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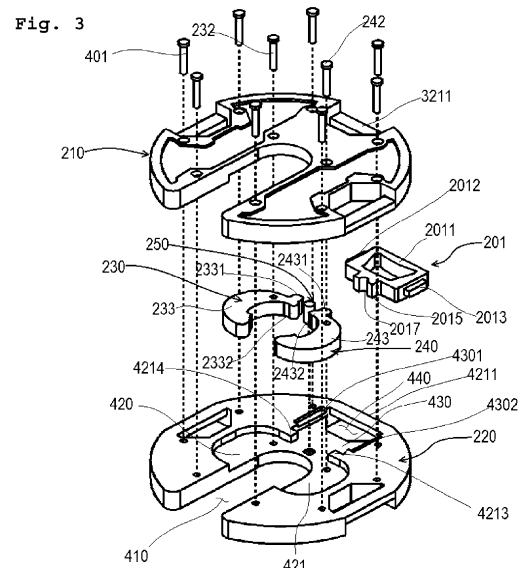
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(54) **BARBELL DISC AUTOMATICALLY MOUNTED ON AND RELEASED FROM BARBELL ROD**

(57) The present invention relates to a barbell disc configured such that the barbell disc can be mounted by being pushed into a barbell rod and released by pulling a handle. Specifically, the barbell disc is characterized by comprising: a barbell disc body which has an opening portion formed on the outer circumferential surface and an elongated groove extending to the center so that a barbell rod can be inserted into the barbell disc body after being mounted by pulling a handle; a recovery shaft mounted on the center line of the width of the elongated groove of the barbell disc body; a handle which is mounted to the barbell disc body and to which is mounted a shaft insertion part that is brought into contact with the recovery shaft by a recovery force from a recovery means; and a locking device which locks the barbell rod to the center of the barbell disc body and prevents the barbell rod from moving when the recovery shaft and the shaft insertion part come into contact as the barbell rod is inserted into the end of the elongated groove, and which separates the barbell rod from the center of the barbell disc body when the recovery shaft and the shaft insertion part are pulled away from each other by pulling the handle toward the outside of the barbell disc body.



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Description

Technical Field

[0001] The present invention relates to a barbell disc which is automatically installed on a barbell rod and is dissociated from the barbell rod by a simple operation.

Background Art

[0002] When a plurality of barbell discs are fit on a barbell rod, fixing devices are mounted at both sides of the barbell rod to prevent the barbell discs from being dissociated from the barbell rod during use, thereby preventing incurrence of an injury. Korean Utility Model Publication No. 1994-0002365 (entitled "barbell ring fixture") discloses a fixing device which can be conveniently attached to and detached from a barbell rod. Such a fixing device has a problem in that the barbell discs are mounted on the barbell rod since the fixing device does not have a device for directly mounting or dissociating the barbell discs on or from the barbell disc.

[0003] Moreover, in order to solve the problem, Korean Patent Publication No. 10-2013-0033591 (entitled "barbell equipped with easy-coupling weights") (hereinafter, called 'conventional art') discloses a barbell disc having an elongated groove into which a barbell rod can be inserted.

[0004] FIG. 1 is an exploded perspective view illustrating a configuration of the conventional art.

[0005] A plurality of barbell discs 10 are mounted on a barbell rod 20 according to the conventional art, and a fixing device 30 is mounted on an outer surface of the barbell disc 10 in order to prevent movement of the barbell discs 10.

[0006] In this instance, the barbell disc 10 has an opening 13 communicating with the outer circumferential surface from the center portion so that the barbell rod 20 can be inserted or dissociated.

[0007] However, in the conventional barbell set, after the barbell discs 10 are mounted on the barbell rod, the fixing device 30 must be mounted on the barbell rod 20 to prevent the barbell discs 10 from being separated to the outside. Especially, since the opening 13 is formed, it is necessary to mount the fixing device 30 since grounding force is very weak between the barbell rod 20 and the barbell disc 10. In addition, even when the barbell discs 10 are dissociated from the barbell rod 20, the fixing device 30 must first be dissociated from the barbell rod 20. Furthermore, when one of the barbell discs 10 is dissociated, after the fixing device 30 is first dissociated, the barbell disc is removed, and then, the fixing device 30 must be installed again.

Disclosure

Technical Problem

[0008] Accordingly, the present invention has been made in view of the above-mentioned problems occurring in the prior art, and it is an object of the present invention to provide a barbell disc which can be simply mounted on a barbell rod, is safe by being firmly maintained in the mounted state, and can be simply dissociated from the barbell rod.

[0009] It is an object of the present invention to provide a barbell disc, which has a simple and firm attachable and detachable structure, thereby increasing the lifespan of the barbell disc, reducing manufacturing costs and improving safety.

Technical Solution

[0010] To accomplish the above object, there is provided a barbell disc including: a barbell disc body which has an opening formed on the outer circumferential surface and an elongated groove extending from the opening to the center so that a barbell rod can be inserted into the barbell disc body; a recovery shaft mounted on the center line of the width of the elongated groove of the barbell disc body; a handle which is mounted to the barbell disc body in a movable way and having a shaft insertion part getting in contact with the recovery shaft by restoring force of a recovery means; and a locking device which locks the barbell rod to the center of the barbell disc body not to move when the recovery shaft and the shaft insertion part come into contact with each other as the barbell rod is inserted into the end of the elongated groove, and which separates the barbell rod from the center of the barbell disc body when a user pulls the handle outwards from the barbell disc body so that the recovery shaft and the shaft insertion part are separated from each other.

[0011] Moreover, the locking device includes: a first operating plate and a second operating plate mounted symmetrically with the first operating plate with respect to the central line; and a first insertion groove and a second insertion groove formed inside the barbell disc body so that the first operating plate and the second operating plate are respectively inserted into the first insertion groove and the second insertion groove, wherein when the shaft insertion part of the handle comes into contact with the recovery shaft, the barbell rod is locked by the first operating plate and the second operating plate when.

[0012] Furthermore, the first operating plate and the second operating plate respectively rotate around eccentric shafts mounted in the first insertion groove and the second insertion groove, and in the case that each of the operating plates is divided into an upper part and a lower part based on the eccentric shaft, each of the operating plates has a C-shaped body in which the lower part is longer than the upper part.

[0013] Additionally, preferably, the recovery means is any one among a magnet, an elastic belt, and a spring.

[0014] In addition, preferably, a curved insertion groove is formed on the shaft insertion part so that the recovery shaft is inserted into the curved insertion groove.

Advantageous Effects

[0015] According to the present invention, when the barbell discs are fit on the barbell rod and the barbell rod raises a lower end of an upper part of the C-shaped body of the locking device, the recovery shaft is inserted into a shaft insertion part of a handle so that a lower part of the C-shaped body maintains a locked state of a lower part of the barbell rod and the barbell discs are mounted on the barbell rod. In order to dissociate the barbell discs from the barbell rod, when a user pulls the handle outwards from the barbell discs, the barbell discs can be simply dissociated from the barbell rod.

[0016] Additionally, the locking device is mounted integrally with the barbell disc without needing to mount the locking device, thereby lowering the entire price of a barbell set.

Brief Description of the Drawings

[0017]

FIG. 1 is a block diagram illustrating the overall configuration of a conventional art.

FIG. 2 is a perspective view of a barbell set having barbell discs according to the present invention.

FIG. 3 is an exploded perspective view of the barbell discs according to the present invention.

FIG. 4 is a cross-sectional view illustrating a process of inserting a barbell rod into the barbell discs of the present invention.

FIG. 5 is a cross-sectional view illustrating a locked state of the barbell rod in the barbell discs according to the present invention.

Mode for Invention

[0018] Hereinafter, an embodiment of the present invention will be described in detail with reference to the accompanying drawings.

[0019] FIG. 2 is a perspective view of a barbell set having barbell discs according to the present invention, FIG. 3 is an exploded perspective view of the barbell discs according to the present invention, FIG. 4 is a cross-sectional view illustrating a process of inserting a barbell rod into the barbell discs of the present invention, and FIG. 5 is a cross-sectional view illustrating a locked state of the barbell rod in the barbell discs according to the present invention.

[0020] As illustrated in FIG. 2, the barbell set 100 includes barbell discs, two of which are mounted on the

left side and two of which are mounted on the right side of the barbell rod 101. In order to mount or dissociate each barbell disc on or from the barbell rod 101, they can be mounted at a desired position regardless of mounting order. So, in order to mount the barbell disc 200, which is located inside, on the barbell rod 101, the barbell rod 101 is inserted into the elongated groove of the barbell disc body to push and move the handle 201 inwards, so that a locking device locks the barbell rod. When a user pulls the pushed handle 201 outwards, the locking device is released so that the user can simply dissociate the barbell discs 200 from the barbell rod 101.

[0021] Moreover, the locking device must be mounted inside the barbell disc body, and the mounted form may be varied. However, as illustrated in FIG. 3, the barbell disc body is divided into a left plate and a right plate, and the locking device is mounted therein, and then, the right plate and the left plate are combined with each other by bolts.

[0022] As illustrated in FIG. 3, the right plate 220 of the barbell disc body includes an opening on the outer circumferential surface thereof so that the barbell rod 101 can be inserted and fit to the center thereof, and an elongated groove 410 extending to the center of the barbell disc body. A first operating plate 230 and a second operating plate 240, which are the locking device, are mounted inside the right plate 220. The left plate 210 is formed in the same shape as the right plate 220, and the right plate 220 and the left plate 210 are combined with each other by bolts 401 and nuts (not shown) so as to form the barbell disc body.

[0023] The right plate 220 has an opening formed on the outer circumferential surface of the elongated groove 410 thereof, and a circularly curved surface formed at an end portion extended in parallel from the opening so that the barbell rod 101 is inserted to the center portion of the right plate 220.

[0024] In addition, a first insertion groove 420 and a second insertion groove 421 recessed inwardly from one side to a predetermined depth so that the first operating plate 230 and the second operating plate 240 which are locking devices can be inserted and moved. An insertion groove 430 is formed inwardly from one side to a predetermined depth so that the handle 201 can be inserted and moved inwards and outwards. A penetration part 440 is formed in such a way that one side and the other side of the right plate 220 are penetrated so that the user can hold a pulling part 2011 of the handle 201 with the hand.

[0025] Moreover, guide grooves 4301 and 4302 are formed so that guide parts 2012 and 2013 of the handle 201 mounted in the insertion groove 430 can be guided and moved.

[0026] Likewise, the left plate 210 also includes a first insertion groove, a second insertion groove, an insertion groove, a penetration part, and guide grooves which have the same shapes as the first insertion groove 420, the second insertion groove 421, the insertion groove 430, the penetration part 440, and the guide groove 4301 and

4302 of the right plate 220, so that the first operating plate 230, the second operating plate 240, and the handle 201 can be inserted and mounted inside the left plate 210 and the right plate 220. Additionally, according to a designer's intention, a flat surface which has no insertion grooves is formed on a surface of the left plate 210 opposed to the right plate 220. Therefore, insertion grooves are deeply formed only on the right plate 220 so that the first operating plate 230 and the second operating plate 240 are moved inside the insertion grooves of the right plate 220. As described above, there are various modifications with respect to methods of forming insertion grooves in the barbell disc body and with respect to the depth of the insertion grooves.

[0027] In addition, the handle 201 includes: both side parts formed outwards from both ends of the inner part vertically formed toward the center; a pulled part 2011 connected to end portions of both sides; guide parts 2013 and 2012 formed at both side parts and respectively inserted into the guide grooves 4301 and 4302; and a shaft insertion part 2015 having a curved insertion groove 2017 into which a recovery shaft is inserted into the center and which is formed toward the inside from the center of the inner surface of the inner part.

[0028] In this instance, one or both of the recovery shaft 250 and the shaft insertion part 2015 are made of magnets so that the shaft insertion part 2015 is pulled and coupled with respect to the recovery shaft 250 in a natural state due to mutual attraction. When the user pulls the pulled part 2011 toward disc exterior spacers 3211 and 4211 beyond magnetic force, the shaft insertion part 2015 is separated from the recovery shaft 250 to be pushed toward the disc exterior spacers 3211 and 4211.

[0029] Moreover, stepped parts 4210 and 4212 from which frond end portions are spaced are formed among the first insertion groove 320, the second insertion groove 421, and the insertion groove 430, and the recovery shaft 250 is mounted on the central line connecting the center of the width of the elongated groove 410 between the stepped parts 4210 and 4212.

[0030] In addition, the recovery shaft 250 and the shaft insertion part 2015 come into contact with each other by mutual magnetic force, and so, there are various modifications of allowing mutual attraction using restoring force of a rubber band or a spring.

[0031] The first operating plate 230 has a C-shaped body 233 rotated by an eccentric shaft 232. The eccentric shaft 232 is eccentrically mounted on the upper part when the C-shaped body 233 is divided into an upper part and a lower part. An end portion of the upper part of the C-shaped body 233 has a concave center, an upper convex part 2331 and a lower convex part 2332 disposed below the upper convex part 2331. In this instance, the lower convex part 2332 is formed to be closer to the recovery shaft 250 than the upper convex part 2331.

[0032] Additionally, like the first operating plate 230, the second operating plate 240 also has a C-shaped body 243 rotating around an eccentric shaft 242 and a lower

convex part 2432 and an upper convex part 2431 formed on the body 243.

[0033] As illustrated in FIG. 4, because the lower part is heavier than the upper part around the eccentric shafts 232 and 242 of the first operating plate 230, the second operating plate 240, an end portion of the lower part approaches near to a line connecting the center portion of the opening 410 and the center of the recovery shaft 250 with each other, hereinafter, called 'disc central line, and an end portion of the upper part is away from the central line of the disc. In such a state, because the shaft insertion portion 2017 is caught by the upper convex part 2331 and the upper convex part 2431, the curved insertion groove 2014 of the shaft insertion part 2017 is maintained in a state in which the curved insertion groove 2014 of the shaft insertion part 2017 is not in contact with the recovery shaft 250.

[0034] In such a state, when the barbell rod 101 is inserted into the opening 410 and the barbell rod 101 pushes up the lower convex part 2332 of the C-shaped body 233 and the lower convex part 2432, a gap between the upper convex part 2331 and the upper convex part 2431 is widened and the barbell rod 101 is pulled by magnetic force acting between the shaft insertion part 2017 of the handle 201 and the recovery shaft 250. According, the shaft insertion part 2017 is pushed down inwards from the upper convex part 2331 and the upper convex part 2431 so that the curved insertion groove 2014 of the shaft insertion part 2017 and the recovery shaft 250 get in contact with each other. Additionally, in such a state, lower end portions of the lower parts of the C-shaped bodies 233 and 243 hold the lower part of the barbell rod 101 in a state in which they approach close each other toward a central line, so that the barbell rod 101 is locked by the C-shaped bodies 233 and 243 and does not get out of the opening, thereby maintaining a locked state as illustrated in FIG. 5.

[0035] In the above state, in order to dissociate the barbell discs 200 from the barbell rod 101, when the user pulls the handle 201 toward the disc exterior spacers 3211 and 4211, and the upper convex parts 2331 and 2431 of the C-shaped bodies 233 and 243 get closer to the central line, and the lower end portions of the C-shaped bodies 233 and 243 get away from the central line so that the barbell rod 101 is dissociated from the opening 410.

Claims

1. A barbell disc comprising:

- a barbell disc body which has an opening formed on the outer circumferential surface and an elongated groove extending from the opening to the center so that a barbell rod can be inserted into the barbell disc body;
- a recovery shaft mounted on the center line of

the width of the elongated groove of the barbell disc body;

a handle which is mounted to the barbell disc body in a movable way and having a shaft insertion part getting in contact with the recovery shaft by restoring force of a recovery means; and a locking device which locks the barbell rod to the center of the barbell disc body not to move when the recovery shaft and the shaft insertion part come into contact with each other as the barbell rod is inserted into the end of the elongated groove, and which separates the barbell rod from the center of the barbell disc body when a user pulls the handle outwards from the barbell disc body so that the recovery shaft and the shaft insertion part are separated from each other.

2. The barbell disc according to claim 1, wherein the locking device comprises: a first operating plate and a second operating plate mounted symmetrically with the first operating plate with respect to the central line; and a first insertion groove and a second insertion groove formed inside the barbell disc body so that the first operating plate and the second operating plate are respectively inserted into the first insertion groove and the second insertion groove, wherein when the shaft insertion part of the handle comes into contact with the recovery shaft, the barbell rod is locked by the first operating plate and the second operating plate when.
3. The barbell disc according to claim 2, wherein the first operating plate and the second operating plate respectively rotate around eccentric shafts mounted in the first insertion groove and the second insertion groove, and in the case that each of the operating plates is divided into an upper part and a lower part based on the eccentric shaft, each of the operating plates has a C-shaped body in which the lower part is longer than the upper part.
4. The barbell disc according to claim 1, wherein the recovery means is any one among a magnet, an elastic belt, and a spring.
5. The barbell disc according to claim 3, wherein a curved insertion groove is formed on the shaft insertion part so that the recovery shaft is inserted into the curved insertion groove.

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Fig. 1

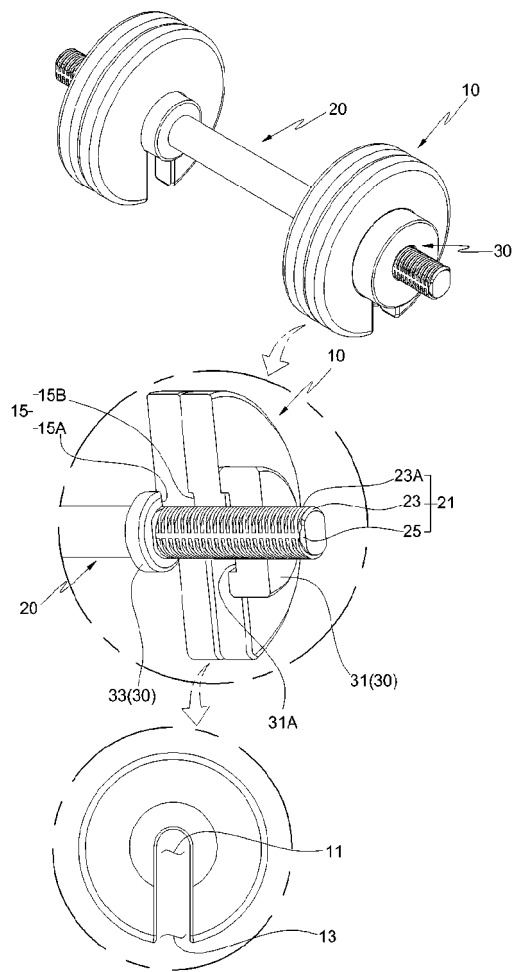


Fig. 2

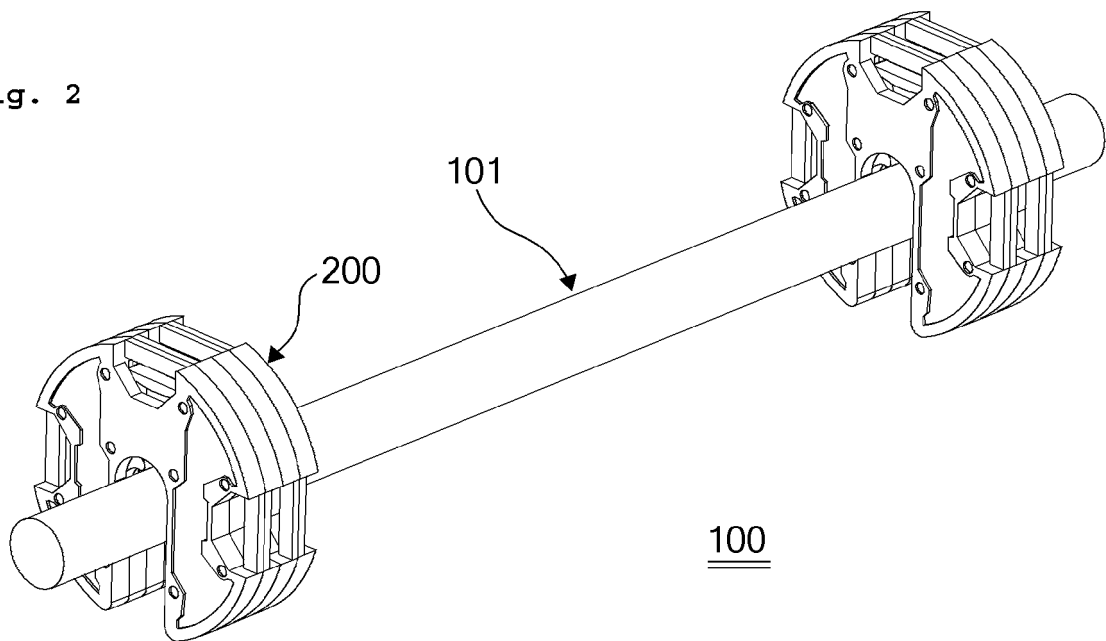


Fig. 3

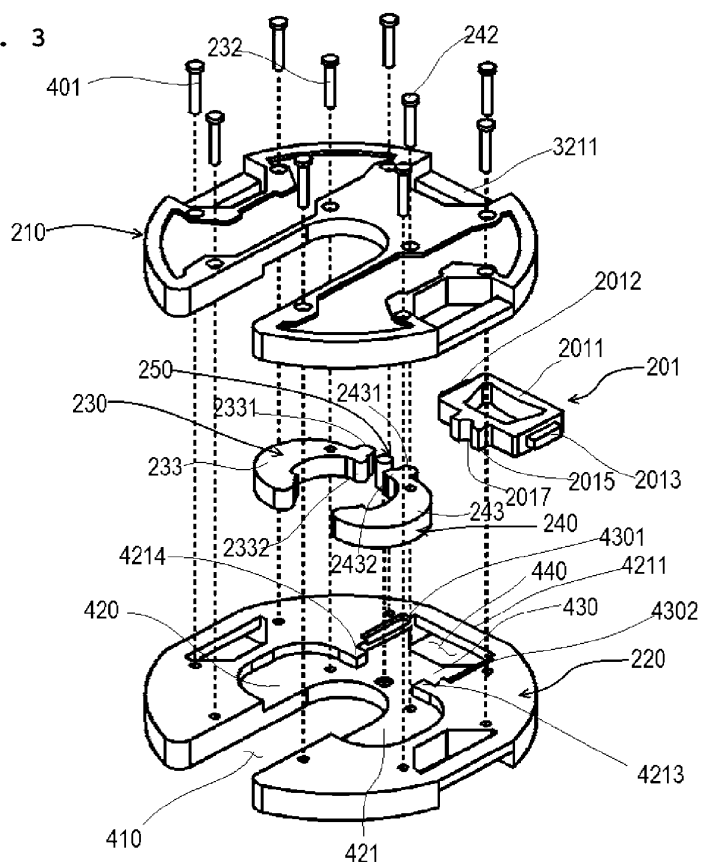


Fig. 4

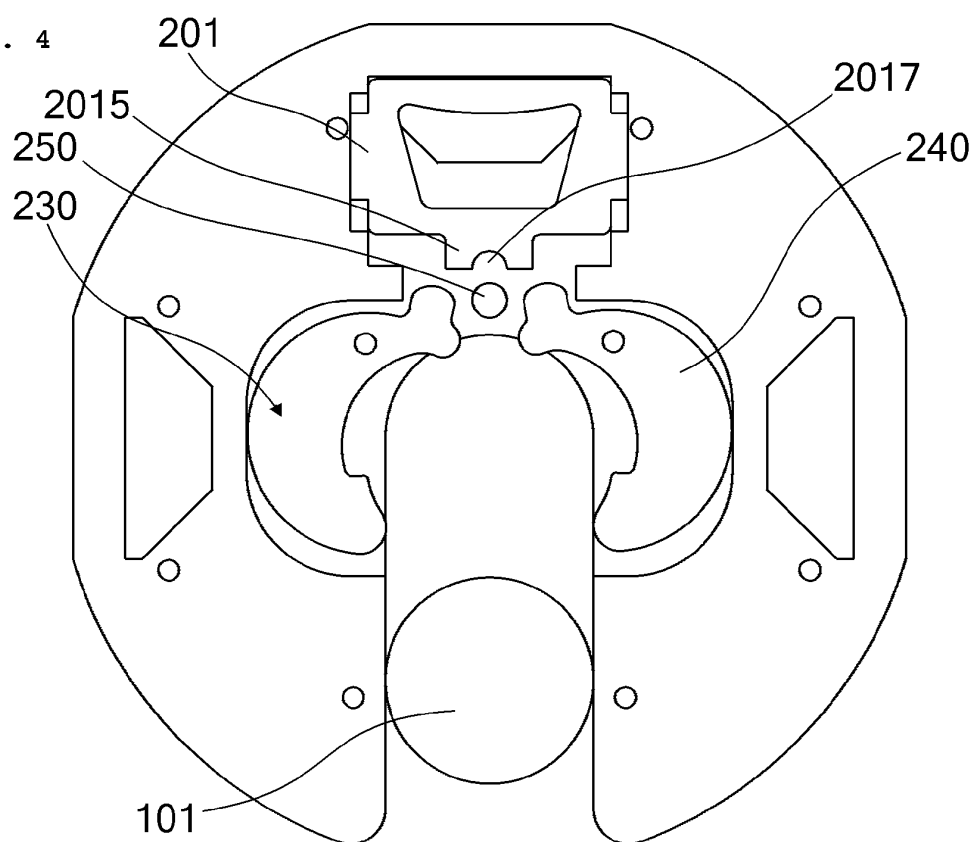
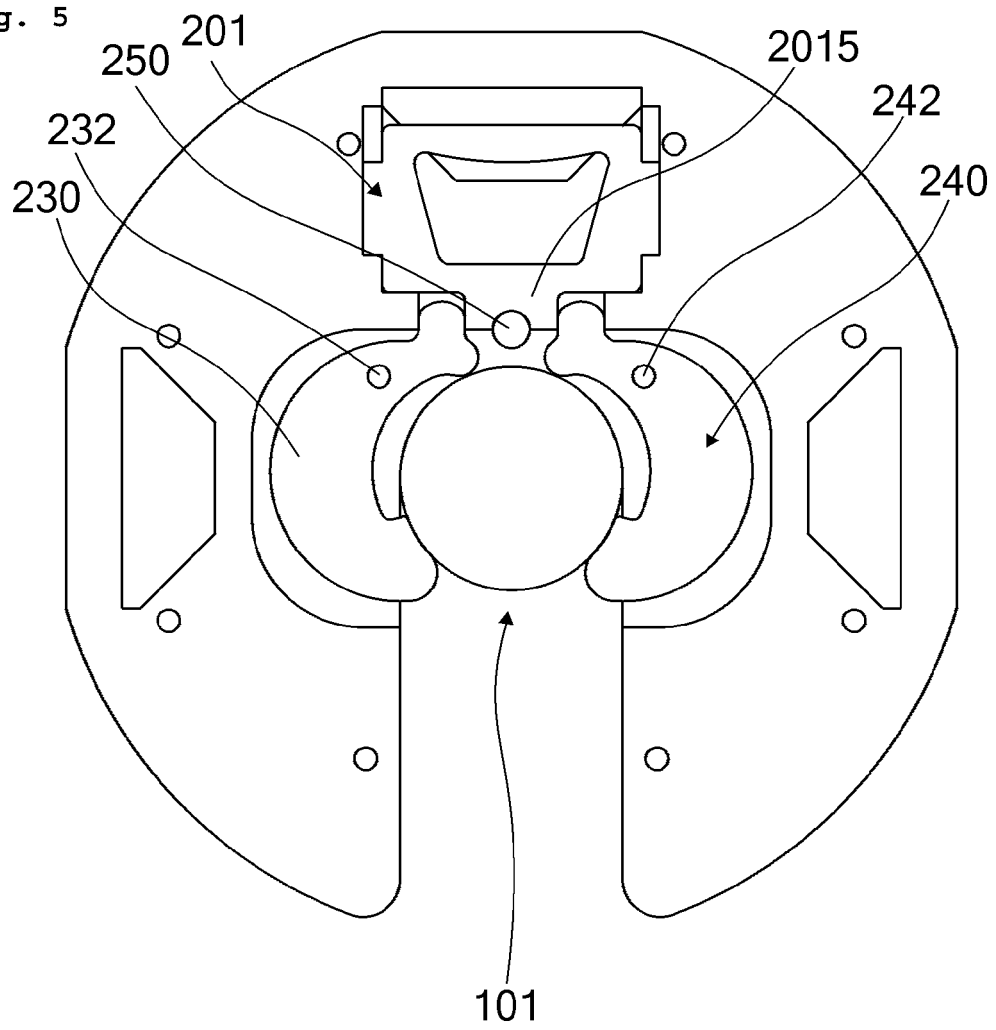


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2020/009019

A. CLASSIFICATION OF SUBJECT MATTER

A63B 21/072(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A63B 21/072; A63B 21/00; A63B 21/075

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 바벨 봉(barbell bar), 바벨 원판(barbell disk), 손잡이(handle), 잠금장치(latching device)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2014-0349820 A1 (BETO ENGINEERING AND MARKETING CO., LTD.) 27 November 2014. See paragraphs [0017]-[0021] and figures 1-9.	1-5
Y	KR 10-1115444 B1 (JANG, Chun Seob) 22 February 2012. See paragraphs [0036]-[0040] and figures 8a-8d.	1-5
A	US 2014-0162855 A1 (BECKMAN, Christopher V.) 12 June 2014. See paragraphs [0032]-[0049] and figures 1-8.	1-5
A	US 2018-0353794 A1 (TORAY ENGINEERING CO., LTD.) 13 December 2018. See paragraphs [0036]-[0048] and figures 1-14.	1-5

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search 22 October 2020	Date of mailing of the international search report 22 October 2020
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208 Facsimile No. +82-42-481-8578	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2020/009019

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2008695 B1 (SUNG, Ho Sung) 08 August 2019. See paragraphs [0058]-[0087] and figures 1-10.	1-5

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2020/009019

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)		Publication date (day/month/year)
US	2014-0349820	A1	27 November 2014	US	9022907 B2	05 May 2015
KR	10-1115444	B1	22 February 2012	None		
US	2014-0162855	A1	12 June 2014	US	9555281 B2	31 January 2017
				US	2017-0135428 A1	18 May 2017
US	2018-0353794	A1	13 December 2018	US	10328299 B2	25 June 2019
KR	10-2008695	B1	08 August 2019	None		

Form PCT/ISA/210 (patent family annex) (July 2019)

REFERENCES CITED IN THE DESCRIPTION

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- KR 1020130033591 [0003]