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(54) **SPINNING TOP TOY**

(57) **[Object]** To provide a new spinning top toy which is capable of taking longer time to disassemble a body and a shaft part.

[Means to solve the problems] A spinning top toy includes a body and a shaft part. An engagement part of the shaft part and an engagement part of the body are engaged by relatively rotating the body in one direction with respect to the shaft part. While rotating, when the shaft part and the body receive an impact caused by a relative rotation power in the other direction, the engagement between the engagement part of the shaft part and the engagement part of the body is released so as to separate and disassemble the shaft part and the body.

The spinning top toy includes a guide groove formed in the shaft part around a rotating shaft and connecting from a first position, where a center distance to a center of the rotating shaft is the largest, to a second position, where the center distance is smaller than the center distance of the first position. A weight member, which is movable inside the guide groove, is stored in the guide groove. When a rotation speed increases, the weight member is moved from the second position to the first position, and when the shaft part and the body receive the impact caused by the relative rotation in the other direction, the weight member is moved from the first position to the second position.

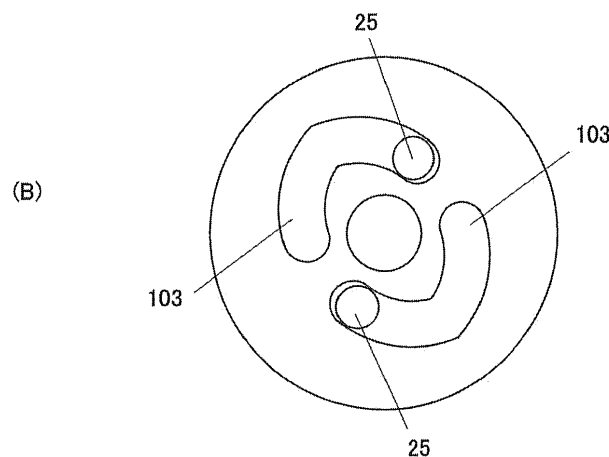


Figure 7

Description

Technological Filed

[0001] The present invention relates to a spinning top toy.

Background Technology

[0002] As battle games using spinning top toys, by applying impact to the spinning top toys each other, there are cases in which the rotation of the spinning top toy of an opponent is stopped by the impact force; the spinning top toy of the opponent is flicked out by the impact force; or the spinning top toy of the opponent is disassembled by the impact force, etc. (see Patent Document 1).

[0003] For example, the spinning top toy described in Patent Document 1 has a body and a shaft part, and the hooks of the shaft part and the hooks of the body are engaged by relatively rotating the body in one direction with respect to the shaft part. When own spinning top toy collides with the spinning top toy of the opponent, the rotation of the body is temporally stopped, and on the other hand, the rotation of the shaft part keeps rotating, so that the engagement of the hooks of the shaft part and the hooks of the body are released by relatively rotating the shaft part and the body in the other direction. Therefore, the shaft part and the body are separated and the spinning top toy is disassembled.

[Prior Art Document]

[Patent Document]

[0004] [Patent Document 1] Japanese Patent Application Publication No. 5959773

Disclosure of the Invention

Problems to Be Solved by the Invention

[0005] In such spinning top toy, a resistance member is provided between the body and the shaft part which are meshed with or contacted to each other, and the speed of the relative rotation in the direction of separating the body and the shaft part becomes slow. With this structure, it takes longer time to disassemble the shaft part and the body, so that the players can enjoy battle games longer.

[0006] An object of the present invention is to provide a new spinning top toy which is capable of taking longer time to disassemble a body and a shaft part by another method.

Means for Solving the Problems

[0007] According to the first means, a spinning top toy includes a body and a shaft part. An engagement part of

the shaft part and an engagement part of the body are engaged by relatively rotating the body in one direction with respect to the shaft part. While rotating, when the shaft part and the body receive an impact caused by a relative rotation power in the other direction, the engagement between the engagement part of the shaft part and the engagement part of the body is released so as to separate and disassemble the shaft part and the body. The spinning top toy includes a guide groove formed in the shaft part around a rotating shaft and connecting from a first position, where a center distance to a center of the rotating shaft is the largest, to a second position, where the center distance is smaller than the center distance in the first position. A weight member, which is movable inside the guide groove, is stored in the guide groove. When a rotation speed increases, the weight member is moved from the second position to the first position, and when the shaft part and the body receive the impact caused by the relative rotation in the other direction, the weight member is moved from the first position to the second position. According to the second means, in the first means, the guide groove is formed in an arc shape in a top view so as to gradually reduce the center distance from the first position to the second position.

[0008] According to the third means, in the first means or the second means, the guide groove is formed in an arcuate shape so that the second position is arranged across the first position in the top view.

[0009] According to the fourth means, in any one of the first means to the third means, the guide groove is formed in each of two sections which are faced each other across the center of the rotating shaft.

Effect of the Invention

[0010] According to the first means, when the spinning top toy collides with the spinning top toy of the opponent, the weight member is moved from the first position to the second position of the guide groove by the inertia force. Since the center distance to the center of the rotating shaft of the spinning top toy in the second position is smaller than the center distance in the first position in the guide groove, when the weight member is moved to the second position side, the rotation energy or the rotation power of the shaft part becomes small. As a result, the speed of the relative rotation in the direction of separating the body and the shaft part becomes slow, so that it takes longer time to disassemble the spinning top toy.

[0011] According to the second means, since the guide groove is formed in an arc shape in a top view so as to gradually reduce the center distance from the first position to the second position, the weight member is smoothly moved inside the guide groove when receiving the external force. According to the third means, since the shaft part is capable of being applied for both rotation directions, it is usable when it is the type of the spinning top toy which is rotated in both directions. Further, since it can be used for the spinning top toy in which a rotation

direction is reversed by replacing the body, the spinning top toy having high usability can be realized. According to the forth means, since the guide groove is formed in each of two sections which are faced each other across the center of the rotating shaft, the spinning top toy having a stable rotation balance can be realized.

Brief Description of the Drawings

[0012]

Fig. 1 is a diagram explaining how to play with a spinning top toy according to an embodiment of the present invention;

Fig. 2 is an exploded perspective view showing a spinning top toy according to the present embodiment;

Fig. 3 is an exploded cross-sectional perspective view showing the spinning top toy according to the present embodiment;

Fig. 4 is an exploded cross-sectional perspective view showing a shaft part of the spinning top toy according to the present embodiment;

Fig. 5 is a diagram showing an engagement relationship of a body, a shaft part, and a flywheel of the spinning top toy according to the present embodiment, Fig. 5(A) is a diagram showing the spinning top toy in an engagement released state, and Fig. 5(B) is a diagram showing the spinning top toy in an engagement state;

Fig. 6 is a perspective view showing an example of a launcher which rotationally drive the spinning top toy according to the present embodiment; and

Fig. 7 is an explanatory diagram showing a movement of weight members in the spinning top toy according to the present invention.

Preferred Embodiments of the Invention

[0013] Hereinafter, a spinning top toy of the present invention will be described based on embodiments shown the drawings.

<Whole structure>

[0014] Fig. 1 is a diagram explaining how to play with a spinning top toy according to an embodiment of the present invention. Fig. 2 is an exploded perspective view showing the spinning top toy according to the present embodiment. Fig. 3 is an exploded cross-sectional perspective view of the spinning top toy according the present embodiment. In the present specification, the terms "top", "bottom", "left", "right", "front", and "back" refer to the corresponding directions in Figs. 2 and 3.

[0015] The spinning top toy 1 of the present embodiment is the spinning top toy which is capable of being used for, so called, battle games. Specifically, the spinning top toys 1 can be used for battle games in which the

spinning top toys 1 collides with each other and the spinning top toy 1 of the opponent is disassembled by the impact force as shown in the right side of Fig. 1, so that the player wins.

[0016] As shown in Figs. 2 and 3, the spinning top toy 1 is provided with a shaft part 10, which configures a lower part structure and becomes a driver, and a performance variable ring 30 and a body 40, which become a layer configuring an upper part structure.

<Detail structure>

1. Regarding the shaft part 10

[0017] As shown in Fig. 2, the shaft part 10 is provided with a rotating shaft 11 at the lower part, a flange 12 at the middle region in the vertical direction, and a cylindrical part 13 at the upper part. Among the parts, the flange 12 and the cylindrical part 13 are integrally formed, so as to configure the upper part of the shaft part, and the flange 12 and the cylindrical part 13 are fixed to the lower part of the shaft part by screws 11c (see Fig. 4).

[0018] As shown in Fig. 4, the lower part of the shaft part is provided with a bowl-shaped base part 100, and an inner fitting part 110 which is fitted into a recessed part 101 of the base part 100. In the base part 100, a circular hole 102 in which a spherical-shaped rotating shaft 11 is held is formed, and in the outside of the circular hole in the radial direction, a guide groove 103 is formed in each of two sections which are faced each other in the right and left direction across an axis of the rotating shaft 11. The two guide grooves 103 are positioned on the same horizontal surface. In each guide groove 103, one spherical weight member 25 is stored. The rotating shaft 11 may be a bar-shape. The two guide grooves 103 may be formed with a slope which is slightly inclined downward in a direction from the first position to the second position. Further, the two guide grooves 103 may be formed with a slop which is slightly inclined upward in a direction from the first position to the second position. However, it is required that the guide grooves are inclined in a range which does not interfere with the performance and the effect of the present invention.

[0019] Fig. 7 is a schematic plane view showing the spinning top toy 1. As shown in the drawing, each guide groove 103 is formed in an arcuate shape so as to be concave to the axial side of the rotating shaft 11 from a top view. When each guide groove 103 is viewed in a circumferential direction of the spinning top toy 1, a center distance of the central part is the largest (the first position), and the center distance from the central part to both ends of the guide groove 103 is set so as to gradually become smaller (two of the second positions). Here, when each guide groove 103 is viewed from the top, the guide groove 103 is formed in an arcuate shape so as to cope with the spinning top toy1 for clockwise direction rotation and the spinning top toy 1 for counterclockwise direction rotation. That is, here, the rotation direction of

the spinning top toy1 can be changed by changing the body 40, but the same shaft part 10 can be used, so that each guide groove 103 is formed in an arcuate shape in a top view. Therefore, when the shaft part 10 is only used for any one of the spinning top toy1 for clockwise direction rotation or the spinning top toy 1 for counterclockwise direction rotation, an arcuate guide groove 103 having one first position and one second position may be provided.

[0020] Further, the inner fitting part 110 is fitted to the recessed part 101 of the base part 100. In the fitting state, the inner fitting part 110 covers the guide grooves 103 and forms a ceiling of the guide grooves 103. With such structure, the guide path of the weight member 25 is formed.

[0021] In the inner fitting part 110, as shown in Fig. 3, a cylindrical part 111 which projects upward, and a cylindrical part 112 which projects downward are formed. The cylindrical part 111 is fitted into a cavity of a columnar body 16 which will be described later. Further, the cylindrical part 112 is fitted into the hole 102 and presses the rotating shaft 11 downward.

[0022] In the flange 12 and the cylindrical part 13, a hole 14 is formed in each of two sections which are faced each other in the front and back direction across the axis of the rotating shaft 11.

[0023] Further, in the cylindrical part 13, a projection part 15 is formed in each of two sections which are faced each other in the right and left direction across the axis of the rotating shaft 11. The outer surface of the projection part 15 is flush with the outer peripheral surface of the flange 12. Further, as shown in Fig. 3, a columnar body 16 is provided inside the cylindrical part 13. The columnar body 16 has a cavity in the inner part and the lower side has an opening. Further, as shown in Fig. 4, a projecting piece 16a is provided in each of the right and left sides of the lower end part of the columnar body 16, and a screw inserting hole 16b is formed therein. A cylindrical part 111 of the inner fitting part 110 is fitted into the cavity part of the columnar body 16 from the lower side. The projecting piece 16a of the columnar body 16 is fitted into the recessed part 113 of the inner fitting part 110. The columnar body 16 and the shaft lower part are mounted to the upper part of the shaft part by the screws 11c which screw through the screw inserting holes 104 of the base part 100 and the screw inserting holes 16b of the projecting piece 16a.

[0024] The position of the upper end of the columnar body 16 is particularly not limited, but it is set in a position which is higher than the upper end of the cylindrical part 13. In the top end part of the columnar body 16, a hook (engagement part) 17 stretching out in the outward radial direction at each of two sections, which are faced each other in the front and back direction across the axis of the rotating shaft 11, is formed.

[0025] Further, the shaft part 10 is provided with a cylindrical shape urging member 18. The urging member 18 is placed to surround the outer peripheral of the co-

lumnar body 16 inside the cylindrical part 13.

[0026] Further, the urging member 18 is provided with leg parts 18c which are formed in the outer peripheral lower end part of the cylindrical part 18a. The leg part 18c is formed at each of two sections which are faced each other in the front and back direction across the axis of the rotating shaft 11. The urging member 18 is energized in the upward direction by a spring 20. At the upper end of the holes 14, the upward movement of the leg parts 18c of the urging member 18 is restricted, and in the normal condition, the top end of the urging member 18 is positioned at the same height as the top end of the cylindrical part 13.

[0027] Further, at the upper surface of the ceiling part of the urging member 18, a protruding strip (projection) 21, which extends in radial direction, is formed at each of two sections which are faced each other in the right and left direction across the axis of the rotating shaft 11.

2. Regarding a performance variable ring 30

[0028] In this embodiment, a flywheel is used as a performance variable ring 30. The performance variable ring 30 has a plate like shape. As shown in Fig. 3, at the bottom surface of the performance variable ring 30, an annular step part 31, which is capable of storing the flange 12 of the shaft part 10 from the lower side, is formed. Further, as shown in Figs. 2 and 3, in the upper surface of the performance variable ring 30, a projection part 32, which stretches out in the upper direction, is formed at each of two sections which are faced each other in the right and left direction across the axis of the rotating shaft 11. In the lower side part of each projection part 32, a recessed part 33, which is capable of storing the projection part 15 of the shaft part 10 from the lower side, is formed. Further, in the upper surface of the performance variable ring 30, a tongue-piece part 34, which extends upward, is formed directly outside each projection part 32. The tongue-piece part 34 is projected more upward than the projection part 32. As the performance variable ring 30, substituting the flywheel or integrating with the flywheel, there may be one having a projection part on the outer peripheral surface, so as to easily attack the spinning top toy 1 of the opponent, or there may be one having a recessed part on the outer peripheral surface, so as to defend from the attack from the spinning top toy 1 of the opponent.

3. Regarding a body 40

[0029] The body 40 has a disk shape. As shown in Fig. 2, the body 40 is provided with a base 400 and a transparent cover body 401 which has a substantially identical shape with the base 400 viewed from top and which is covered on the base 400.

[0030] In the outer peripheral of the body 40, protrusions and recesses 40a are formed. Further, at the center of the base 400, a circular hole 41 is formed. The afore-

mentioned transparent cover body 401 covers the part except the circular hole 41 and arcuate slits 46 which will be described later. Further, in the lower surface of the body 40, an annular-shaped recess part 42 which is capable of storing the projection part 32 of the performance variable ring 30 from the lower side is formed.

[0031] At the lower end of the inner circumferential surface of the inner circumferential wall 43a which partitions and forms the annular-shaped recess part 42, a hook (engagement part) 44 which overhangs in the inward radial direction is projected at each of two sections which are faced each other in the front and back direction across the axis of the rotating shaft 11.

[0032] Further, at the middle region in the vertical direction of the inner circumferential surface of the inner circumferential wall 43a, a protrusion 47 which overhangs in the inward radial direction is projected at each of two sections which are faced each other in the right and left direction across the axis of the rotating shaft 11.

[0033] In addition, at the lower end surface of the inner circumferential wall 43a, a raised part 45 in which protrusions and recesses are continuously formed so as to mesh with the protruding strips 21 is formed at each of two sections which are faced each other in the right and left direction across the axis of the rotating shaft 11.

[0034] Further, at the ceiling wall 43b which partitions and forms the annular-shaped recess part 42 of the body 40, an arcuate slit 46, which is capable of inserting the tongue-piece part 34 of the performance variable ring 30 from the lower side, is formed. The length of the arcuate slit 46 is the length in which the tongue-piece part 34 can be sufficiently moved.

4. Regarding identification part 60

[0035] In the circular hole 41 of the body 40, an identification part 60 is mounted. The identification part 60 is used for the identification of the spinning top toy 1 or the identification of a player. As the identification, in the present embodiment, a plurality of identification parts in which decorations and/or colors, etc. are different are offered, and one of the identification parts 60 which is selected by the player is mounted in the circular hole 41 by using the projections 47 in a screw manner.

«Assembly method»

[0036] Next, an example of an assembly method of the spinning top toy 1 will be described. Here, it is assumed that the assembly of the shaft part 10 has been already finished. Further, it is assumed that the assembly of the identification part 60 to the circular hole 41 has been also finished. First, the shaft part 10 and the performance variable ring 30 are assembled in a fitting state in a manner in which the projection parts 15 of the shaft part 10 are engaged to the recessed parts 33 of the performance variable ring 30 from the lower side. Next, the assembled body is brought close to the body 40 from the lower side.

At this point, the tongue-piece parts 34 of the performance variable ring 30 of the aforementioned assembled body are engaged with a predetermined end of the arcuate slits 46 of the body 40 (Fig. 5(A)). In this state, the hooks 17 of the shaft part 10 are not overlapped with the hooks 44 of the body 40 in the vertical direction. This state is the state capable of being disassembled. After that, the shaft part 10 of the aforementioned assembled body is pressed to the body 40 side. Then, first, the performance variable ring 30 is pressed against the lower surface of the body 40. Further, the spring 20 is contracted, so that the hooks 17 of the shaft part 10 are relatively pushed more upward than the hooks 44 of the body 40. The shaft part 10 is integrally rotated with the performance variable ring 30 with respect to the body 40 until the tongue-piece part 34 moves to the end which is the opposite side of the predetermined end (Fig. 5(B)). In this case of the rotation, it is the relative rotation between the body 40 and the performance variable ring 30 and the shaft part 10, and Fig. 5(B) shows the state in which the body 40 is rotated with respect to the shaft part 10 and the performance variable ring 30. And then, it becomes the state in which the hooks 17 of the shaft part 10 and the hooks 44 of the body part 40 are vertically overlapped. When a hand is released from the shaft part 10, the lower surface of the hooks 17 of the shaft part 10 and the upper surface of the hooks 44 of the body 40 are abutted by the urging force of the spring 20.

[0037] This state in which the lower surface of the hooks 17 of the shaft part 10 and the upper surface of the hooks 44 of the body 40 are abutted is the assembled state. With such structure, the shaft part 10, the performance variable ring 30, and the body 40 are assembled, so that the spinning top toy 1 is assembled.

«How to play»

[0038] Next, an example of how to play with the spinning top toy 1 will be described.

[0039] In the example of how to play, by spinning the spinning top toy 1, a battle is performed with the spinning top toy 1 of the opponent.

[0040] In this case, a charge of the spinning force of the spinning top toy 1 is performed by the launcher 50 as shown in Fig. 6. In the inside part, the launcher 50 is provided with a disk which is not shown, and the disk is energized in one rotational direction by the power spring which is not shown. When the string, which is not shown, wound around the disk is pulled by a handle 51, the disk is rotated, and therefore, the spinning top holder 53 is rotated. The rotation of the spinning holder 53 is transmitted to the spinning top 1 by the forks 54 projected downward, so that the spinning top toy 1 is rotated. In this case, the forks 54 are inserted to the arcuate slits 46 of the body part 40. When the handle 51 of the launcher 50 is pulled to the end, the rotation of the disk and further, the spinning top holder 53 is stopped, and on the other hand, the spinning top toy 1 is rotated further by the inertia

force, so that the spinning top toy 1 is released from the spinning top holder 53 in accordance with the tilting faces 54a of the forks 54. The reference numeral 52 in Fig. 5 denotes a rod which is capable of protruding and retracting with respect to the spinning top holder 53. When the spinning top toy 1 is mounted to the spinning top holder 53, the rod 52 is pressed by the upper surface of the spinning top toy 1 so as to be retracted to the spinning top holder 53. For example, the rod 52 is used to detect whether the spinning top toy 1 is mounted or detached.

[0041] The spinning top toy 1 which is launched in such manner, is rotated in a predetermined field. When it collides with the spinning top toy 1 of the opponent, by the impact force or the frictional force, etc. of the collision, the opposite direction force, which is opposite to the rotation direction of the shaft part 10 and the performance variable ring 30, is applied to the body 40. With this, the body part 40 is relatively rotated to the direction opposite to the rotation direction of the shaft part 10 and the performance variable ring 30.

[0042] And then, the protruding strips 21 are engaged with the raised parts 45 of the body 40. In this case, since the urging force of the spring 20 is applied to the protruding strips 21, every time the impact force is applied by the collision, the shaft part 10 is relatively rotated with respect to the body 40 and the engagement position is changed. When it reaches at the locking releasing position, the hooks 44 of the body 40 are removed from the hooks 17 of the shaft part 10, so that the body 40 is separated from the shaft part 10 by the urging force of the spring 20. As shown in the right side of Fig. 1, the spinning top toy 1 is disassembled.

<Effect of guide grooves 103 and weight members 25>

[0043] The weight members 25 are moved from the second positions side to the first position of the guide grooves 103 by the centrifugal force or the inertia force and it keeps the position (Fig. 7(A)). When the spinning top toy 1 collides with the spinning top toy of the opponent (not shown), with this collision, the weight members 25 are moved from the first position side to one of the second positions of the guide grooves 103 in response to the rotation direction of the spinning top toy 1 by the inertia force (Fig. 7(B)). That is, the weight members 25 are moved to the second positions where the center distance to the axis of the rotating shaft is smaller in the guide groove 103. When the weight members 25 are moved to the second positions, the rotation energy or the rotation power of the shaft part 10 becomes small. As a result, the speed of the relative rotation in the direction of separating the body 40 and the shaft part 10 becomes slow, so that it takes longer time to disassemble the spinning top toy. Therefore, in the present embodiment, as the rotation resistance, the protruding strips 21 are formed in the shaft part 10 and the raised part 45 of the body 40 is formed in the body 40, but if desired, the rotation resistance can be omitted.

«Modification example of the present invention»

[0044] The embodiments of the present invention were described above, but the present invention is not limited to the aforementioned embodiments, and needless to say, various modifications may be made within the scope that does not depart from the essential point of the present invention. For example, the aforementioned embodiment, as the rotation resistance between the shaft part 10 and the body 40, the protruding strips 21 are formed in the shaft part 10 and the raised part 45 of the body 40 is formed in the body 40, but as other shapes, a convex part and a concave part may be formed. The number is also not limited to the aforementioned embodiment. Further, the rotation resistance may be a rubber, etc. formed in the opposing face between the shaft part 10 and the body 40. In this case, by the impact force, etc. from the external part, the shaft part 10 and the body 40 are relatively and gradually rotated in the disassembling direction.

[0045] Further, in the aforementioned embodiment, the half of the guide groove 103 is formed in an arc shape, and as a whole, it is formed in an arcuate shape, but the half of the guide groove 103 may be formed in a linear shape, and as a whole, it may be formed in a V-shape. Needless to say, when the spinning top toy, which specifies the rotation direction, is used, only half of the V-shaped guide groove 103 may be formed.

[Explanation of symbols]

[0046]

1	spinning top toy
10	shaft part
23	groove part
24	step part
25	weight member
30	performance variable ring
34	tongue-piece part
40	body
46	arcuate slits
50	launcher
103	guide groove

Claims

1. A spinning top toy including a body and a shaft part, wherein an engagement part of the shaft part and an engagement part of the body are engaged by relatively rotating the body in one direction with respect to the shaft part, and while rotating, when the shaft part and the body receive an impact caused by a relative rotation power in the other direction, the engagement between the engagement part of the shaft part and the engagement part of the body is released so as to separate and disassemble the shaft part and

the body, the spinning top toy comprising:

- a guide groove formed in the shaft part around
a rotating shaft and connecting from a first po- 5
sition, where a center distance to a center of the
rotating shaft is the largest, to a second position,
where the center distance is smaller than the
center distance in the first position,
wherein a weight member, which is movable in- 10
side the guide groove, is stored in the guide
groove,
when a rotation speed increases, the weight
member is moved from the second position to
the first position, and
when the shaft part and the body receive the 15
impact caused by the relative rotation in the oth-
er direction, the weight member is moved from
the first position to the second position.
2. The spinning top toy according to claim 1, wherein 20
the guide groove is formed in an arc shape in a top
view so as to gradually reduce the center distance
from the first position to the second position.
3. The spinning top toy according to claim 1 or claim 2, 25
wherein the guide groove is formed in an arcuate
shape so that the second position is arranged across
the first position in the top view.
4. The spinning top toy according to any one of claims 30
1 to 3, wherein the guide groove is formed in each
of two sections which are faced each other across
the center of the rotating shaft.

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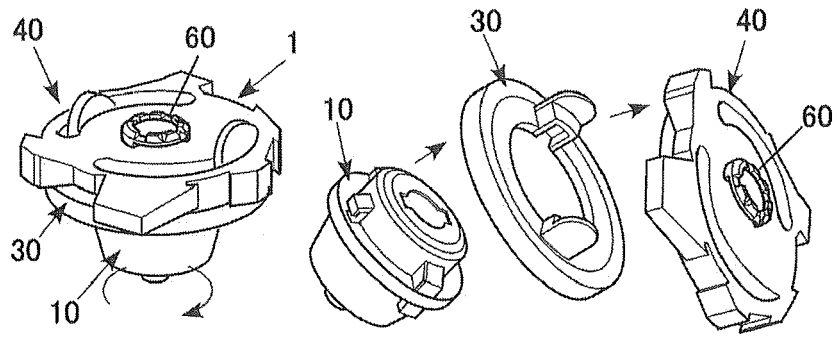


Figure 1

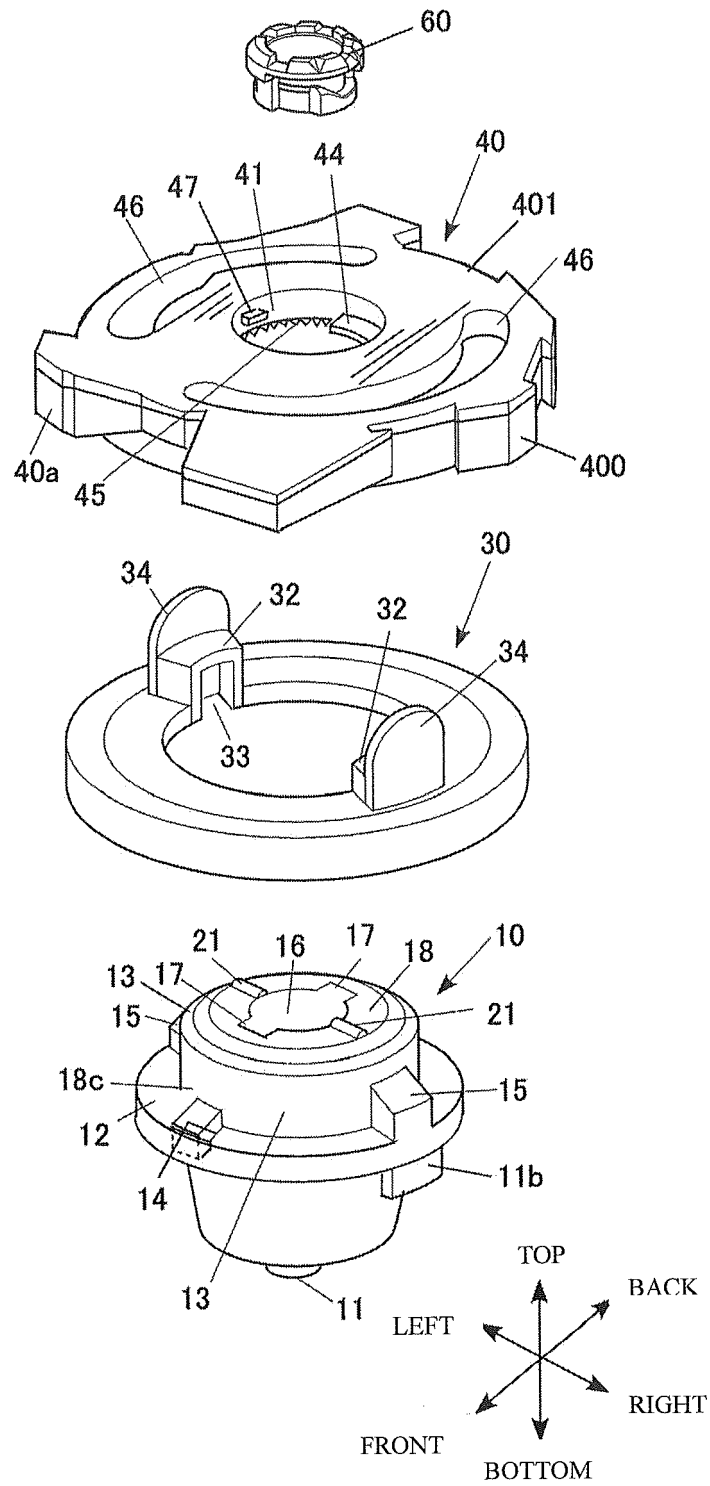


Figure 2

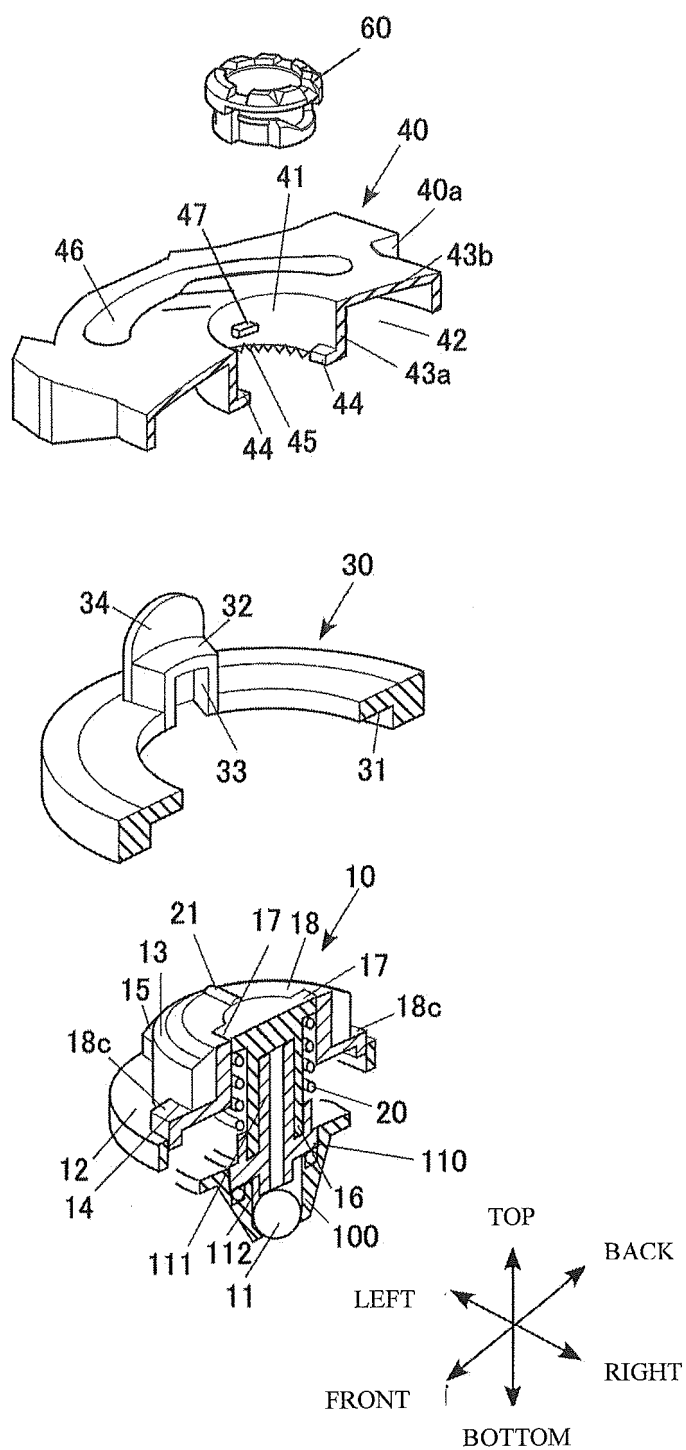


Figure 3

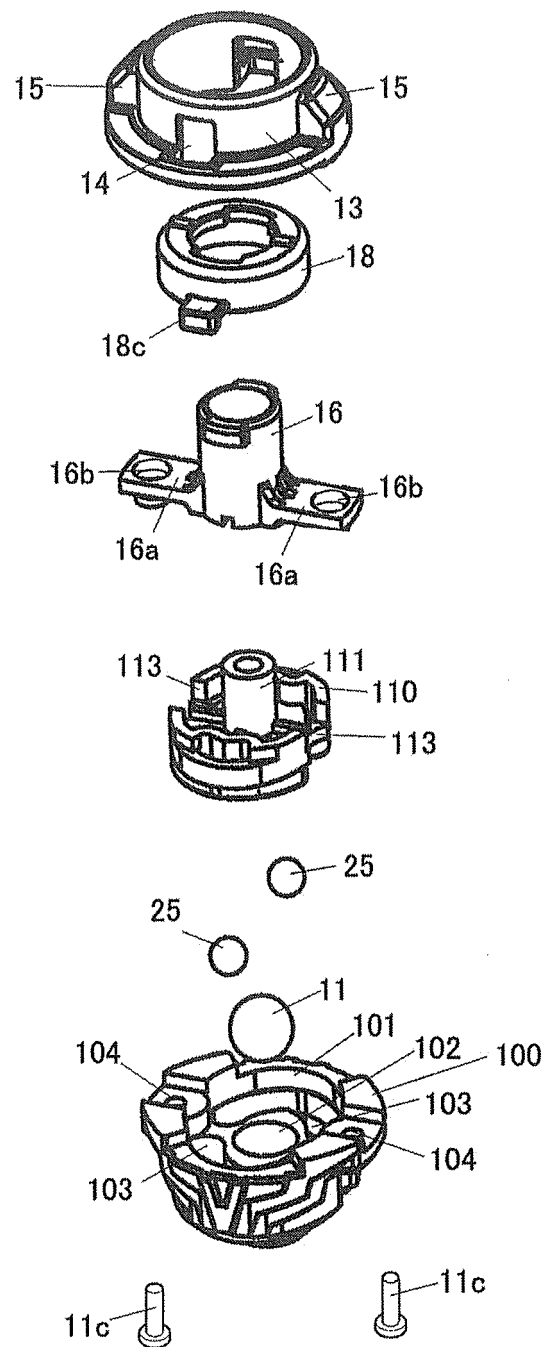


Figure 4

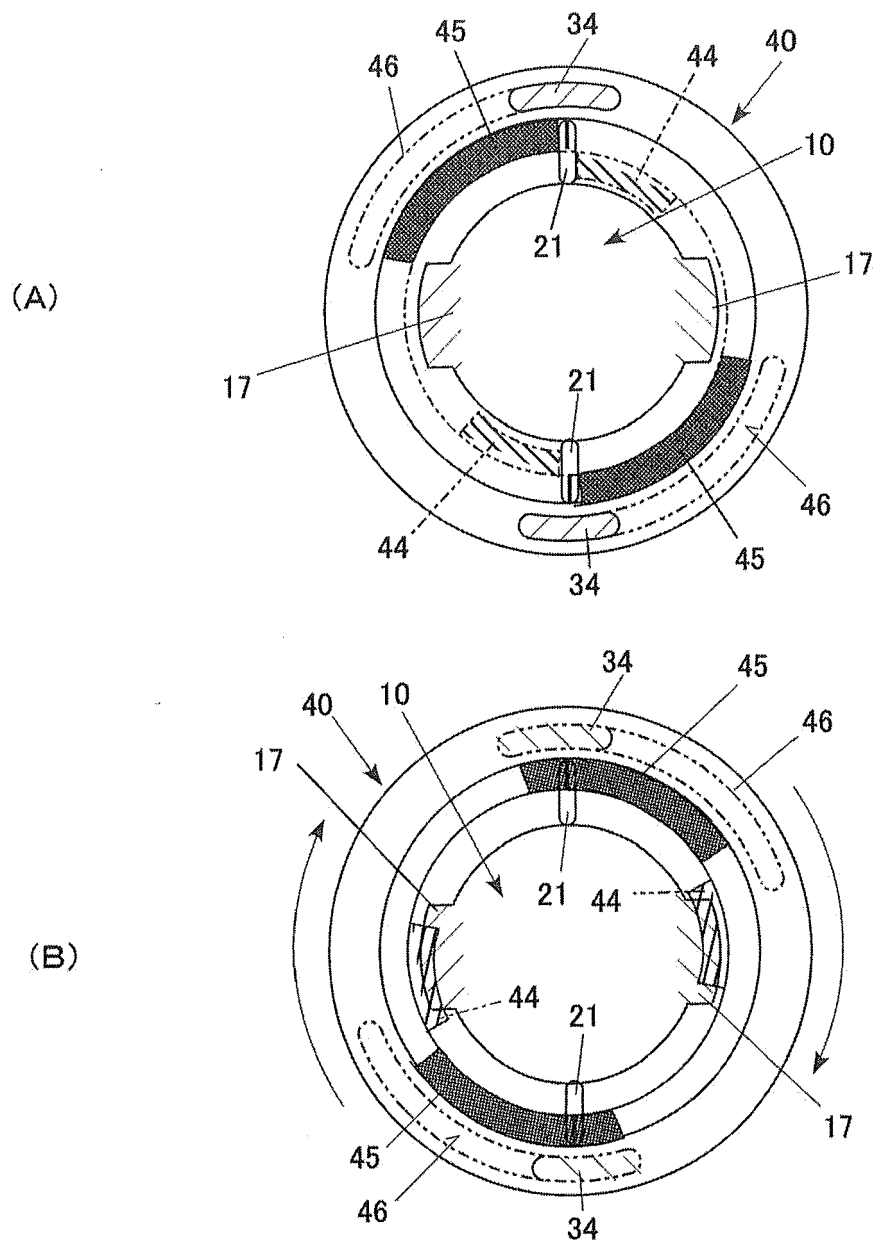


Figure 5

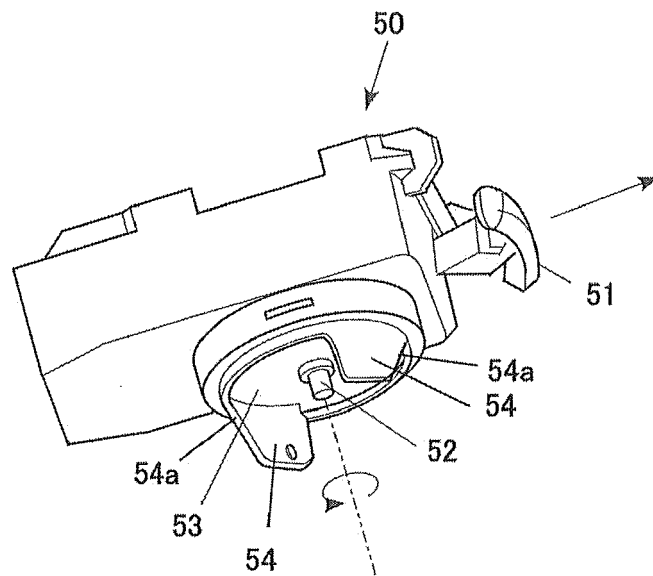


Figure 6

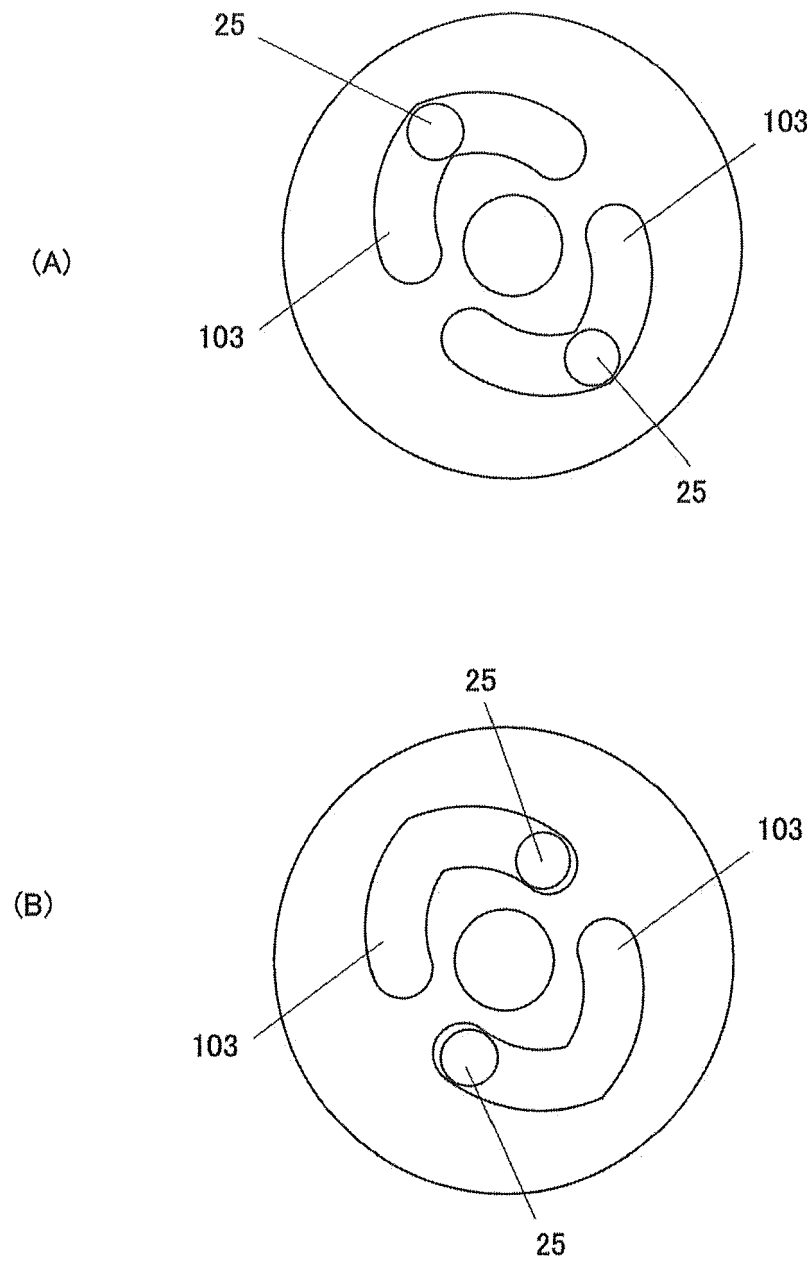


Figure 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 15 8877

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	JP 5 959773 B1 (TOMY CO LTD; TOKYO UNIQUE:KK) 2 August 2016 (2016-08-02) * abstract; figures *	1-4	INV. A63H1/00 A63H1/02
A	JP 3 071767 U (*) 22 September 2000 (2000-09-22) * abstract; figures *	1-4	
A	JP 3 088350 U (*) 6 September 2002 (2002-09-06) * abstract; figures *	1-4	
A	US 6 364 734 B1 (NG RICKY [HK]) 2 April 2002 (2002-04-02) * abstract; figures *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 June 2018	Examiner Turmo, Robert
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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