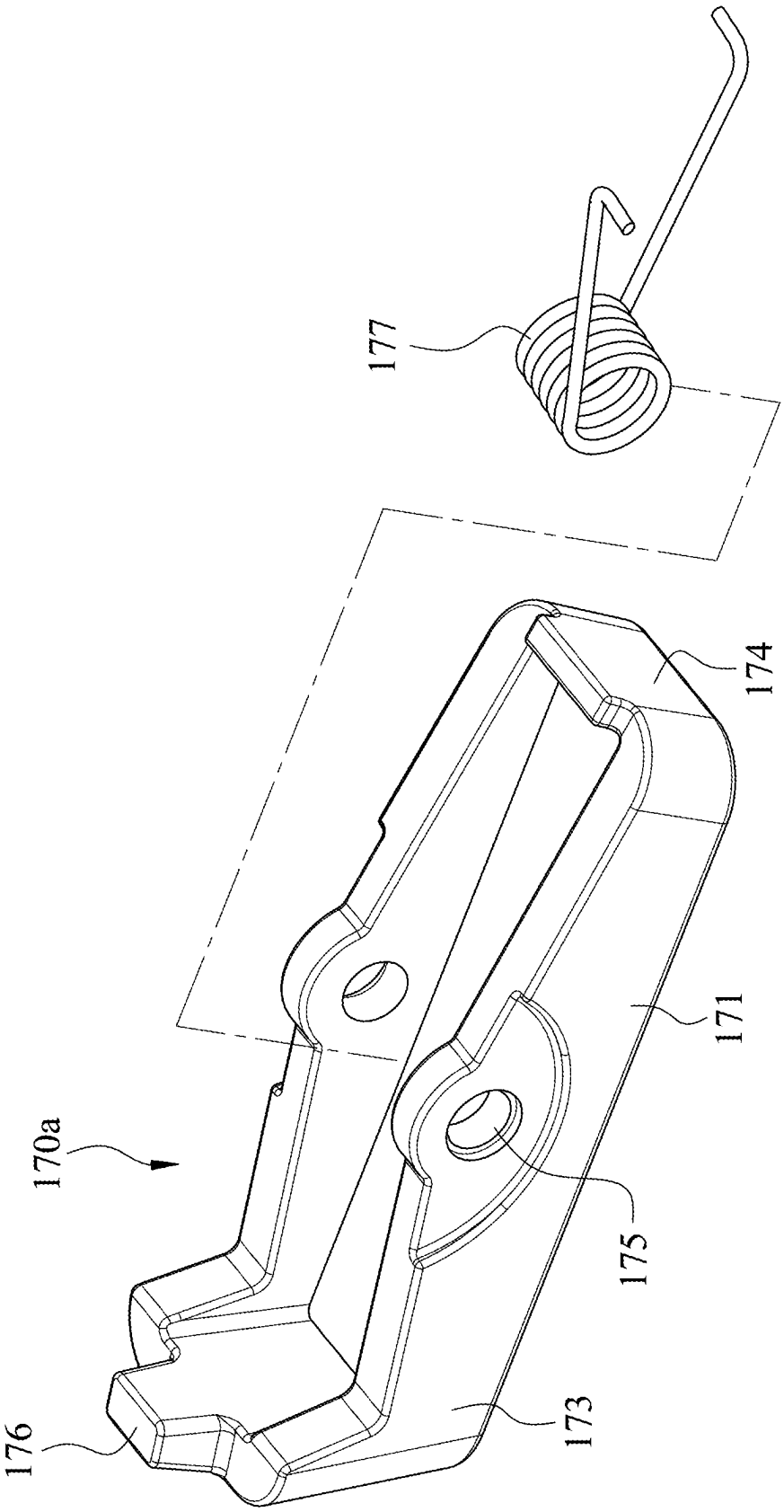

Fig. 11

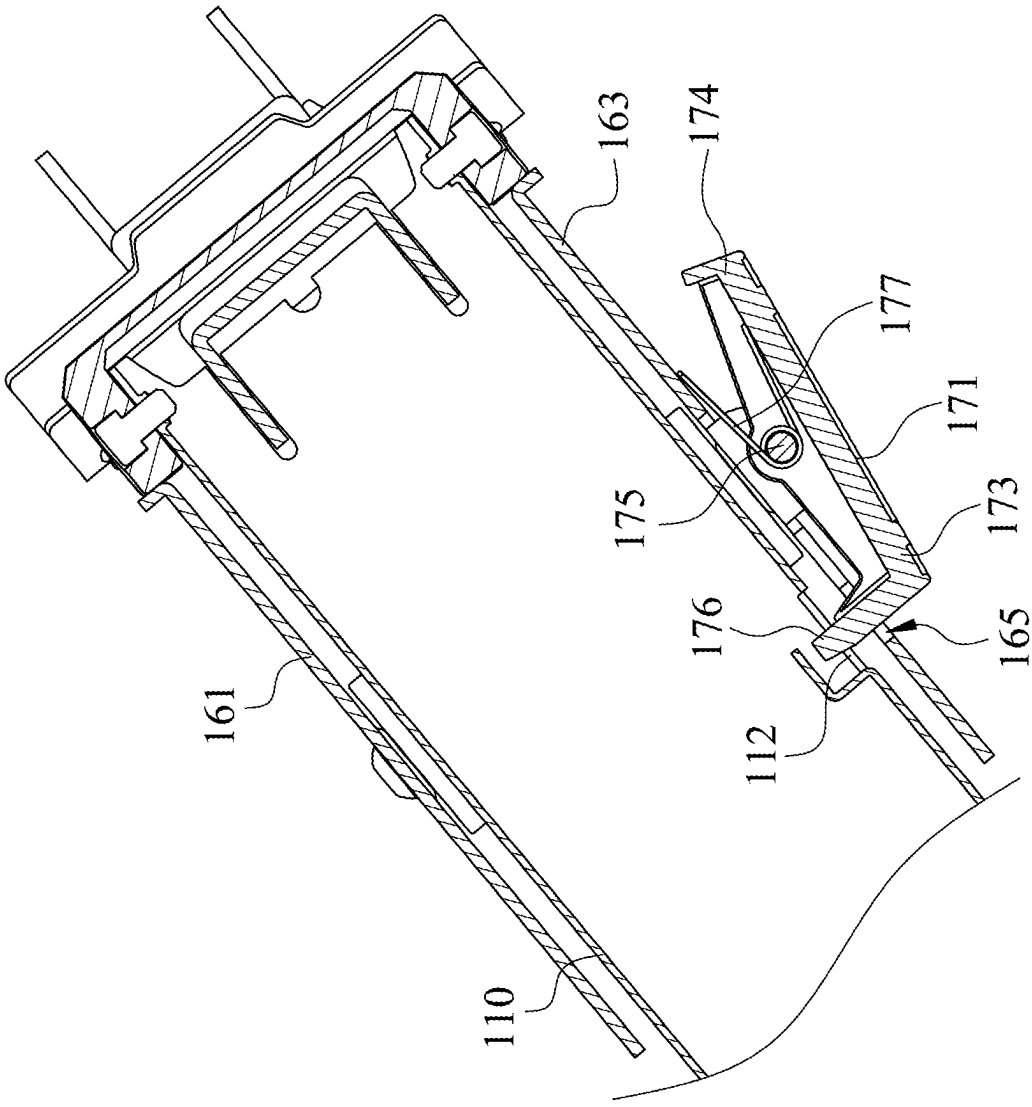

Fig. 12

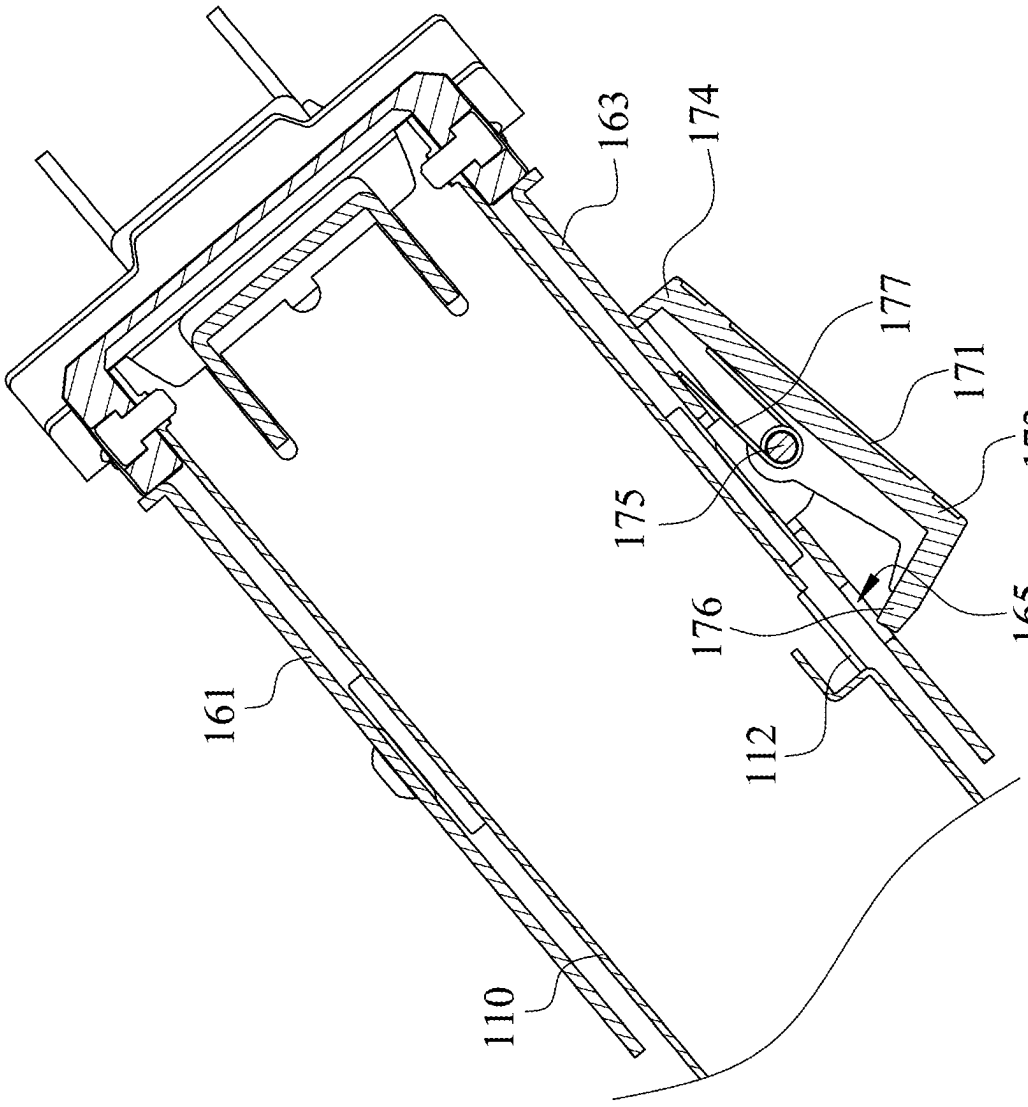

Fig. 13

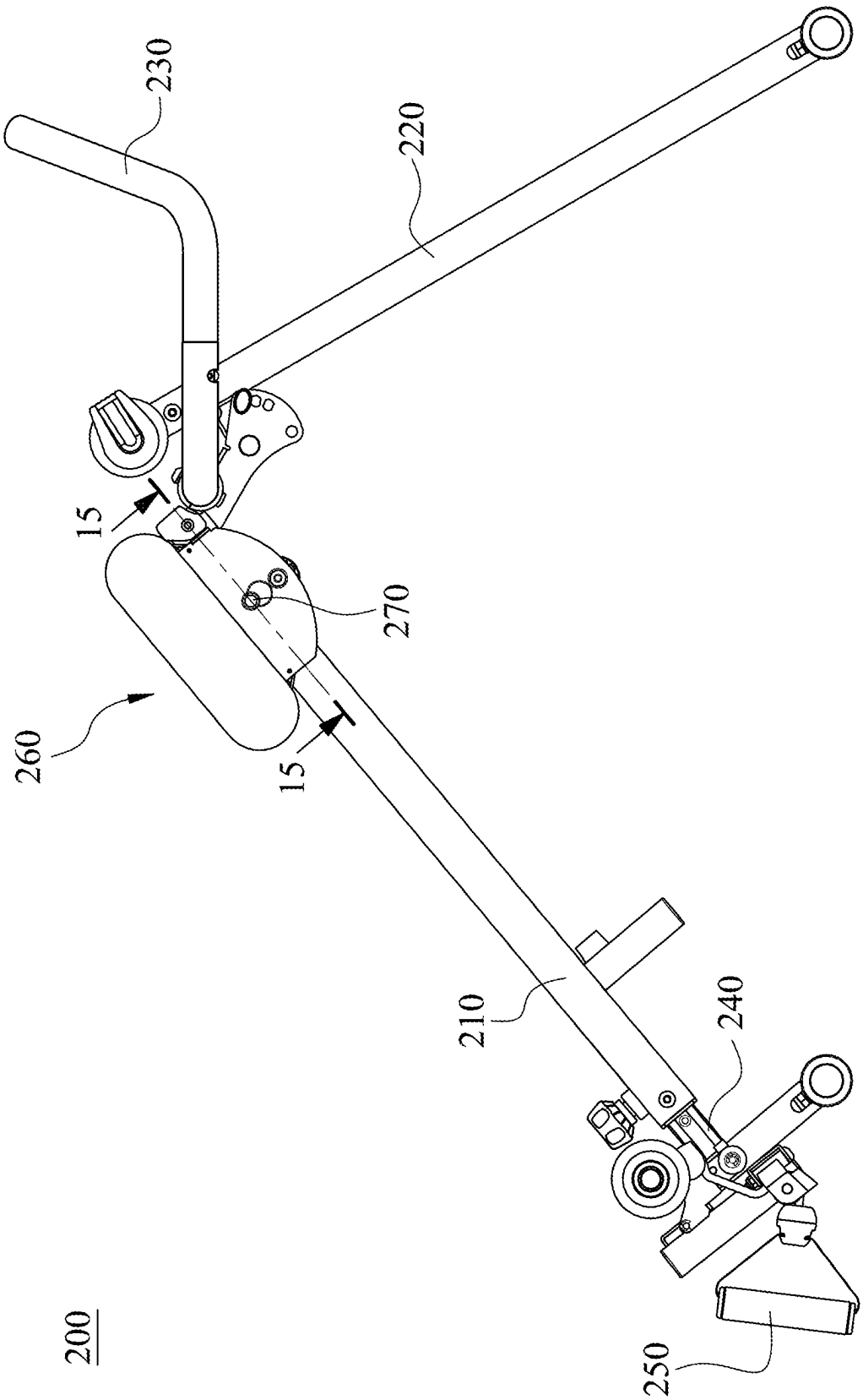

Fig. 14

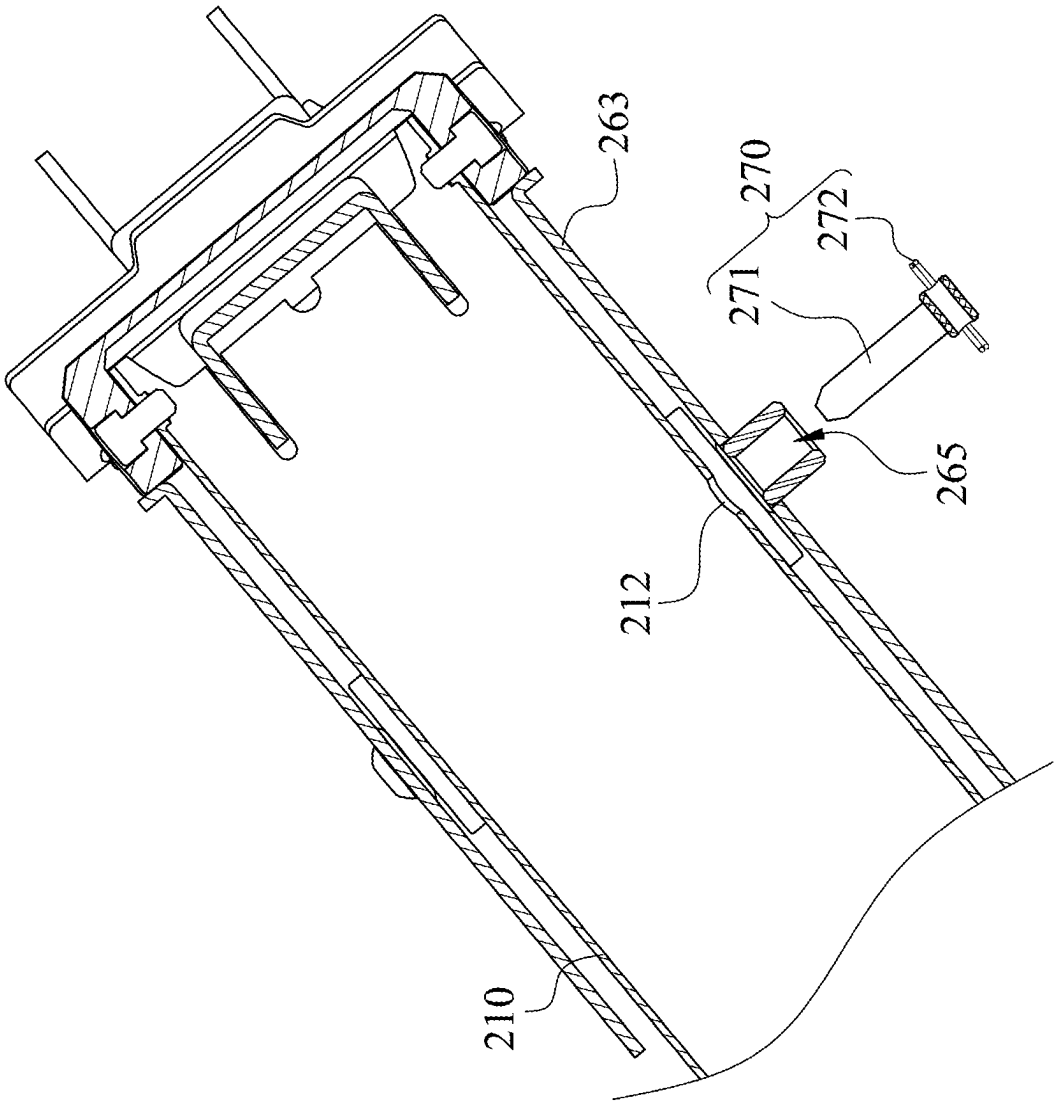

Fig. 15

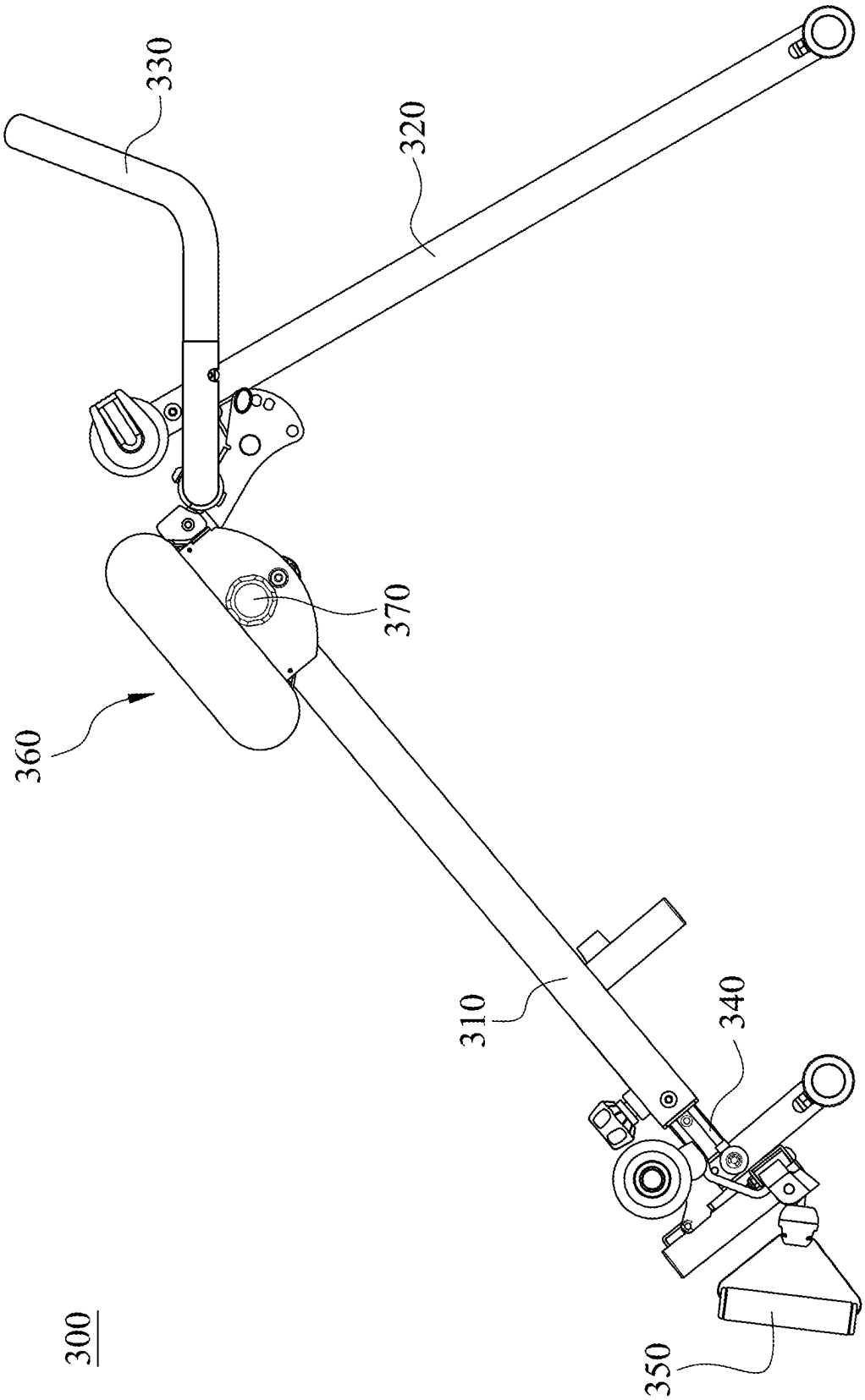

Fig. 16

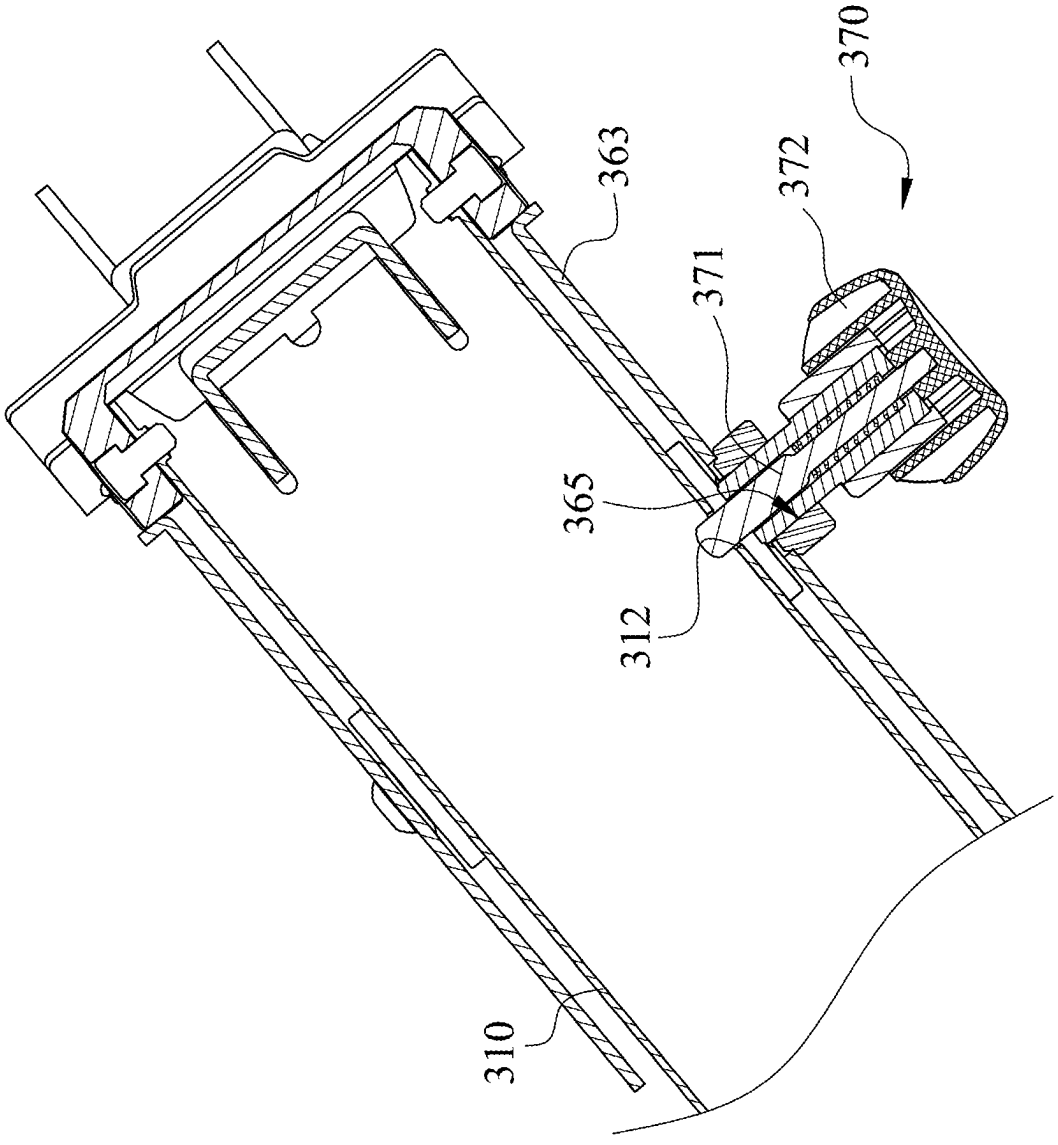

Fig. 17

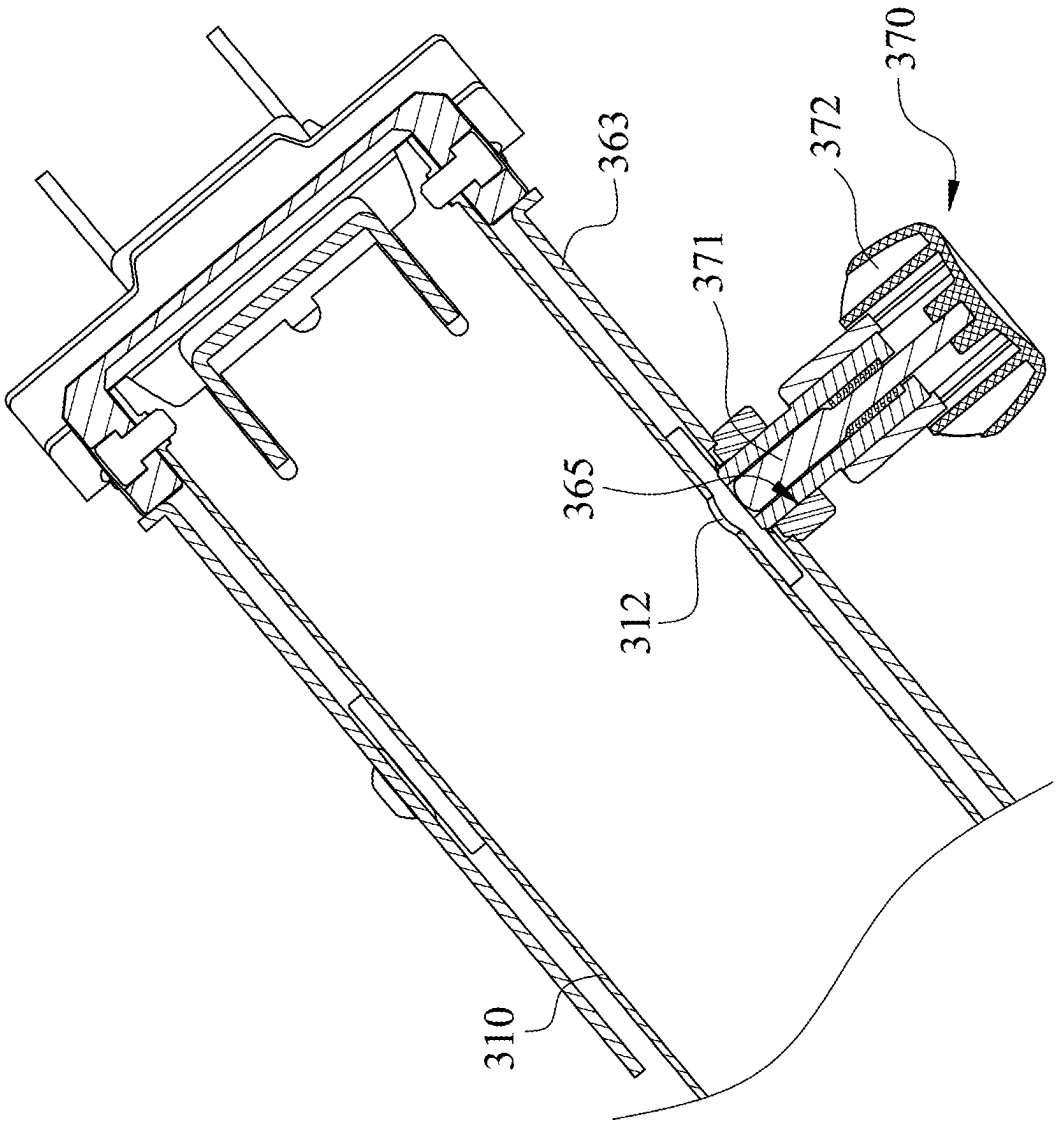

Fig. 18

MULTIFUNCTIONAL CORE TRAINING DEVICE

RELATED APPLICATIONS

This application claims priority to China Application Serial Number 202321340702.5, filed May 30, 2023, which is herein incorporated by reference.

BACKGROUND

Technical Field

The present disclosure relates to a fitness-training device. More particularly, the present disclosure relates to a multifunctional core training device capable of changing exercise modes for core training.

Description of Related Art

Core muscles are located in the center of the human trunk and are for protecting the spine. The core muscles surround the waist, the abdomen, and the trunk center to the pelvic floor and are composed of deep muscles and superficial muscles in different parts of the body. During exercise, the core muscles contract before taking an action to stabilize the body axis, so that an injury caused by the lumbar spine displacement during the action is prevented. Therefore, the strength of the core muscles is very important for the human health and the physical flexibility.

To increase the strength of the core muscles, many different types of fitness devices for training the waist and the abdomen have been launched to markets, and a user can perform a strength training for different muscles. Thus, the aforementioned fitness devices become very popular. However, the conventional fitness devices have only one exercise mode, and the user needs to prepare extra-devices for performing a variety of exercising. Accordingly, the cost spent on fitness will be raised, and it requires more space for simultaneously using different fitness devices.

In order to solve such the aforementioned problems, a fitness device with multi-function is provided on the market. However, the fitness device with multi-function is heavier, and more space must be occupied when using different fitness modes. Thus, such the fitness device is not as convenient as predict.

Therefore, how to provide a fitness device that is easy to use and has different exercise modes for core training is a technical subject with commercial value.

SUMMARY

According to one aspect of the present disclosure, a multifunctional core training device includes a first frame body, a second frame body, a holding device, two elastic elements, two forcing elements, a sliding structure, and a switch. The first frame body includes a pivoting device. The second frame body is pivotally disposed on the first frame body and includes a pivoting portion and a distal portion, and the pivoting portion is pivotally disposed on the pivoting device. The holding device is disposed on one end portion of the first frame body. The two elastic elements are disposed on the first frame body. The two forcing elements are respectively connected to the two elastic elements, wherein each of the two forcing elements is connected to one end of one of the two elastic elements, and the other end of the one of the two elastic elements is connected to the first frame body. The sliding structure is movably disposed on the first frame body. The switch is disposed on the sliding structure, wherein the switch is for positioning a position of the sliding structure relative to the first frame body. When the second frame body pivots relative to the first frame body along a first circumferential direction with the pivoting device as an axis center, the distal portion of the second frame body gradually approaches the first frame body, so that the first frame body and the second frame body are arranged side by side, and then the sliding structure moves reciprocally along a major axis of the first frame body. When the second frame body pivots relative to the first frame body along a second circumferential direction with the pivoting device as the axis center, the distal portion of the second frame body is gradually away from the first frame body, so that the other end portion of the first frame body and the distal portion of the second frame body respectively abut against a ground, and then the sliding structure moves reciprocally along the major axis of the first frame body or is positioned on the first frame body.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure can be more fully understood by reading the following detailed description of the embodiment, with reference made to the accompanying drawings as follows:

FIG. **1** is a three-dimensional schematic view of a multifunctional core training device according to the first embodiment of the present disclosure.

FIG. **2** is another three-dimensional schematic view of the multifunctional core training device of FIG. **1**.

FIG. **3** is a side view of the multifunctional core training device of FIG. **1**.

FIG. **4** is a three-dimensional schematic view of a sliding structure of the multifunctional core training device of FIG. **1**.

FIG. **5** is an operational schematic view of the multifunctional core training device of FIG. **1** during adjusting exercise modes.

FIG. **6** is a three-dimensional schematic view of the multifunctional core training device of FIG. **1** in a mode of abdominal muscle training device.

FIG. **7** is a three-dimensional schematic view of the multifunctional core training device of FIG. **1** in a mode of Roman chair.

FIG. **8** is a schematic view of one switch of the multifunctional core training device of FIG. **1**.

FIG. **9** is a cross-sectional view of the switch of FIG. **8** at a first position.

FIG. **10** is a cross-sectional view of the switch of FIG. **8** at a second position.

FIG. **11** is a schematic view of another switch of the multifunctional core training device of FIG. **1**.

FIG. **12** is a cross-sectional view of the switch of FIG. **11** at the first position.

FIG. **13** is a cross-sectional view of the switch of FIG. **11** at the second position.

FIG. **14** is a schematic view of a multifunctional core training device according to the second embodiment of the present disclosure.

FIG. **15** is a cross-sectional view of the multifunctional core training device of FIG. **14** along Line **15-15**.

FIG. **16** is a schematic view of a multifunctional core training device according to the third embodiment of the present disclosure.

FIG. **17** is a schematic view of a switch of the multifunctional core training device of FIG. **16** in an open state.

FIG. **18** is a schematic view of the switch of the multifunctional core training device of FIG. **16** in a closed state.

DETAILED DESCRIPTION

The present disclosure will be further exemplified by the following specific embodiments. However, the embodiments can be applied to various inventive concepts and can be embodied in various specific ranges. The specific embodiments are only for the purposes of description and are not limited to these practical details thereof. Furthermore, in order to simplify the drawings, some conventional structures and elements will be illustrated in the drawings by a simple and schematic way. The duplicated elements may be denoted by the same number or similar numbers.

Reference is made to FIG. **1**, FIG. **2**, and FIG. **3**. FIG. **1** is a three-dimensional schematic view of a multifunctional core training device **100** according to the first embodiment of the present disclosure. FIG. **2** is another three-dimensional schematic view of the multifunctional core training device **100** of FIG. **1**. FIG. **3** is a side view of the multifunctional core training device **100** of FIG. **1**. The multifunctional core training device **100** includes a first frame body **110**, a second frame body **120**, a holding device **130**, two elastic elements **140**, two forcing elements **150**, a sliding structure **160**, and a switch **170**.

The first frame body **110** includes a pivoting device **111**. As shown in FIG. **2** and FIG. **3**, the pivoting device **111** can be located at one end portion of the first frame body **110** or be disposed close to the end portion of the first frame body **110** so as to facilitate the pivoting connection between the first frame body **110** and the second frame body **120**.

The second frame body **120** is pivotally disposed on the first frame body **110** and includes a pivoting portion **121** and a distal portion **122**, and the pivoting portion **121** is pivotally disposed on the pivoting device **111**.

The holding device **130** is disposed on the end portion of the first frame body **110**. As shown in FIG. **1** to FIG. **3**, the holding device **130** can be disposed adjacent to the pivoting device **111**, and the holding device **130** can be integrally bent to form two holding portions (reference number is omitted) for holding by a user. Further, as shown in FIG. **1** and FIG. **2**, the multifunctional core training device **100** can further include a handle member **102**. The handle member **102** is disposed on the second frame body **120** and is close to the pivoting portion **121**, and the holding device **130** and the handle member **102** can be held by the user when the user performs different exercises. Thus, the exercise effect of the user and the usage safety of the multifunctional core training device **100** can be enhanced, but the present disclosure is not limited thereto.

The two elastic elements **140** are disposed on the first frame body **110**, and the two forcing elements **150** are respectively connected to the two elastic elements **140**, wherein each of the two forcing elements **150** is connected to one end of one of the two elastic elements **140**, and the other end of the one of the two elastic elements **140** is connected to the first frame body **110**. Particularly, in the multifunctional core training device **100**, the two elastic elements **140** can be two elastic cords, and the two elastic elements **140** can extend along a major axis of the first frame body **110** and be respectively disposed on two sides of the first frame body **110**. Thus, both hands of the user can respectively hold the two forcing elements **150** to drive the two elastic elements **140** to stretch, and the user can utilize the elastic restoring force of the two elastic elements **140** to perform reciprocating stretching exercise.

The sliding structure **160** is movably disposed on the first frame body **110**. Reference is made to FIG. **4**, which is a three-dimensional schematic view of the sliding structure **160** of the multifunctional core training device **100** of FIG. **1**. In the multifunctional core training device **100**, the sliding structure **160** can include a sliding base **161** and a seat cushion **162**.

The sliding base **161** can include a sliding base mainbody **163** and at least two pulleys **164**. The sliding base mainbody **163** has an opening **165** (as shown in FIG. **4**, FIG. **9**, and FIG. **10**), and the sliding base mainbody **163** is movably disposed on the first frame body **110**. The at least two pulleys **164** are disposed in the sliding base mainbody **163**, and the at least two pulleys **164** can be located between the sliding base mainbody **163** and the first frame body **110**. The seat cushion **162** is disposed on the sliding base **161**. In detail, a number of the pulleys **164** in the embodiment of FIG. **4** is three, wherein two of the three pulleys **164** are located between the sliding base mainbody **163** and the first frame body **110**, and another one of the three pulleys **164** is located on another side of the first frame body **110**. In other words, the first frame body **110** is located in an accommodating space (reference number is omitted) of the sliding base mainbody **163** and is restricted by the three pulleys **164**. At that time, the sliding base **161** can slide on the first frame body **110** by the three pulleys **164**, and the reciprocating movements of the sliding structure **160** on the first frame body **110** can be smoother.

The switch **170** is disposed on the sliding structure **160**, and the switch **170** is for positioning a position of the sliding structure **160** relative to the first frame body **110**.

Reference is made to FIG. **1**, FIG. **5**, FIG. **6**, and FIG. **7**. FIG. **5** is an operational schematic view of the multifunctional core training device **100** of FIG. **1** during adjusting exercise modes. FIG. **6** is a three-dimensional schematic view of the multifunctional core training device **100** of FIG. **1** in a mode of abdominal muscle training device. FIG. **7** is a three-dimensional schematic view of the multifunctional core training device **100** of FIG. **1** in a mode of Roman chair. In particular, the multifunctional core training device **100** of FIG. **1** is in a mode of rowing machine, and the user can sit on the seat cushion **162** of the sliding structure **160** and hold the two forcing elements **150** respectively with the both hands so as to pull the two forcing elements **150** to drive the two elastic elements **140** to stretch. At the same time, the user can move the body to drive the sliding structure **160** to move reciprocally relative to the first frame body **110** so as to simulate the situation of holding paddles with both hands and the body rising and falling with the water flow during sliding, thereby achieving the exercise effect of rowing.

Further, when the user wants to change the exercise modes of the multifunctional core training device **100**, as shown in FIG. **5**, the user can move the second frame body **120** to allow the second frame body **120** to pivot relative to the first frame body **110** with the pivoting device **111** as an axis center, so that the relative position of the first frame body **110** and the second frame body **120** is changed, and different exercise modes of the multifunctional core training device **100** can be changed. In detail, when the second frame body **120** pivots relative to the first frame body **110** along a first circumferential direction D1 with the pivoting device **111** as the axis center, the distal portion **122** of the second frame body **120** gradually approaches the first frame body **110**, so that the first frame body **110** and the second frame body **120** are arranged side by side, and then the multifunc-

tional core training device **100** is in the mode of rowing machine as shown in FIG. **1**. Accordingly, the sliding structure **160** can move reciprocally along the major axis of the first frame body **110**.

Furthermore, as shown in FIG. **5**, the user can also move the second frame body **120** to allow the second frame body **120** to pivot relative to the first frame body **110** along a second circumferential direction D**2** with the pivoting device **111** as the axis center, and the distal portion **122** of the second frame body **120** is gradually away from the first frame body **110**, so that the other end portion of the first frame body **110** and the distal portion **122** of the second frame body **120** respectively abut against a ground. At that time, a horizontal height of the multifunctional core training device **100** relative to the ground is increased, and the first frame body **110** and the second frame body **120** can be used as two supporting stands of the multifunctional core training device **100**, so that the user can perform different modes of exercise.

As shown in FIG. **6**, when the horizontal height of the multifunctional core training device **100** relative to the ground is increased, the sliding structure **160** can move reciprocally along the major axis of the first frame body **110**. Since the major axis of the first frame body **110** relative to the ground has an inclined angle, the user can kneel and sit on the seat cushion **162** of the sliding structure **160** and hold the holding device **130** or the handle member **102** with both hands to drive the legs to move by the core muscles. Accordingly, the sliding structure **160** can be driven to move reciprocally relative to the first frame body **110** so as to simulate an exercise mode of abdominal muscle training device on the market for training the core muscles.

As further shown in FIG. **7**, when the switch **170** is turned on to position the sliding structure **160** to one end different from the ground of the first frame body **110**, the user can lean on the seat cushion **162** with the abdomen facing the sliding structure **160** and then keep the upper body hanging in the air. Then, the user can move the body to drive the upper body to move by the core muscles so as to simulate an exercise mode of Roman chair on the market for training the core muscles. Furthermore, the holding device **130** can also be adjusted so that both ends of the holding device **130** can extend outward to facilitate the holding by the user with both hands, but the present disclosure is not limited thereto.

Therefore, by the arrangement that the second frame body **120** can pivot relative to the first frame body **110** to change the position of the first frame body **110** relative to the second frame body **120**, and the sliding structure **160** is movably disposed on the first frame body **110** or is positioned on the first frame body **110** by the switch **170**, the multifunctional core training device **100** of the present disclosure can change the exercise modes according to the actual training needs, so that the multifunctional core training device **100** of the present disclosure can be used as a rowing machine, an abdominal muscle training device, or a Roman chair to do exercises for training different muscles of the core muscles. Thus, the convenience of use and the breadth of applications of the multifunctional core training device **100** of the present disclosure can be enhanced.

Further, in the embodiment of FIG. **1**, the multifunctional core training device **100** can further include two supporting rods **101**, wherein one of the two supporting rods **101** is disposed on the other end portion of the first frame body **110**, and the other one of the two supporting rods **101** is disposed on the distal portion **122** of the second frame body **120**. By the arrangement of the two supporting rods **101**, the support stability of the first frame body **110** and the second frame body **120** on the ground can further be enhanced. Furthermore, in the multifunctional core training device **100**, two ends of the two supporting rods **101** can respectively have a skidproof sheath (reference number is omitted), and the displacement of the multifunctional core training device **100** during exercise by the user can be prevented. Therefore, the usage safety of the multifunctional core training device **100** can be enhanced, but the present disclosure is not limited thereto.

Reference is made to FIG. **1** and FIG. **2**. The handle member **102** can further include two supporting elements **103**, and the two supporting elements **103** are respectively disposed on two ends of the handle member **102**. In particular, each of the two supporting elements **103** can include a planar structure (reference number is omitted), wherein when the multifunctional core training device **100** is in the mode of rowing machine, the first frame body **110** and the second frame body **120** are arranged side by side, and the handle member **102** is supported on the ground because the second frame body **120** pivots relative to the first frame body **110**. At the same time, the two supporting elements **103** can further abut against the ground by the planar structure thereof, so that the stability of the multifunctional core training device **100** can be enhanced, and the displacement of the multifunctional core training device **100** during the rowing exercise of the user can be prevented.

As further shown in FIG. **1**, FIG. **2**, and FIG. **3**, the multifunctional core training device **100** can further include a positioning rod **180**. The positioning rod **180** is disposed on one side different from the sliding structure **160** of the first frame body **110**, wherein when the first frame body **110** and the second frame body **120** are arranged side by side to allow the multifunctional core training device **100** in the mode of rowing machine, two ends of the positioning rod **180** respectively abut against the first frame body **110** and the second frame body **120** so as to prevent the second frame body **120** from excessively pivoting relative to the first frame body **110**. Therefore, the stability and the usage safety of the multifunctional core training device **100** during the rowing exercise of the user can be enhanced.

As further shown in FIG. **1** and FIG. **2**, the first frame body **110** can further include a housing element **113**, a first frame element **114**, and a positioning element **115**. The housing element **113** has a through hole (reference number is omitted). The first frame element **114** is telescopically disposed in the housing element **113**, and the first frame element **114** includes at least two penetrating holes **116**. The positioning element **115** passes through the through hole and one of the at least two penetrating holes **116** in sequence so as to position the position of the first frame element **114** relative to the housing element **113**. Therefore, by the arrangement that the positioning element **115** is disposed in the different penetrating holes **116**, the position of the first frame element **114** relative to the housing element **113** can be adjusted, the demands of different users can be satisfied, and the breadth of applications of the multifunctional core training device **100** of the present disclosure can be enhanced.

Furthermore, as shown in FIG. **1**, FIG. **2**, and FIG. **3**, the two elastic elements **140** can also extend along the major axis of the first frame body **110** and be disposed on the first frame element **114**, wherein the two elastic elements **140** are located in the housing element **113**. In particular, each of the two elastic elements **140** can extend from one end portion (reference number is omitted) close to the forcing elements **150** of the first frame element **114** toward the sliding structure **160** and be disposed on the first frame element **114**,

and then each of the two elastic elements **140** can be rotated at one end portion (reference number is omitted) different from the forcing elements **150** of the first frame element **114** and extend along the major axis of the first frame body **110** and be disposed on the first frame element **114**. Thus, the other end portion of each of the two elastic elements **140** is connected to the first frame body **110**. Therefore, the breakage of the two elastic elements **140** due to being pulled by other elements during movement can be prevented, and the sufficient length and space for stretching and restoration of the two elastic elements **140** can be obtained, so that the use of the multifunctional core training device **100** of the present disclosure can be safer, and the exercise performance of the user by using the multifunctional core training device **100** of the present disclosure can be enhanced.

As further shown in FIG. **1** and FIG. **2**, the multifunctional core training device **100** of the present disclosure can also include a bottom rod **190**. The bottom rod **190** is disposed on the other end of the first frame body **110**. When the user performs a rowing exercise, both feet of the user can rest on the bottom rod **190** to stabilize the body and maintain balance. Further, when the user exercises in the mode of abdominal muscle training device or the mode of Roman chair, as shown in FIG. **6** and FIG. **7**, the bottom rod **190** can assist the user to maintain balance when the user kneels sitting or leans in front of the sliding structure **160**, but the present disclosure is not limited thereto.

Furthermore, although it is not shown in the figures, the multifunctional core training device of the present disclosure can include a count displayer. The count displayer can be disposed on the first frame body so as to count a number of actions and an exercise time of the user, but the present disclosure is not limited thereto.

Reference is made to FIG. **1**, FIG. **4**, FIG. **5**, FIG. **8**, FIG. **9**, and FIG. **10**. FIG. **8** is a schematic view of one switch **170** of the multifunctional core training device **100** of FIG. **1**. FIG. **9** is a cross-sectional view of the switch **170** of FIG. **8** at a first position. FIG. **10** is a cross-sectional view of the switch **170** of FIG. **8** at a second position. Particularly, in the multifunctional core training device **100** of the present disclosure, the switch **170** can include a switch mainbody **171** and two magnet elements **172**.

The switch mainbody **171** is disposed on the sliding base mainbody **163** and has a first end portion **173** and a second end portion **174**, wherein the switch mainbody **171** includes a central pivot portion **175** and a protruding structure **176**. As shown in FIG. **4**, FIG. **8**, FIG. **9**, and FIG. **10**, the central pivot portion **175** is pivotally disposed on the sliding base mainbody **163** of the sliding base **161**, wherein the switch mainbody **171** pivots with the central pivot portion **175** as an axis center, and then the switch mainbody **171** is located relative to the sliding base **161** at the first position as shown in FIG. **9** or at the second position as shown in FIG. **10**. The protruding structure **176** is disposed on the first end portion **173** so as to position the switch mainbody **171**. The two magnet elements **172** are respectively disposed on the first end portion **173** and the second end portion **174**.

In particular, as shown in FIG. **9**, when the switch mainbody **171** is located relative to the sliding base **161** at the first position, the protruding structure **176** is correspondingly inserted in the opening **165** of the sliding base mainbody **163** and is connected to the first frame body **110** so as to position the position of the sliding structure **160** relative to the first frame body **110**. Further, in the multifunctional core training device **100**, the first frame body **110** can further include a positioning hole **112**, and the positioning hole **112** is located on the first frame body **110** close to the pivoting device **111**. When the switch mainbody **171** is located relative to the sliding base **161** at the first position, the protruding structure **176** can pass through the opening **165** of the sliding base mainbody **163** and be disposed in the positioning hole **112**, and the sliding structure **160** is positioned on the end different from the ground of the first frame body **110** (as shown in FIG. **7**) so as to simulate the exercise mode of Roman chair on the market for training the core muscles.

Further, as shown in FIG. **10**, when the switch mainbody **171** is located relative to the sliding base **161** at the second position, the second end portion **174** abuts against the sliding base mainbody **163**. At the same time, the first end portion **173** is away from the sliding base mainbody **163**, and the protruding structure **176** escapes from the opening **165** of the sliding base mainbody **163** and the positioning hole **112** of the first frame body **110**. Therefore, the sliding structure **160** can move reciprocally along the major axis of the first frame body **110**.

Furthermore, when the switch mainbody **171** is located relative to the sliding base **161** at the first position or the second position, the two magnet elements **172** can respectively stick to the first frame body **110** to further prevent the switch mainbody **171** from arbitrarily changing positions relative to the sliding base mainbody **163** during the exercise of the user, so that the usage safety of the multifunctional core training device **100** of the present disclosure can be enhanced. Moreover, a material of the first frame body **110** can include a magnetic metal material so as to facilitate the two magnet elements **172** sticking to the first frame body **110**, and the usage safety of the multifunctional core training device **100** can be further enhanced.

Reference is made to FIG. **11**, FIG. **12**, and FIG. **13**. FIG. **11** is a schematic view of another switch **170***a* of the multifunctional core training device **100** of FIG. **1**. FIG. **12** is a cross-sectional view of the switch **170***a* of FIG. **11** at the first position. FIG. **13** is a cross-sectional view of the switch **170***a* of FIG. **11** at the second position. Particularly, the multifunctional core training device **100** of the present disclosure can include the switch **170** or the switch **170***a* as required, and the details of the switch **170***a* are described below with reference to FIG. **1**, FIG. **4**, and FIG. **5**. As shown in FIG. **11**, the switch **170***a* can include a switch mainbody **171** and a switch elastic member **177**.

The switch mainbody **171** is disposed on the sliding base mainbody **163** and has a first end portion **173** and a second end portion **174**, wherein the switch mainbody **171** includes a central pivot portion **175** and a protruding structure **176**. As shown in FIG. **4**, FIG. **11**, FIG. **12**, and FIG. **13**, the central pivot portion **175** is pivotally disposed on the sliding base mainbody **163** of the sliding base **161**, wherein the switch mainbody **171** pivots with the central pivot portion **175** as the axis center, and the switch mainbody **171** is located relative to the sliding base **161** at the first position as shown in FIG. **12** or at the second position as shown in FIG. **13**. The protruding structure **176** is disposed on the first end portion **173** so as to position the switch mainbody **171**. The switch elastic member **177** is disposed on the second end portion **174** of the switch mainbody **171**, and two ends of the switch elastic member **177** respectively abut against the switch mainbody **171** and the sliding base mainbody **163**.

As shown in FIG. **12**, when the switch mainbody **171** is located relative to the sliding base **161** at the first position, the two ends of the switch elastic member **177** respectively abut against the switch mainbody **171** and the sliding base mainbody **163**, and the protruding structure **176** is stably and correspondingly inserted in the opening **165** of the sliding

base mainbody **163** and then is positioned in the positioning hole **112** of the first frame body **110** so as to position the sliding structure **160** to the end different from the ground of the first frame body **110** (referred to FIG. **7**). Thus, the multifunctional core training device **100** of the present disclosure can simulate the exercise mode of Roman chair on the market for training the core muscles.

As further shown in FIG. **13**, when the switch mainbody **171** is located relative to the sliding base **161** at the second position, the switch elastic member **177** is compressed by the press of the second end portion **174** of the switch mainbody **171**. At the same time, the second end portion **174** abuts against the sliding base mainbody **163**, and the first end portion **173** is away from the sliding base mainbody **163**, so that the protruding structure **176** escapes from the opening **165** of the sliding base mainbody **163** and the positioning hole **112** of the first frame body **110**. Thus, the sliding structure **160** can move reciprocally along the major axis of the first frame body **110**. Furthermore, although it is not shown in the figures, a magnet member, a buckle, or other fastener can be disposed on the second end portion **174** of the switch mainbody **171**, so that the second end portion **174** can stably abut against the sliding base mainbody **163**. Furthermore, the switch elastic member **177** can be a torsion spring, but the present disclosure is not limited thereto.

Reference is made to FIG. **14** and FIG. **15**. FIG. **14** is a schematic view of a multifunctional core training device **200** according to the second embodiment of the present disclosure. FIG. **15** is a cross-sectional view of the multifunctional core training device **200** of FIG. **14** along Line **15-15**. The multifunctional core training device **200** includes a first frame body **210**, a second frame body **220**, a holding device **230**, two elastic elements **240** (only one of the two elastic elements **240** is shown in FIG. **14**), two forcing elements **250** (only one of the two forcing elements **250** is shown in FIG. **14**), a sliding structure **260**, and a switch **270**, wherein the first frame body **210**, the second frame body **220**, the holding device **230**, the two elastic elements **240**, the two forcing elements **250** and the sliding structure **260** are similar in the structures of the first frame body **110**, the second frame body **120**, the holding device **130**, the two elastic elements **140**, the two forcing elements **150**, and the sliding structure **160** of the multifunctional core training device **100**, so that the details of the same elements are not described herein.

As shown in FIG. **14** and FIG. **15**, the switch **270** includes a pin **271**. The pin **271** is detachably inserted in the opening **265** of the sliding base mainbody **263** of the sliding structure **260** and the positioning hole **212** of the first frame body **210** in sequence so as to position the position of the sliding structure **260** relative to the first frame body **210**. When the pin **271** is inserted in the opening **265** and the positioning hole **212** in sequence, the sliding structure **260** is positioned on one end different from the ground of the first frame body **210** so as to simulate the exercise mode of Roman chair on the market for training the core muscles.

Furthermore, the switch **270** can further include a pulling element **272**. The pulling element **272** is connected to one end of the pin **271**, wherein when the user wants to change the exercise mode of the Roman chair of the multifunctional core training device **200** to another exercise mode, the user can pull the pulling element **272**, so that the pin **271** is pulled by the pulling element **272** and escapes from the positioning hole **212** of the first frame body **210** and the opening **265** of the sliding base mainbody **263**. Then, the sliding structure **260** can move reciprocally along the major axis of the first frame body **210**. Moreover, the pulling element **272** can be a pull ring, but the present disclosure is not limited thereto.

Reference is made to FIG. **16**, FIG. **17**, and FIG. **18**. FIG. **16** is a schematic view of a multifunctional core training device **300** according to the third embodiment of the present disclosure. FIG. **17** is a schematic view of a switch **370** of the multifunctional core training device **300** of FIG. **16** in an open state. FIG. **18** is a schematic view of the switch **370** of the multifunctional core training device **300** of FIG. **16** in a closed state. The multifunctional core training device **300** includes a first frame body **310**, a second frame body **320**, a holding device **330**, two elastic elements **340** (only one of the two elastic elements **340** is shown in FIG. **16**), two forcing elements **350** (only one of the two forcing elements **350** is shown in FIG. **16**), a sliding structure **360**, and a switch **370**, wherein the first frame body **310**, the second frame body **320**, the holding device **330**, the two elastic elements **340**, the two forcing elements **350**, and the sliding structure **360** are similar in the structures of the first frame body **110**, the second frame body **120**, the holding device **130**, the two elastic elements **140**, the two forcing elements **150**, and the sliding structure **160** of the multifunctional core training device **100**, so that the details of the same elements are not described herein.

The switch **370** includes a spring pin **371**. As shown in FIG. **17**, when the switch **370** is in the open state, the spring pin **371** of the switch **370** is inserted in the opening **365** of the sliding base mainbody **363** of the sliding structure **360** and the positioning hole **312** of the first frame body **310** in sequence. At the same time, the position of the sliding structure **360** relative to the first frame body **310** is positioned, so that the sliding structure **360** is positioned on one end different from the ground of the first frame body **310** (as shown in FIG. **16**) so as to simulate the exercise mode of Roman chair on the market for training the core muscles.

As further shown in FIG. **18**, when the user wants to change the switch **370** from the open state to the closed state, the user can pull the spring pin **371** of the switch **370** to allow the spring pin **371** escaping from the positioning hole **312** of the first frame body **310**, so that the positioning position of the sliding structure **360** relative to the first frame body **310** can be released, and then the sliding structure **360** can move reciprocally along the major axis of the first frame body **310**.

Furthermore, the switch **370** can further include a controlling element **372**. The controlling element **372** is connected to one end of the spring pin **371**. When the user wants to change the exercise mode of the multifunctional core training device **300**, the user can press or pull the controlling element **372** to allow the end of the spring pin **371** entering or escaping from the positioning hole **312** of the first frame body **310** so as to position or un-position the position of the sliding structure **360** relative to the first frame body **310**. Therefore, the use of the multifunctional core training device **300** can be more convenient.

According to the aforementioned embodiments, the multifunctional core training device of the present disclosure has the advantages described bellowing.

First, by the arrangement that the second frame body pivots relative to the first frame body, and the sliding structure is movably disposed on the first frame body or is positioned on the first frame body by the switch, the exercise modes of the multifunctional core training device of the present disclosure can be changed according to the actual training needs, so that the multifunctional core training device of the present disclosure can be used as the rowing machine, the abdominal muscle training device, or the Roman chair to do exercise for training different muscles of the core muscles.

Second, by the arrangement that the switch includes the switch mainbody, and the protruding structure of the switch mainbody is disposed on the first end portion of the switch mainbody, the protruding structure can be corresponding inserted in the opening of the sliding base mainbody and be connected to the first frame body when the switch mainbody is located at the first position. Accordingly, the position of the sliding structure relative to the first frame body can be positioned, and the multifunctional core training device of the present disclosure can further be used as the Roman chair. Therefore, the multifunctional core training device of the present disclosure can be applied broadly.

Third, by the arrangement that the switch includes the two magnet elements, and the material of the first frame body includes the magnetic metal material, the two magnet elements can respectively stick to the first frame body when the switch mainbody is located relative to the sliding base at the first position or the second position. Therefore, position changing of the switch mainbody relative to the sliding base mainbody during exercise of the user can be further prevented, and the usage safety of the multifunctional core training device of the present disclosure can be enhanced.

Fourth, by the arrangement that the switch includes the pin, and the pin is detachably inserted in the opening of the sliding base mainbody and the positioning hole of the first frame body in sequence, the position of the sliding structure relative to the first frame body can be effectively positioned, so that the multifunctional core training device of the present disclosure can be further used as the Roman chair, and the breadth of applications thereof can be enhanced.

Although the present disclosure has been described in considerable detail with reference to certain embodiments thereof, other embodiments are possible. Therefore, the spirit and scope of the appended claims should not be limited to the description of the embodiments contained herein.

It will be apparent to those skilled in the art that various modifications and variations can be made to the structure of the present disclosure without departing from the scope or spirit of the disclosure. In view of the foregoing, it is intended that the present disclosure cover modifications and variations of this disclosure provided they fall within the scope of the following claims.

What is claimed is:

1. A multifunctional core training device, comprising:

a first frame body comprising a pivoting device;

a second frame body pivotally disposed on the first frame body and comprising a pivoting portion and a distal portion, and the pivoting portion pivotally disposed on the pivoting device;

a holding device disposed on one end portion of the first frame body;

two elastic elements disposed on the first frame body; and

two forcing elements respectively connected to the two elastic elements, wherein each of the two forcing elements is connected to one end of one of the two elastic elements, and the other end of the one of the two elastic elements is connected to the first frame body;

a sliding structure movably disposed on the first frame body; and

a switch disposed on the sliding structure, wherein the switch is for positioning a position of the sliding structure relative to the first frame body;

wherein when the second frame body pivots relative to the first frame body along a first circumferential direction with the pivoting device as an axis center, the distal portion of the second frame body gradually approaches the first frame body, so that the first frame body and the second frame body are arranged side by side, and then the sliding structure moves reciprocally along a major axis of the first frame body;

wherein when the second frame body pivots relative to the first frame body along a second circumferential direction with the pivoting device as the axis center, the distal portion of the second frame body is gradually away from the first frame body, so that the other end portion of the first frame body and the distal portion of the second frame body respectively abut against a ground, and then the sliding structure moves reciprocally along the major axis of the first frame body or is positioned on the first frame body.

2. The multifunctional core training device of claim **1**, wherein the sliding structure comprises:

a sliding base, comprising:

a sliding base mainbody having an opening, and the sliding base mainbody movably disposed on the first frame body; and

at least two pulleys disposed in the sliding base mainbody, and the at least two pulleys located between the sliding base mainbody and the first frame body; and

a seat cushion disposed on the sliding base.

3. The multifunctional core training device of claim **2**, wherein the switch comprises:

a switch mainbody disposed on the sliding base mainbody, wherein the switch mainbody has a first end portion and a second end portion, and the switch mainbody comprises:

a central pivot portion pivotally disposed on the sliding base mainbody, wherein the switch mainbody pivots with the central pivot portion as an axis center, and then the switch mainbody is located relative to the sliding base at a first position or a second position; and

a protruding structure disposed on the first end portion;

wherein when the switch mainbody is located relative to the sliding base at the first position, the protruding structure is corresponding inserted in the opening of the sliding base mainbody and is connected to the first frame body so as to position the position of the sliding structure relative to the first frame body;

wherein when the switch mainbody is located relative to the sliding base at the second position, the second end portion abuts against the sliding base mainbody, and then the sliding structure moves reciprocally along the major axis of the first frame body.

4. The multifunctional core training device of claim **3**, wherein the first frame body further comprises a positioning hole, and the protruding structure passes through the opening of the sliding base mainbody and is disposed in the positioning hole.

5. The multifunctional core training device of claim **3**, wherein the switch further comprises:

two magnet elements respectively disposed on the first end portion and the second end portion.

6. The multifunctional core training device of claim **5**, wherein a material of the first frame body comprises a magnetic metal material.

7. The multifunctional core training device of claim **4**, wherein the switch further comprises:

a switch elastic member, wherein two ends of the switch elastic member respectively abut against the switch mainbody and the sliding base mainbody.

8. The multifunctional core training device of claim **7**, wherein the switch elastic member is a torsion spring.

9. The multifunctional core training device of claim 2, wherein the switch comprises a pin, the first frame body further comprises a positioning hole, and the pin is detachably inserted in the opening of the sliding base mainbody and the positioning hole of the first frame body in sequence so as to position the position of the sliding structure relative to the first frame body.

10. The multifunctional core training device of claim 9, wherein the pin is a spring pin.

11. The multifunctional core training device of claim 1, further comprising:

two supporting rods, wherein one of the two supporting rods is disposed on the other end portion of the first frame body, and the other one of the two supporting rods is disposed on the distal portion of the second frame body.

12. The multifunctional core training device of claim 1, further comprising:

a handle member disposed on the second frame body and close to the pivoting portion.

13. The multifunctional core training device of claim 12, wherein the handle member comprises:

two supporting elements respectively disposed on two ends of the handle member.

14. The multifunctional core training device of claim 1, further comprising:

a positioning rod disposed on one side different from the sliding structure of the first frame body, wherein when the first frame body and the second frame body are arranged side by side, two ends of the positioning rod respectively abut against the first frame body and the second frame body.

15. The multifunctional core training device of claim 1, wherein the first frame body further comprises:

a housing element having a through hole;

a first frame element telescopically disposed in the housing element, and the first frame element comprising at least two penetrating holes; and

a positioning element passing through the through hole and one of the at least two penetrating holes in sequence.

16. The multifunctional core training device of claim 15, wherein the two elastic elements extend along the major axis of the first frame body and are disposed in the housing element.

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