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(54) **ARM TRAINER STRUCTURE**

(57) An arm trainer structure comprises a main body, two wheels, two bearing sets, two resilient blocks, a rear holding plate, a front holding plate and an adjustment knob. The main body has two outer rings. The two wheels are coaxially rotatably disposed in the two outer rings. The two bearing sets are disposed between the two wheels and the two outer rings. The two resilient blocks have resilient deformation abilities and are combined with the main body. The rear holding plate is disposed on rear sides of the two resilient blocks and has a middle frontwardly projecting to form a screwed fitting rod. An end surface of the screwed fitting rod has a screw hole. Each of the two lateral sides of the two rear holding plates has a rear damping sheet pressing against the two wheels to generate a resisting force. The front holding plate is disposed on front sides of the two resilient blocks, and has a middle having a through hole. Each of two lateral sides of the front holding plate has a front damping sheet pressing against the two wheels to generate a resisting force. The adjustment knob has a bolt penetrating through the through hole screwed into the screw hole of the screwed fitting rod. The adjustment knob is tightened to force the front and rear holding plates to tightly press against the two resilient blocks to cause resilient deformation to increase rotational resistance forces of the front and rear damping sheets. The adjustment knob is loosened to move the front and rear holding plates outward by the resilient forces of the two resilient blocks to reduce rotational resistance forces of the front and rear damping sheets. The structure can train the arm muscle groups and hand joints, and can adjust the resisting forces to achieve different degrees of training effects.

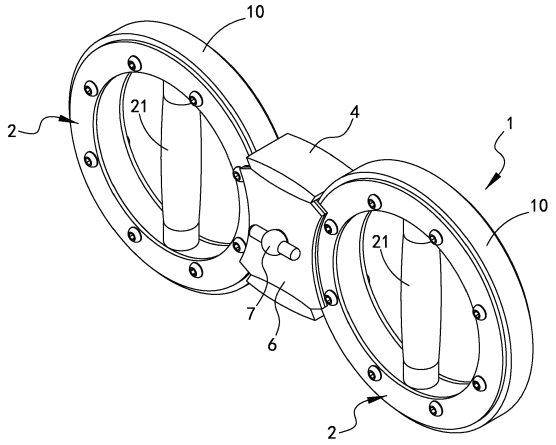

FIG. 2

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Description

BACKGROUND OF THE INVENTION

(1) FIELD OF THE INVENTION

[0001] The invention relates to a technical field of fitness equipment for training arms, and more particularly to an arm trainer structure, which can be gripped by two hands or one hand to perform different directions of twisting, rotating or swinging to train arm muscle groups and hand joints, and can achieve different degrees of training effects by adjusting the rotational resistance force and thus satisfy different requirements of different users.

(2) DESCRIPTION OF THE PRIOR ART

[0002] A typical conventional arm trainer, such as that disclosed in Taiwan Patent No. M424160, has the main structure, in which freely rotatable wheels are disposed within two outer rings of a main body, respectively. A handle to be gripped by the hand is disposed on the wheel. Two hands or one hand grips the handle of the wheel to do various different directions of twisting, rotating or swinging to simulate various basic return-hand actions of Tai Ji Quan, and various continuous strike actions of boxing and inertia swinging, so that the objects of training the arm muscle groups and wrist, elbow and shoulder joints are achieved.

[0003] However, the two wheels of the conventional arm trainer can be freely and smoothly rotated in the two outer rings of the main body, and only can provide the same training effect to various persons. However, different persons have different constitutions and training time periods, and thus have different degrees of training requirements. The existing conventional arm trainer only can generate different degrees of training by increasing or decreasing the overall weight. However, generating different degrees of training by increasing or decreasing the overall weight will cause the restricted training directions and effects, and different arm trainers with different weights need to be prepared for different degrees or different stages of users. Thus, the costs of purchasing the arm trainers are relatively high, and the space is significantly occupied. More particularly, the operations of the arm trainer are not only the lifting operations, and further comprise rotating, twisting and swinging operations and the like. Thus, the conventional arm trainer cannot adjust the rotational resistance force, and cannot achieve the effective and proper training effects on the users in different stages or having different training requirements.

SUMMARY OF THE INVENTION

[0004] The conventional arm trainer cannot adjust the rotational resistance force according to different requirements of different users to achieve different training effects, so that a lot of costs are required to purchase equipment with different weights, a larger space is occupied and other problems may occur.

[0005] The invention provides an arm trainer structure comprising a main body, two wheels, two bearing sets, two resilient blocks, a rear holding plate, a front holding plate and an adjustment knob. The main body comprises two ring-shaped outer rings, and a connection sheet connected between the two outer rings. The connection sheet has a through hole disposed at a middle. The two wheels are coaxially rotatably combined within the two outer rings, respectively. Each of the wheels comprises an inner ring, two inner ring cover sheets and a handle. The inner ring is disposed in the corresponding outer ring. The two inner ring cover sheets are combined with front and rear side surfaces of the inner ring, respectively, and have outer peripheries extending outside front and rear side surfaces of the outer ring. The handle is combined within the inner ring to facilitate a user in gripping the handle. The two bearing sets are disposed between the two wheels and the two outer rings, respectively, so that the two wheels can be smoothly and freely rotated in the two outer rings, respectively. The two resilient blocks have resilient deformation abilities, and are combined with upper and lower lateral sides of the connection sheet, respectively. The rear holding plate is disposed on rear side surfaces of the two resilient blocks. Two lateral sides of the rear holding plate extend outside the two inner ring cover sheets of rear sides of the two wheels, respectively. The two lateral sides of the rear holding plate corresponding to side surfaces of the two inner ring cover sheets have rear damping sheets, respectively. The two rear damping sheets can press against the two inner ring cover sheets of the rear sides of the two wheels to generate resisting forces. A middle of the rear holding plate has a screwed fitting rod penetrating through the through hole, and an end surface of the screwed fitting rod has a screw hole. The front holding plate is disposed on front side surfaces of the two resilient blocks. Two lateral sides of the front holding plate extend outside the two inner ring cover sheets of the front sides of the two wheels, respectively. Two lateral sides of the front holding plate corresponding to the side surfaces of the two inner ring cover sheets have front damping sheets, respectively. The two front damping sheets can press against the two inner ring cover sheets of the front sides of the two wheels to generate resisting forces. A middle of the front holding plate has a through hole. The adjustment knob has one side having a bolt, which penetrates through the through hole from the outside of the front holding plate and is screwed to the screw hole of the screwed fitting rod.

[0006] With the arm trainer structure of the invention, two hands can grip the handles of the two wheels, respectively, to do twisting or rotating actions with different directions, or one hand can grip one of the handles of the wheels to do the swinging action so that various basic return-hand actions of Tai Ji Quan, the continuous strike actions of boxing and inertia swinging actions can be

simulated to achieve the object of training the arm muscle groups and hand joints. More particularly, when the adjustment knob is tightened, the front and rear holding plates tightly press against the two resilient blocks to cause the resilient deformation to increase the forces of the front and rear damping sheets pressing against the corresponding inner ring cover sheets, and thus increase the rotational resistance forces. When the adjustment knob is loosened, the resilient forces of the two resilient blocks move the front and rear holding plates outward to reduce the forces of the front and rear damping sheets pressing against the corresponding inner ring cover sheets, and thus reduce the rotational resistance forces. So, the object of adjusting and controlling the rotational resistance forces can be easily achieved by tightening or loosening the adjustment knob, so that different training effects can be obtained, and the requirements of effective training for different users can be satisfied. So, different degrees of training effects can be achieved without purchasing different equipment with different weights. Thus, the cost can be significantly saved, the occupied space is reduced, and the training effect also becomes better. More particularly, using the two resilient blocks as the resilient members for adjusting the resisting forces can further significantly simplify the structure, so that the overall manufacturing and assembling processes become simpler, and the manufacturing costs may also be significantly lowered.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a pictorially decomposed schematic view showing the invention.

FIG. 2 is a pictorially enlarged schematic view showing the invention.

FIG. 3 is a schematically enlarged plane view showing the invention.

FIG. 4 is a schematically enlarged view of an A-A cross section of FIG. 3.

FIG. 5 is a schematic view showing a first used state of the invention.

FIG. 6 is a schematic view showing a second used state of the invention.

FIG. 7 is a schematic view showing a third used state of the invention.

FIG. 8 is a schematic view showing a fourth used state of the invention.

FIG. 9 is a schematic view showing a fifth used state of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] Referring to FIGS. 1 to 4, the arm trainer structure of the invention comprises a main body 1, two wheels 2, two bearing sets 3, two resilient blocks 4, a rear holding plate 5, a front holding plate 6 and an adjustment knob 7.

[0009] The main body 1 comprises two outer rings 10 disposed on the same plane, and a connection sheet 11 disposed between the two outer rings 10. Each inner edge of front and rear side surfaces of the two outer rings 10 has an annular groove 12, which extends to an inner lateral side of the outer ring 10 in an opened manner. Two ends of the connection sheet 11 are fixedly connected to outer walls of opposite sides of the two outer rings 10, respectively. The connection sheet 11 has a through hole 13 at a middle, and four guide holes 14 symmetrically disposed on opposite sides of the through hole 13.

[0010] The two wheels 2 are coaxially rotatably disposed in the two outer rings 10 of the main body 1, respectively. Each wheel 2 comprises an inner ring 20, a handle 21 and two inner ring cover sheets 22. The inner ring 20 is disposed in the corresponding outer ring 10. Two ends of the handle 21 are combined with two inner walls of the inner ring 20 through two plugs 23, respectively. The two inner ring cover sheets 22 are screwed to the front and rear side surfaces of the inner ring 20 through a plurality of bolts 24, respectively. The outer periphery of the inner ring cover sheet 22 extends to front and rear side surfaces of the corresponding outer ring 10.

[0011] The two bearing sets 3 are disposed between the two wheels 2 and the two outer rings 10, respectively. Each bearing set 3 comprises two bearing rings 30 to be disposed on front and rear sides between the corresponding wheel 2 and outer ring 10, respectively. The bearing ring 30 is made of a wear-resistant material, such as a Teflon material, having a small coefficient of friction. Each bearing ring 30 is composed of a standing sheet 31 and a transversal sheet 32 perpendicularly connected to each other, and has an L-shaped cross-sectional area. The standing sheet 31 is disposed between an inner wall of the outer ring 10 and an outer wall of the inner ring 20. The transversal sheet 32 is embedded into the annular groove 12 of the outer ring 10, and is clamped between the outer ring 10 and the inner ring cover sheet 22.

[0012] The two resilient blocks 4 have the resilient deformation abilities and may be made of the material, such as rubber. The opposite inner sides of the two resilient blocks 4 have slots 40 into which the upper and lower lateral sides of the connection sheet 11 are embedded, respectively; and two opposite outer sides of the two resilient blocks 4 have projections 41, respectively. The portions on the two resilient blocks 4 corresponding to the four guide holes 14 are formed with penetrating holes 42, respectively.

[0013] The rear holding plate 5 is disposed on the rear side surfaces of the two resilient blocks 4, and has left and right lateral sides respectively extending outside the two inner ring cover sheets 22 of the rear sides of the two wheels 2. The two lateral sides of the rear holding plate 5 corresponding to the side surfaces of the two inner ring cover sheets 22 have rear damping sheets 50, respectively. The two rear damping sheets 50 may press against two inner ring cover sheets 22 of the rear sides

of the two wheels 2 to generate the resisting forces. The rear holding plate 5 has a screwed fitting rod 51 at a middle, and two rear guiding rods 52 symmetrically disposed on upper and lower sides of the screwed fitting rod 51. The screwed fitting rod 51 penetrates through the through hole 13, and has an end surface formed with a screw hole. The two rear guiding rods 52 extend and insert into two guide holes 14 and two holes 42 at the diagonal positions, respectively.

[0014] The front holding plate 6 is disposed on front side surfaces of the two resilient blocks 4, and has the left and right lateral sides respectively extending outside the two inner ring cover sheets 22 of the front sides of the two wheels 2. The two lateral sides of the front holding plate 6 corresponding to the side surfaces of the two inner ring cover sheets 22 are formed with front damping sheets 60, respectively. The two front damping sheets 60 can press against the two inner ring cover sheets 22 of the front sides of the two wheels 2 to generate the resisting forces. The front holding plate 6 has a through hole 61 disposed at a middle, and two front guiding rods 62 symmetrically disposed on the upper and lower sides of the through hole 61. The two front guiding rods 62 extend and are inserted into the two guide holes 14 and the two holes 42 at the other diagonal positions, respectively.

[0015] The adjustment knob 7 has a bolt 70, wherein one end of the bolt 70 has a rotating portion 71. The bolt 70 can penetrate through the through hole 61 from the outside of the front holding plate 6 and be screwed into the screw hole of the screwed fitting rod 51. The rotating portion 71 has the larger width to facilitate the force application and rotation.

[0016] In FIG. 4, using the two inner ring cover sheets 22 disposed opposite each other can restrict the inner ring 20 within the outer ring 10, and the inner ring 20 only can be coaxially rotated on the inner side of the outer ring 10. In addition, using the two bearing rings 30 disposed opposite each other can smooth the rotation of the inner ring 20 in the outer ring 10, and reduce the noise generated upon rotation. In addition, using the plurality of front and rear guiding rods 62, 52 correspondingly inserted into the plurality of guide holes 14 and holes 42 for guiding and fitting can make the front and rear holding plates 6, 5 move close to or away from each other in the direction toward the connection sheet 11. More particularly, when the adjustment knob 7 is tightened, the front and rear holding plates 6, 5 can tightly press against the two resilient blocks 4 to cause the resilient deformation to increase the forces of the front and rear damping sheets 60, 50 pressing against the corresponding inner ring cover sheets 22, and thus increase the rotational resistance forces. When the adjustment knob 7 is loosened, the resilient forces of the two resilient blocks 4 can move the front and rear holding plates 6, 5 outward to reduce the forces of the front and rear damping sheets 60, 50 pressing against the corresponding inner ring cover sheets 22, and thus to reduce the rotational resistance forces. Thus, using the adjustment knob 7 to adjust the pressures of the front and rear damping sheets 60, 50 on the corresponding inner ring cover sheet 22 can achieve the object of adjusting the rotational resistance forces of the two wheels 2, so that different degrees of training can be performed by the adjustment to satisfy the requirements of effectively training different users. So, different degrees of training effects can be achieved without purchasing equipment with different weights. Thus, the cost can be significantly saved, the space occupied can be saved, and the better training effect can also be obtained. More particularly, using the two resilient blocks 4 as the resilient members for adjusting the resisting forces can further significantly simplify the structure, so that the overall manufacturing and assembling processes become simpler, and the manufacturing costs may also be significantly reduced.

[0017] Referring to FIG. 5 showing the first application of the invention, two hands straighten and grip the handles 21 of two wheels 2, and then two hands concurrently twist the two wheels 2 in the clockwise or counterclockwise direction or in the clockwise and counterclockwise directions with the main body 1 being held stationary.

[0018] Referring to FIG. 6 showing the second application of the invention, two hands straighten and negatively grip the handles 21 of the two wheels 2, and then the main body 1 is rotated in between the two hands from top to bottom, and then pushed frontward so that the two hands straighten and positively grip the handles 21 of the two wheels 2. Then, the main body 1 is rotated in between the two hands from bottom to top, and pushed frontward so that the two hands straighten and negatively grip the handles 21 of the two wheels 2. The operations are repeated.

[0019] Referring to FIG. 7 showing the third application of the invention, two hands straighten and grip the handles 21 of the two wheels 2, and then the main body 1 is rotated clockwise and counterclockwise reciprocally, so that the two hands at upper and lower positions cross each other, and the cross position between the left and right hands changes alternately.

[0020] The three applications of FIGS. 5, 6 and 7 can simulate the various basic operations of return-hand of Tai Ji Quan.

[0021] Referring to FIG. 8 showing the fourth application of the invention, two hands grip the handles 21 of the two wheels 2 from two sides, respectively, while the main body 1 and the handle 21 are in the upright states. Then, the main body 1 is rotated frontward or backward. Thus, the continuous striking action of boxing can be simulated.

[0022] Referring to FIG. 9 showing the fifth application of the invention, one single hand grips one of the handles 21 of the wheels 2, and then swings the main body 1, and the other wheel 2 is rotated about the wheel 2 gripped by the hand. Thus, the actions of inertia swinging can be formed.

Claims

1. An arm trainer structure, comprising:

a main body (1) comprising two ring-shaped outer rings (10), and a connection sheet (11) connected between the two outer rings (10), wherein the connection sheet (11) has a through hole (13) disposed at a middle;

two wheels (2) coaxially rotatably combined within the two outer rings (10), respectively, wherein each of the wheels (2) comprises an inner ring (20), two inner ring cover sheets (22) and a handle (21), the inner ring (20) is disposed in the corresponding outer ring (10), the two inner ring cover sheets (22) are combined with front and rear side surfaces of the inner ring (20), respectively, and have outer peripheries extending outside front and rear side surfaces of the outer ring (10), and the handle (21) is combined within the inner ring (20) to facilitate a user in gripping the handle (21);

two bearing sets (3) disposed between the two wheels (2) and the two outer rings (10), respectively, so that the two wheels (2) can be smoothly and freely rotated in the two outer rings (10), respectively;

two resilient blocks (4), which have resilient deformation abilities, and are combined with upper and lower lateral sides of the connection sheet (11), respectively;

a rear holding plate (5) disposed on rear side surfaces of the two resilient blocks (4), wherein two lateral sides of the rear holding plate (5) extend outside the two inner ring cover sheets (22) of rear sides of the two wheels (2), respectively, the two lateral sides of the rear holding plate (5) corresponding to side surfaces of the two inner ring cover sheets (22) have rear damping sheets (50), respectively, the two rear damping sheets (50) can press against the two inner ring cover sheets (22) of the rear sides of the two wheels (2) to generate resisting forces, a middle of the rear holding plate (5) has a screwed fitting rod (51) penetrating through the through hole (13), and an end surface of the screwed fitting rod (51) has a screw hole;

a front holding plate (6) disposed on front side surfaces of the two resilient blocks (4), wherein two lateral sides of the front holding plate (6) extend outside the two inner ring cover sheets (22) of front sides of the two wheels (2), respectively, two lateral sides of the front holding plate (6) corresponding to the side surfaces of the two inner ring cover sheets (22) have front damping sheets (60), respectively, the two front damping sheets (60) can press against the two inner ring cover sheets (22) of the front sides of the two wheels (2) to generate resisting forces, and a middle of the front holding plate 6 has a through hole (61); and

an adjustment knob (7) having one side having a bolt (70), which penetrates through the through hole (61) from the outside of the front holding plate (6) and is screwed to the screw hole of the screwed fitting rod (51), wherein when the adjustment knob (7) is tightened, the front and rear holding plates (6, 5) press against the two resilient blocks (4) to have resilient deformations to increase forces of the front and rear damping sheets (60, 50) pressing against the corresponding inner ring cover sheets (22) and thus to increase rotational resistance forces; and when the adjustment knob (7) is loosened, resilient forces of the two resilient blocks (4) move the front and rear holding plates (6, 5) outward to reduce the forces of the front and rear damping sheets (60, 50) pressing against the corresponding inner ring cover sheets (22), and thus to reduce the rotational resistance forces.

2. The arm trainer structure according to claim 1, wherein opposite inner sides of the two resilient blocks (4) have slots (40), into which the upper and lower lateral sides of the connection sheet (11) are embedded, respectively.

3. The arm trainer structure according to claim 2, wherein each of opposite outer sides of the two resilient blocks (4) has a projection (41) for covering upper and lower lateral sides of the front and rear holding plates (6, 5).

4. The arm trainer structure according to claim 3, wherein the two resilient blocks (4) are made of resilient rubber materials.

5. The arm trainer structure according to claim 1, wherein the connection sheet (11) has a plurality of guide holes (14) symmetrically disposed around the through hole (13), holes (42) are formed on portions of the two resilient blocks (4) corresponding to the plurality of guide holes (14), respectively, the rear holding plate (5) has a plurality of rear guiding rods (52) extending and being inserted into one or multiple ones of the plurality of guide holes (14) and the plurality of holes (42), the front holding plate (6) has a plurality of front guiding rods (62) extending and being inserted into the plurality of guide holes (14) and the plurality of holes (42) where no rear guiding rod or rods (52) are inserted.

6. The arm trainer structure according to claim 1, wherein each of the bearing sets (3) comprises two bearing rings (30) respectively disposed between the corresponding wheel (2) and outer ring (10), and

each of the bearing rings (30) is made of a wear-resistant material with a small coefficient of friction and is composed of a standing sheet (31) and a transversal sheet (32) perpendicularly connected to each other and has an L-shaped cross-sectional area, wherein the standing sheet (31) is disposed between the outer ring (10) and the inner ring (20), and the transversal sheet (32) is disposed between the outer ring 10 and the inner ring cover sheet (22).

7. The arm trainer structure according to claim 6, wherein inner edges of the front and rear side surfaces of the outer ring (10) have annular grooves (12), respectively, and the annular groove (12) extends to an inner lateral side of the outer ring (10) in an opened manner and accommodates the transversal sheet (32) of the corresponding bearing ring (30).

8. The arm trainer structure according to claim 1, wherein the adjustment knob (7) has a wider rotating portion (71) to facilitate force application and rotation.

9. The arm trainer structure according to claim 1, wherein each of two ends of the handle (21) is combined within the corresponding inner ring (20) through a plug (23).

10. The arm trainer structure according to claim 1, wherein the two inner ring cover sheets (22) are screwed to the front and rear side surfaces of the two inner rings (20) through a plurality of bolts (24), respectively.

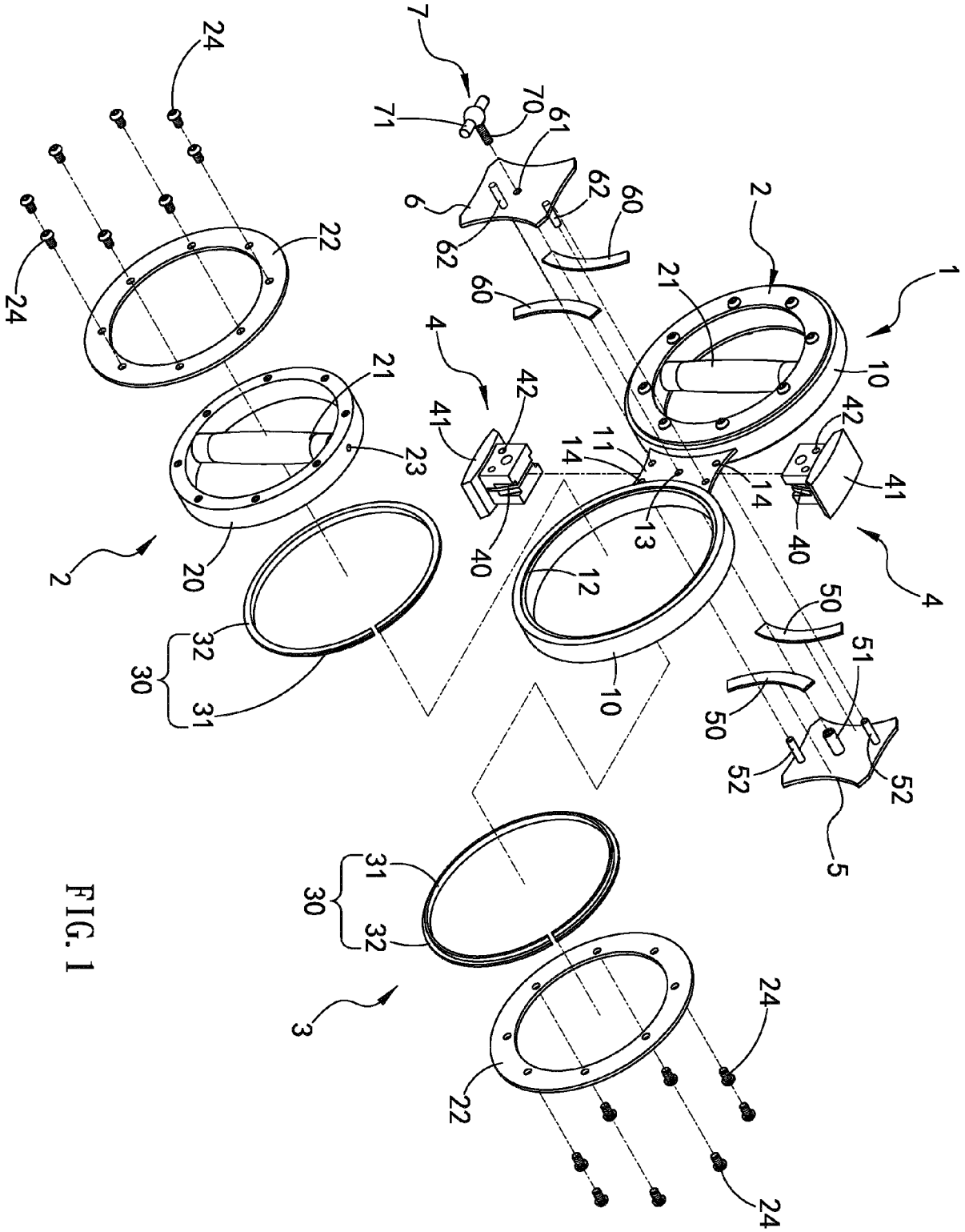
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FIG. 1

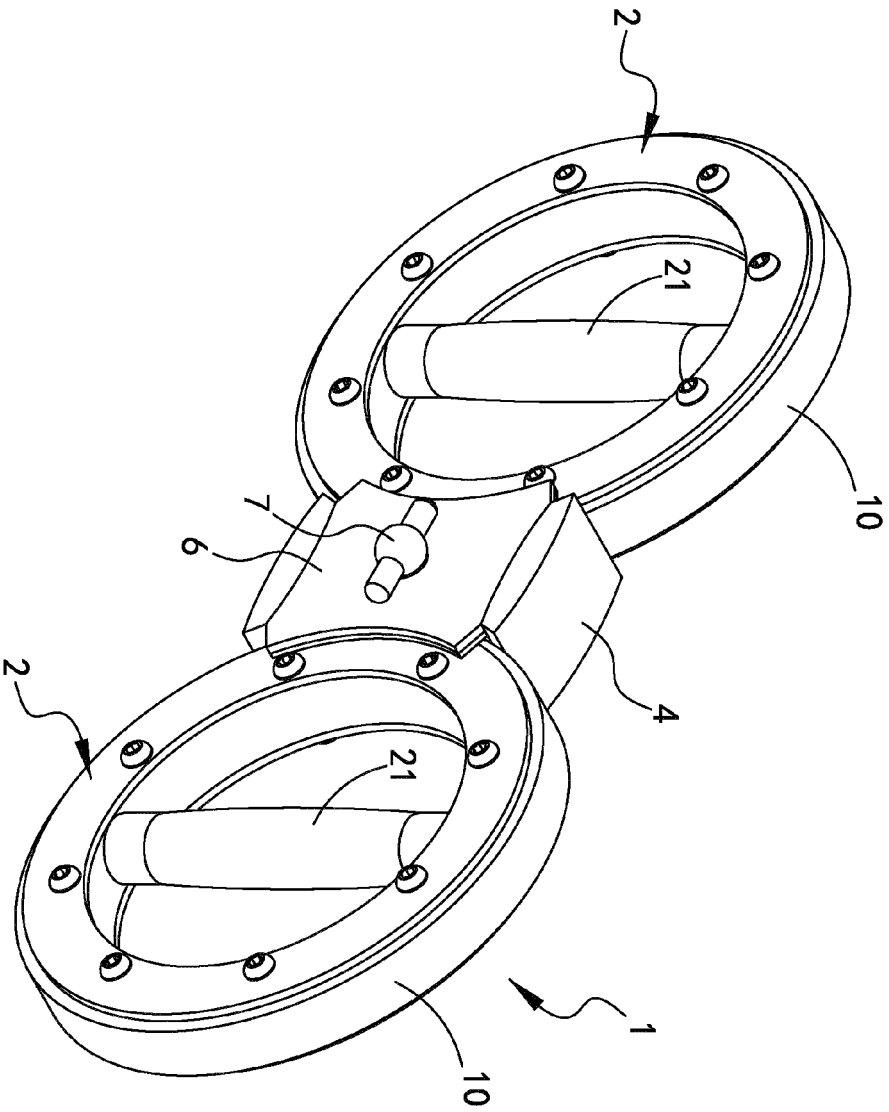

FIG. 2

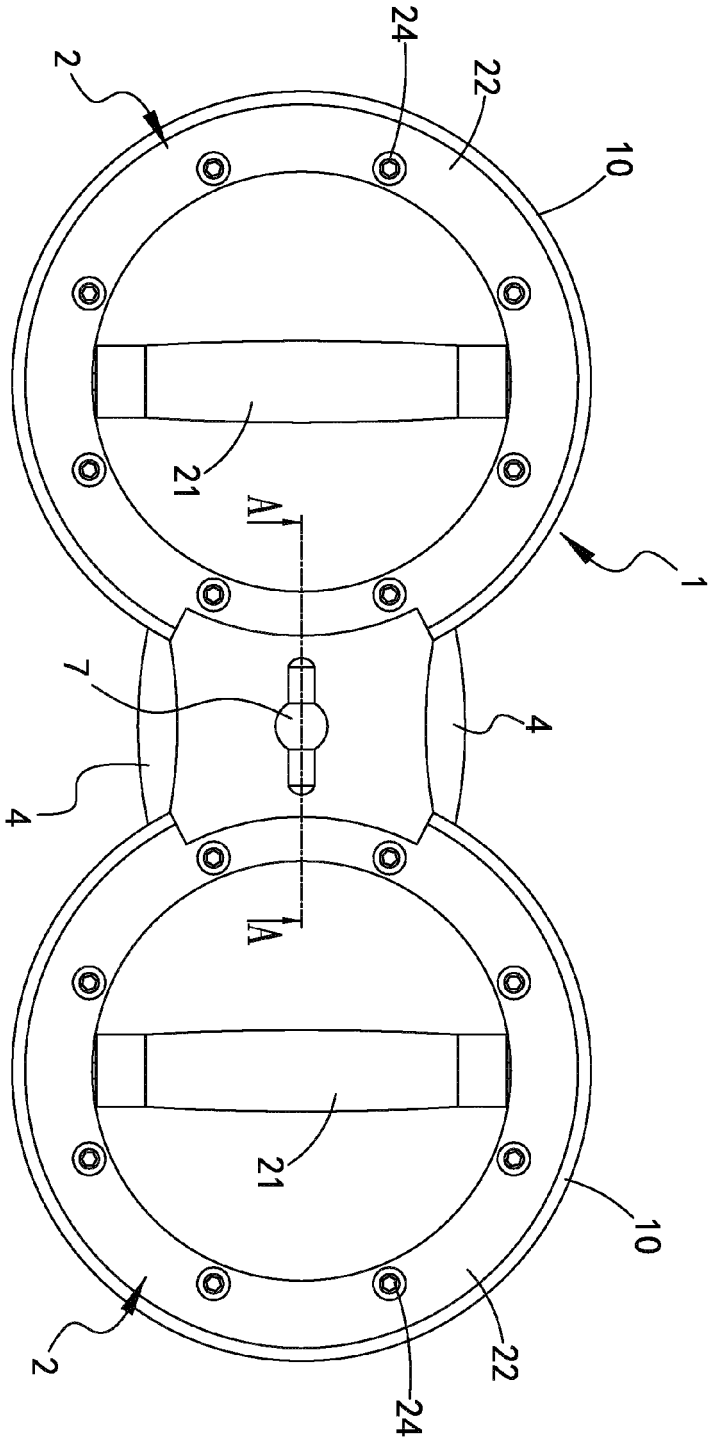

FIG. 3

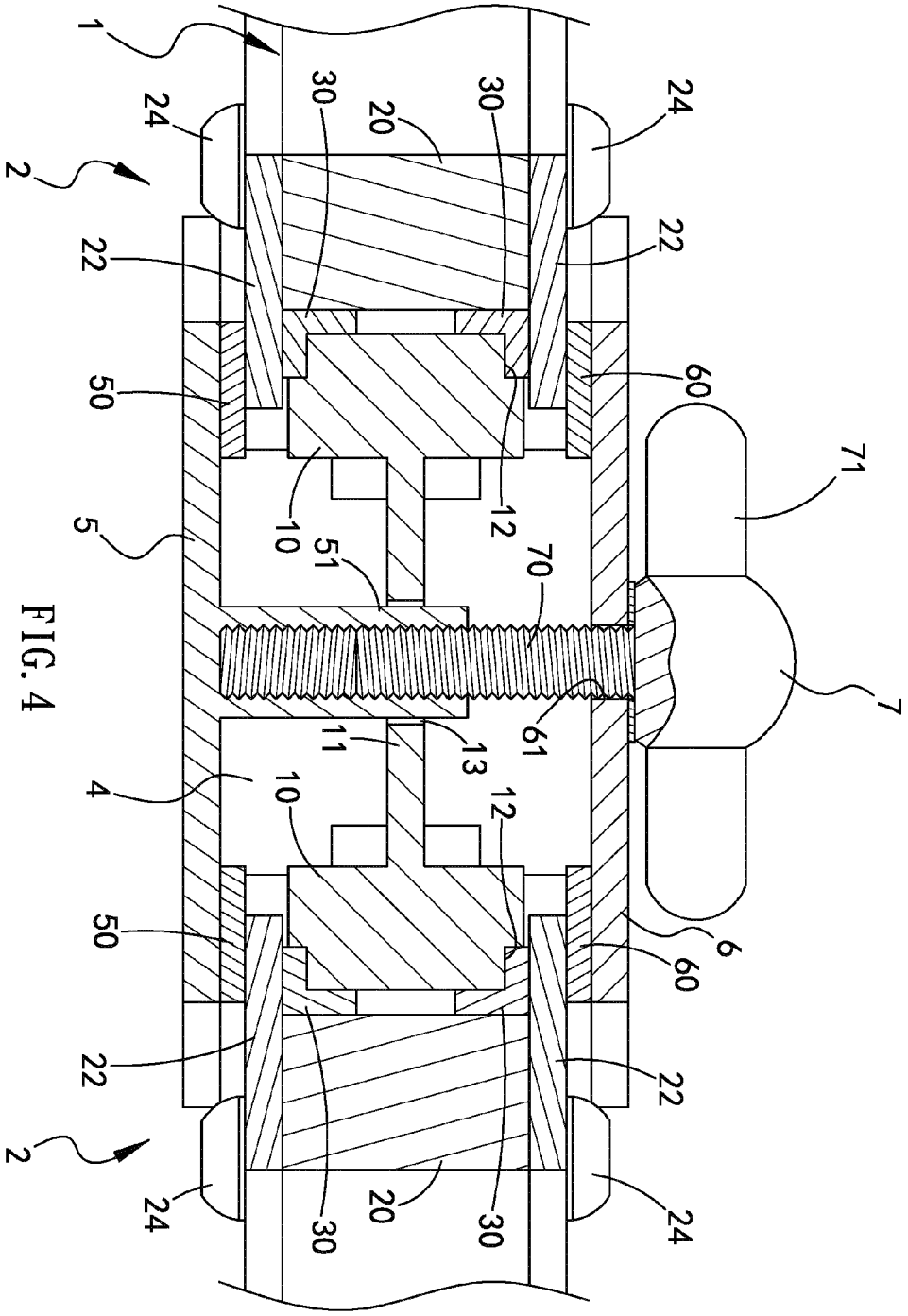

FIG. 4

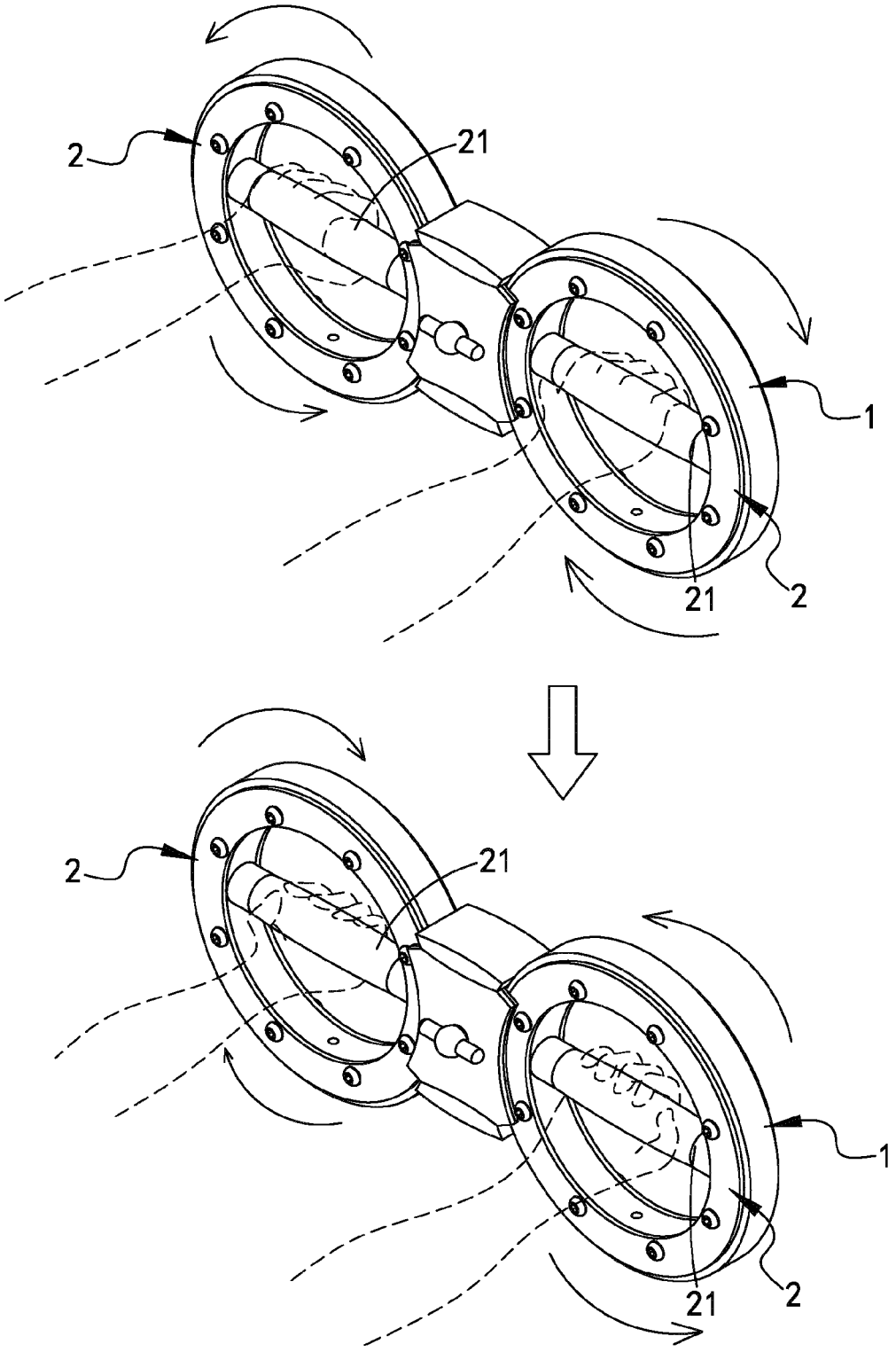

FIG. 5

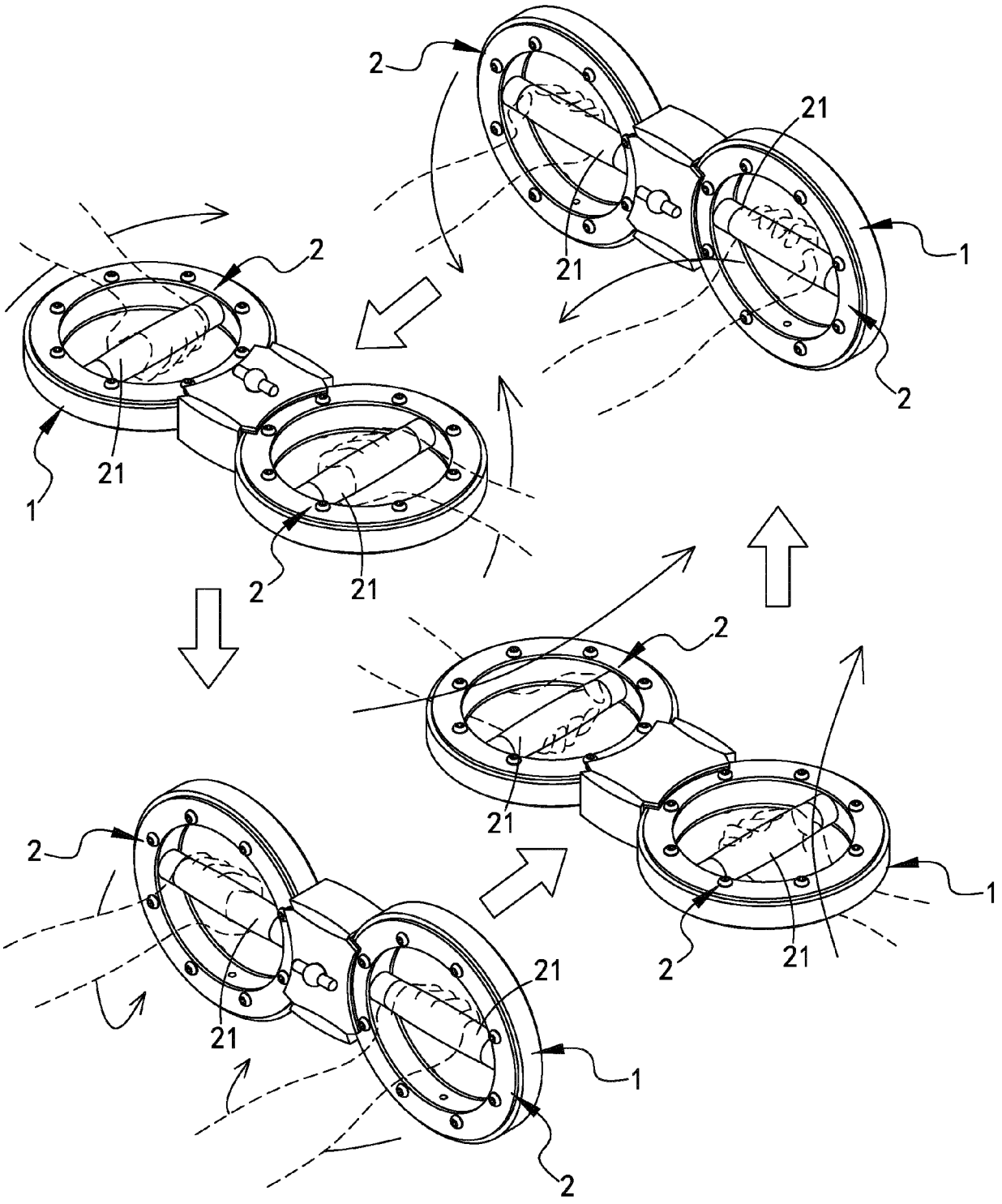

FIG. 6

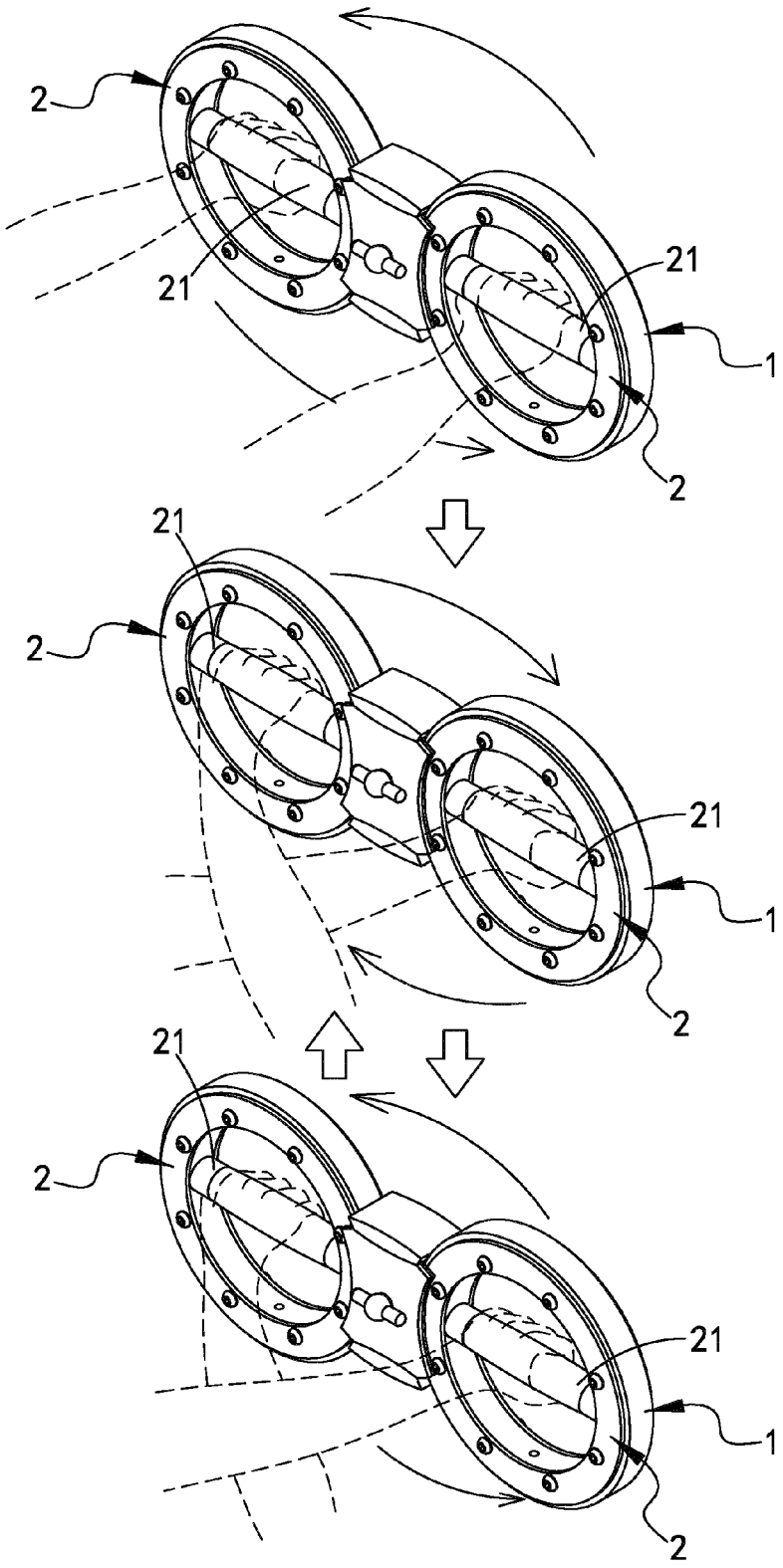

FIG. 7

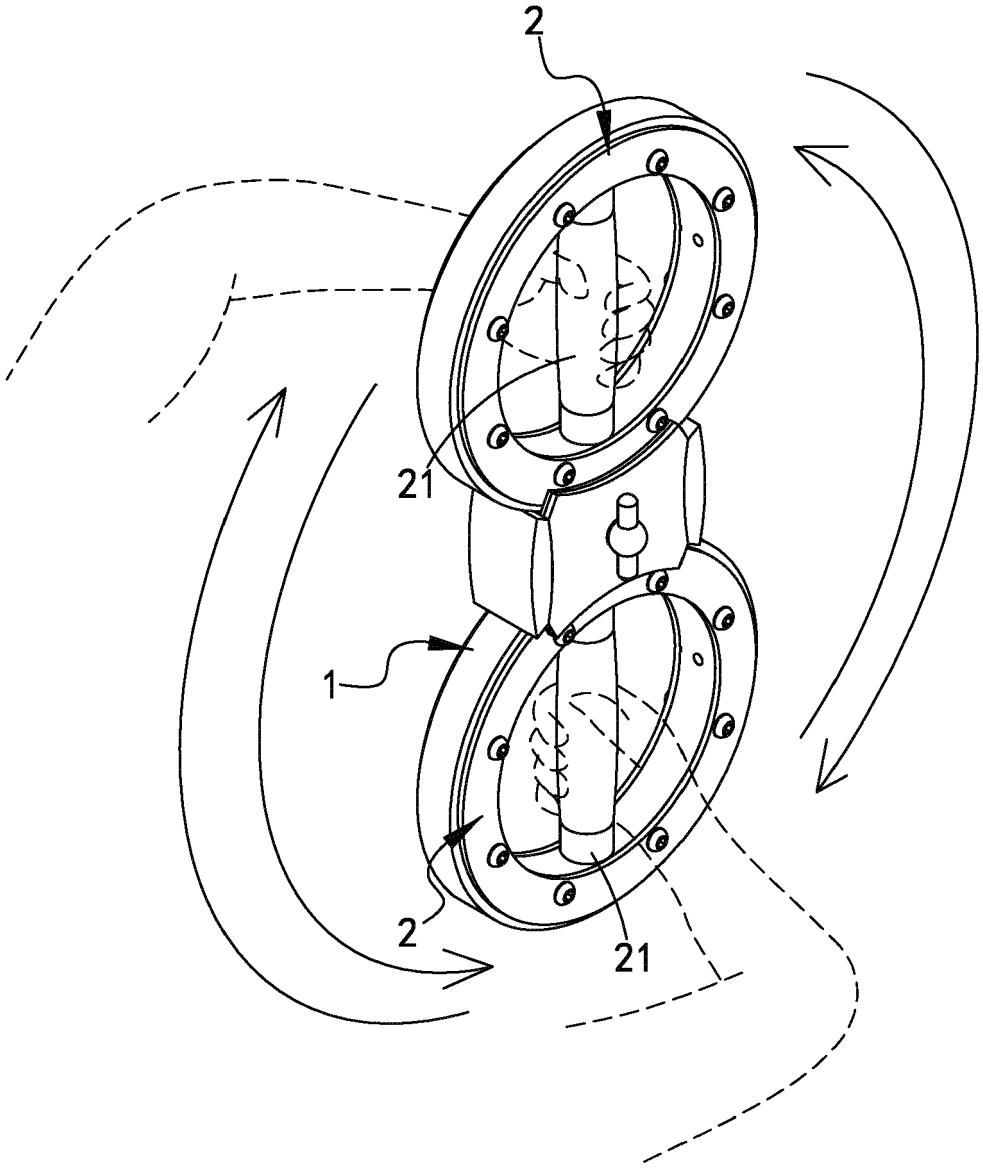

FIG. 8

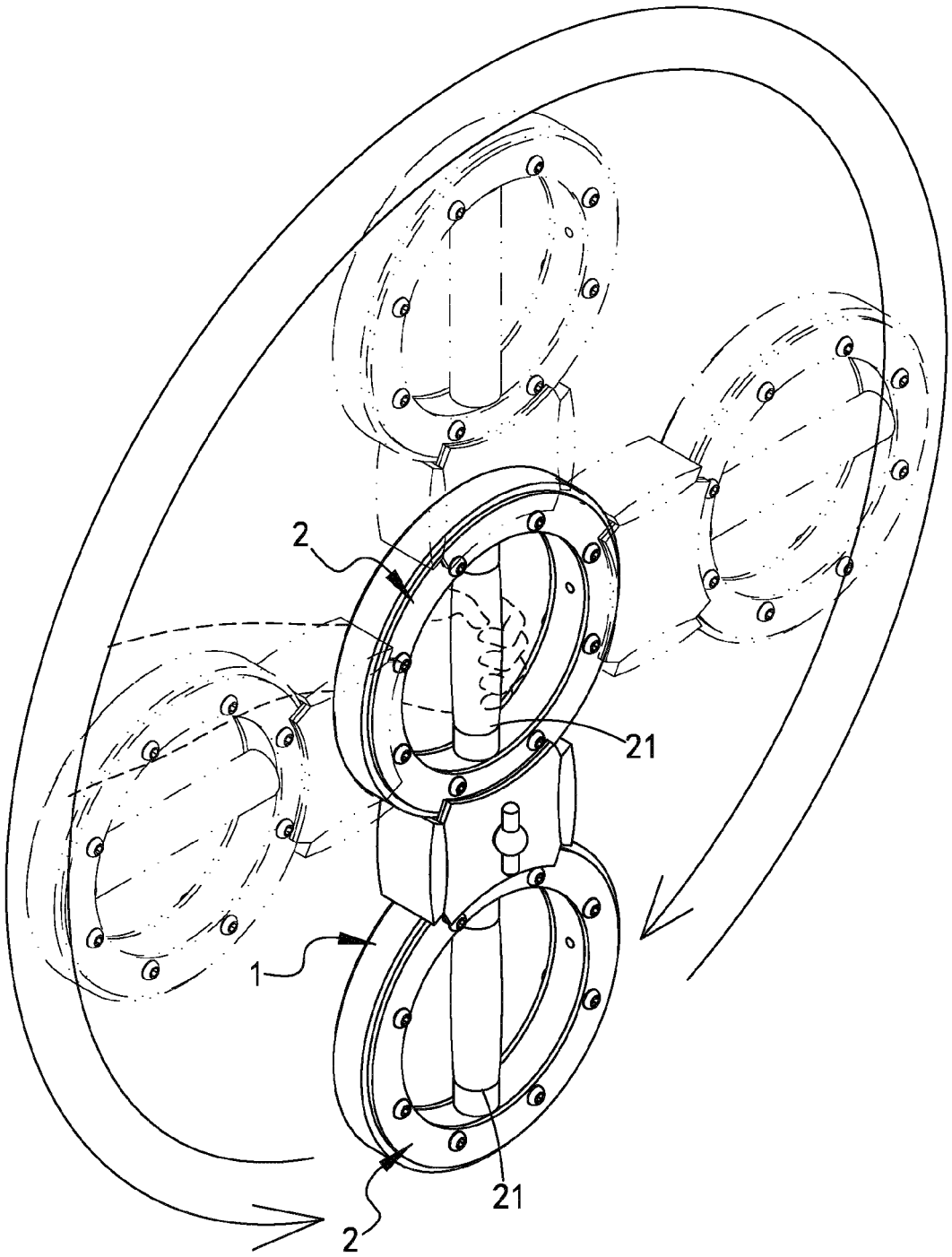

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 6167

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2013/260969 A1 (HUANG CHIA-YU [TW]) 3 October 2013 (2013-10-03) * the whole document * -----	1-10	INV. A63B21/00 A63B21/015 A63B23/035 A63B23/12 A63B23/14 ADD. A63B21/02 A63B21/072 A63B21/22
X	WO 2006/134334 A1 (DUNCAN DAVID [GB]) 21 December 2006 (2006-12-21) * page 6, line 5 - page 9, line 2; figures 1,4 * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 October 2015	Squeri, Michele

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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20-10-2015

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