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(71) Applicant: **Novel Co., Ltd.**
Nagasaki-shi, Nagasaki 850-0862 (JP)

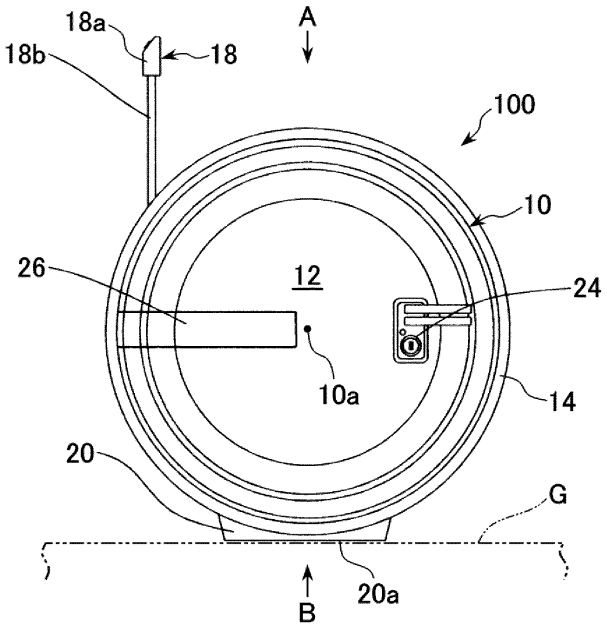
(72) Inventor: **TACHIKAWA, Masaaki**
Isahaya-shi, Nagasaki 859-0407 (JP)

(74) Representative: **Winter, Brandl, Fürniss, Hübner, Röss, Kaiser, Polte - Partnerschaft mbB**
Patent- und Rechtsanwaltskanzlei
Alois-Steinecker-Strasse 22
85354 Freising (DE)

(54) **SUITCASE**

(57) A suitcase is provided that can easily pass over stairs, level differences, etc., and can ensure a relatively wide article storage space while limiting large increases to the weight and size of the suitcase. Such a suitcase is provided with: a main body adapted to store article therein; a lid formed at the main body to open and close the main body; a plurality of annular rotators each surrounding an outer periphery of the main body and rotatably attached to the main body; a handle fixed to the main body to pull the main body; and a grounding piece formed at the outer periphery of the main body to keep the main body standing.

FIG. 1



EP 3 494 830 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a suitcase which a person can pull to move on a floor of a building or a road.

BACKGROUND ART

[0002] A suitcase to be moved by a user while being lifted up by a user gives physically large burden to a user. Thus, suitcases each having wheels are available a lot these days. However, a conventional suitcase with wheels is accompanied with a problem that wheels have an outer diameter smaller than a size of a suitcase, and accordingly, it is difficult for the suitcase to go upstairs or downstairs, and pass areas having large level differences.

[0003] In order to solve the above-mentioned problem, there has been suggested a suitcase including wheels each having an outer diameter greater than the same of wheels in a conventional suitcase (for instance, see the patent documents 1 and 2). The suitcase disclosed in the patent document 1 is designed to include storage boxes located at opposite sides of a wheel having an outer diameter greater than the same of a conventional wheel. The suitcase disclosed in the patent document 2 is designed to include wheels at opposite sides of a storage box, wheels each having an outer diameter greater than the same of a conventional wheel.

[0004] Since the suitcases disclosed in the patent documents 1 and 2 are designed to have wheels having an outer diameter greater than a height of stairs, it is guessed that the suitcases can readily go upstairs or downstairs. However, the one-wheel type suitcase disclosed in FIGs. 1 to 3 in the patent document 1 is short of stability while moving.

[0005] On the other hand, the suitcase disclosed in FIGs. 4 to 6 in the patent document 1 and the suitcase disclosed in the patent document 2 are designed to include a pair of wheels at opposite sides of a storage box, and accordingly, are able to have improved stability. However, since the two wheels each having a great outer diameter are provided at opposite sides of a storage box, the suitcases is unavoidably accompanied with a problem of an increase in a weight and a size.

[0006] Thus, there has been suggested a round-shaped suitcase 700 illustrated in FIG. 31. The suitcase 700 illustrated in FIG. 31 is commercially available from Samsonite under the tradename of "Samsonite OBAG".

[0007] The suitcase 700 includes two case bodies 701 and 702 each being short cylindrical, a carry handle 703 projecting from a gap G formed between the case bodies 701 and 702, and ring-shaped rotators 705 and 706 rotatable around a periphery of the case bodies 701 and 702 in a circumferential direction of the case bodies 701 and 702.

[0008] A support 704 for keeping the suitcase 700 standing on a ground projects retractably from the gap G formed between the case bodies 701 and 702, towards a ground. The case body 701 is formed at an outer surface thereof with a lid 708 for opening and closing an entry/exit (not illustrated) through which article is brought into and taken out of the case body 701, and a grip 709 for opening and closing the lid 708. Though not illustrated, similarly to the case body 701, the case body 702 is formed at an outer surface thereof with a lid for opening and closing an entry/exit through which article is brought into and taken out of the case body 702, and a grip for opening and closing the lid.

[0009] In using the suitcase 700, similarly to a conventional suitcase having wheels, a user holds a grip 707 formed at the carry handle 703 with one hand, and then, walks to a destination. Then, two rotators 705 and 706 both making contact with a ground rotate around the case bodies 701 and 702, respectively, to thereby follow the user. Thus, a user can readily carry the suitcase 700.

[0010] Since the suitcase 700 is designed to include the rotators 705 and 706 around the case bodies 701 and 702, respectively, each of which has an outer diameter greater than the same of wheels included in the suitcases disclosed in the patent documents 1 and 2, the suitcase 700 can pass over stairs and level differences more readily than the suitcases disclosed in the patent documents 1 and 2. Furthermore, since the rotators 705 and 706 are in the shape of a ring, it is guessed that they can avoid to some degree an increase in a weight and a size of a suitcase.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0011]

Patent Document 1: Japanese Patent Application Publication No. 2010-94489
Patent Document 2: Japanese Patent Application Publication No. 2011-177484

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0012] As mentioned earlier, the suitcase 700 illustrated in FIG. 31 is designed to include the rotators 705 and 706 each having an outer diameter greater than outer diameters of the wheels in a conventional suitcase having ordinary wheels or the suitcases disclosed in the patent documents 1 and 2. Thus, the suitcase 700 can go upstairs or downstairs and pass over level differences more readily than conventional suitcases, and further, it is guessed that noises generated in moving can be reduced.

[0013] However, the suitcase 700 is accompanied with

the following problem. The gap G is formed around peripheries of the case bodies 701 and 702, and the carry handle 703 is rotatably supported at a proximal end thereof (not illustrated) at the gap G in the suitcase 700. Since the suitcase 700 is necessary to have a large space for supporting the carry handle 703, a storage space of the case bodies 701 and 702 for storing article therein is relatively small, whereas the suitcase 700 entirely has a large size.

[0014] Furthermore, it is not only a conventional need, but also a present and important need for a suitcase having wheels for carriage to be able to readily pass over stairs and level differences and avoid an increase in a weight and a size thereof.

[0015] However, a conventional suitcase having wheels for carriage does not reach at a satisfactory level with respect to being able to readily pass over stairs and level differences, and avoiding an increase in a weight and a size thereof.

[0016] In view of the above-mentioned problems in the conventional suitcases, it is an object of the present invention to provide a suitcase capable of being able to readily pass over stairs and level differences, avoiding an increase in a weight and a size thereof, and providing a relatively large space for storing article therein.

SOLUTION TO THE PROBLEMS

[0017] The present invention provides a suitcase including a main body adapted to store article therein, a lid formed at the main body to open and close the main body, a plurality of annular rotators each surrounding an outer periphery of the main body and rotatably attached to the main body, a handle fixed to the main body to pull the main body, and a grounding piece formed at the outer periphery of the main body to keep the main body standing.

[0018] In the suitcase, it is preferable that the main body is cylindrical or polygonal, the rotators being attached to the main body in a circumferential direction of the main body.

[0019] In the suitcase, it is preferable that the lid is formed at at least one of end surfaces situated axially of the main body.

[0020] In the suitcase, it is preferable that the lid is formed at a peripheral surface of the main body.

[0021] In the suitcase, it is preferable that the lid is attached to the main body through a fastener or a hinge.

[0022] In the suitcase, it is preferable that the lid is rotatable around a support shaft fixed at the main body in parallel with an axis of the rotators.

[0023] In the suitcase, it is preferable that the grounding piece projects from the outer periphery of the main body.

[0024] In the suitcase, it is preferable that the rotators are positioned on the main body such that a space therebetween gradually increases towards a ground.

[0025] It is preferable that the suitcase further includes a grip on the main body.

[0026] It is preferable that the suitcase further includes splash guards covering therewith the rotators circumferentially around a periphery of the rotators.

ADVANTAGES PROVIDED BY THE INVENTION

[0027] The present invention provides a suitcase capable of being able to readily pass over stairs and level differences, reducing noises generated in moving, and providing a relatively large space for storing article therein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028]

FIG. 1 is a right-side view of the suitcase in accordance with an embodiment of the present invention.
FIG. 2 is a left-side view of the suitcase illustrated in FIG. 1.
FIG. 3 is a front view of the suitcase illustrated in FIG. 1.
FIG. 4 is a rear view of the suitcase illustrated in FIG. 1.
FIG. 5 is a plan view of the suitcase viewed in a direction indicated with an arrow A shown in FIG. 1.
FIG. 6 is a bottom view of the suitcase viewed in a direction indicated with an arrow B shown in FIG. 1.
FIG. 7 is a cross-sectional view of the suitcase across the line C-C shown in FIG. 5.
FIG. 8 is a right-side view of the suitcase illustrated in FIG. 1 while being carried.
FIG. 9 is a right-side view of the suitcase in accordance with another embodiment of the present invention.
FIG. 10 is a left-side view of the suitcase illustrated in FIG. 9.
FIG. 11 is a front view of the suitcase illustrated in FIG. 9.
FIG. 12 is a rear view of the suitcase illustrated in FIG. 9.
FIG. 13 is a plan view of the suitcase viewed in a direction indicated with an arrow D shown in FIG. 9.
FIG. 14 is a bottom view of the suitcase viewed in a direction indicated with an arrow E shown in FIG. 9.
FIG. 15 is a cross-sectional view of the suitcase across the line F-F shown in FIG. 13.
FIG. 16 is a right-side view of the suitcase in accordance with still another embodiment of the present invention.
FIG. 17 is a left-side view of the suitcase illustrated in FIG. 16.
FIG. 18 is a front view of the suitcase illustrated in FIG. 16.
FIG. 19 is a rear view of the suitcase illustrated in FIG. 16.
FIG. 20 is a plan view of the suitcase viewed in a

direction indicated with an arrow G shown in FIG. 16.
FIG. 21 is a bottom view of the suitcase viewed in a direction indicated with an arrow H shown in FIG. 16.
FIG. 22 is a cross-sectional view of the suitcase across the line J-J shown in FIG. 20.
FIG. 23 is a right-side view illustrating that the lid of the suitcase illustrated in FIG. 16 is open and closed.
FIG. 24 is a right-side view of the suitcase in accordance with yet another embodiment of the present invention.
FIG. 25 is a left-side view of the suitcase illustrated in FIG. 24.
FIG. 26 is a front view of the suitcase illustrated in FIG. 24.
FIG. 27 is a rear view of the suitcase illustrated in FIG. 24.
FIG. 28 is a plan view of the suitcase viewed in a direction indicated with an arrow K shown in FIG. 24.
FIG. 29 is a bottom view of the suitcase viewed in a direction indicated with an arrow L shown in FIG. 24.
FIG. 30 is a cross-sectional view of the suitcase across the line M-M shown in FIG. 28.
FIG. 31 is a perspective view illustrating a conventional round-shaped suitcase.
FIG. 32 is a right-side view of the suitcase in accordance with still yet another embodiment of the present invention.
FIG. 33 is a right-side view illustrating that the lid is open in the suitcase illustrated in FIG. 32.

EMBODIMENTS FOR REDUCING THE INVENTION TO PRACTICE

[0029] The suitcases 100, 200, 300, 400 and 500 in accordance with embodiments of the present invention is explained hereinbelow with reference to FIGs. 1 to 30, 32 and 33. In FIGs. 9 to 30, 31 and 33, parts or elements in the suitcases 200, 300, 400 and 500 that have the same structures and functions as those of the suitcase 100 have been provided with the same reference numerals as the reference numerals shown in FIGs. 1 to 8, and will not be explained. Hereinbelow, a direction indicated with an arrow S shown in FIG. 8 (a direction in which a suitcase is pulled) is indicated as a forward side (or a front side), and a direction opposite by 180 degrees to the arrow direction S is indicated as a rearward side (or a rear side).

[0030] The suitcase 100 is explained hereinbelow with reference to FIGs. 1 to 8. As illustrated in FIGs. 1 to 6, the suitcase 100 includes a substantially cylindrical main body 10 for storing article therein, an openable/closable lid 12 formed at one of side surfaces of the main body 10 situated in a direction in which an axis 10a of the main body 10 extends, a plurality of (a pair of) annular rotators 14 and 16 rotatably attached to the main body 10 such that the rotators surround an outer periphery of the main body 10, a handle 18 integrally attached to the main body 10, and a grounding piece 20 formed at the outer periphery of the main body 10 so as to keep the main body 10 standing on a ground G. The grounding piece 20 is oval in shape when viewed from above, and has a planar grounding area 20a projecting beyond the outer periphery of the main body 10 and being in parallel with a tangent of the outer periphery of the main body 10.

[0031] As illustrated in FIGs. 3 and 4, the rotators 14 and 16 are attached to the main body 10 such that they are in parallel with each other along a circumferential direction of the main body 10. Between each of the rotators 14 and 16 and the main body 10 is positioned a bearing 29 (see FIG. 7) entirely around the outer periphery of the main body 10. The rotators 14 and 16 can rotate independently of each other relative to the main body 10.

[0032] As illustrated in FIGs. 3 and 4, the lid 12 is attached to one of the side surfaces of the main body 10 through a fastener 22. As illustrated in FIG. 1, the lid 12 includes a lock unit 24 for locking the fastener 22. The lid 12 is designed to include a display area 26 at an outer surface thereof for displaying a logo mark thereon, for instance.

[0033] The handle 18 comprises a grip portion 18a and a pair of support pillars 18b. The support pillars 18b protrude out of a recess 28 formed at the outer periphery of the main body 10. The grip portion 18a connects upper ends of the support pillars 18b to each other. The support pillars 18b are extendable/contractable. The handle 18 can be stored in the recess 28 by contracting the support pillars 18b.

[0034] A belt-shaped grip 30 is attached to the outer periphery of the main body 10 for raising the suitcase 100 up at a location away from the grounding piece 20 by 180 degrees around the axis 10a.

[0035] As illustrated in FIG. 7, the interior of the main body 10 is partitioned by a partition wall 32 into two storage spaces 34 and 36. It should be noted that the partition of the interior of the main body 10 illustrated in FIG. 7 is just an example, and is not to be limited to the example. The main body 10 may include no partition wall 32, or include two or more partition walls 32 to form three or more storage spaces.

[0036] In using the suitcase 100, the suitcase 100 is put on a certain support plane such that a sidewall 38 of a side surface opposite to the lid 12 is directed downwardly. Then, the lock unit 24 is unlocked, and the fastener 22 is open to thereby turn the lid 12 to be openable. Then, the user opens the lid 12, and puts article into the storage spaces 34 and 36 formed in the main body 10. After article storage is finished, the fastener 22 is closed, and the lock unit 24 is locked.

[0037] Then, as illustrated in FIG. 1, the user can stand the main body 10. Since the grounding piece 20 makes contact with the ground G, the suitcase 100 is kept in such a position that the handle 18 stands upright and the grip 30 is situated at an uppermost portion of the main body 10, in which case, the rotators 14 and 16 are kept away from the ground G.

[0038] When the user wants to move the suitcase 100,

as illustrated in FIG. 8, the user holds the grip portion 18a of the handle 18 with his/her hand, and inclines the main body 10 until the grounding piece 20 goes away from the ground G, and accordingly, the rotators 14 and 16 make contact with the ground G. Then, the user pulls the handle 18 in a direction the user moves, keeping the main body 10 inclined, thereby the rotators 14 and 16 start rotating. Thus, the user can readily carry the suitcase 100.

[0039] When the user wants to stop the movement of the suitcase 100, as illustrated in FIG. 1, the user stands the main body 10 to thereby cause the grounding area 20a of the grounding piece 20 to make contact with the ground G. Thus, the suitcase 100 is kept standing in such a posture. Since the rotators 14 and 16 are away from the ground G, it is possible to prevent the suitcase 100 from unintentionally moving.

[0040] Since the rotators 14 and 16 included in the suitcase 100 are designed to have a great outer diameter, they can readily pass over stairs and level differences, and reduce noises generated during rotation thereof. In addition, since the main body 10 of the suitcase 100 has a single-piece structure, the main body 10 can provide an article storage space larger than the same of the suitcase 700 illustrated in FIG. 31.

[0041] Hereinbelow is explained a suitcase 200 with reference to FIGs. 9 to 15. As illustrated in FIGs. 9 to 15, the suitcase 200 is designed to include a pair of lids 41 and 42 at side surfaces of a substantially cylindrical main body 40 situated in a direction in which an axis 40a of the main body 40 extends. Each of the lids 41 and 42 is attached to the main body 40 through hinges 43 and 44, respectively, such that the lids 41 and 42 are openable and closable relative to the main body 40. The lids 41 and 42 include grips 45 and 46 for opening and closing the lids 41 and 42, and lock units 47 and 48, respectively.

[0042] In order to keep the main body 40 standing on the ground G, the main body 40 is designed to include a pair of grounding pieces 49, 49 on the outer periphery of the main body 40. Each of the grounding pieces 49, 49 is in the shape of a substantially triangular prism with rounded corners, and is spaced away from each other circumferentially on the outer periphery of the main body 40 so that a length-wise direction of the main body 40 is in parallel with the axis 40a of the main body 40. The grounding pieces 49, 49 projects at theirs summits 49a, 49a beyond outer peripheries of the rotators 14 and 16.

[0043] In the suitcase 200, the main body 40 is formed with splash guards 51 and 52 covering therewith the rotators 14 and 16 in a circumferential direction of the rotators 14 and 16. As illustrated in FIG. 9, the splash guards 51 and 52 are designed to cover therewith upper halves of the rotators 14 and 16 when the suitcase 200 is kept standing (stationary). The main body 40 is formed on the outer periphery of the main body 40 below a recess 28 into which the handle 18 is retracted, with a holder 50 in the shape of a cup for storing cans and/or bottles therein (that is, nearer to the grounding pieces 49 than the recess 28).

[0044] As mentioned earlier, the suitcase 200 is designed to include the lids 41 and 42 at both of side surfaces of the main body 40 located in a direction in which the axis 40a of the main body 40 extends, ensuring that the user can put article into or take article out of the main body 40 through either of the side surfaces of the main body 40. The lids 41 and 42 can be open by unlocking the lock units 47 and 48 and pulling the grips 45 and 46.

[0045] Since the suitcase 200 is designed to include the grounding pieces 49, 49 spaced away from each other on circumferentially on the outer periphery of the main body 40, it is possible to keep the suitcase 200 stably standing, when the main body 40 is caused to stand on the ground G, as illustrated in FIG. 9. Furthermore, since the main body 40 is formed on the outer periphery thereof with the holder 50, it is conveniently possible to store therein a can and/or a bottle filled with water and so on.

[0046] Since the suitcase 200 is designed to include the splash guards 51 and 52 covering therewith the rotators 14 and 16 in a circumferential direction of the rotators 14 and 16, it is possible to prevent the rotators 14 and 16 from scattering water drops and/or muddy water therearound, even if the suitcase 200 moves across an area wet with rain or an area of a puddle. How to use the suitcase 200 and the advantages of the suitcase 200 are identical with those of the suitcase 100 illustrated in FIG. 1.

[0047] Hereinbelow is explained a suitcase 300 with reference to FIGs. 16 to 23. As illustrated in FIGs. 16 to 23, both of side surfaces of a substantially cylindrical main body 60 located in a direction in which an axis 60a of the main body 60 extends are closed with sidewalls 61 and 62, respectively. The main body 60 is formed with an openable/closable lid 63 covering therewith an upper half of the main body 60. The lid 63 is attached to the main body 60 through a hinge 64 arranged at a rear of the main body 60. A grip 30 is attached onto an upper surface of the lid 63.

[0048] The suitcase 300 is designed to include splash guards 68 and 69 covering therewith the rotators 14 and 16 in a circumferential direction of the rotators 14 and 16. Each of the splash guards 68 and 69 includes front guard portions 68a and 69a, respectively, formed integral with the main body 60 at a front of the main body 60, and rear guard portions 68b and 69b, respectively, formed integral with the lid 63 at both an upper portion and a rear of the main body 60. While the lid 63 is closed, the front guard portions 68a and 69a and the rear guard portions 68b and 69b are joined with each other through joint portions 68c and 69c located at the rear of the recess 28.

[0049] As illustrated in FIG. 22, interior of the main body 60 in the suitcase 300 is partitioned into a plurality of storage spaces 66 and 67 by a partition wall 65 extending in parallel with a length-wise direction of the support pillars 18b of the handle 18. In addition, as illustrated in FIG. 23, the lid 63 in the suitcase 300 is rotatable together with the grip 30 (see FIG. 22) around the hinge 64 ex-

tending in parallel with the axis 60a.

[0050] Since the lid 63 is openable and closable relative to the main body 60 by rotating around the hinge 64 in the suitcase 300, as illustrated in FIG. 23, the user can readily put article into and take article out of the main body 60, even when the suitcase 300 is caused to stand on the ground G (that is, when the grounding pieces 49 make contact with the ground G). How to use the suitcase 300 and the advantages of the suitcase 300 are identical with those of the suitcases 100 and 200 illustrated in FIGs. 1 and 9, respectively.

[0051] A suitcase 400 is explained hereinbelow with reference to FIGs. 24 to 30. As illustrated in FIGs. 24 to 30, the suitcase 400 is designed to include a lid 71 at one of side surfaces of a substantially cylindrical main body 70 situated in a direction in which an axis 70a of the main body 40 extends. The other of side surfaces of the main body 70 is closed with a sidewall 72. The lid 71 is attached to the main body 70 through a hinge 73 such that the lid 71 is openable and closable relative to the main body 70. The lid 71 includes a grip 75 for opening and closing the lid 71, and a lock unit 77.

[0052] As illustrated in FIGs. 26 to 28, the pair of the rotators 14 and 16 in the suitcase 400 is positioned in such a manner that a space therebetween is gradually increased towards the ground G. A space between the rotators 14 and 16 is greatest in an area in which the grounding pieces 49, 49 are situated between the rotators 14 and 16 on the outer periphery of the main body 70, and smallest in an area away from the grounding pieces 49, 49 by 180 degrees in a circumferential direction of the outer periphery of the main body 70.

[0053] As illustrated in FIGs. 26 and 27, the rotators 14 and 16 are positioned so that they make a pattern of "ハ", when the suitcase 400 is viewed from a front or a rear thereof. The splash guards 51 and 52 are arranged in accordance with a "ハ"-shaped inclination of the rotators 14 and 16. The lid 71 and the sidewall 61 of the main body 70 are in parallel with planes (not illustrated) in which the rotators 14 and 16 rotate, respectively.

[0054] As illustrated in FIGs. 26 and 27, since the rotators 14 and 16 in the suitcase 400 are positioned so that they make a "ハ"-shaped pattern, the user can stably pull and carry the suitcase 400, and the suitcase 400 can have high straight-moving stability. Furthermore, as illustrated in FIG. 24, the suitcase 400 can keep standing with high stability. How to use the suitcase 400 and the advantages of the suitcase 400 are identical with those of the suitcases 100, 200 and 300 illustrated in FIGs. 1, 9 and 16, respectively.

[0055] Hereinbelow is explained a suitcase 500 with reference to FIGs. 32 and 33. As illustrated in FIG. 32, the suitcase 500 includes a lid 81 attached to the main body 10 rotatably in a direction indicated with an arrow R around a support shaft 80 attached to the main body 10 so as to extend in parallel with axes of the rotators 14 and 16 (the axis 10a of the main body 10). A rotation range of the lid 81 around the support shaft 80 is not to be limited to any range. In the suitcase 500, the rotation range is set to be 180 degrees starting from a position in which the lid 81 is closed (a position illustrated in FIG. 32). The lid 81 includes a button 82 used for opening the lid 81, and a lock unit 24 for locking the lid 81.

[0056] As illustrated in FIG. 32, when the lid 81 is closed in the suitcase 500, the user pushes the button 82, resulting in that an elastic mechanism (not illustrated) included in the main body 10 is actuated to thereby cause the lid 81 to move away from the main body 10 in a lengthwise direction of the support shaft 80 (a direction in parallel with a direction in which the axis 10a extends). Then, as illustrated in FIG. 33, the lid 81 slowly rotates around the support shaft 80 by means of the elastic mechanism in a direction indicated with an arrow R1, and stops after the lid 81 rotated about 180 degrees. Thus, the lid 81 is kept open (a situation illustrated in FIG. 33), and accordingly, the user can put article into and take article out of the storage spaces 34 and 36.

[0057] After the user finished putting article into and taking article out of the storage spaces 34 and 36, the user rotates the lid 81 around the support shaft 80 in a direction indicated with an arrow R2, as illustrated in FIG. 33. Then, when a center 81a of the lid 81 is coincident with the axis 10a of the main body 10, the user pushes the lid 81 towards the main body 10 along the axis 10a, resulting in that the lid 81 makes close contact with and is engaged to the main body 10. Thereafter, the lid 81 is locked by the lock unit 24, ensuring that the lid 81 is kept not open, even if the button 82 is actuated.

[0058] It should be noted that the suitcases 100, 200, 300, 400 and 500 having been explained with reference to FIGs. 1 to 30, 32 and 33 are just examples of the present invention, and the scope of the present invention is not limited to the above-mentioned suitcases 100, 200, 300, 400 and 500.

INDUSTRIAL APPLICABILITY

[0059] The suitcase in accordance with the present invention can be broadly used as an article carrier when a user travels with article, for instance, in a domestic or overseas trip and a business trip.

INDICATION BY REFERENCE NUMERALS

[0060]

10, 40, 60, 70 Main body
10a, 40a, 60a, 70a Axis
12, 41, 42, 63, 71, 81 Lid
14, 16 Rotator
18, 45, 46, 75 Handle
18a Grip portion
18b Support pillar
20, 49 Grounding pieces
20a Grounding area
22 Fastener

24, 47, 48, 77 Lock unit
26 Display area
28 Recess into which the handle is retracted
29 Bearing
30 Grip
32, 65 Partition wall
34, 36, 66, 67 Storage space
38, 61, 62, 72 Sidewall
43, 44, 64, 73 Hinge
49a Summit
50 Holder
51, 52, 68, 69 Splash guard
68a, 69a Front guard portion
68b, 69b Rear guard portion
68c, 69c Joint portion
80 Support shaft
81 Center
82 Button
100, 200, 300, 400, 500 Suitcase
G Ground
R, R1, R2 Arrow

Claims

1. A suitcase including:

a main body adapted to store article therein;
a lid formed at the main body to open and close the main body;
a plurality of annular rotators each surrounding an outer periphery of the main body and rotatably attached to the main body;
a handle fixed to the main body to pull the main body; and
a grounding piece formed at the outer periphery of the main body to keep the main body standing.

2. The suitcase as set forth in claim 1, wherein the main body is cylindrical or polygonal, the rotators being attached to the main body in a circumferential direction of the main body.

3. The suitcase as set forth in claim 2, wherein the lid is formed at at least one of end surfaces situated axially of the main body.

4. The suitcase as set forth in claim 2, wherein the lid is formed at a peripheral surface of the main body.

5. The suitcase as set forth in any one of claims 1 to 4, wherein the lid is attached to the main body through a fastener or a hinge.

6. The suitcase as set forth in any one of claims 1 to 4, wherein the lid is rotatable around a support shaft fixed at the main body in parallel with an axis of the rotators.

7. The suitcase as set forth in any one of claims 1 to 6, wherein the grounding piece projects from the outer periphery of the main body.

8. The suitcase as set forth in any one of claims 1 to 7, wherein the rotators are positioned on the main body such that a space therebetween gradually increases towards a ground.

9. The suitcase as set forth in any one of claims 1 to 8, further including a grip on the main body.

10. The suitcase as set forth in any one of claims 1 to 9, further including splash guards covering therewith the rotators circumferentially around a periphery of the rotators.

FIG. 1

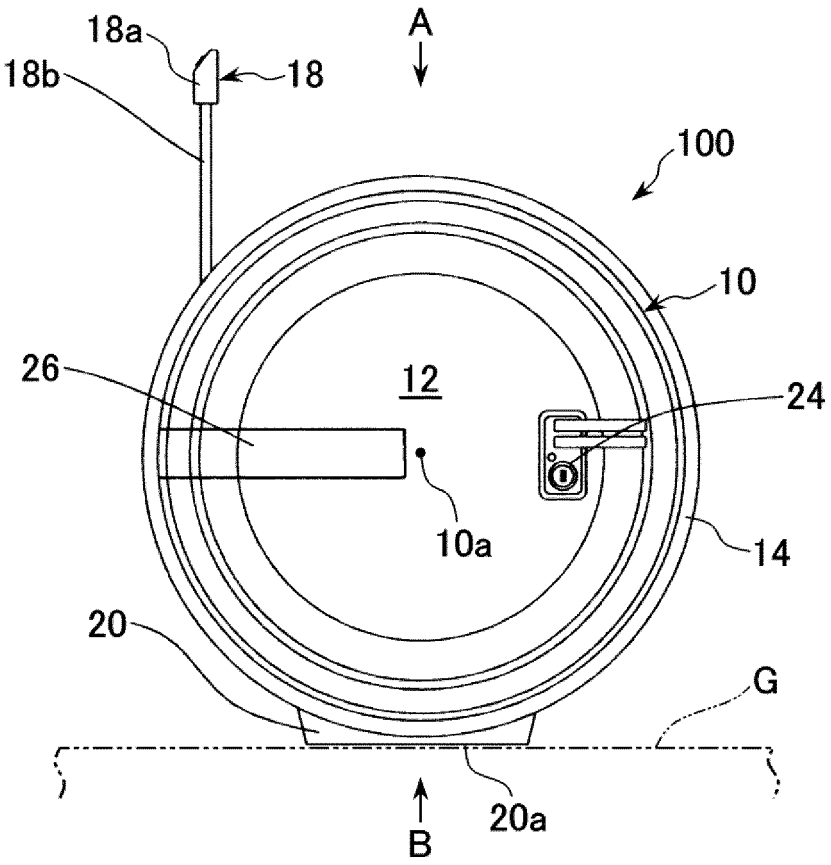


FIG. 2

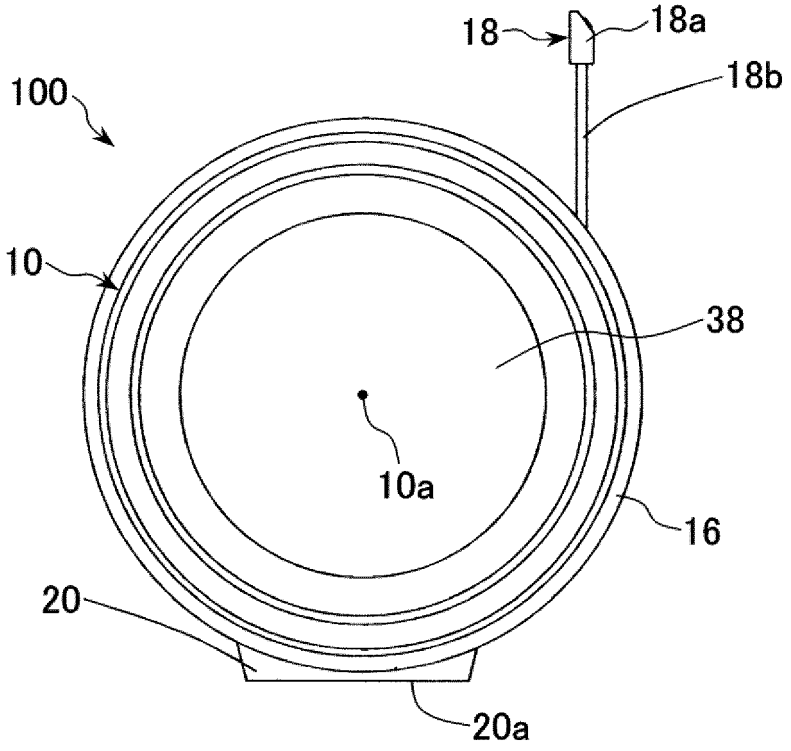


FIG. 3

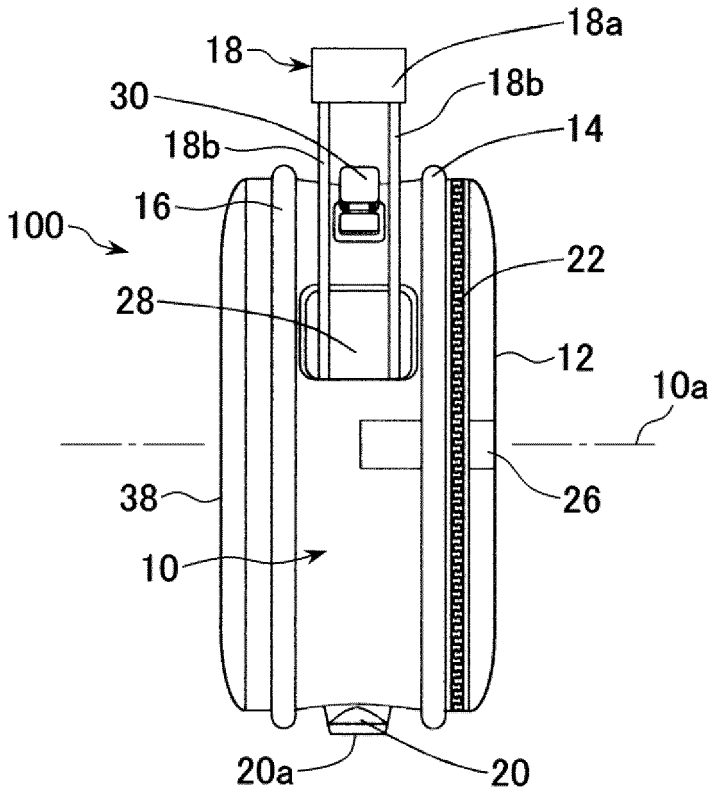


FIG. 4

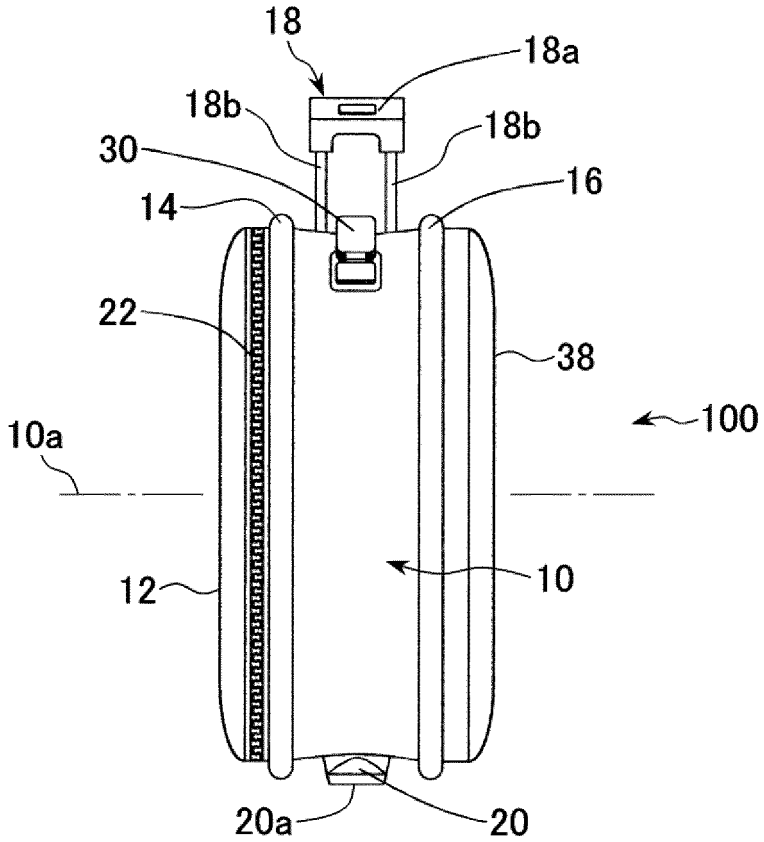
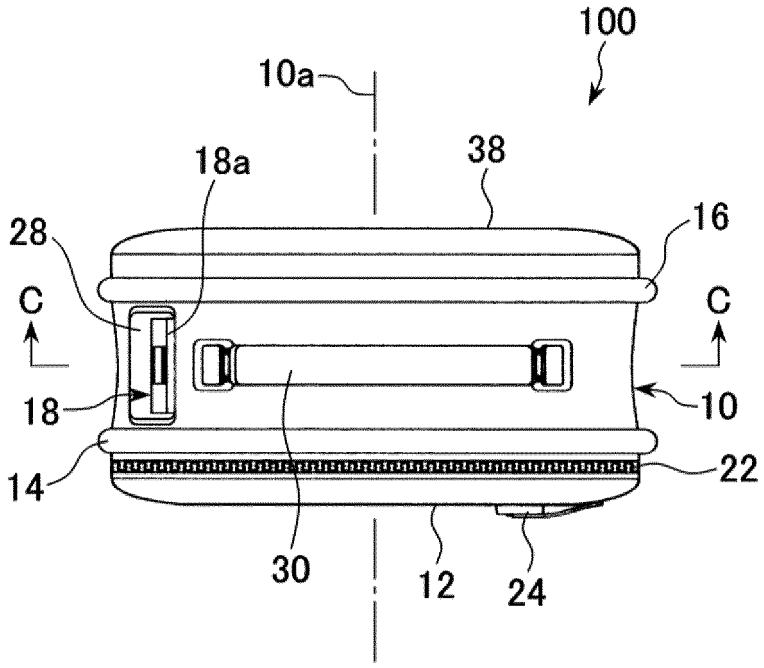


FIG. 5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10a
18a
38
28
16
C
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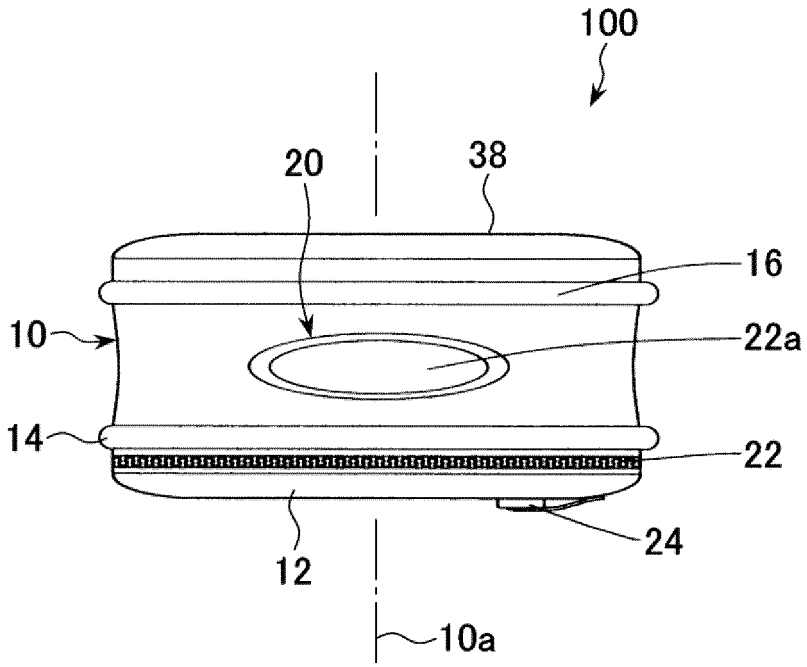
18
10
14
22
30
12
24

FIG. 6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20
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10
22a
14
22
24
12
10a

FIG. 7

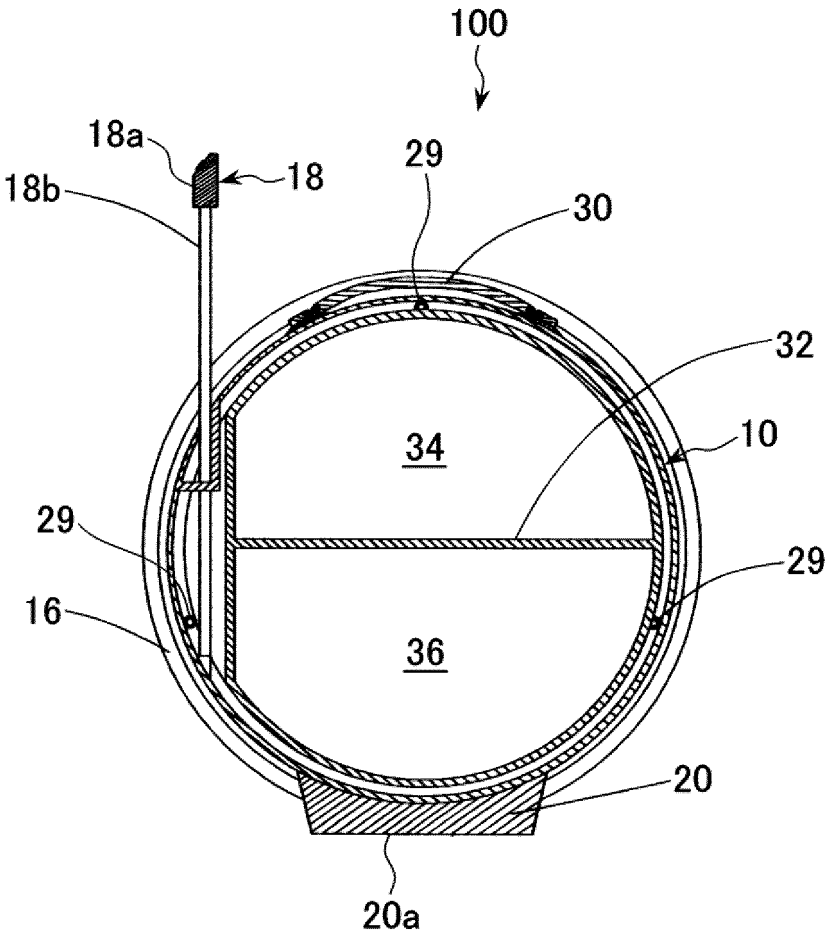


FIG. 8

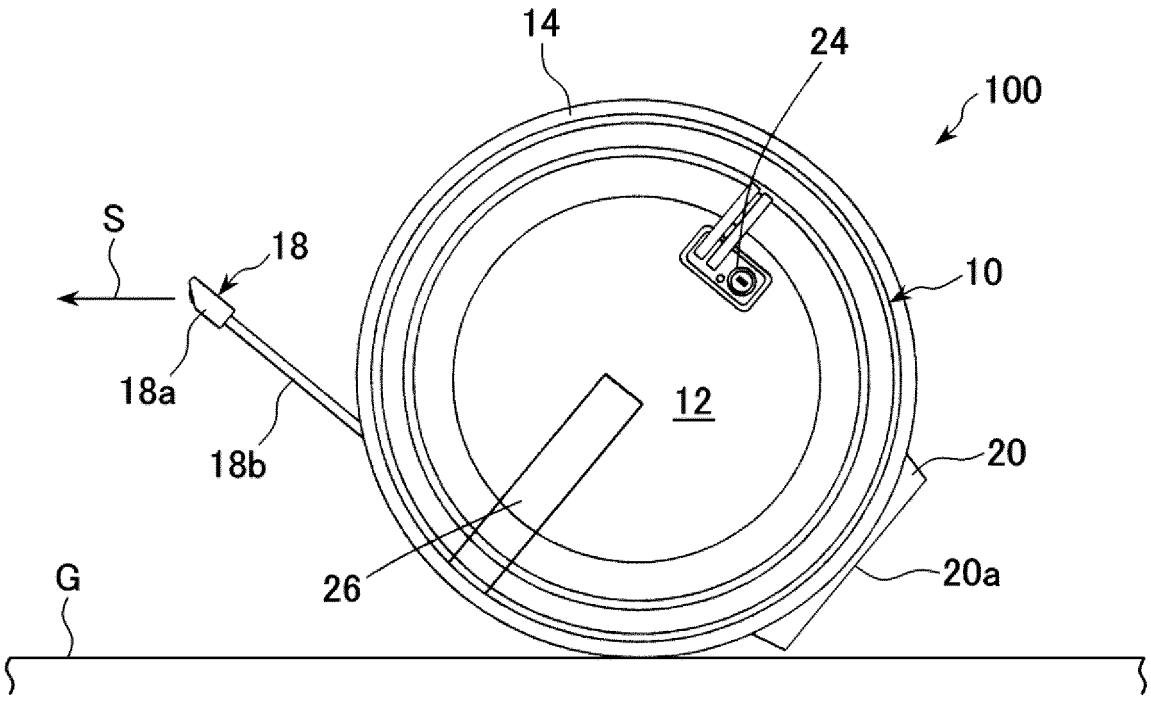


FIG. 9

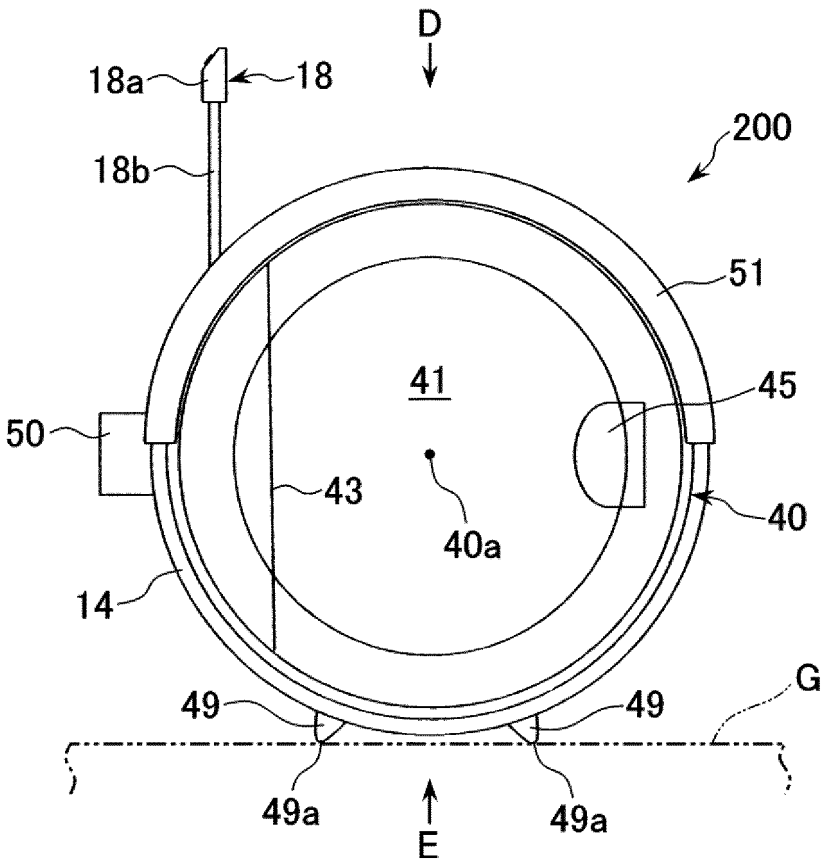


FIG.10

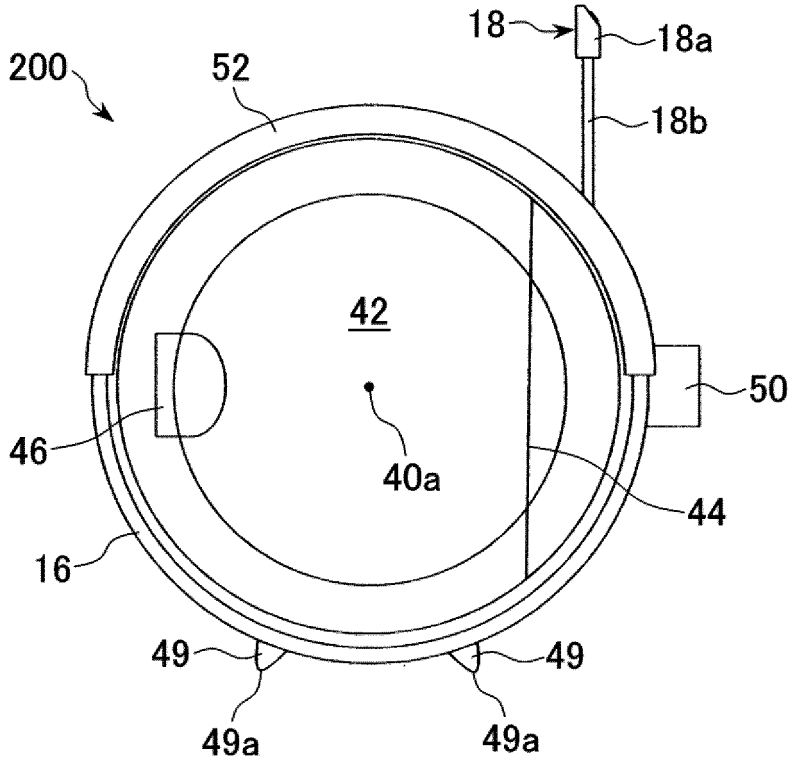


FIG. 11

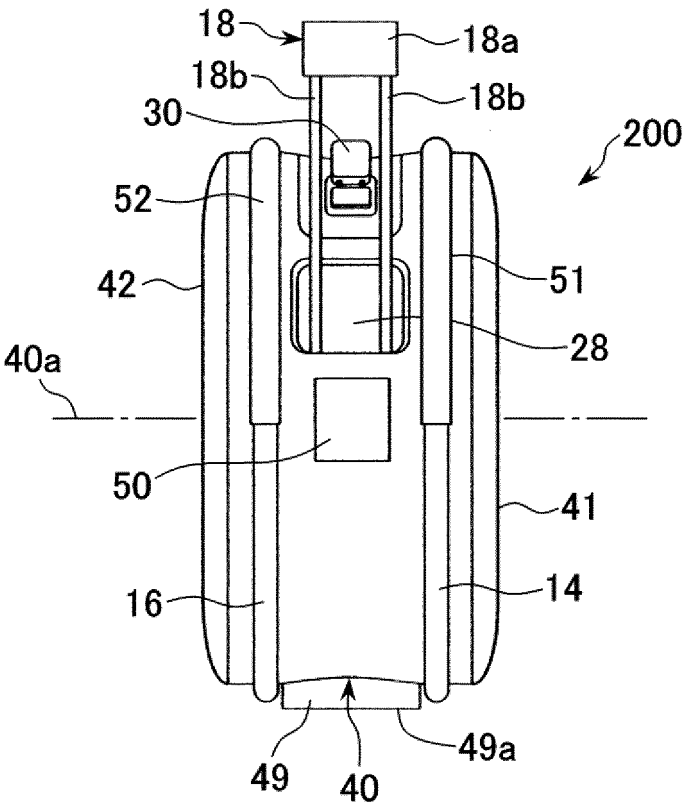


FIG. 12

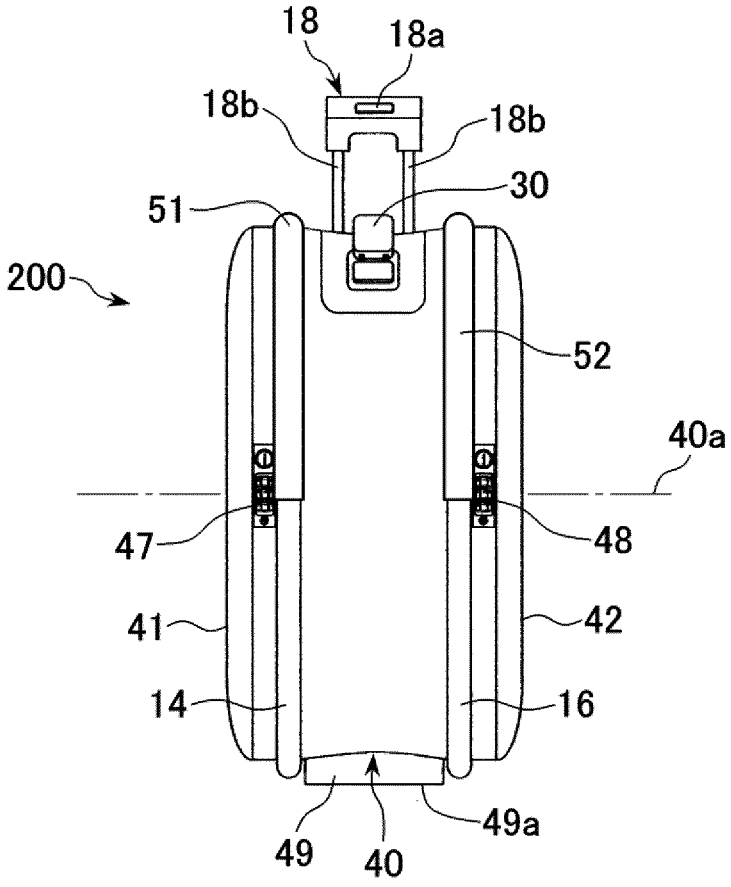
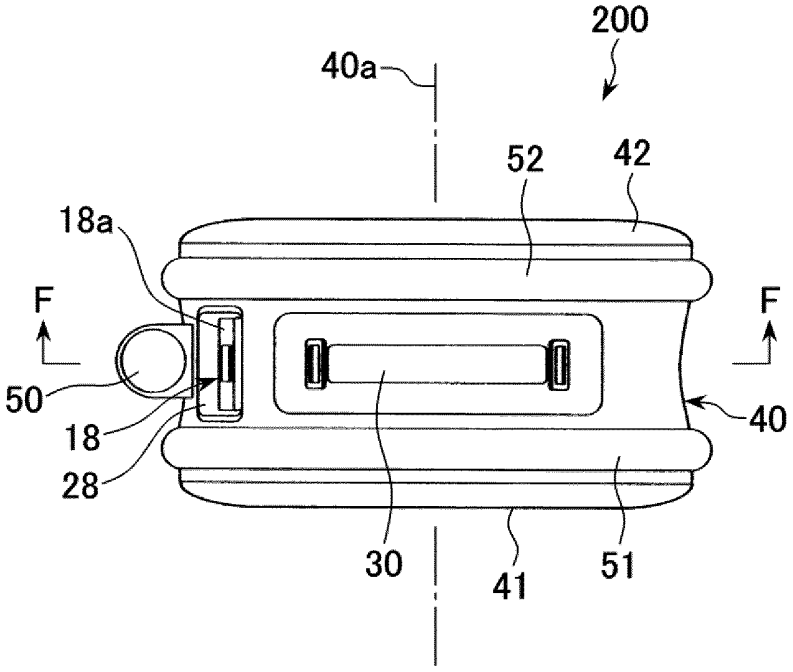


FIG. 13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40a
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F
F
50
18
28
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30
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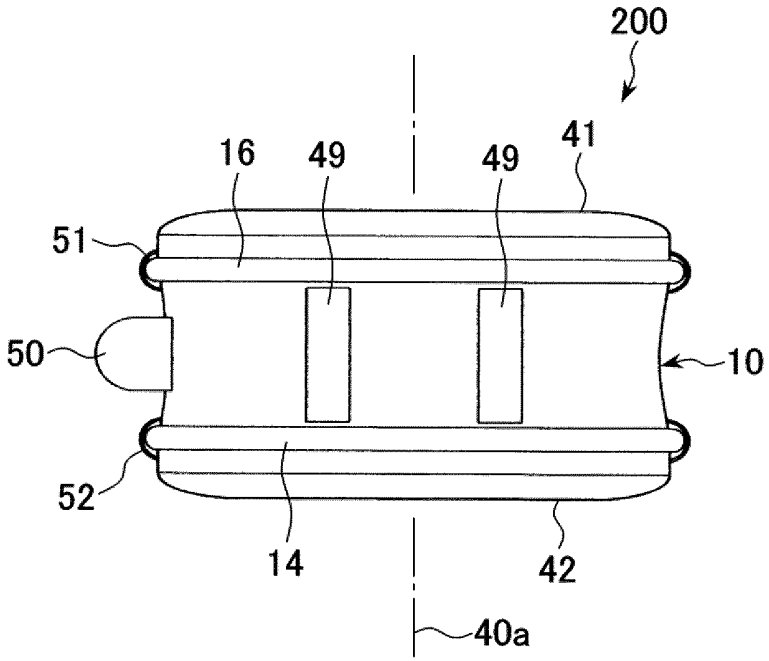
51

FIG. 14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41
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42
40a

FIG. 15

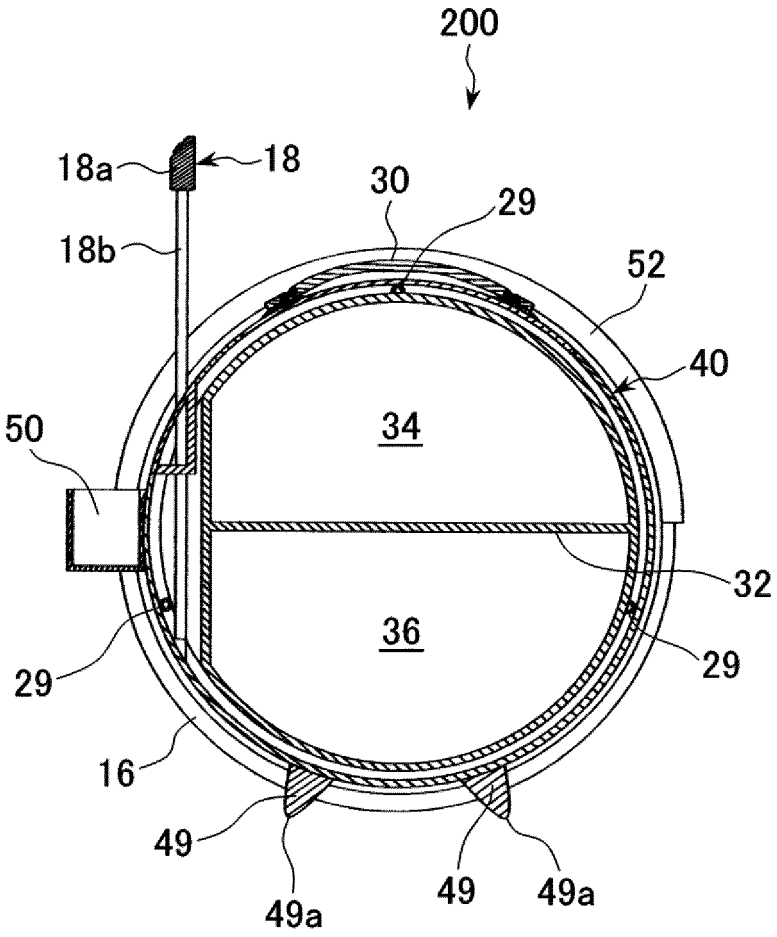


FIG. 16

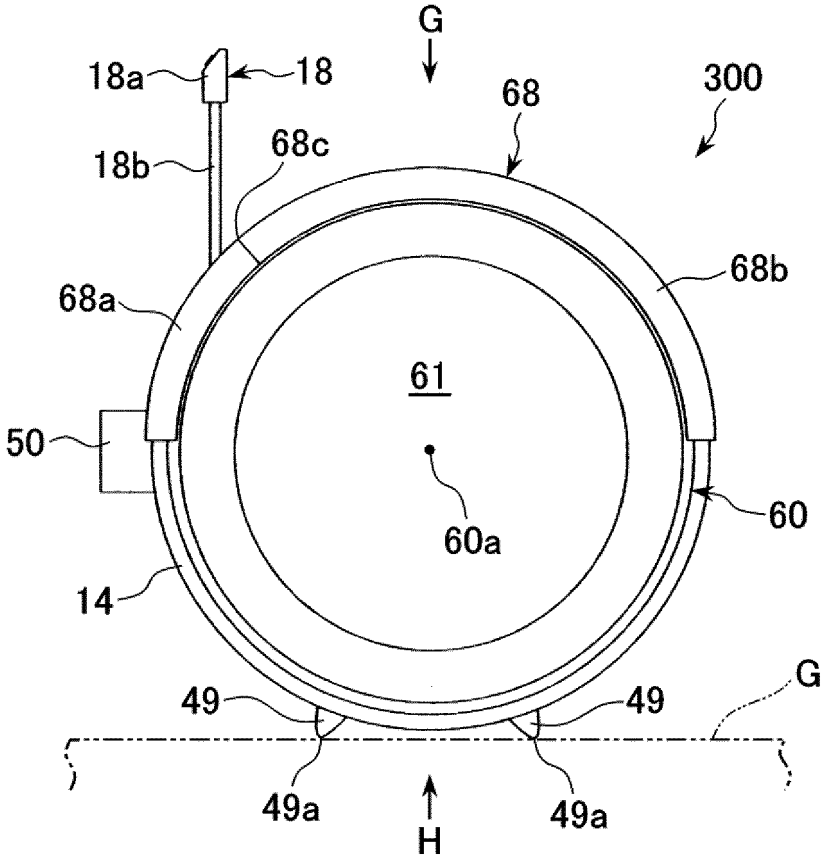


FIG. 17

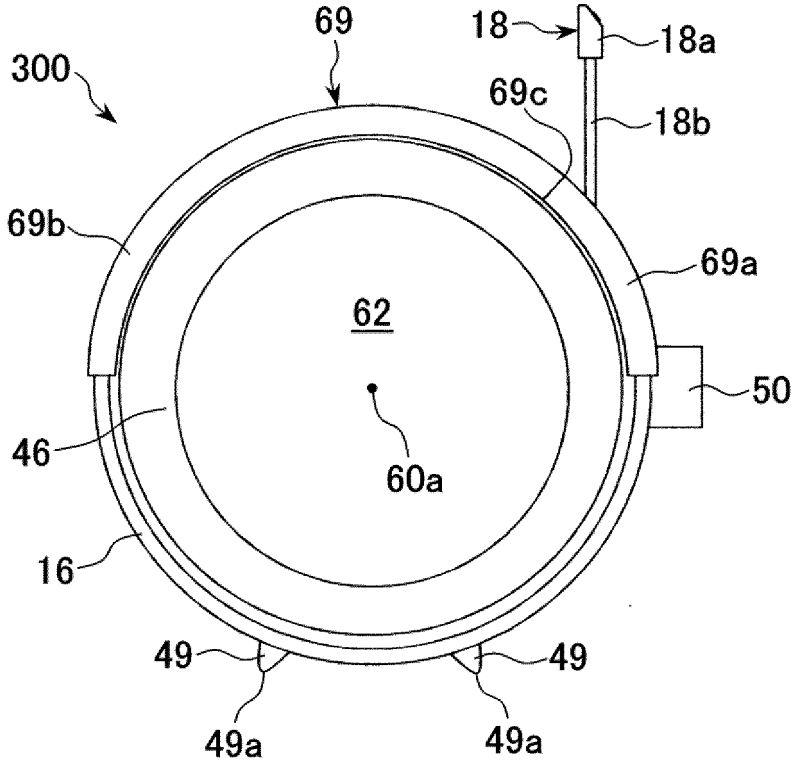
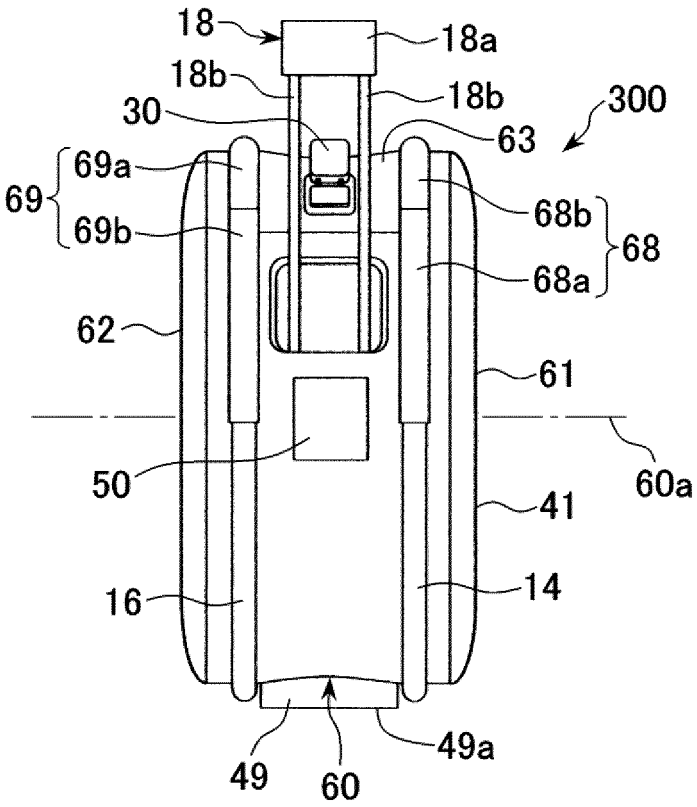


FIG. 18


18
18a
18b
18b
30
300
63
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69a
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68b
68
68a
62
61
50
60a
41
16
14
49
60
49a

FIG. 19

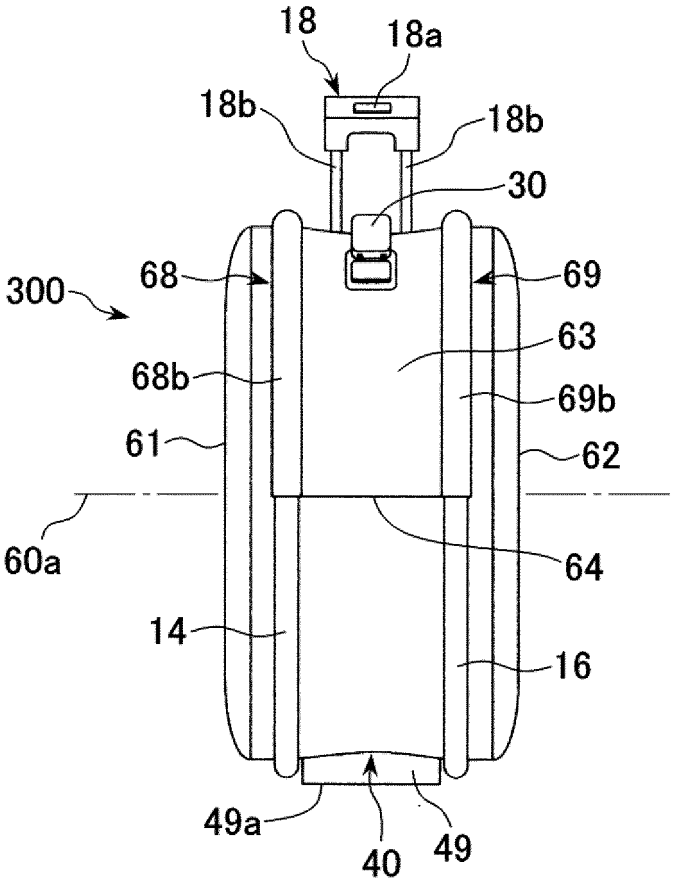
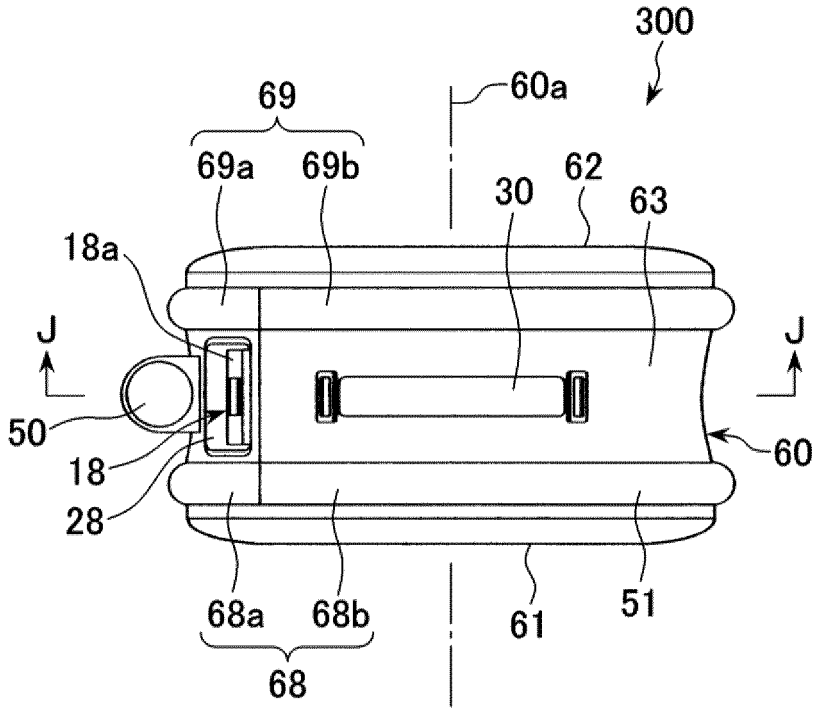


FIG. 20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18a
J
J
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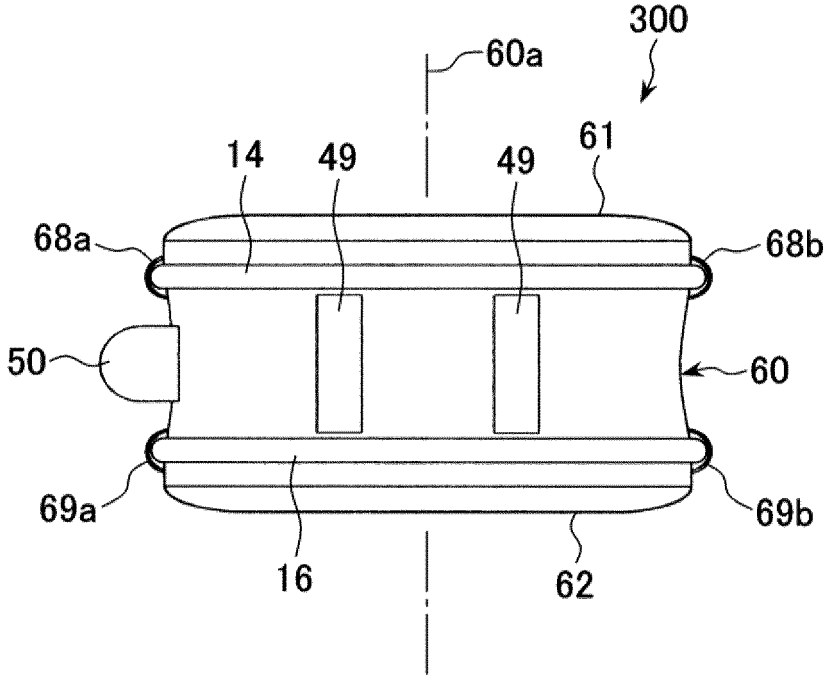
51
68

FIG. 21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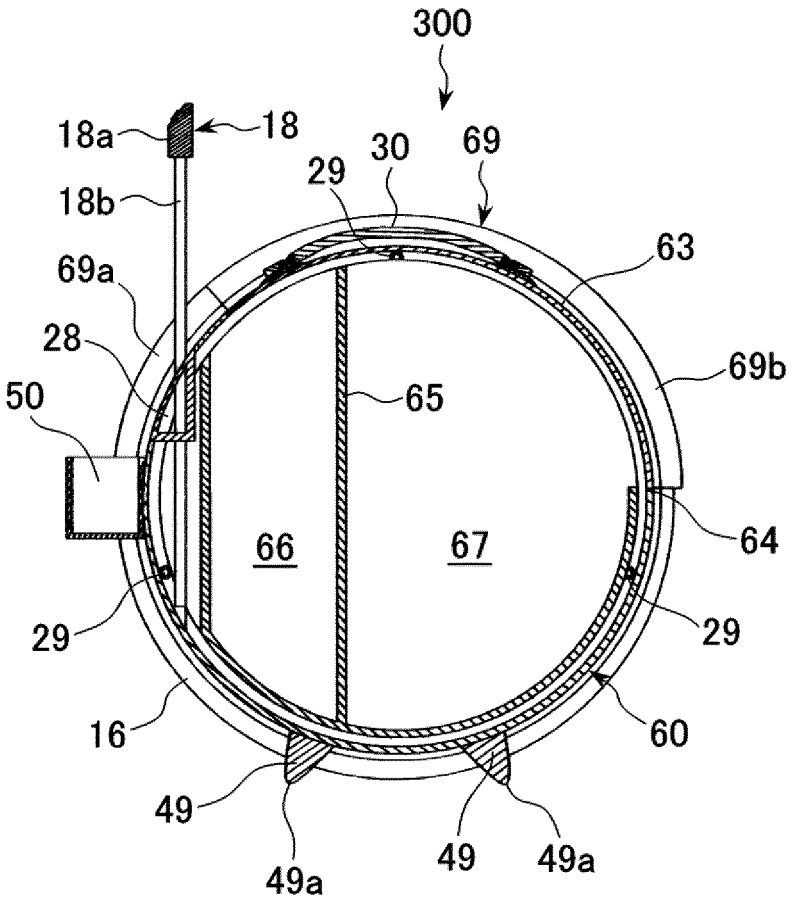
60
69a
69b
16
62

FIG. 22


300
18a
18
30
69
29
18b
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69a
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69b
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66
67
29
29
16
60
49
49a
49
49a

FIG. 23

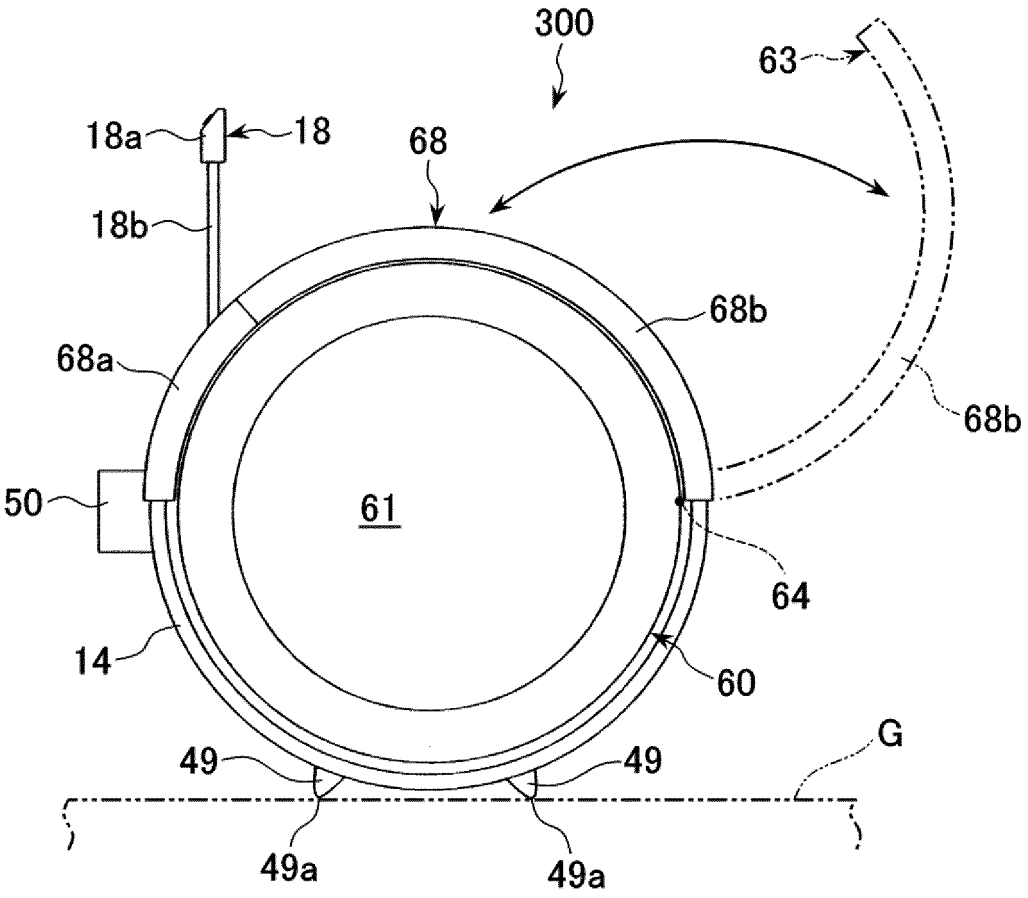


FIG. 24

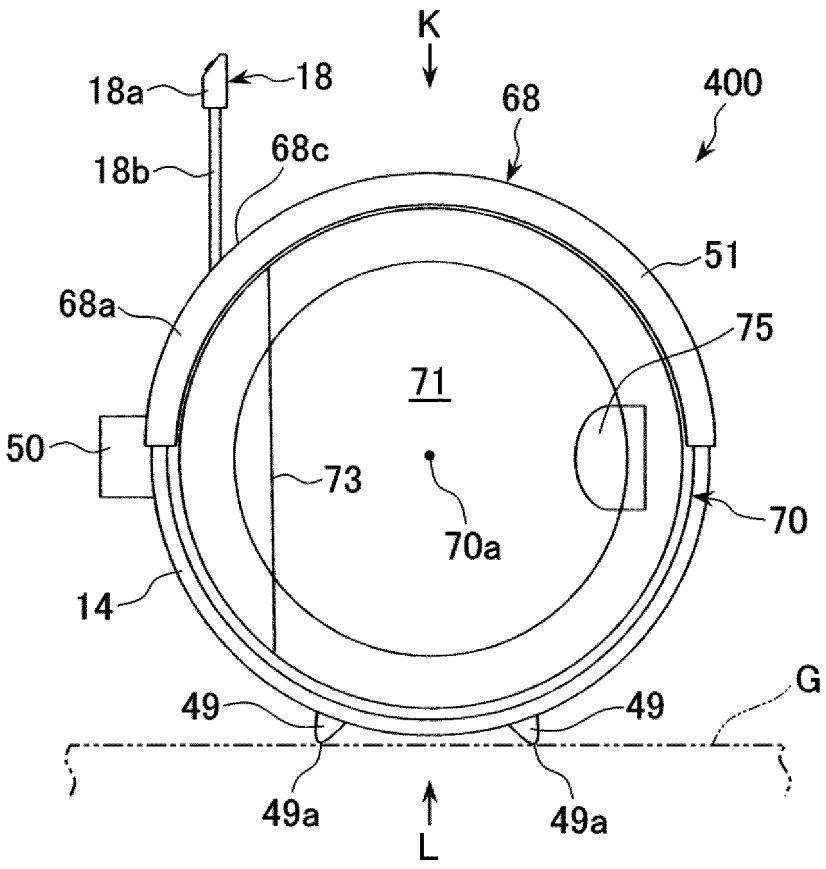


FIG. 25

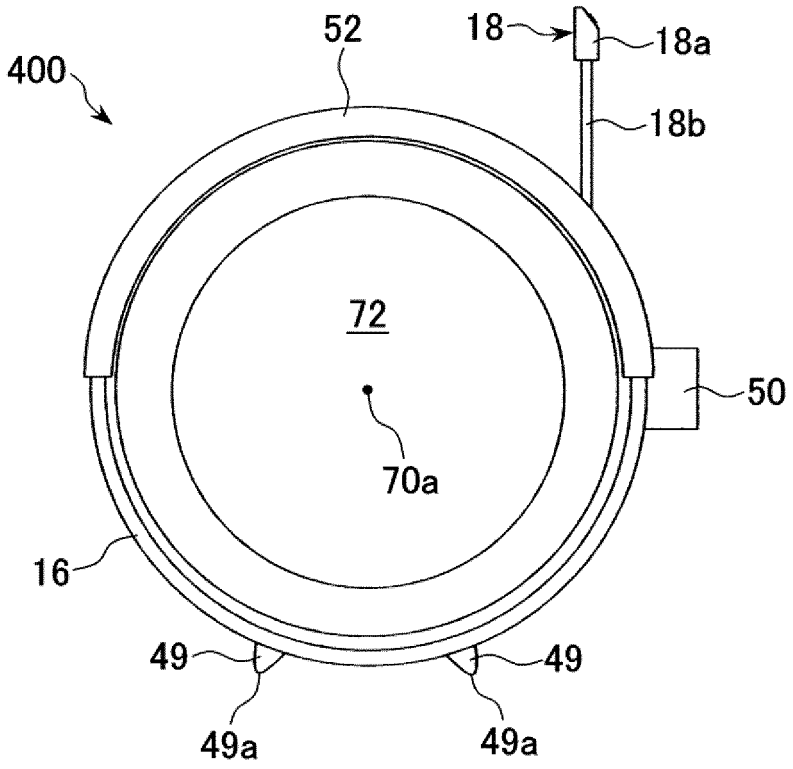


FIG. 26

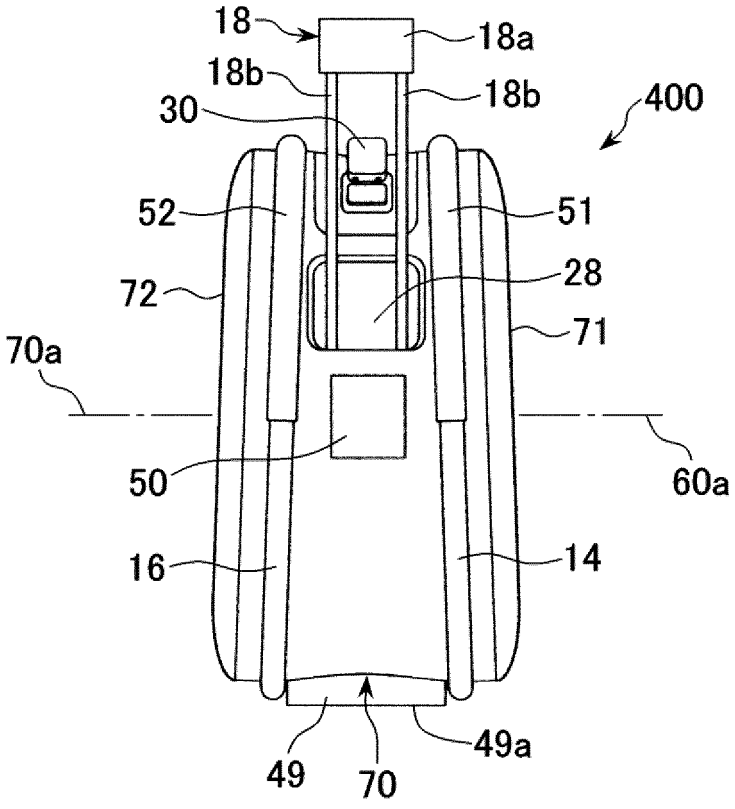


FIG. 27

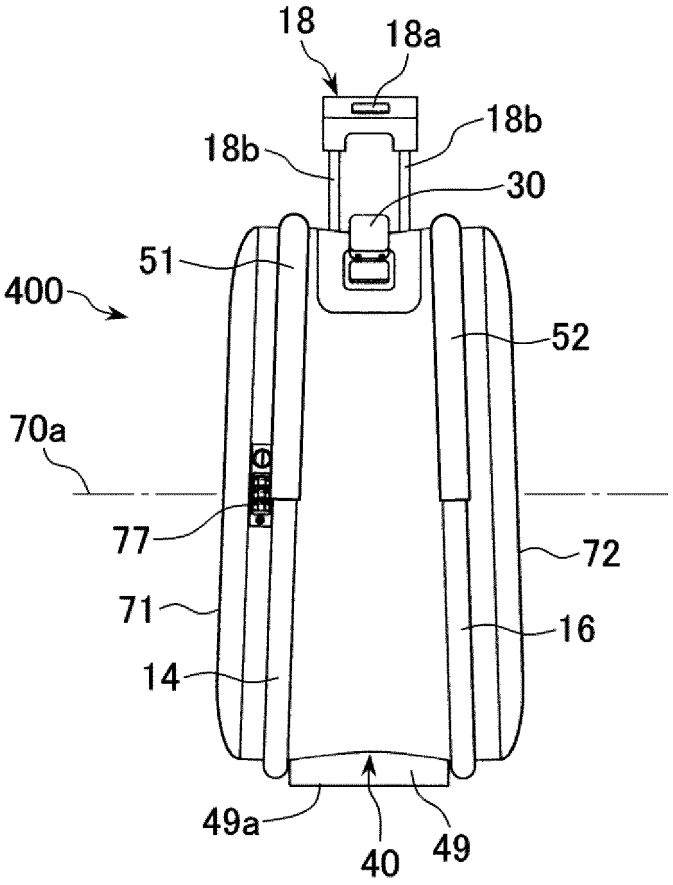
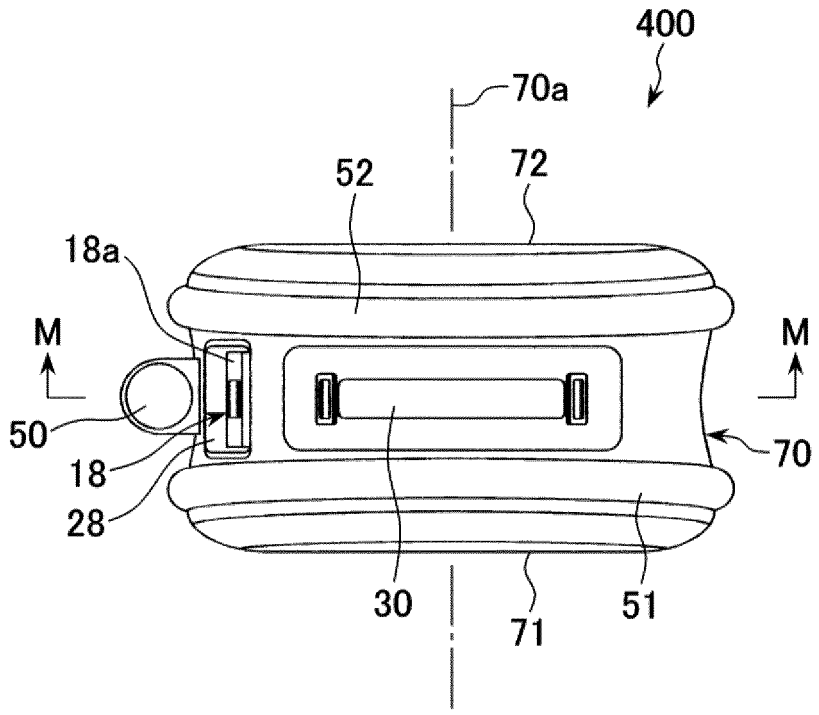


FIG. 28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70a
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18a
M
M
50
18
28
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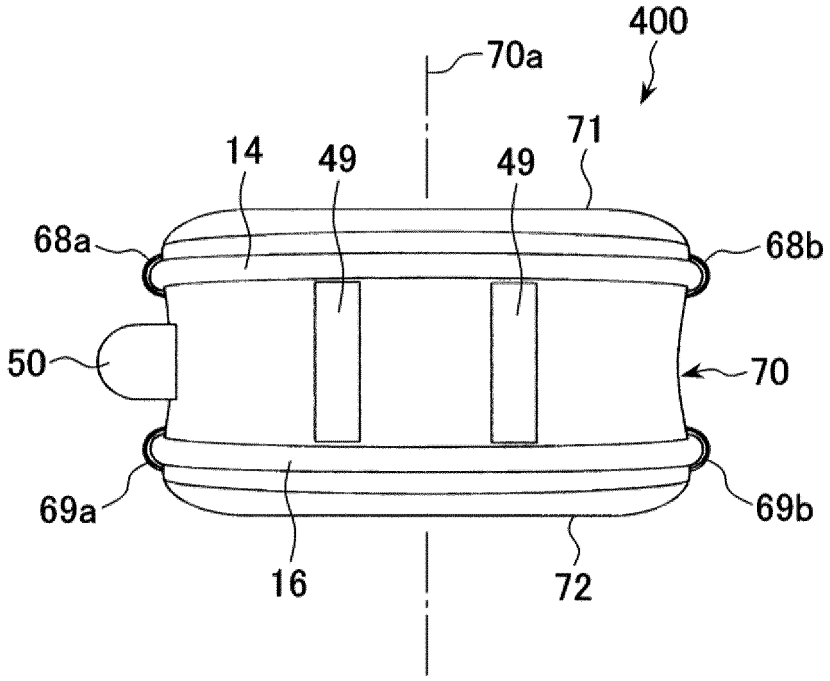
30
71
51

FIG. 29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68a
68b
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70
69a
69b
16
72

FIG. 30

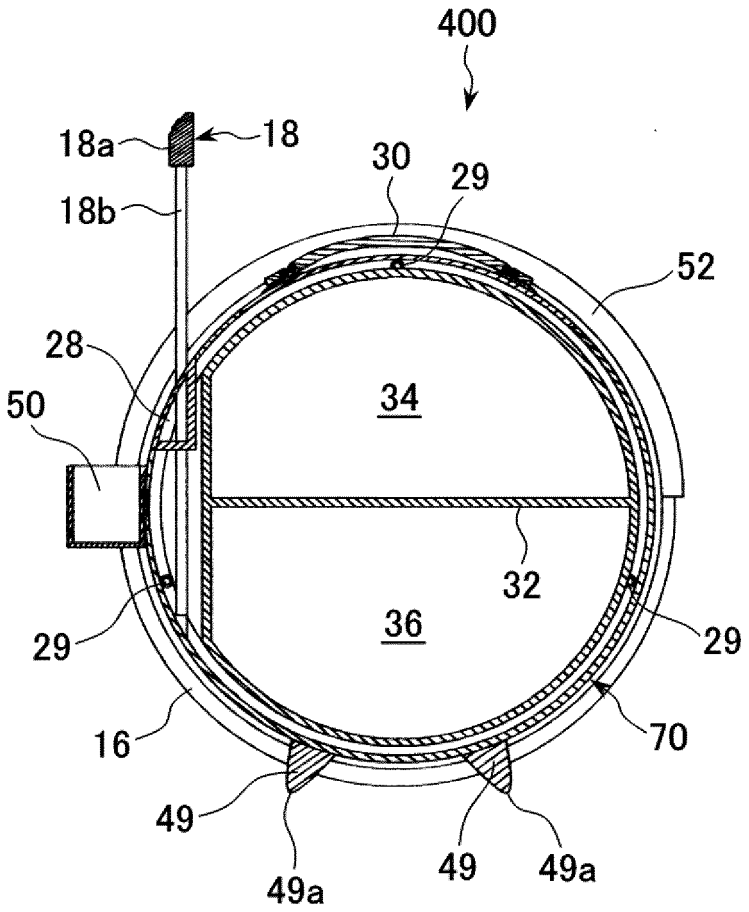


FIG. 31

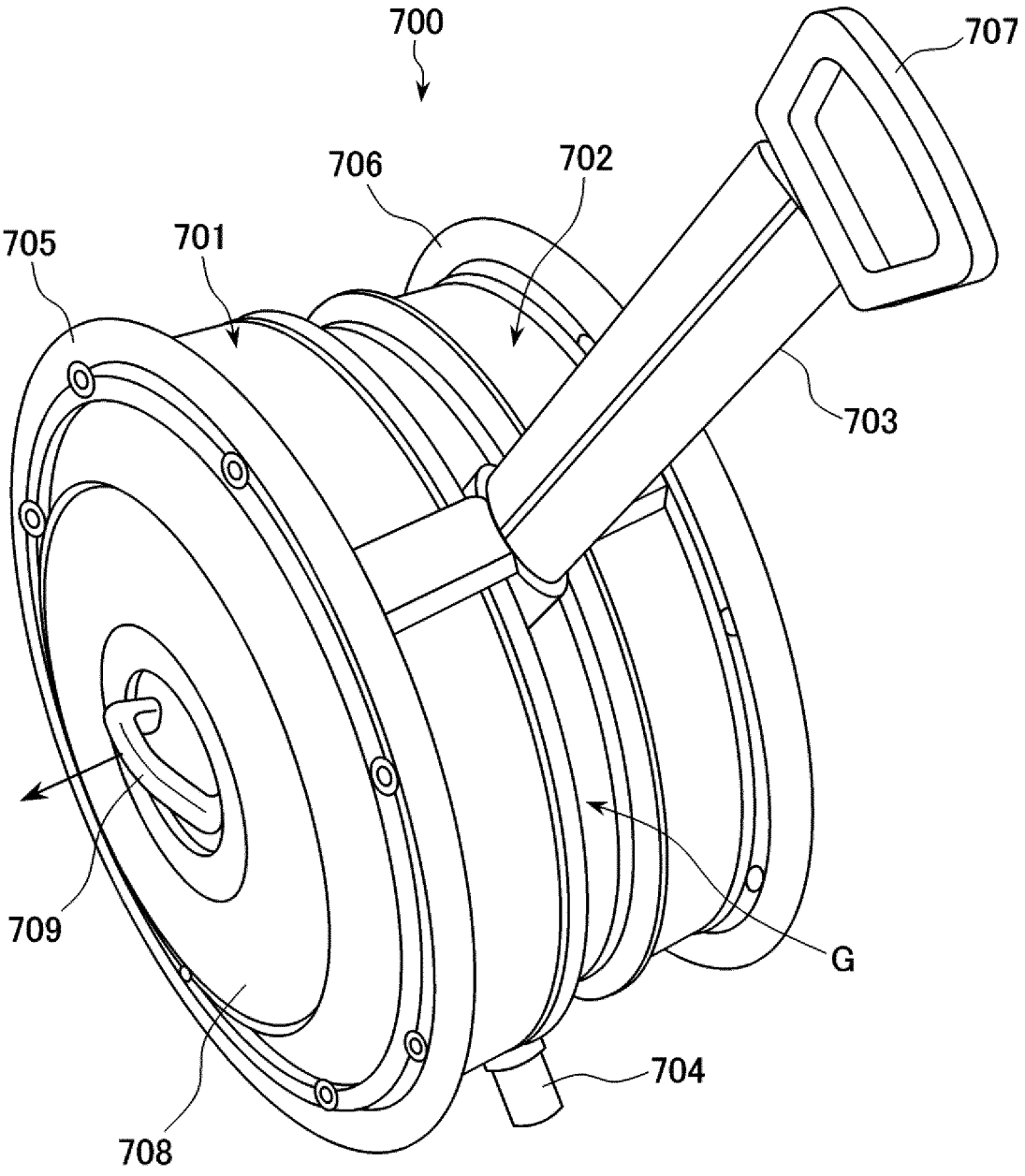


FIG. 32

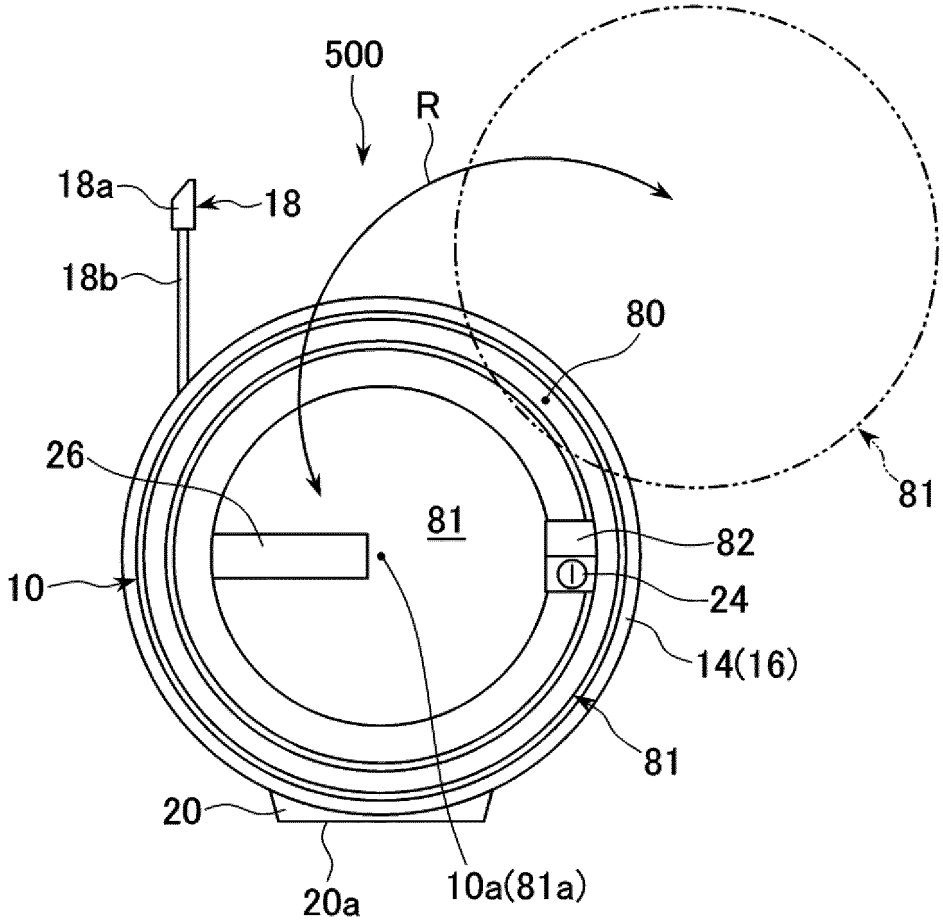
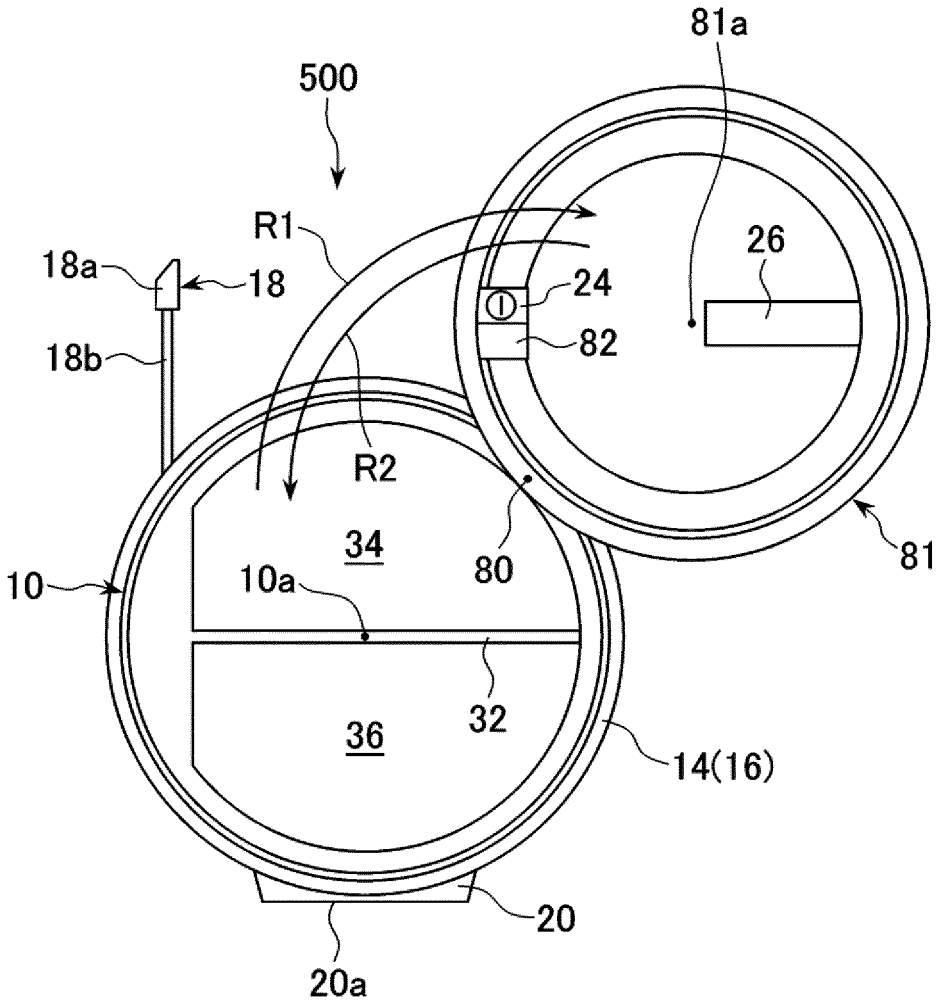


FIG. 33



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/028032

A. CLASSIFICATION OF SUBJECT MATTER
A45C5/14(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)
A45C5/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2017
Kokai Jitsuyo Shinan Koho 1971-2017 Toroku Jitsuyo Shinan Koho 1994-2017

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 4-276209 A (I De A SpA Institute of Development in Automotive Engineering), 01 October 1992 (01.10.1992), paragraphs [0007] to [0015]; fig. 1 to 5 (Family: none)	1-3 4-10
Y A	US 5062653 A (DEGLIS, Janis W.), 05 November 1991 (05.11.1991), column 1, line 55 to column 2, line 4; fig. 1 to 6 (Family: none)	4-10 1-3
Y A	US 4160495 A (CONARD, Donald D.), 10 July 1979 (10.07.1979), column 2, line 67 to column 3, line 49; fig. 1 to 3 (Family: none)	5-10 1-4

☒ 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	Date of mailing of the international search report
30 October 2017 (30.10.17)	14 November 2017 (14.11.17)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/028032

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 3011791 U (Yutaka NAKAYAMA), 06 June 1995 (06.06.1995), paragraphs [0005] to [0009]; fig. 1 to 3 (Family: none)	8-10 1-7
Y A	JP 2013-132355 A (Seiji SHIMIZU), 08 July 2013 (08.07.2013), paragraphs [0017] to [0024]; fig. 1 to 6 (Family: none)	10 1-9

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2010094489 A **[0011]**
- JP 2011177484 A **[0011]**