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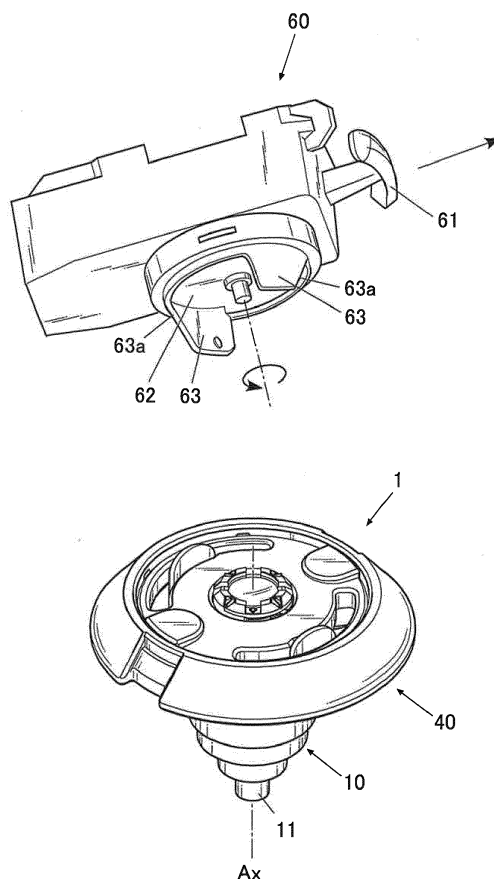
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(54) **TOY TOP**

(57) A toy top includes a body, a shaft portion, a movable component and a biasing member. The movable component includes at least a portion of the body and is movable upward and downward along the rotational axis of the toy top. The biasing member urges the movable component upward or downward. The movable component has a circumferential face that flares away from the biasing direction of the biasing member as the circumferential face recedes from the rotational axis. When the circumferential face collides with an opponent toy top, the movable component moves against a biasing force of the biasing member in a direction opposite to the biasing direction, and then the movable component is urged by resilience of the biasing member, so that the opponent toy top is moved in the biasing direction.

FIG. 1



Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

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

2. Description of Related Art

[0002] A battle game using traditional toy tops causes toy tops to collide with each other to generate impact force, which stops an opponent toy top from spinning, flicks or disassembles the toy top (e.g. Japanese Utility Model No. 3151700) .

[0003] However, the game with traditional toy tops is a simple one where the body of a toy top only collides with the opponent toy top in the attack and cannot thus lean or fell the opponent toy top.

SUMMARY OF THE INVENTION

[0004] An object of the present invention, which has been made in view of such drawbacks, is to provide a toy top that can effectively attack an opponent toy top.

[0005] According to an aspect of the present invention, a toy top having a rotational axis includes:

- a body;
 - a shaft portion;
 - a movable component including at least a portion of the body and being movable upward and downward relative to the rotational axis of the toy top; and
 - a biasing member which urges the movable component in a biasing direction which is either upward or downward,
- wherein the movable component has a circumferential face that flares away from the biasing direction of the biasing member as the circumferential face recedes from the rotational axis, and
- wherein when the circumferential face collides with an opponent toy top, the movable component moves against a biasing force of the biasing member in a direction opposite to the biasing direction, and then the movable component is urged by resilience of the biasing member to move the opponent toy top in one of upward and downward directions that is same as the biasing direction.

[0006] Preferably, the circumferential face of the movable component surrounds the entire circumference of the body.

[0007] Preferably, the biasing member urges the movable component upward, and the circumferential face of the movable component flares downwardly as the circumferential face recedes from the rotational axis.

[0008] In accordance with the present invention, the

toy top includes a movable component that can move vertically and a biasing member that urges the movable component to move upward or downward. If an opponent toy top collides with the movable component, the impact generated thereby causes the movable component to move in the direction opposite to the biasing direction of the biasing member. The movable component is then moved in either the upward or downward biasing direction by the resilience of the biasing member and pushes back the opponent toy top.

[0009] The toy top can thus make an attack that is likely to lean the opponent toy top. The toy top can effectively attack the opponent toy top, compared to a traditional toy top simply clashing the opponent toy top with the body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The advantages and features provided by one or more embodiments of the invention will become more fully understood from the detailed description given hereinafter and the appended drawings which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention.

Fig. 1 is a perspective view of a toy top and a toy-top launcher according to the present embodiment. Fig. 2 is a perspective view of the toy top in action according to the embodiment.

Fig. 3 is a cross-sectional perspective view of part of the toy top according to the embodiment.

Fig. 4 is an exploded top-down perspective view of the body of the toy top according to the embodiment.

Fig. 5 is an exploded bottom-up perspective view of the body of the toy top according to the embodiment.

Fig. 6 explains the operation of the body of the toy top according to the embodiment.

DESCRIPTION OF THE EMBODIMENTS

[0011] A toy top according to embodiments of the present invention will now be described with reference to the accompanying drawings.

OVERALL CONFIGURATION

[0012] Fig. 1 illustrates a toy set including a toy top 1 and a toy-top launcher 60 according to the first embodiment.

[0013] The toy top 1 is of a type that can be used in a so-called "top battle game." The toy top 1, for example, can be used in a battle game in which a player wins the game when an opponent toy top 1 is disassembled as illustrated in Fig. 2 by the impact force of a collision between toy tops.

[0014] The toy top 1 has a substantially axisymmetric shape around its rotational axis Ax. As illustrated in Fig. 2, the toy top 1 includes a shaft portion 10, a flywheel 30, and a body 40.

DETAILS

1. Shaft Portion 10

[0015] Fig. 3 is a perspective cross-sectional view of the shaft portion 10 and the flywheel 30. In the shaft portion 10 and the flywheel 30, the terms up-down, right-left and front-rear represent the respective directions as illustrated in Fig. 3. The shaft portion 10 and the flywheel 30 each have a substantially symmetrical shape.

[0016] The shaft portion 10 includes a ground contact or spinning shaft 11 in the lower end section, a flange 12 in the middle section in the up-down direction, and a cylinder 13 in the upper end section.

[0017] The flange 12 is integrated with the cylinder 13. The core of the cylinder 13 includes a post 14. The upper end of the post 14 has a large diameter. This large diameter portion has two hooks 17 protruding radially outward in the front and back directions. The post 14 is fixed to a lower shaft portion 10a. The circumferential face of the lower shaft portion 10a has a diameter that decreases stepwise from the flange 12 to the tip of the spinning shaft 11, defining an inverted substantial cone as a whole. The lower shaft portion 10a is fixed to the flange 12 with, for example, a screw (not shown).

[0018] Two holes 15 are formed in the front and back regions across the flange 12 and the cylinder 13. The circumferential face of the cylinder 13 has two protrusions 16 in the right and left regions. The outer faces of the protrusions 16 are flush with the circumferential face of the flange 12.

[0019] The shaft portion 10 includes a cylindrical urging member 18. The urging member 18 includes an annular top panel that fits to the upper end portion of the post 14. The urging member 18 is hollow and has a downward opening. The urging member 18 fits inside the cylinder 13 and surrounds the post 14. The circumferential face at the lower end of the urging member 18 has two legs 18a protruding radially outward in the front and back directions.

[0020] With reference to Fig. 3, the urging member 18 is assembled such that the legs 18a are exposed from the respective holes 15. The holes 15 allow the respective legs 18a to move in the up-down direction therein. The upward movement, however, is limited by the upper edges of the holes 15. The urging member 18 is urged upward by a spring 19. In a normal state, the upper end face of the urging member 18 is substantially flush with the upper edge of the cylinder 13.

[0021] The upper face of the urging member 18 has two ridges 20 radially extending in the left and right directions.

2. Flywheel 30

[0022] The flywheel 30 has an annular shape. The inner bottom face of the flywheel 30 has an annular step 30a that accommodates the flange 12 of the shaft portion

10 disposed below. The upper face of the flywheel 30 has two upward protrusions 31 extending in the right and left directions. In lower parts of the protrusions 31, recesses 32 are formed so that the protrusions 16 of the shaft portion 10 can be respectively received therein. The upper face of the flywheel 30 has tongues 33 adjoining the outer faces of the protrusions 31 and extending upward. The tongues 33 protrude above the protrusions 31.

3. Body 40

[0023] Fig. 4 is an exploded top perspective view of the body 40. Fig. 5 is an exploded bottom perspective view of the body 40.

[0024] With reference to Figs. 4 and 5, the body 40 includes a top plate 41, a middle plate 42, and a bottom plate 43. The top plate 41 and the bottom plate 43 constitute a main component. In the body 40, the terms "top," "bottom," "left," "right," "front," and "back" refer to the corresponding directions in Figs. 4 and 5.

(1) Top Plate 41

[0025] The top plate 41 has a substantially circular hole 41a defined in the center. The top plate 41 has hooks 41b protruding inwardly from the hole 41a in the left and right regions in the lower portion of the inner circumference. The top plate 41 has arcuate slits 41c in the right and left regions on the top wall. The tongues 33 of the flywheel 30 can be inserted into the respective slits 41c from below. The width of each arcuate slit 41c is large at one end and small at the other end in the circumferential direction.

[0026] The top plate 41 has recesses 41d in the front and rear of the bottom face. The recesses 41d are downwardly fit to projections 42b on the middle plate 42, which will be described below. The front and rear regions of the bottom face of the top plate 41 have cylindrical bosses 41e in positions slightly remote from the recesses 41d around the axis Ax. The inner face of a hole defined in the center of each boss 41e has an internal thread (now shown).

(2) Middle Plate 42

[0027] The middle plate 42 has an annular shape and is disposed in the outer circumference of the body 40. The middle plate 42 has a circumferential face 42a that flares downward, in other words, being away from the axis Ax over the substantially entire circumference, and surrounds the circumference of the body 40.

[0028] The inner wall of the middle plate 42 has projections 42b disposed in the front and rear and extending toward the center of the middle plate 42. The bottom face of each projection 42b has a boss 42c to which a coil spring 44, which will be described below, is fitted.

[0029] The middle plate 42 also has four slits 42d in the lower portion of the inner wall.

(3) Bottom Plate 43

[0030] The bottom plate 43 includes an annular frame 43a. The frame 43a has a circumferential face having four protrusion 43b corresponding to the slits 42d in the middle plate 42. Vertical fitting of the four protrusions 43b to the respective four slits 42d in the middle plate 42 causes the middle plate 42 and the bottom plate 43 to rotate together around the axis Ax.

[0031] A connector 43c that supports the frame 43a is disposed inside of the frame 43a and extends over the front and rear of the frame 43a. Gaps defined in the right and left regions by the connector 43c and the frame 43a serve as arcuate slits 43d corresponding to the arcuate slits 41c in the top plate 41. The connector 43c has a hole 43e in its center.

[0032] The top face of the connector 43c has front and rear guide hollows 43f that guide the projections 42b of the middle plate 42. The guide hollows 43f are open at their tops and outer portions, and movably support the projections 42b of the middle plate 42 along the axis Ax. Each of the projections 42b of the middle plate 42 is inserted into the guide hollow 43f through the intermediary of the coil spring 44, which upwardly biases the middle plate 42.

[0033] The front and rear regions of the top face of the connector 43c have fitting holes 43g in positions slightly remote from the guide hollows 43f around the axis Ax. The bosses 41e of the top plate 41 are inserted into the fitting holes 43g and are fixed with screws (not shown) from below. The top plate 41 and the bottom plate 43 are fixed by the middle plate 42 held therebetween and vertically movable.

[0034] The bottom face of the connector 43c has an annular wall 43h having an inner diameter equal to the diameter of the hole 43e. The annular wall 43h has two hooks 43i protruding inwardly on its lower inner face at opposite positions across the axis Ax. One end of the lower face of each hook 43i has an undulation 43j that engages with the ridge 20 of the shaft portion 10. The undulation 43j includes several ridges in the circumferential direction.

(4) Decorative Component 47

[0035] The hole 41a in the top plate 41 accommodates a decorative component 47 latched with the hooks 41b. Several decorative components 47 having different top colors and shapes are provided to discriminate toy tops 1 from each other.

ASSEMBLY OF TOY TOP 1

[0036] Assembly of the toy top 1 will now be described. At this point, the assembly of the shaft portion 10 and the body 40 should already be completed as illustrated in Fig. 2.

[0037] The protrusions 16 of the shaft portion 10 are

aligned with the recesses 32 of the flywheel 30 from below, so as to combine the shaft portion 10 with the flywheel 30, which combination is then moved close to the body 40 from below.

[0038] The tongues 33 of the flywheel 30 are inserted into the arcuate slits 41c and 43d in the body 40. In this state, the hooks 17 of the shaft portion 10 are not aligned with the hooks 43i of the body 40 in the up-down direction. This state is referred to as a decoupled state. When the shaft portion 10 of the combination is urged to the body 40, the flywheel 30 is biased against the bottom face of the body 40. In response, the spring 19 in the shaft portion 10 contracts, and the urging member 18 sinks. This causes the hooks 17 of the shaft portion 10 to be relatively urged above the hooks 43i of the body 40. The shaft portion 10 spins together with the flywheel 30 in a pre-determined direction (the direction reversed to the spin direction of the toy top 1) relative to the body 40. This causes the hooks 43i of the body 40 to move beneath the hooks 17 of the shaft portion 10, such that the hooks 17 are aligned with the hooks 43i in the up-down direction. In response to release of the shaft portion 10 from the hand of an assembler, the biasing force of the spring 19 in the shaft portion 10 causes the lower faces of the hooks 17 of the shaft portion 10 to come into contact with the upper faces of the hooks 43i of the body 40. This state of the lower faces of the hooks 17 of the shaft portion 10 in contact with the upper faces of the hooks 43i of the body 40 is referred to as a coupled state. In this manner, the ridges 20 engage with the undulations 43j, and the toy top 1 is assembled.

HOW TO PLAY

[0039] An example of how to play with the toy top 1 will now be described.

[0040] Fig. 1 is a perspective view of an example launcher that spins and drives the toy top 1. Fig. 6 explains the operation of the body 40 of the toy top 1 in a game.

[0041] In this example of how to play, the toy top 1 is spun to engage in a battle with an opponent toy top 1A (Fig. 6B).

[0042] In such a case, the rotational force of the toy top 1 is generated with a toy-top launcher 60, such as that illustrated in Fig. 1. The launcher 60 includes an internal disk (not shown). The disk is urged in a first rotational direction by a spiral spring (not shown). A handle 61 is then pulled to pull a string (not shown) wound around the disk so as to spin the disk, thereby spinning a top holder 62. The spinning of the top holder 62 is transmitted to the toy top 1 through forks 63 protruding downward so as to spin the toy top 1. In such a case, the forks 63 are inserted into the arcuate slits 41c in the body 40. Fully pulling the handle 61 of the launcher 60 stops the spinning of the disk and thus the spinning of the top holder 62, but the toy top 1 continues to spin due to inertia. The toy top 1 follows the tilting faces 63a of the forks 63 and

detaches from the top holder 62.

[0043] The toy top 1 launched in this way spins in a predetermined direction in a predetermined field and collides with another toy top 1A of an opponent spinning in the same direction, for example. The impact force generated by the collision causes a reactive force to be applied to the body 40 in a direction opposite to the rotational direction of the shaft portion 10 and the flywheel 30. This causes the body 40 to spin in the opposite direction relative to the rotational direction of the shaft portion 10 and the flywheel 30.

[0044] In response, the undulations 43j on the bottom face of the bottom plate 43 and the ridges 20 vary their engagement position as the shaft portion 10 relatively rotates with respect to the body 40. In the course of this, if the hooks 17 of the shaft portion 10 and the hooks 43i of the body 40 reach the decoupled state and are released from coupling with each other, the biasing force of the spring 19 causes the body 40 to be detached from the shaft portion 10. As a result, as illustrated in Fig. 2, the toy top 1 is disassembled.

[0045] In the body 40 of the toy top 1 launched by the launcher 60, the middle plate 42 is upwardly biased by the coil spring 44 and is normally in contact with the top plate 41, as illustrated in Fig. 6A.

[0046] As illustrated in Fig. 6B, if the toy top 1 (or the body 40) spins in this state and collides with the opponent toy top 1A (illustrated by dotted lines), the collision of the flared circumferential face 42a of the middle plate 42 with the opponent top toy 1A generates an impact from which the middle plate 42 receives downward force. This causes the middle plate 42 to be downwardly urged against the biasing force of the coil spring 44. In response, the middle plate 42 upwardly urged by the resilience of the coil springs 44, so that the opponent toy top 1A is upwardly urged back and flipped up as illustrated in Fig. 6C.

[0047] The top toy 1 can thus make an attack that is likely to lean the opponent toy top 1A. Compared to a traditional toy top simply clashing an opponent toy top with the body, the toy top 1 can effectively attack the opponent toy top 1A. The toy top 1 can also promise an effect of relieving the impact force applied by the collision with the opponent toy top 1A through the coil spring 44.

ALTERNATE EMBODIMENTS OF THE INVENTION

[0048] Although an embodiment of the present invention has been described, the invention may include any other embodiment. Various modifications can be made without departing from the spirit of the invention.

[0049] For example, in the embodiment described above, the coil spring 44 upwardly biases the middle plate 42. Alternatively, the coil spring 44 may bias the middle plate 42 in one direction, i.e., upward or downward. In other words, the coil spring 44 may downwardly bias the middle plate 42. Also in this case, an effective attack can be made that leans an opponent toy top.

[0050] The circumferential face 42a of the middle plate

42 may have any shape other than the flared shape, provided, however, that the circumferential face 42a preferably flares away from the biasing direction of the coil spring 44 as the circumferential face 42a recedes from the axis Ax.

[0051] The circumferential face 42a of the middle plate 42 need not surround the entire circumference of the body 40. Alternatively, the circumferential face 42a may surround a partial circumference or may be divided in several segments in the circumference, which are individually biased by the coil spring 44.

[0052] The movable component according to the present invention may include at least a portion of the body. For example, the entire body may be the movable component. In this case, the biasing member upwardly and downwardly urging the movable component may be disposed to bias the movable component relative to the shaft portion.

Claims

1. A toy top having a rotational axis, comprising:

a body;
a shaft portion;
a movable component including at least a portion of the body and being movable upward and downward relative to the rotational axis of the toy top; and
a biasing member which urges the movable component in a biasing direction which is either upward or downward,
wherein the movable component has a circumferential face that flares away from the biasing direction of the biasing member as the circumferential face recedes from the rotational axis, and
wherein when the circumferential face collides with an opponent toy top, the movable component moves against a biasing force of the biasing member in a direction opposite to the biasing direction, and then the movable component is urged by resilience of the biasing member to move the opponent toy top in one of upward and downward directions that is same as the biasing direction.

2. The toy top according to claim 1, wherein the circumferential face of the movable component surrounds an entire circumference of the body.

3. The toy top according to claim 1 or 2, wherein the biasing member urges the movable component upward, and the circumferential face of the movable component flares downwardly as the circumferential face recedes from the rotational axis.

FIG. 1

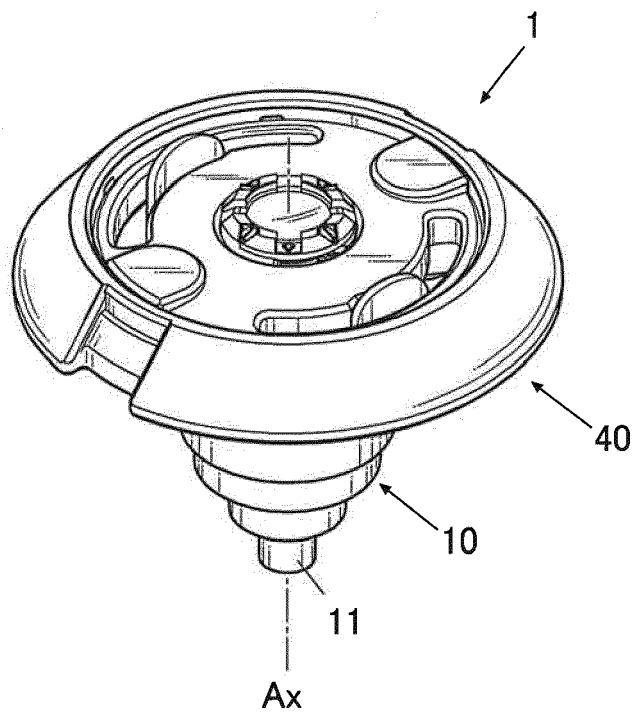
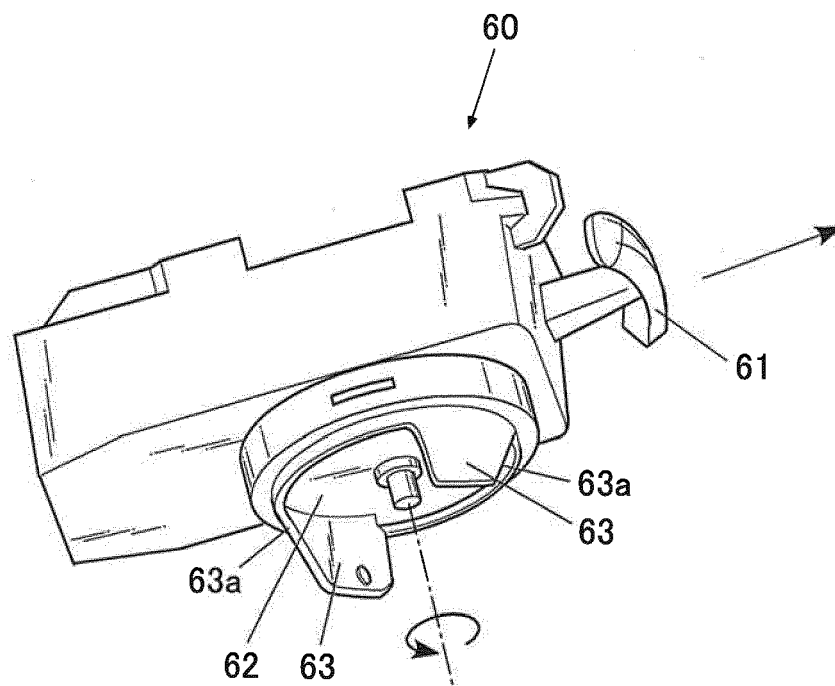


FIG.2

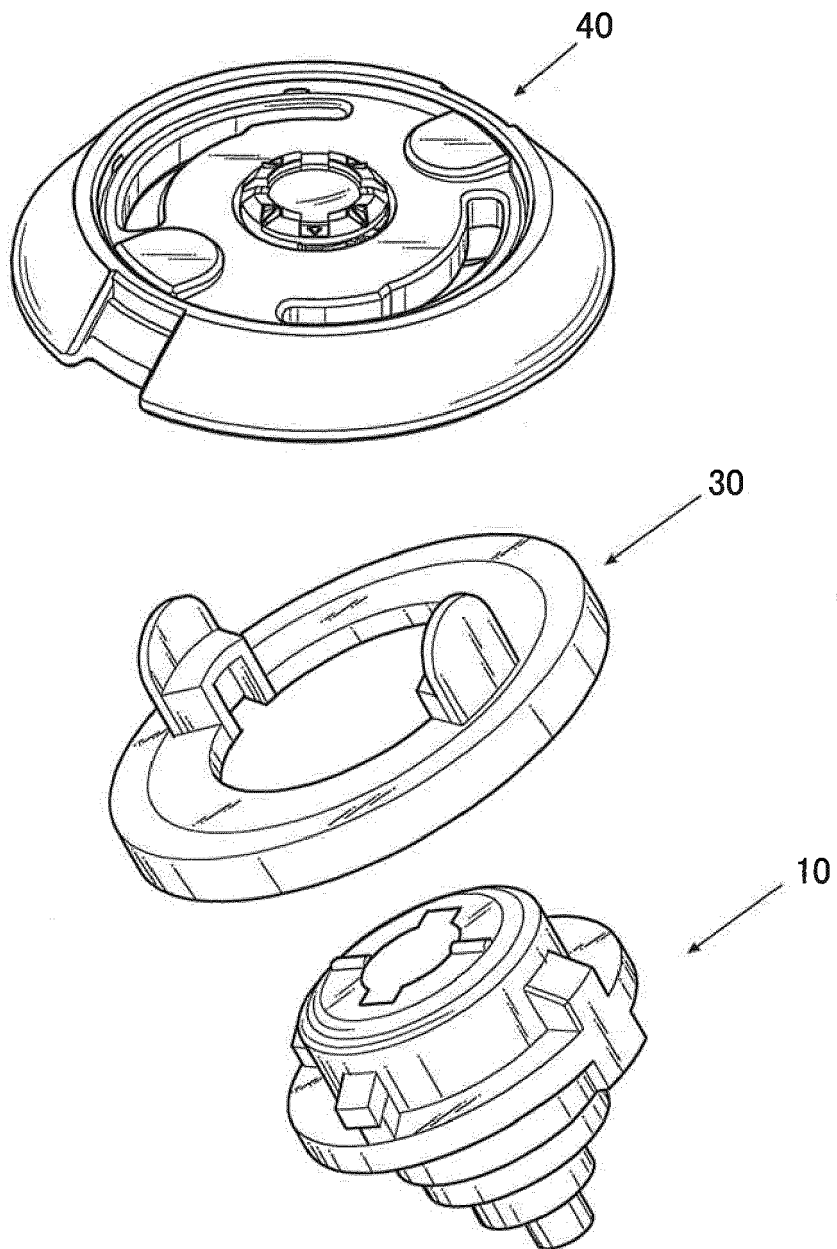


FIG.3

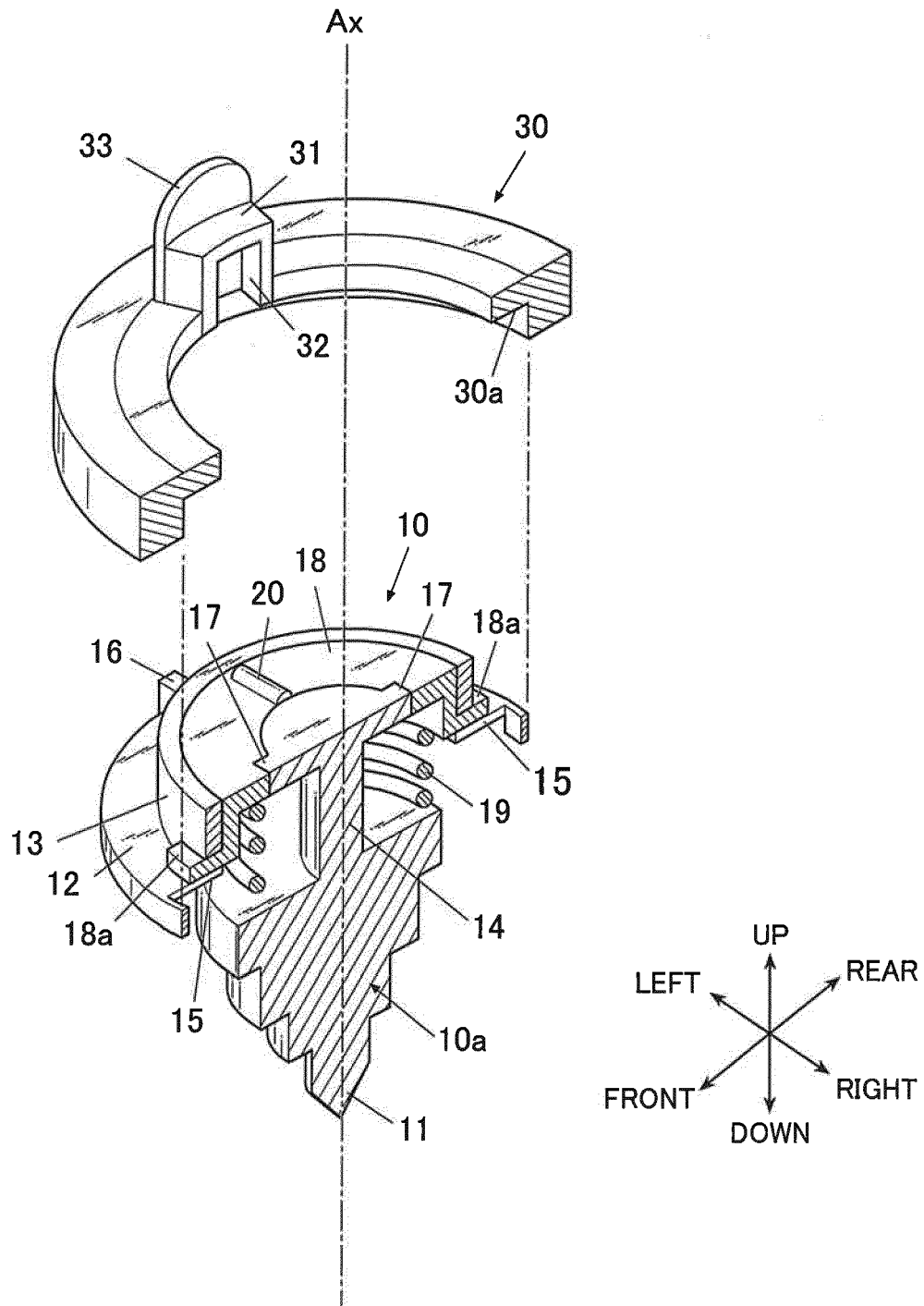


FIG. 4

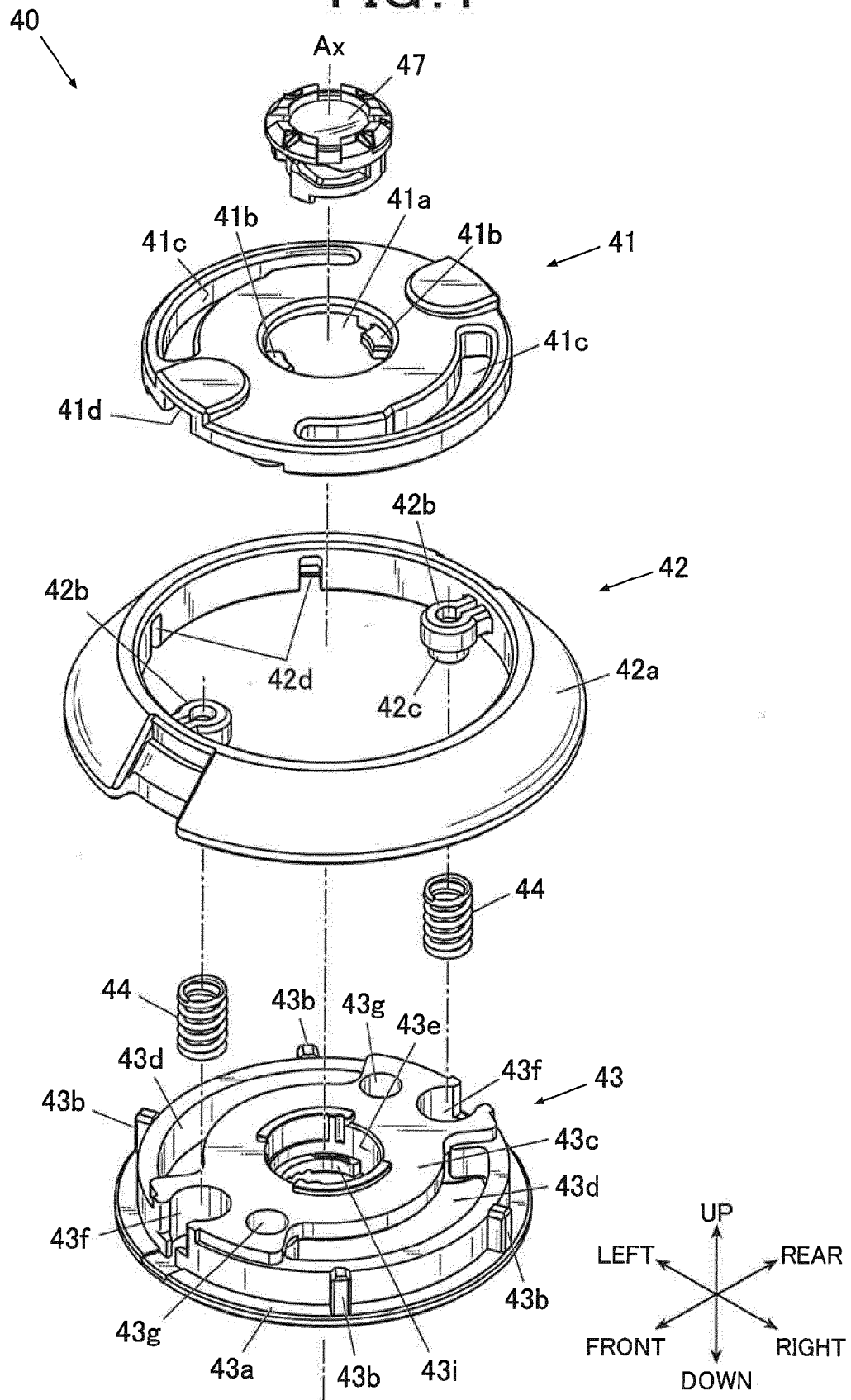


FIG. 5

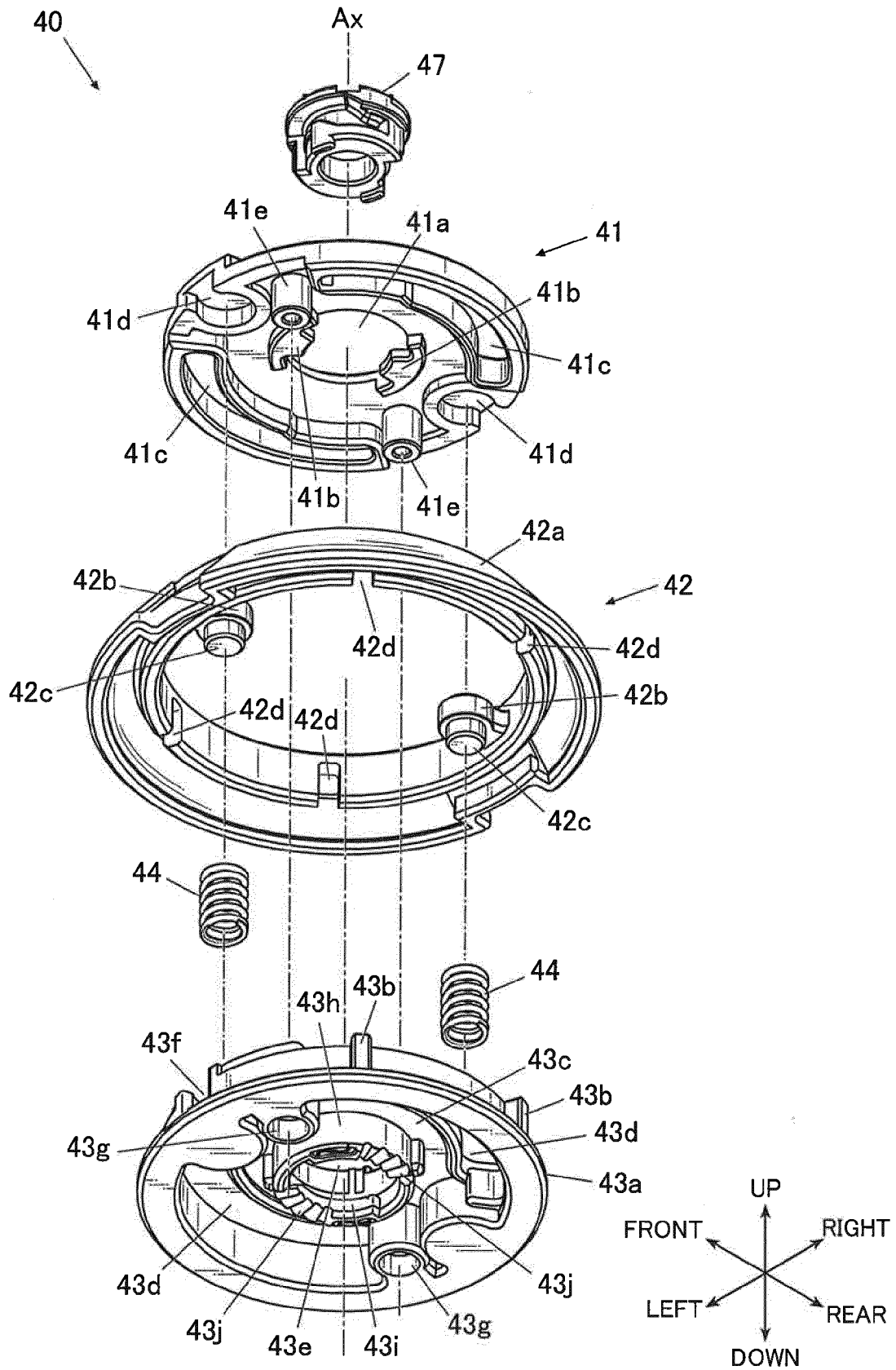


FIG. 6A

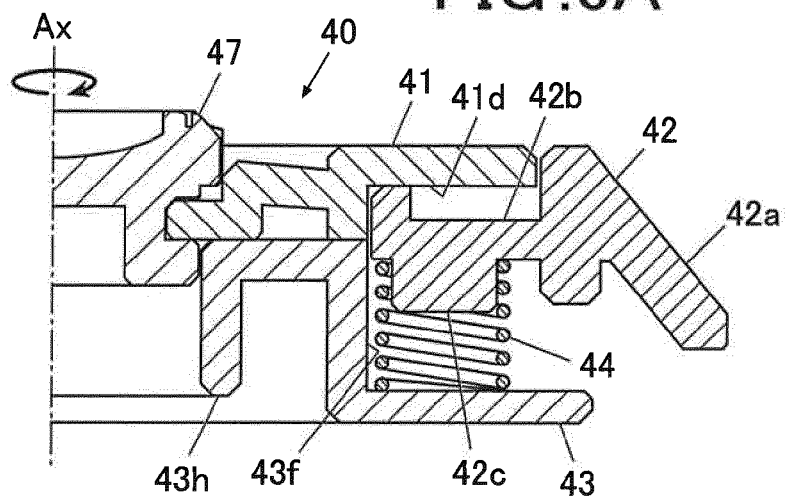


FIG. 6B

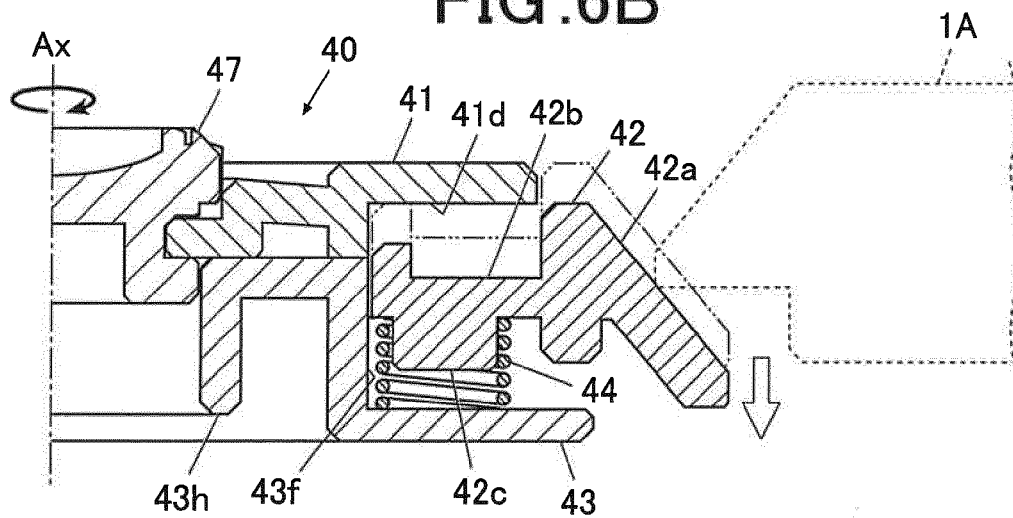
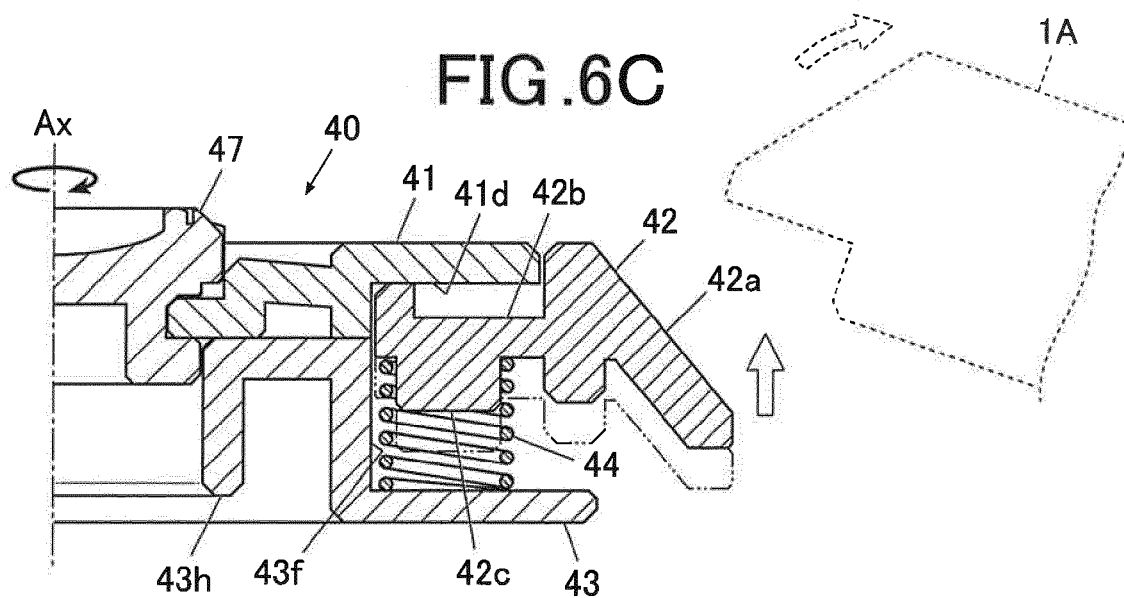


FIG. 6C





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 EP 18 17 3395

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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